

Ron Heuer

Senate Energy Committee Testimony

February 9, 2011 -- Madison

Chairman Ott and members of the Committee

My name is Ron Heuer, I reside at E3530 Townline Road, Kewaunee, WI. 54216. Thank you for calling this hearing to listen to citizen testimony.

In October 2009, a representative of Element Power LLC called and asked if I would be interested in hosting a wind turbine on my land. Knowing absolutely nothing about wind turbines, I had him email me information about the planned Element Power LLC, Tisch Mills project that include 111, 2.5 Megawatt, 492 ft. turbines. In January 2010, Element Power called and indicated they were ready to contract. I asked them to email the contract, they said they couldn't, they needed to meet me directly to go over the contract. I invited them to my home.

The Element Power LLC representative came to my home, and introduced me to a 28 page contract. This Representative urged me to sign this contract without receiving legal advice. This contract would give them control of my land for 50 years (here is a copy of that contract). This representative said, "Ron, you might as well sign right now because your neighbors (and he named them) have already signed and you're going to have turbines here whether you like it or not. You might as well make some money from it". I quite honestly felt as though I were with a high pressure timeshare sales guy.

This cover sheet attached to the contract showed I would make Thirteen Thousand Five Hundred and Eighty Dollars a year with just one 2.5 MW turbine, that sounded pretty good.

However, in analyzing the contract I found on page 6, a paragraph 5.7 No Warranty of WTGs which says, I quote, "Tenant has not made and does not make any representations or warranties regarding the likelihood that Tenant will install Facilities on the Premises." Why would Element Power provide a worksheet with the workup of \$13,580 per year and then have the no warranty clause? Simple, the money enticed people to sign, and sign they did! After researching, I confirmed a number of farmers nearby signed these contracts with zero legal advice. Now we have people who want out of these contacts and there is no escape clause. Needless to say, I did not sign!

There needs to be something done to control the sleazy underhanded tactics employed by companies like Element Power LLC. Land leasing transactions like these should be handled by professional licensed Real Estate Personnel. These Wind developers conduct themselves as though their interests supersede all others. They are arrogant and act as though they should be treated with some sort of special status as if they were doing us a favor, even though all the financial benefits of their projects are realized by the developer and all of the adverse consequences and external costs of the project are imposed upon innocent third party land owners and tax payers.

After this incident, I began my own research on the impacts of these monolithic landscape dominant turbine monsters. Who's making all the money? Why are we wasting tax dollars to fund the construction of these turbines when they cannot reliably contribute base-load energy to the grid. Simply stated, this is not a business, it is a SCAM, there wouldn't be a turbine erected in the U.S. or any other country if it weren't for the outrageous subsidies provided Wind Developers by governments.

Within 12 miles of my home are two Nuclear Plants with combined base-load generation capacity of 1700 megawatts. This production is equivalent to about 1,500 2.5 MW wind turbines. Imagine one or two wind turbines on every square mile of both Kewaunee and Manitowoc counties. That is a pretty ugly picture, isn't it? That would draw the tourists, wouldn't it? Why don't we lift the ban on Nuclear in Wisconsin and build more Nuclear facilities. Facilities that provide high-paying, long lasting jobs for the communities that are involved.

Kewaunee County has a history with wind turbines. Wisconsin Electric installed 220 Ft turbines in Lincoln Township and they began operation in 2000. Michael Vickermann, (Executive Director of Renew Wisconsin and a member of the Wind Siting Council), testified there were no problems with the Lincoln Township Turbine farm. No problems? If you don't believe high noise levels, sleep deprivation, shadow flicker, stray voltage, resident health issues, decreased property values or farm animals dying a problem, then Mr. Vickermann was right. However interviews with residents who live in and near this wind farm proved otherwise.

Real Estate values plummeted; two houses were purchased by Wisconsin Electric and bulldozed. Mr. Yunk's home was appraised at \$168K and later sold for \$112K, 33% below appraised value. Another home on County Trunk P recently sold for \$21K after being on the market for \$89,500 that is a 76% decrease in the value of the home. So I would ask Mr. Vickermann and the Wind Developers to be honest. If there are no problems with real estate values, then the Wind Developers should have no issues in providing "Property Value Guarantees".

Think about this for a minute, we experienced these problems in Kewaunee County with the 220 ft Turbines ... in the new projects we are looking at 400 to 500 Ft. Turbines with rotor wide in excess of 300 Ft. with blades weighing over 7 tons rotating at speeds up to 150 mph. These huge industrial turbines emit loud, continuous, repetitive pulsing noise and cast shadows over many acres of land.

Setbacks of 2,600 feet from a property line would have eliminated most if not all these problems. The PSC setback of 1 times the height of a turbine from a property line or 1250 ft. from a home is simply not acceptable. The PSC noise standards 45dba night and 50dba daytime are too high, 5 dB over ambient would be more acceptable. Was PSC Commissioner Azar correct when, at the advice of staff, she suggested a setback of 2200 ft. may mitigate the noise issues?

The Doyle administration had the deck stacked and worked in tandem with the Wind Developers to take away rights at local level by passing Act 40. This Act ultimately needs to be repealed. City and County officials are elected to maintain the quality of life within their areas and to take care of development. That is something that should be kept in their hands and to their discretion.

In closing I implore you to suspend the PSC rules that are scheduled to go into effect. Thank you for your time and consideration.

Element Power LLC Contract Notes: (All Pages mentioned are attached hereto:

There are a lot of issues with these contracts. Here are just a few---

Cover Sheet – *This is the enticement, with the glowing numbers....*

Page 1 – Kewaunee and/or Manitowoc County (each a “County”), State of Illinois

Page 4 – Paragraph 4.4 Tenant has right throughout the Term to terminate Lease all or any part of it. Paragraph 5.1 – Note, Tenant indicates they have rights on “adjacent properties”

Page 5 – Paragraph 5.3 Wind Developer also has rights for Solar Energy on the same property and can sublet the premises to alternate 3rd party.

Page 6 – Paragraph 5.7 No Warranty of WTGs – Tenant does not warrant there will be any turbines installed (kills the pricing incentive)

Page 10 – Paragraph 7.7.4 deals with the compensation of livestock loss from construction, maintenance or operation? If turbines don’t pose a risk to humans, why with operation do they anticipate losses?

Page 21 – Paragraph 16.3 – Removal Security – Real costs for removal of a 496 Ft. turbine is already proven to be in the range of \$350K. The Element Power contract falls woefully short of that number. There is very little salvage value in a turbine. Taking out reinforced concrete out is very expensive. The state of California has a \$120,000,000 unfunded liability for removal of turbines from companies that have gone bankrupt!

Tisch Mills Wind Project, 2015

Confidential and Proprietary Information

**Element Power
Tisch Mills Project Worksheet**

The figures below represent payments made by the Tisch Mills Wind Project. This information is presented only as an example based on some reasonable assumptions. Please note that the annual payment shown in the Operations and Maintenance Term will increase each year at the rate two percent.

1) Development Term (Five years plus optional five-year extension; five-year extension payment is \$5/acre)

Number of acres in project 54 times \$10 per acre \$ 1,000
(\$1,000 minimum)

2) Construction Impact Fee (one time)

Payment will be \$2000/MW of installed capacity.

3) Operations and Maintenance Term (30 years, plus two 10 year extensions)

Number of acres in project:	<u>54</u> times \$20 per acre	<u>\$ 1,080</u>
Number of turbines:	<u>1</u> times \$10,000 per turbine*	<u>\$ 10,000</u>
House: Yes (1) No (0)	<u>1</u> times \$1,000	<u>\$ 1,000</u>
Linear feet of access roads:	<u>1200</u> times \$1.00 per linear foot**	<u>\$ 1,200</u>
Linear feet of underground wires:	<u>1200</u> times \$0.25 per linear foot	<u>\$ 300</u>
	Estimated Annual Payment	<u>\$ 13,580</u>

*Assumes \$4,000 per MW of nameplate capacity and use of a (2.5) MW wind turbine.

The information contained herein is purely an estimation, based on several assumptions, all of which are believed to be reasonable as of the date hereof. When reviewing this information, please be reminded that it is preliminary and is subject to change based on any number of variables that may change or be introduced over time. Such changes may be material and we cannot guarantee that the information contained herein will reflect the actual performance or financial terms of the project if and when it enters operation. This is NOT an offer to purchase or a solicitation of an offer to purchase and any transaction will only be consummated upon execution of negotiated agreements between the parties.

RENEWABLE ENERGY LEASE

This Renewable Energy Lease (this "Lease") is entered into as of _____, 20__ (the "Effective Date") by and between _____ ("Landlord") and ELEMENT POWER WIND DEVELOPMENT, LLC, a Delaware limited liability company ("Tenant").

NOW THEREFORE, for good and valuable consideration including the covenants, terms and conditions of this Lease, Landlord and Tenant agree as follows:

1. BASIC LEASE TERMS.

- 1.1 Premises.** The real property owned by Landlord and located in Kewaunee County and/or Manitowoc County (each a "County"), State of Illinois, as more particularly described in ~~Exhibit A hereto, including all rights, privileges, easements and appurtenances pertaining thereto.~~ The Premises consist of _____ acres. This acreage is an estimate agreed to by Landlord and Tenant, and shall be conclusive for purposes of this Lease, regardless of whether the actual acreage of the Premises may be different.
- 1.2 Project.** The larger, integrated renewable energy project that may be constructed by Tenant on the Premises and on other adjacent or nearby real property.
- 1.3 Phase.** A portion of the Project that is distinguishable from the remainder of the Project because it is constructed and put into operation at approximately the same time. The Project may have one or more Phases. Phases shall be determined by Tenant in its reasonable discretion.
- 1.4 Development Period.** The period commencing on the Effective Date of this Lease and expiring five (5) years thereafter, if not extended or sooner terminated as provided in this Lease. Tenant may, by written notice to Landlord given no earlier than one hundred eighty (180) days before expiration of the Development Period, extend the Development Period for an additional five (5) years.
- 1.5 Operations Period.** The period commencing on the last day of the Development Period and expiring thirty (30) years thereafter, and which may be extended pursuant to Section 4.3.

4.3 Extension Rights. If the term of this Lease has been extended for the Operations Period, and provided that Tenant is not then in default of this Lease, Tenant shall have the right to extend the Operations Period for up to two (2) additional ten (10) year periods by providing written notice thereof to Landlord no later than thirty (30) days before the then-existing expiration date of the Operations Period. As used hereafter, "Term" refers collectively to the Development Period and any Operations Period, including any and all extensions thereof.

4.4 Tenant's Right to Terminate. Tenant shall have the right throughout the Term to terminate this Lease as to all or any part of the Premises upon thirty (30) days prior written notice to Landlord, subject to Tenant's obligation to restore the Premises pursuant to Section 16.2.

5. USE OF PREMISES.

5.1 Tenant's Use. Throughout the Term, Tenant shall have the sole and exclusive rights to use the Premises for wind energy purposes and to convert all of the wind resources of the Premises including, without limitation, all rents, royalties, credits and profits derived from wind energy and the wind resources upon, over and across the Premises. "Wind energy purposes" means: wind resource evaluation (including use of SODAR or LIDAR technology) and determination of the feasibility of wind energy conversion on the Premises or on adjacent lands, including studies of wind speed, wind direction and other meteorological data; wind energy development; conversion of wind energy into electrical energy; collection and transmission of electrical energy converted from wind energy; and any and all other activities related to the foregoing. Without limiting the generality of the foregoing, Tenant's rights hereunder specifically include the right to:

5.1.1 Extract soil samples, perform geotechnical tests, and conduct such other tests, studies, inspections and analysis on the Premises as Tenant deems necessary, useful or appropriate in its sole discretion.

5.1.2 Construct, install, lay down, erect, improve, place, replace, remove, relocate and operate any and all improvements, machinery or equipment that Tenant deems necessary or desirable in connection with the uses described above, including, without limitation, the following (collectively, the "Facilities"): (a) one or more wind turbine energy generators, associated towers, related fixtures, equipment and improvements, including the appurtenant footings, support structures and towers ("WTGs"); (b) underground electrical and communications lines, collection and transmission equipment ("Underground Collection Facilities"); (c) aboveground electrical and communications lines between Tenant's substations and one or more points of interconnection with the existing electricity grid ("Aboveground Collection Facilities"); (d) power conditioning equipment, substations, interconnection facilities, switching facilities, operations and maintenance buildings, transformers, SCADA and telecommunications equipment; and (e) roads, gates, signs, fences, meteorological towers, renewable energy measurement equipment, maintenance yards and other related facilities, machinery, equipment and improvements. Aboveground Collection Facilities are not allowed between individual WTGs and Tenant's substations, except to the extent it would be

commercially unreasonable to install such facilities underground due to topographical or geological conditions of the Premises.

5.1.3 Allow rotor blades of WTGs installed on adjacent land to overhang on the Premises.

5.1.4 Capture, use and convert the unobstructed wind resources over and across the Premises.

5.1.5 Generate electromagnetic, audio, flicker, visual, view, light, noise, vibration, air turbulence, wake, electrical, radio interference, shadow or other effects attributable to the Facilities or any other operational or development activities.

5.1.6 Undertake any other activities, whether accomplished by Tenant or third parties authorized by Tenant, that Tenant reasonably deems necessary, useful or appropriate to accomplish the development and operation of the Facilities, provided that such activities are conducted in a manner consistent with customary industry practices.

5.2 Solar Development. During the Term, Tenant shall have the right to evaluate the solar energy development potential of the Premises. For so long as this Lease is in effect, Landlord may lease the Premises, or a portion thereof, for solar energy purposes to any third party, provided that: (a) the development and operation of a solar energy facility on the Premises does not affect Tenant's development, operation and maintenance of the Project, as reasonably determined by Tenant; and (b) prior to entering into any solar energy lease or similar contract or arrangement with any third party, Landlord shall first offer to lease the subject property to Tenant for solar energy purposes on the same terms and conditions offered by such third party. However, Landlord shall have no obligation to offer to lease the subject property to Tenant for solar energy purposes if at that time Tenant is in default hereunder beyond expiration of any applicable cure period. If Landlord believes it has no obligation to offer to lease due to a default by Tenant, Landlord shall so notify Tenant in writing, and allow Tenant an additional ten (10) business days thereafter to cure the subject default and preserve its right of first refusal to lease the subject property for solar energy purposes. If Tenant fails to accept Landlord's offer to lease the subject property within thirty (30) days after receipt by Tenant of notice thereof, then Landlord shall have the right for one year thereafter to enter into a lease on terms no more favorable to the tenant thereunder than as set forth in Landlord's offer to Tenant pursuant to this Section 5.2. If Landlord does not enter into such a lease within the one year period, any offer shall be submitted again to Tenant as provided above.

5.3 Substations and O&M Buildings. Prior to installation of any substations or operations and maintenance buildings on the Premises as part of the Facilities, Tenant shall, at its option, either: (a) enter into a separate agreement with Landlord to additionally compensate Landlord for the use of the site; or (b) purchase the site from Landlord, in which case the purchase price shall be the fair market per-acre agricultural land value of the site, multiplied by three (3). Any and all costs associated with partitioning the site from the remainder of the Premises shall be borne by Tenant; however, Landlord shall cooperate in such efforts at no out-

hereby granted. Landlord shall reimburse Tenant for the cost to repair any damage to Tenant's roads caused by Landlord or those using the roads with Landlord's permission.

7.7 Crop/Livestock Damage. Tenant shall reimburse Landlord (or, if requested by Landlord, Landlord's agricultural tenants) for each incident of damage to cropland, crops and livestock caused by Tenant's construction, operation and maintenance of Facilities on the Premises as follows:

7.7.1 At \$30 per acre for any land that does not have growing crops and yet has been cultivated for the purpose of growing crops within the prior three (3) growing seasons;

7.7.2 For land with growing crops, an amount equal to the fair market price multiplied by yield multiplied by percentage of damage multiplied by acreage damaged or destroyed. Prices for damaged or destroyed crops shall be based on the average price for that crop in the County during the prior crop year. Yield shall be the average of the previous three (3) seasons' yields according to Landlord's records for the land area that includes the damaged area, provided that the yield shall not exceed the County average yield for the same crop by more than twenty-five percent (25%).

7.7.3 For any land determined to have significant soil compaction directly caused by Tenant's activities on the Premises, an amount equal to quadruple the value calculated under Section 7.7.2 ("**Cropland Compaction Rate**"), except that Tenant shall have the right to decompact such areas before any payments are due, and to complete such decompaction within three (3) months of final construction of the Facilities on the Premises, in which event no amounts shall be payable under this Section 7.7.3.

7.7.4 For livestock, an amount equal to the average market price in the County for each head of livestock lost in the year in which the loss occurred.

7.7.5 The remedies provided in this Section 7.7 shall be the exclusive remedy for damages to cropland, crops or livestock caused by construction, operation and maintenance of Facilities on the Premises. Landlord and Tenant acknowledge that this liquidated remedy is appropriate because of the difficulty and expense of fixing actual, direct damages for such losses. Except as expressly set forth in this Section 7.7, Tenant shall not be responsible to compensate Landlord or its agricultural tenants for soil compaction, its inability to grow crops, raise livestock or otherwise use the Premises as a result of the construction, maintenance or operation of the Facilities on the Premises.

7.7.6 If Landlord and Tenant cannot agree in good faith on yields, prices or the extent of soil compaction for purposes of calculating the payments required under this Section 7.7, the matters shall upon mutual agreement of Landlord and Tenant be referred to an independent crop insurance adjuster for resolution, or if Landlord and Tenant cannot so agree then as provided in Section 14.9.

7.8 Gates and Fences. Tenant shall keep all gates on the Premises closed except when open to permit the passage of vehicular traffic, and shall not permit livestock to stray or

becomes insufficient or unsuitable for Tenant's purposes hereunder, then Tenant shall have the right to terminate this Lease in its entirety.

15.3 Apportionment; Distribution of Award. On any taking covered by Sections 15.1 or 15.2 above, all sums, including damages and interest, awarded shall be paid first to tenant in an amount equal to the aggregate of any costs or losses that Tenant may sustain in the taking, removal and/or relocation of the Facilities; and then to Landlord and/or Tenant consistent with the law of the state in which the Premises are located.

16. EXPIRATION OR TERMINATION.

16.1 Holding Over. This Lease shall terminate without further notice at the date of expiration of the Term. Any holding over by Tenant after expiration shall not constitute a renewal or extension of this Lease or give Tenant any rights in or to the Premises, except as set forth in Section 16.2.

16.2 Restoration of Premises. Upon expiration or termination of the Term, Tenant shall surrender and vacate the Premises within sixty (60) days; provided, however, that Tenant shall have a license to enter onto the Premises for eighteen (18) months following termination to: (a) remove or cause to be removed any and all Facilities from the Premises, except that any Facilities more than three (3) feet below the surface may be left in place, and Tenant shall leave in place any roads it constructed if requested to do so by Landlord and Tenant is not otherwise prohibited from doing so; (b) otherwise restore the Premises to substantially the same condition that existed on the Effective Date, to the extent it is commercially reasonable to do so; (c) reseed any areas that were vegetated prior to disturbance to commercially reasonable standards, in consultation with Landlord; and (d) implement commercially reasonable erosion control devices and procedures. If Tenant does not remove the Facilities and restore the Premises as required by this Section 16.2 within eighteen (18) months after termination, Landlord may do so and Tenant shall reimburse Landlord the reasonable and actual costs incurred by Landlord, less the salvage value of the Facilities, within thirty (30) days of receipt of an invoice from Landlord.

16.3 Removal Security. In the event that: (a) Tenant is not required to post a bond, letter of credit or similar financial assurance for decommissioning Facilities as a condition of approval from any governmental agency with jurisdiction over the Project; or (b) such a condition is imposed, but is then removed and any bond, letter of credit or similar financial assurance is actually released; then Tenant shall, on the fifteenth (15th) anniversary of the first day of the Operations Period or within one hundred and twenty days after release of the bond, letter of credit or similar financial assurance, whichever is later, post a bond, letter of credit or similar financial assurance to secure the cost of decommissioning the Facilities located on the Premises, in form and substance reasonably satisfactory to Landlord (the "Removal Security"). The Removal Security shall be equal to the estimated amount, if any (the "Net Removal Costs"), by which the cost of removing the Facilities exceeds the salvage value of such Facilities, to be determined by Tenant in its reasonable discretion. To the extent that the Net Removal Costs are zero (or negative), the Removal Security shall not be required; provided, however that Tenant shall re-evaluate the need for the Removal Security at least annually after

Written testimony of:

Feb-7-11

Andrew S. Knipp.
1303 Ellis Street
Kewaunee, WI 54216
(920)388-4681

I agree with the goal of renewable energy... but not at the expense of my property values and health.

I would like to have a half mile setback to protect citizens from adverse effects. If wind energy is truly viable government subsidies should not be necessary either. As a businessman myself, I feel these limited liability companies are being established simply to make a profit off of tax dollars and selling it as "green" when in truth they realize wind energy is not viable at this time.

Citizens from around the state came to Madison on October 13, 2010 to attend the Senate Energy Committee Hearings and I implore you to respect the taxpayers you were elected to represent by ensuring the PSC establishes rules that reflect the wishes of those citizens.

Andrew S. Knipp

State of Wisconsin
County of Kewaunee

On this day Andrew S. Knipp personally appeared before me, Fred H. Steffen, to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

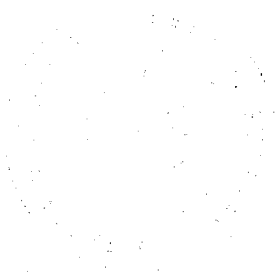
Fred H. Steffen

Notary's Signature

July 28, 2013

Notary's Expiration Date

Notary's Seal



To whom it may concern,

Our home is located in the heart of the W.E. Energies Blue Sky Wind Turbine Farm. We are unhappy living in such close proximity to these towers for these reasons:

1. The noise associated with the turbines interrupts sleep and outdoor activity. We were promised a low decibel and they exceed the level quite often.
2. Shadowing in our home takes place on almost a daily level at 5-6 a.m. Our blinds do not cut out the flickering and we prefer not to have our room darkened by blinds.
3. The red blinking lights at night are not only an eyesore but we have lost our beautiful night sky.
4. We are told Flight to Life helicopters are limited in their ability to land in the area due to the Turbines.
5. The devaluation of our property for resale is substantial because many potential home buyers will not consider a home within the wind farm.
6. People actually moved when they heard wind turbines were going to be constructed in the area.
7. Health issues such as sleep deprivation, seizures and headaches have been linked to the presence of turbines.
8. Traffic has become much heavier and the road quality is less than acceptable in comparison to before the turbines.
9. Sightseers cause danger to residents as they stop on the roads for pictures, etc. causing near miss accidents.
10. Bird population is affected by the turbines. We know this to be true because wind turbines were not allowed to be constructed near an osprey nest on a nearby road.
11. The slow response we have received to resolve TV. and radio reception has been frustrating. We are asked to sign documents, been billed for services and continue to have problems with reception.
12. The movement of the wind farm into our residential and farming community was passed sneakily without input allowed from land owners who did not put up turbines.

For these reasons, from the start we have opposed the construction of wind farms within a residential and farming community such as ours.

Sincerely,

Joe and Carol Bauer
N9204 Oak Road
St. Cloud, WI 53079

Written testimony OF:

Jordan Greco

N3330 Cty B

Kewaunee, WI 54216

(920) 388-2196

IN FAVOR OF SUSPENDING THE WIND SITING RULES

I truly believe if wind energy was a viable source of renewable energy it would not need government subsidies to fund it. Wind energy needs alot more study done on it. I also think wind turbines need to be placed no closer than a half mile from property lines, not buildings. I was also at the senate energy committee hearing in Madison on October 13, 2010.

Please respect the tax payers that elected you to represent us
thank you.

State OF Wisconsin
County OF Kewaunee

Jordan Greco

x Laurel Spitzer
exp: 1-18-2015

To: Joint Legislative Committee on Administrative Rules

Official Position - Town of Holland, Wisconsin

As the official position from the Town of Holland, we urge you to suspend the new PSC State Wind Siting Rules and to direct that setbacks be established at 2640 ft from property lines and noise levels not to exceed 5 db over ambient.

Support of Guidelines

These guidelines were approved and established as part of our Town Ordinance after extensive review of wind turbine information, research and scientific data, and especially recent surveys, case studies, and personal testimonials from people living in Wisconsin wind farm areas of Fond du Lac, Oakfield, Kewaunee, and Brown County. The Ordinance was unanimously approved by the Wind Study Committee, the Town Planning Commission, and the full Holland Town Board.

PSC Rules Disregard People's Property Rights

The latest PSC Rules actually softened the setback requirements, noise limits, and payments to adjoining land owners. The PSC Rules completely ignored the Senate Committee on Utilities and Energy directive and their rules showed a blatant disregard for public testimony from those of us living in areas targeted by wind developers.

PSC Rules Are a Job-Killing Policy and a Death-Blow to Building Development

The present PSC Rules with their limited setback of 1250 ft and 50 db will deal a death blow to the housing industry, real estate property values, and economic development because no one is going to develop land, build businesses or housing within the proximity of 40-story high industrial wind turbines. The government should not mandate the supply or the source of energy uses in homes or businesses, but free market solutions that do not require multimillion dollar taxpayer subsidies should be followed.

Protect Property Rights, Stop Added Wind Energy Taxes, Promote Business Development

Our state needs to stop policies that infringe on the rights of property owners and added taxes coming as a result of present PSC wind turbine rules.

Wind turbines are proven to be an inefficient and expensive source of electricity. The only green coming out of wind turbine development in Wisconsin is the green coming out of the pocketbooks of Wisconsin taxpayers. Any further construction of turbines is not a solid policy that should be pursued by Wisconsin government through PSC mandated rules and regulations. We cannot afford job-killing policies under the guise of "clean green energy" that stifle our economy and infringe on people's property rights.

Confidential and Proprietary Information

**Element Power
Tisch Mills Project Worksheet**

The figures below represent payments made by the Tisch Mills Wind Project. This information is presented only as an example based on some reasonable assumptions. Please note that the annual payment shown in the Operations and Maintenance Term will increase each year at the rate two percent.

1) Development Term (Five years plus optional five-year extension; five-year extension payment is \$5/acre)

Number of acres in project _____ times \$10 per acre \$ _____
(\$1,000 minimum)

2) Construction Impact Fee (one time)

Payment will be \$2000/MW of installed capacity.

3) Operations and Maintenance Term (30 years, plus two 10 year extensions)

Number of acres in project: _____ times \$20 per acre
Number of turbines: _____ times \$10,000 per turbine* \$
House: Yes (1) No (0) _____ times \$1,000 \$
Linear feet of access roads: _____ times \$1.00 per linear foot** \$
Linear feet of underground wires: _____ times \$0.25 per linear foot \$

Estimated Annual Payment

*Assumes \$4,000 per MW of nameplate capacity and use of a (2.5) MW wind turbine.

The information contained herein is purely an estimation, based on several assumptions, all of which are believed to be reasonable as of the date hereof. When reviewing this information, please be reminded that it is preliminary and is subject to change based on any number of variables that may change or be introduced over time. Such changes may be material and we cannot guarantee that the information contained herein will reflect the actual performance or financial terms of the project if and when it enters operation. This is NOT an offer to purchase or a solicitation of an offer to purchase and any transaction will only be consummated upon execution of negotiated agreements between the parties.



elementpower

Element Power
421 SW Sixth Avenue, Suite 1000
Portland, OR 97204
503.416.0800 – Main
503.416.0801 – Fax

Signing Instructions

Thank you for including your property in the Tisch Mills Wind Project. After reviewing the ownership information, your address (page 23 of the Renewable Energy Lease), and legal description (Exhibit A) on the enclosed (1) **Renewable Energy Lease**, (2) **Memorandum of Lease and Right of First Refusal**, and (3) **Agreement for Waiver of Setback Requirements**, please execute as follows:

- Sign both originals of the **Renewable Energy Lease**. This document does not have to be notarized. Element Power will enter the effective date when they execute the documents.
- Sign and have notarized both originals of the **Memorandum of Lease and Right of First Refusal**. Element Power will enter the effective date when they execute the documents.
- Sign and have notarized both originals of the **Agreement for Waiver of Setback Requirements**. Element Power will enter the effective date when they execute the documents.
- Complete and sign **IRS Form W-9**. Your payments must be reported annually on IRS Form 1099.

You will receive your first payment and a set of fully executed documents after Element Power has signed and processed the documents.

If at any time you have any questions or concerns, please contact either land agent Elizabeth Creviston at 704/607-0264 (ecreviston@aol.com), or Mike Arndt, Development Director for the Midwest, at 612/353-4227 (michael.arndt@elpower.com).

Tisch Mills Renewable Energy Lease Summary **An Element Power Project**

Annual Rent during option period

- \$10** per acre for first year
 - \$5** per acre per year for additional years.
- Minimum payment of \$1,000 per year.

Construction Payment

-**\$2,000** per megawatt at commencement of construction for any turbine installed.

Operating Fees (annual)

- \$4,000** per megawatt of turbine's installed capacity.
 - \$1** per linear foot of access road installed.
 - \$.25** per foot for underground collection system.
 - \$20** per acre of land under easement.
 - \$1,000** for each residence on the property under easement.
- Payments to increase annually by 2%.

Crop Damage and Soil Compaction

Element Power will pay 4 years of crop damage for any areas that are deemed to be compacted as a result of its activities, plus pay fair market value for other crops that are damaged as a result of its activities.

Taxes:

Element Power will pay all taxes associated with the windpower facilities. A request will be made to the County to send the facilities' tax bills directly to Element Power.

Insurance:

Element Power will carry all necessary insurance for the project and will indemnify the landowner.

Drainage Tile:

Element Power will repair drainage tile that is damaged as a result of its activities..

THIS INSTRUMENT DRAFTED BY AND
WHEN RECORDED RETURN TO:

Tonkon Torp LLP
1600 Pioneer Tower
888 SW Fifth Avenue
Portland, OR 97204
Attn: David J. Petersen

(Space Above for Recorder's Use Only)

MEMORANDUM OF LEASE AND RIGHT OF FIRST REFUSAL

THIS MEMORANDUM OF LEASE AND RIGHT OF FIRST REFUSAL ("Memorandum") is made and entered into as of _____, 20___, by and between RONALD J. KAKES, A SINGLE PERSON ("Landlord"), and ELEMENT POWER WIND DEVELOPMENT, LLC, a Delaware limited liability company ("Tenant").

1. Lease. For the term and upon the provisions set forth in that Renewable Energy Lease of even date herewith between Landlord and Tenant (the "Lease"), all of which provisions are specifically made a part hereof as though fully and completely set forth herein, Landlord hereby leases to Tenant, and Tenant hereby leases from Landlord for wind energy purposes, that certain real property (the "Premises") located in Manitowoc County, Wisconsin, as more particularly described in Exhibit "A" attached hereto, together with all rights of ingress and egress and all other rights appurtenant to the Premises, as more particularly described in the Lease.
2. Term. The term of the Lease shall expire five (5) years from the date of this Memorandum unless sooner terminated or extended pursuant to the terms of the Lease, and provided that the term of the Lease may be extended by Tenant for up to fifty (50) additional years.
3. Right of First Refusal. As set forth in greater detail in the Lease, Tenant also holds a right of first refusal for the term of the Lease to lease the Premises, or a portion thereof, for solar energy purposes.
4. Notice. This Memorandum is prepared for the purpose of giving notice of the Lease and in no way modifies the express provisions of the Lease. This Memorandum shall continue to constitute notice of the Lease, even if the Lease is subsequently amended.
5. Successors and Assigns. The covenants, conditions and restrictions contained in the Lease shall run with the land and be binding on the successors and assigns of both Landlord and Tenant.

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

Tonkon Torp LLP
1600 Pioneer Tower
888 SW Fifth Avenue
Portland, OR 97204
Attn: David J. Petersen

AGREEMENT FOR WAIVER OF SETBACK REQUIREMENTS

THIS AGREEMENT FOR WAIVER OF SETBACK REQUIREMENTS (this "Waiver") is made as of _____, 20__ by and among _____ ("Grantor") and ELEMENT POWER WIND DEVELOPMENT, LLC, a Delaware limited liability company ("Grantee").

Grantor is the sole owner in fee of certain real property located in Manitowoc County, Wisconsin (the "County"), as more particularly described in Exhibit A attached hereto ("Grantor Property"). Grantor leases the Grantor Property to Grantee pursuant to a Renewable Energy Lease between Grantor and Grantee dated _____, 20__ (the "Wind Lease") for the purpose of installing, constructing, maintaining, and operating a wind energy generation facility thereon (the "Project").

Grantor acknowledges that the Project may involve the installation of Facilities (as defined in the Wind Lease) on the Grantor Property, or on adjacent property, closer to the boundary line between the Grantor Property and the adjacent property than is permitted pursuant to any applicable law, ordinance, regulation or permit establishing minimum setbacks (collectively, "Setback Regulations").

Now, therefore, Grantor and Grantee hereby agree as follows:

1. Waiver of Setbacks by Grantor. To the extent that Grantee or any transferee or affiliate of Grantee has installed or constructed or desires to install or construct any Facilities on the Grantor Property or on adjacent property closer to the common boundary between the Grantor Property and the adjacent property than is permitted by a Setback Regulation, then Grantor hereby waives any and all setbacks and setback requirements, whether imposed by law or by any person or entity, including, without limitation, any setback requirements described in the zoning ordinance of the County, or in any governmental entitlement or permit heretofore or hereafter issued to Grantee or such transferee or affiliate. This waiver is for the benefit of Grantee, any transferee or affiliate of Grantee, and the owner(s) of the adjacent property.

2. Covenant Against Habitable Structures. Grantor covenants that no structures designed primarily for human habitation or occupancy (such as dwellings, offices, stores and places of work) shall be constructed on the Grantor Property within the circular area

around any WTG (as defined in the Wind Lease) constructed on the Grantor Property or on adjacent property, where the radius of the circle, measured from the center of the WTG tower, is equal to the vertical height of the WTG from the ground to the tip of the blade when the blade is parallel to the WTG tower and pointed upward.

3. Binding Effect. This Waiver shall run with the Grantor Property and shall bind the successors and assigns of Grantor. This Waiver shall survive expiration of the Wind Lease and shall not expire until no Facilities exist on real property adjacent to the Grantor Property as part of the Project.

4. Authority. Grantor (or the individual executing and delivering this Waiver on behalf of Grantor, if applicable) represents and warrants that he/she is duly authorized and empowered to do so.

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RENEWABLE ENERGY LEASE

This Renewable Energy Lease (this "**Lease**") is entered into as of _____, 20____ (the "**Effective Date**") by and between _____ ("**Landlord**") and ELEMENT POWER WIND DEVELOPMENT, LLC, a Delaware limited liability company ("**Tenant**").

NOW THEREFORE, for good and valuable consideration including the covenants, terms and conditions of this Lease, Landlord and Tenant agree as follows:

1. **BASIC LEASE TERMS.**

1.1 **Premises.**

The real property owned by Landlord and located in Kewaunee County and/or Manitowoc County (each a "**County**"), State of Illinois, as more particularly described in Exhibit A hereto, including all rights, privileges, easements and appurtenances pertaining thereto. The Premises consist of _____ acres. This acreage is an estimate agreed to by Landlord and Tenant, and shall be conclusive for purposes of this Lease, regardless of whether the actual acreage of the Premises may be different.

1.2 **Project.**

The larger, integrated renewable energy project that may be constructed by Tenant on the Premises and on other adjacent or nearby real property.

1.3 **Phase.**

A portion of the Project that is distinguishable from the remainder of the Project because it is constructed and put into operation at approximately the same time. The Project may have one or more Phases. Phases shall be determined by Tenant in its reasonable discretion.

1.4 **Development Period.**

The period commencing on the Effective Date of this Lease and expiring five (5) years thereafter, if not extended or sooner terminated as provided in this Lease. Tenant may, by written notice to Landlord given no earlier than one hundred eighty (180) days before expiration of the Development Period, extend the Development Period for an additional five (5) years.

1.5 **Operations Period.**

The period commencing on the last day of the Development Period and expiring thirty (30) years thereafter, and which may be extended pursuant to Section 4.3.

- 1.6 Commercial Operations Date.** With respect to any Phase, the date that WTGs representing at least ninety-five percent (95%) of the installed capacity of that Phase are authorized and able to continuously and reliably generate and deliver energy. Tenant shall notify Landlord in writing of the Commercial Operations Date for any Phase that includes the Premises no later than 60 days after it occurs.
- 1.7 Development Rent.** For the first year of the Development Period, an annual payment of \$10 per acre. For all subsequent years of the Development Period, an annual payment of \$5 per acre. However, no annual Development Period payment shall be less than \$1,000.
- 1.8 Construction Impact Fee.** A one-time payment of \$2,000 per megawatt ("MW") of rated nameplate capacity of any WTGs installed on the Premises by Tenant, prorated for any partial MW.
- 1.9 Operating Rent.** An annual payment during the Operations Period consisting of the following components:
1. *WTG Payment.* Four Thousand Dollars (\$4,000) for each MW of installed nameplate capacity for each WTG installed on the Premises.
 2. *Road Payment.* One Dollar (\$1) per lineal foot of new roads constructed on the Premises by Tenant.
 3. *Underground Facilities Payment.* Twenty-Five Cents (\$0.25) per lineal foot of underground electrical or communication transmission lines installed on the Premises.
 4. *Aboveground Facilities Payment.* One Thousand Dollars (\$1,000) for each transmission structure supporting aboveground electrical or communication transmission lines installed on the Premises.
 5. *Acreage Payment.* Twenty Dollars (\$20) per acre of the Premises subject to this Lease.
 6. *Met Tower Payment.* One Thousand Dollars (\$1,000) per year for each temporary meteorological tower and Five Thousand Dollars (\$5,000) per year for each permanent meteorological tower installed on the Premises.
 7. *Occupied Residence Payment.* One Thousand Dollars (\$1,000) per year for each residence on the Premises occupied during the year for which Operating Rent is being paid. This Occupied Residence Payment shall only apply to

those residences continually occupied from the Effective Date through the date of payment of Operating Rent.

All components of Operating Rent shall be subject to adjustment pursuant to Section 6.8.

1.10 Default Rate.

The Prime Rate as most recently published by the Wall Street Journal at the time the Default Rate is applied.

1.11 Inflation Adjustment Factor.

Two percent (2.0%).

2. OTHER DEFINITIONS.

In addition to the terms defined in Section 1, the following capitalized terms have the meanings given in this Lease:

Aboveground Collection Facilities – see Section 5.1.2	Lease – see opening paragraph
Claims – see Section 8.8	Liens – see Section 7.1
Confidential Information – see Section 17.1	Mortgage – see Section 11.1
County – see Section 1.1	Mortgagee - see Section 11.1
Cropland Compaction Rate – see Section 7.7.3	MW – see Section 1.8
CRP – see Section 6.7	Net Removal Costs – see Section 16.3
Development Rights – see Section 17.17	Public Official – see Section 17.17
Effective Date – see opening paragraph	Removal Security – see Section 16.3
Event of Force Majeure – see Section 13.1	Tenant – see opening paragraph
Facilities – see Section 5.1.2	Term – see Section 4.3
Hazardous Materials – see Section 8.5.3	Transferee – see Section 10.1
Landlord – see opening paragraph	WTGs – see Section 5.1.2
Laws – see Section 5.5	Underground Collection Facilities – see Section 5.1.2

3. LEASING CLAUSE.

Landlord leases the Premises to Tenant, and Tenant leases the Premises from Landlord, on the terms and conditions of this Lease.

4. TERM.

4.1 Development Period. The initial term of this Lease shall be for the Development Period specified in Section 1.4.

4.2 Operations Period. If, at any time during the Development Period, the Commercial Operations Date for a Phase that includes the Premises occurs, then the Development Period of this Lease shall end and the term of this Lease automatically shall be extended for the Operations Period specified in Section 1.5.

4.3 Extension Rights. If the term of this Lease has been extended for the Operations Period, and provided that Tenant is not then in default of this Lease, Tenant shall have the right to extend the Operations Period for up to two (2) additional ten (10) year periods by providing written notice thereof to Landlord no later than thirty (30) days before the then-existing expiration date of the Operations Period. As used hereafter, "**Term**" refers collectively to the Development Period and any Operations Period, including any and all extensions thereof.

4.4 Tenant's Right to Terminate. Tenant shall have the right throughout the Term to terminate this Lease as to all or any part of the Premises upon thirty (30) days prior written notice to Landlord, subject to Tenant's obligation to restore the Premises pursuant to Section 16.2.

5. USE OF PREMISES.

5.1 Tenant's Use. Throughout the Term, Tenant shall have the sole and exclusive rights to use the Premises for wind energy purposes and to convert all of the wind resources of the Premises including, without limitation, all rents, royalties, credits and profits derived from wind energy and the wind resources upon, over and across the Premises. "Wind energy purposes" means: wind resource evaluation (including use of SODAR or LIDAR technology) and determination of the feasibility of wind energy conversion on the Premises or on adjacent lands, including studies of wind speed, wind direction and other meteorological data; wind energy development; conversion of wind energy into electrical energy; collection and transmission of electrical energy converted from wind energy; and any and all other activities related to the foregoing. Without limiting the generality of the foregoing, Tenant's rights hereunder specifically include the right to:

5.1.1 Extract soil samples, perform geotechnical tests, and conduct such other tests, studies, inspections and analysis on the Premises as Tenant deems necessary, useful or appropriate in its sole discretion.

5.1.2 Construct, install, lay down, erect, improve, place, replace, remove, relocate and operate any and all improvements, machinery or equipment that Tenant deems necessary or desirable in connection with the uses described above, including, without limitation, the following (collectively, the "**Facilities**"): (a) one or more wind turbine energy generators, associated towers, related fixtures, equipment and improvements, including the appurtenant footings, support structures and towers ("**WTGs**"); (b) underground electrical and communications lines, collection and transmission equipment ("**Underground Collection Facilities**"); (c) aboveground electrical and communications lines between Tenant's substations and one or more points of interconnection with the existing electricity grid ("**Aboveground Collection Facilities**"); (d) power conditioning equipment, substations, interconnection facilities, switching facilities, operations and maintenance buildings, transformers, SCADA and telecommunications equipment; and (e) roads, gates, signs, fences, meteorological towers, renewable energy measurement equipment, maintenance yards and other related facilities, machinery, equipment and improvements. Aboveground Collection Facilities are not allowed between individual WTGs and Tenant's substations, except to the extent it would be

commercially unreasonable to install such facilities underground due to topographical or geological conditions of the Premises.

5.1.3 Allow rotor blades of WTGs installed on adjacent land to overhang on the Premises.

5.1.4 Capture, use and convert the unobstructed wind resources over and across the Premises.

5.1.5 Generate electromagnetic, audio, flicker, visual, view, light, noise, vibration, air turbulence, wake, electrical, radio interference, shadow or other effects attributable to the Facilities or any other operational or development activities.

5.1.6 Undertake any other activities, whether accomplished by Tenant or third parties authorized by Tenant, that Tenant reasonably deems necessary, useful or appropriate to accomplish the development and operation of the Facilities, provided that such activities are conducted in a manner consistent with customary industry practices.

5.2 Solar Development. During the Term, Tenant shall have the right to evaluate the solar energy development potential of the Premises. For so long as this Lease is in effect, Landlord may lease the Premises, or a portion thereof, for solar energy purposes to any third party, provided that: (a) the development and operation of a solar energy facility on the Premises does not affect Tenant's development, operation and maintenance of the Project, as reasonably determined by Tenant; and (b) prior to entering into any solar energy lease or similar contract or arrangement with any third party, Landlord shall first offer to lease the subject property to Tenant for solar energy purposes on the same terms and conditions offered by such third party. However, Landlord shall have no obligation to offer to lease the subject property to Tenant for solar energy purposes if at that time Tenant is in default hereunder beyond expiration of any applicable cure period. If Landlord believes it has no obligation to offer to lease due to a default by Tenant, Landlord shall so notify Tenant in writing, and allow Tenant an additional ten (10) business days thereafter to cure the subject default and preserve its right of first refusal to lease the subject property for solar energy purposes. If Tenant fails to accept Landlord's offer to lease the subject property within thirty (30) days after receipt by Tenant of notice thereof, then Landlord shall have the right for one year thereafter to enter into a lease on terms no more favorable to the tenant thereunder than as set forth in Landlord's offer to Tenant pursuant to this Section 5.2. If Landlord does not enter into such a lease within the one year period, any offer shall be submitted again to Tenant as provided above.

5.3 Substations and O&M Buildings. Prior to installation of any substations or operations and maintenance buildings on the Premises as part of the Facilities, Tenant shall, at its option, either: (a) enter into a separate agreement with Landlord to additionally compensate Landlord for the use of the site; or (b) purchase the site from Landlord, in which case the purchase price shall be the fair market per-acre agricultural land value of the site, multiplied by three (3). Any and all costs associated with partitioning the site from the remainder of the Premises shall be borne by Tenant; however, Landlord shall cooperate in such efforts at no out-

of-pocket cost to Landlord. If Landlord and Tenant cannot in good faith agree on any compensation required under this Section 5.3, the amount of compensation shall be resolved as provided in Section 14.9.

5.4 Ownership of Facilities. Tenant shall at all times retain title to the Facilities and shall have the right to remove them from the Premises at any time. Landlord shall have no ownership, lien, security or other interest in any Facilities installed on the Premises and Landlord expressly waives, relinquishes and quitclaims any lien or security interest in and to the Facilities or any other real or personal property of Tenant, whether arising at law or in equity. Landlord shall not have any ownership or other interest in any and all credits, tax credits, benefits, emissions reductions, offsets and allowances of any kind, howsoever entitled, attributable to the Facilities, nor to the electric energy, capacity or other products produced therefrom. The manner of operation of the Facilities is within the sole discretion of Tenant. Nothing in this Lease shall be construed as requiring Tenant to construct or operate Facilities or any other business or use on the Premises.

5.5 Compliance with Law. Tenant shall at all times and at its expense comply in all material respects with all valid laws, ordinances, statutes, orders and regulations of any governmental agency (collectively, "Laws") now or hereafter applicable to its use of the Premises, provided that Tenant shall have the right to contest the validity or applicability to the Premises or to the Facilities of any Law so long as Landlord is reasonably protected against any adverse impact to its interest in the Premises that could foreseeably result from such contest.

5.6 Right of Access. Tenant shall have the right of access over and across all portions of the Premises, and any adjacent property owned by Landlord, as reasonably necessary to use the Premises as permitted by this Lease and to develop and operate the Project. Before constructing any new roads on the Premises, Tenant shall consult with Landlord as to the proposed location of the roads and consider the Landlord's comments in good faith, but the final location of any new roads shall be determined by Tenant in its sole discretion.

5.7 No Warranty of WTGs. Tenant has not made and does not make any representations or warranties regarding the likelihood that Tenant will install Facilities on the Premises. Landlord acknowledges that the operation of any Facilities actually installed on the Premises is subject to adverse weather, lack of wind or sun, equipment failures and other events beyond the control of Tenant.

5.8 Quiet Enjoyment. As long as Tenant observes the terms and conditions of this Lease, it shall peaceably hold and enjoy the rights of Tenant hereunder and any and all other rights granted by this Lease for its entire term without hindrance or interruption by Landlord or any other person or persons.

6. RENT AND OTHER PAYMENTS.

6.1 Payment of Rent Generally. All rent payments shall be made to Landlord at Landlord's address set forth in Section 17.2 below. Tenant shall not be required to make any rent

payment to Landlord under this Lease until such time as Landlord has returned to Tenant a completed and executed Internal Revenue Service Form W-9. Further, all payments issued hereunder will be paid to the Landlord, as set forth in this Lease, or its permitted successors and assigns. If Landlord is comprised of more than one person or entity, then all payments will be issued by a single check payable to all such persons or entities, unless otherwise indicated below. Each person or entity holding record title to the Premises hereby acknowledges and agrees that all payments are legally permitted to be made as set forth below and that no other party shall have any right to such payments or to contest the payments and allocations as set forth below. Each person receiving payment hereunder agrees to fully indemnify and hold harmless Tenant against claims by any third party in connection with its payments hereunder to the person/entities set forth herein. Check one below:

- A single check should be issued payable to all persons/entities comprising the Landlord.
- Separate checks should be issued to each Landlord as set forth below:

Owner:	Name 1	Name 2	Name 3	Name 4
Payment Allocation:	[]%	[]%	[]%	[]%

6.2 Payments During the Development Period. During the Development Period, Tenant shall pay the Development Rent specified in Section 1.7. Payment shall be due within sixty (60) days after the Effective Date and within thirty (30) days after each anniversary of the Effective Date during the Development Period. If the Development Period ends on any day other than an anniversary of the Effective Date, Development Rent already paid for periods of time after termination of the Development Period shall be applied to payments due during the Operations Period.

6.3 Construction Impact Fees. Tenant shall pay Landlord a Construction Impact Fee in the amount specified in Section 1.8 for each WTG installed on the Premises by Tenant. Each Construction Impact Fee shall be paid fifty percent (50%) upon commencement of construction of the first WTG within the Phase that includes the Premises, with the balance due on the Commercial Operations Date for that Phase.

6.4 Operating Rent. Commencing on the first day of the Operations Period, Tenant shall annually pay Landlord "**Operating Rent**" as set forth in Section 1.9. Payment of Operating Rent shall due within thirty (30) days after the first day of the Operations Period and each anniversary thereof.

6.5 Taxes and Assessments. Tenant shall pay any increase in the real property taxes levied against the Premises directly attributable to the installation of Facilities on the Premises. Tenant shall not be liable for taxes attributable to facilities installed by Landlord or others on the

Premises or to the underlying value of the Premises itself. Landlord and Tenant shall cooperate in an effort to have Tenant separately billed for its share of taxes; however, if such arrangement cannot be made, then Landlord shall submit the real property tax bill to Tenant within ten (10) days after Landlord receives the bill, and Tenant shall pay its share of the taxes to Landlord no later than ten (10) days prior to the date the taxes are due. If Landlord does not pay its share of taxes on the Premises in a timely manner, Tenant shall be entitled (but not obligated) to make payments in fulfillment of Landlord's tax obligations and may offset those payments against future payments due Landlord under this Lease.

6.6 Tenant's Right to Contest Taxes. Tenant shall have the right to contest the legal validity or amount of any taxes payable by Tenant hereunder and may institute such proceedings as it considers necessary, at its own cost. If the contest poses a reasonable risk of loss, forfeiture, or imposition of a penalty on Landlord, then Tenant shall, at Tenant's option, post sufficient financial assurance or provide Landlord with a reasonably satisfactory indemnity against such risks. Landlord shall render to Tenant all reasonable assistance, at no cost or expense to Landlord, in pursuing any tax contest, including joining in the signing of any protest or pleadings which Tenant reasonably deems advisable; provided, however, that Tenant shall reimburse Landlord for its reasonable attorney fees and other expenses actually incurred in connection with providing such assistance.

6.7 Conservation Reserve Programs. Landlord has disclosed to Tenant all portions of the Premises, if any, that are currently enrolled in the USDA Conservation Reserve Program or any substantially similar local, state or federal program for the preservation of agricultural land (any such program, "CRP") as of the Effective Date. Landlord shall cooperate (at no out-of-pocket cost to Landlord) in any effort by Tenant to remove all or a portion of any such land from the CRP as needed for construction, operation and maintenance of the Project. Upon removal from CRP of any portion of the Premises that is enrolled in CRP as of the Effective Date, Tenant shall reimburse Landlord for any penalties or reinstated taxes resulting from such removal, but shall not be obligated to reimburse Landlord for any future CRP payments that would otherwise have been made to Landlord after the date of removal. After the Effective Date, Landlord shall not enroll any portion of the Premises in CRP without Tenant's consent, not to be unreasonably withheld.

6.8 Inflation Adjustments. Each component of Operating Rent shall increase by the Inflation Adjustment Factor set forth in Section 1.11, starting on the first January 1 during the Operations Period and each January 1 thereafter during the Term. For example, if (a) the Inflation Adjustment Factor is 2.0%, and (b) the WTG Payment is \$1,000 per MW of installed nameplate capacity, then on the next adjustment date hereunder, the WTG Payment shall increase to \$1,020 ($\1000×1.02) per MW of installed nameplate capacity.

7. IMPROVEMENTS TO THE PREMISES.

7.1 **Mechanics Liens.** Tenant shall pay when due all claims for labor and material furnished to the Premises, and shall not permit any mechanic's, materialmen's, contractor's, or other claims of liens (collectively "**Liens**") arising from any construction, maintenance, repair, or alteration of improvements by Tenant to be enforced against the Premises or any part thereof. Tenant may, however, in good faith and at Tenant's own expense, contest the validity of any asserted Lien, provided that Tenant has, at Tenant's option, bonded against the Lien pursuant to applicable law or provided Landlord with an indemnity against enforcement of the Lien in a form reasonably satisfactory to Landlord. Tenant shall give Landlord at least twenty (20) days prior written notice of the commencement of any work on the Premises that could be the subject of a Lien, and Landlord shall have the right to record and post notices of non-responsibility for the work.

7.2 **Landlord's Right to Discharge Lien.** If Tenant fails to comply with Section 7.1 and a Lien is enforced against the Premises as a result, Landlord shall have the right, but not the obligation, upon ten (10) business days notice to Tenant, to pay or otherwise discharge, stay, or prevent the execution of any such Lien. Tenant shall reimburse Landlord for all sums paid by Landlord under this Section 7.2, together with interest thereon at the Default Rate and all of Landlord's reasonable attorney fees and costs incurred in connection with the Lien.

7.3 **Maintenance of Premises.** On completion of construction, Tenant shall restore all portions of the Premises temporarily disturbed by Tenant to a condition substantially similar to the condition that existed prior to construction, to the extent such restoration is commercially reasonable. Tenant shall reseed any areas that were vegetated prior to disturbance to commercially reasonable standards, in consultation with Landlord. Throughout the Term, Tenant shall, at Tenant's sole cost and expense, maintain the Facilities in good condition and repair, ordinary wear and tear excepted, and in accordance with all applicable Laws.

7.4 **Transmission and Collection Lines.** All underground transmission and collection lines on the Premises shall be buried at least three (3) feet below the surface or below any existing drainage tiles, to the extent practicable, and all overhead transmission lines shall satisfy the minimum height requirements of any applicable electrical or building code.

7.5 **Erosion and Weed Control.** Tenant shall, at its sole cost and expense, take commercially reasonable steps to mitigate erosion and control noxious weeds within one hundred (100) feet of the Facilities, along roads built by Tenant, and on any other portions of the Premises where the surface of the land has been disturbed by Tenant. If Tenant fails to control noxious weeds as required by this Section 7.5, then Landlord may upon ten (10) days prior written notice to Tenant assume responsibility for the implementation of all weed control measures, and Tenant shall reimburse Landlord for all reasonable weed control measures at the rates published by the County agency with responsibility for weed control.

7.6 **Roads.** Tenant shall post any roads it constructs on the Premises as private roads only for use by authorized personnel in connection with the Facilities. Landlord may use or cross (or permit the use or crossing of) such roads only to the extent such use or crossing does not interfere with Tenant's operations pursuant to this Lease or enjoyment of Tenant's rights

hereby granted. Landlord shall reimburse Tenant for the cost to repair any damage to Tenant's roads caused by Landlord or those using the roads with Landlord's permission.

7.7 Crop/Livestock Damage. Tenant shall reimburse Landlord (or, if requested by Landlord, Landlord's agricultural tenants) for each incident of damage to cropland, crops and livestock caused by Tenant's construction, operation and maintenance of Facilities on the Premises as follows:

7.7.1 At \$30 per acre for any land that does not have growing crops and yet has been cultivated for the purpose of growing crops within the prior three (3) growing seasons;

7.7.2 For land with growing crops, an amount equal to the fair market price multiplied by yield multiplied by percentage of damage multiplied by acreage damaged or destroyed. Prices for damaged or destroyed crops shall be based on the average price for that crop in the County during the prior crop year. Yield shall be the average of the previous three (3) seasons' yields according to Landlord's records for the land area that includes the damaged area, provided that the yield shall not exceed the County average yield for the same crop by more than twenty-five percent (25%).

7.7.3 For any land determined to have significant soil compaction directly caused by Tenant's activities on the Premises, an amount equal to quadruple the value calculated under Section 7.7.2 ("**Cropland Compaction Rate**"), except that Tenant shall have the right to decompact such areas before any payments are due, and to complete such decompaction within three (3) months of final construction of the Facilities on the Premises, in which event no amounts shall be payable under this Section 7.7.3.

7.7.4 For livestock, an amount equal to the average market price in the County for each head of livestock lost in the year in which the loss occurred.

7.7.5 The remedies provided in this Section 7.7 shall be the exclusive remedy for damages to cropland, crops or livestock caused by construction, operation and maintenance of Facilities on the Premises. Landlord and Tenant acknowledge that this liquidated remedy is appropriate because of the difficulty and expense of fixing actual, direct damages for such losses. Except as expressly set forth in this Section 7.7, Tenant shall not be responsible to compensate Landlord or its agricultural tenants for soil compaction, its inability to grow crops, raise livestock or otherwise use the Premises as a result of the construction, maintenance or operation of the Facilities on the Premises.

7.7.6 If Landlord and Tenant cannot agree in good faith on yields, prices or the extent of soil compaction for purposes of calculating the payments required under this Section 7.7, the matters shall upon mutual agreement of Landlord and Tenant be referred to an independent crop insurance adjuster for resolution, or if Landlord and Tenant cannot so agree then as provided in Section 14.9.

7.8 Gates and Fences. Tenant shall keep all gates on the Premises closed except when open to permit the passage of vehicular traffic, and shall not permit livestock to stray or

escape through the gates at any time. Tenant and Landlord may maintain separate locks on all gates such that either lock is capable of unlocking a given gate. When relocating an existing fence, Tenant shall pay for the cost of relocation, and also shall obtain Landlord's prior consent on the new location of the fence, not to be unreasonably withheld. When installing a gate within an existing fence, Tenant shall make fence cuts, braces, and repairs that will be permanent and remain functional for the remaining expected life of the fences of which they are part. Tenant shall have the right to install cattle guards in lieu of gates with the consent of Landlord, not to be unreasonably withheld. Within ten (10) days after written notice from Landlord of any problem with a gate, cattle guard or fence installed or maintained by Tenant, Tenant shall make adequate repairs, weather permitting; provided, however, that in the event Landlord reasonably deems it necessary to make repairs without notice to Tenant because of the imminent escape or loss of livestock, then Landlord may do so and shall be reimbursed by Tenant for the reasonable and actual out-of-pocket costs incurred by Landlord.

7.9 Drainage Tiles. Tenant shall repair or replace any drainage tiles on or under the Premises damaged by Tenant during construction or operation of the Project.

8. LANDLORD'S REPRESENTATIONS AND COVENANTS.

8.1 No Interference. Landlord shall not cause nor permit any restriction or interference with: (a) the siting, permitting, construction, installation, maintenance, operation, replacement, or removal of Project Facilities; (b) the flow of wind, wind speed or wind direction over the Premises; (c) the amount, intensity, or duration of sunlight reaching the Project Facilities; (d) access over the Premises to Project Facilities; or (e) any other activities of Tenant permitted under this Lease. Clause (b) above shall apply at all times in a three-hundred sixty degree (360°) radius from each WTG on the Premises to the boundaries of the Premises, and in a one-hundred eighty degree (180°) vertical arc above each WTG.

8.2 Trees, Structures and Improvements. Section 8.1 notwithstanding, all trees, structures and improvements on the Premises as of the Effective Date shall be allowed to remain and Tenant may not require their removal. After the Effective Date, Landlord may install new trees, structures and improvements on the Premises that are less than sixty (60) feet in height and at least five hundred (500) feet from the base of any WTG without Tenant's consent; provided, however, that if construction of Facilities on the Premises is not yet complete then Landlord shall first consult with Tenant to ensure that the new tree, structure or improvement is not within five hundred (500) feet of any planned WTG. Any new trees, structures and improvements on the Premises after the Effective Date that either exceed sixty (60) feet in height or are proposed to be within five hundred (500) feet of the base of an existing or planned WTG shall require Tenant's prior written consent, not to be unreasonably withheld.

8.3 Legal Requirements. Landlord shall, at no out-of-pocket cost to Landlord, assist and fully cooperate with Tenant in complying with or obtaining any and all Laws, land use permits and approvals, tax-incentive or tax-abatement program approvals, building permits, environmental impact reviews or any other approvals required or deemed desirable by Tenant in connection with the development, financing, sale, construction, installation, replacement,

relocation, maintenance, operation or removal of the Project and/or Facilities, including execution of applications for such approvals and delivery of requested information and documentation. Nothing herein shall prevent Landlord from expressing its opinion or appearing at any public proceeding and providing information to any government agency; provided, Landlord may only oppose Tenant's projects if and to the extent Tenant has breached this Lease beyond the expiration of any applicable cure periods.

8.4 Reclassification of Premises. Landlord shall not take or agree to any action that could potentially cause a rezoning or reclassification of the Premises resulting in Tenant's use of the Premises pursuant to this Lease being: (a) nonconforming, (b) prohibited, or (c) a conditional use if Tenant's use was not a conditional use as of the Effective Date, unless Landlord has Tenant's prior written consent which Tenant may withhold in its sole discretion.

8.5 Representations and Warranties. Landlord (and each person or entity comprising Landlord, if applicable) represents and warrants to Tenant as follows:

8.5.1 Landlord is the sole owner of the Premises and has the unrestricted right and authority to execute this Lease and to grant to Tenant the rights granted hereunder. Each person signing this Lease on behalf of Landlord is authorized to do so, and all persons having any ownership or possessory interest in the Premises have signed this Lease as Landlord. When signed by Landlord, this Lease constitutes a valid and binding agreement enforceable against Landlord in accordance with its terms and shall run with the land.

8.5.2 No rights to convert the renewable resources of the Premises or to otherwise use the Premises for renewable energy purposes have been granted to or are held by any party other than Tenant, nor shall Landlord grant such rights in the future without the written consent of Tenant, which Tenant may withhold in its sole discretion.

8.5.3 Landlord shall not violate, and shall indemnify and hold Tenant harmless for, from and against any violation or claimed violation (past, present or future) by Landlord or by persons on the Premises with Landlord's permission of any federal, state or local law, ordinance or regulation relating to the generation, manufacture, production, use, storage, release or threatened release, discharge, disposal, transportation or presence of any substance, material or waste which is now or hereafter classified as hazardous or toxic, or which is regulated under current or future federal, state or local laws or regulations (collectively, "**Hazardous Materials**") on or under the Premises.

8.6 Information About Premises. Within sixty (60) days after the Effective Date, Landlord shall provide Tenant with copies of any surveys, studies, reports, appraisals, investigations, information regarding ownership or control of mineral rights to the Premises (if not owned or controlled by Landlord), or other documents concerning the Premises in Landlord's possession.

8.7 Condition of Title. Except as expressly set forth in this Lease, Landlord makes no representation or warranty concerning the condition of title to the Premises. However,

Landlord shall use its best efforts to cause any person or entity (including without limitation Landlord or any person or entity comprising Landlord) with a lien, encumbrance, mortgage, lease or other exception to Landlord's fee title to the Premises, whether recorded or unrecorded, to enter into nondisturbance, subordination and other title curative agreements as requested by Tenant in its sole discretion. If Landlord and Tenant are unable to obtain such agreements from any person or entity holding an interest in the Premises, and Landlord defaults on its obligations to such holder, then Tenant shall be entitled (but not obligated) to fulfill Landlord's obligations to such holder and may offset the cost of doing so against future payments due Landlord under this Lease. Landlord also shall provide Tenant with any further assurances and shall execute any estoppel certificates, consents to assignments or additional documents that may be reasonably necessary for recording purposes or otherwise reasonably requested by Tenant. After the Effective Date, Landlord shall not create or suffer any lien or encumbrance against the Premises unless the holder thereof enters into a nondisturbance or similar agreement in a form reasonably acceptable to Tenant, which protects and preserves all of Tenant's rights hereunder in the event of a foreclosure.

8.8 Indemnity. Landlord shall defend, indemnify and hold Tenant harmless for, from and against any third-party claims, losses, liabilities, damages, costs or expenses, including reasonable attorney fees (collectively, "**Claims**"): (a) for physical damage to property and for physical injuries or death, to the extent caused by the operations, activities, negligence or willful misconduct of Landlord or persons on the Premises with Landlord's permission; and (b) arising out of or related to Landlord's breach of this Lease or the inaccuracy of any representation or warranty made by Landlord herein. The foregoing notwithstanding, Landlord's liability for persons on the Premises with Landlord's permission does not extend to hunting on the Premises pursuant to written permission to hunt as provided in Section 17.13.

9. TENANT'S REPRESENTATIONS AND COVENANTS.

9.1 Insurance. Throughout the Term, Tenant shall, at its expense, maintain: (a) a commercial general liability insurance policy in an amount not less than Five Million Dollars (\$5,000,000) of combined single limit liability coverage per occurrence, accident or incident, which has a commercially reasonable deductible; and (b) casualty loss insurance on the Facilities in amounts and as required by Tenant's lender(s), if any. Tenant shall have the right to use a qualified program of self-insurance to meet these requirements.

9.2 Indemnity. Tenant shall defend, indemnify and hold Landlord harmless for, from and against any third-party Claims: (a) for physical damage to property and for physical injuries or death, to the extent caused by the operations, activities, negligence or willful misconduct of Tenant or persons on the Premises with Tenant's permission; and (b) arising out of or related to Tenant's breach of this Lease or the inaccuracy of any representation or warranty made by Tenant herein. The indemnity provided by this Section 9.2 does not extend to Claims for damage to cropland, crops or livestock, which are governed solely by Section 7.7.

9.3 Hazardous Materials. Tenant shall not violate, and shall indemnify and hold Landlord harmless for, from and against any violation or claimed violation during the Term by

Tenant or persons on the Premises with Tenant's permission of any federal, state, or local law or ordinance or regulation relating to the generation, manufacture, production, use, storage, release, or threatened release, discharge, disposal, transportation, or presence of any Hazardous Materials on or under the Premises.

10. ASSIGNMENTS AND SUBLEASES.

10.1 Tenant's Right to Transfer. Tenant and any Transferee (as defined below) shall have the right throughout the Term to transfer, convey, sublease or assign this Lease or any interest in this Lease or the Facilities to any person or entity (a "**Transferee**") without the consent of Landlord. A Transferee also includes any person or entity acquiring an interest in the Lease or the Facilities by foreclosure or a conveyance in lieu of foreclosure, and a Mortgagee as defined in Section 11.1. Upon receipt of written notice of any transfer under this Section 10.1 that includes contact information for the Transferee, Landlord shall thereafter provide the Transferee with simultaneous copies of any notices of default issued to any person or entity under this Lease.

10.2 Liability of Assignor. If the transfer, conveyance or assignment is of all of Tenant's interest in this Lease and the Transferee expressly agrees to be bound by and assumes all the terms and conditions of this Lease, then Tenant shall be released of any further obligation or liability under this Lease as of the date of transfer. No sublease shall relieve Tenant of any of its obligations or liabilities hereunder.

10.3 Rights and Obligations of Transferees. No Transferee shall have any obligation or liability under this Lease prior to the time that the Transferee directly holds an interest in the Lease or the Facilities, or in the case of an interest granted for security purposes, the holder thereof succeeds to absolute title to the interest. Except as otherwise expressly provided in this Lease, a Transferee shall be liable to perform obligations under this Lease only for and during the period the Transferee directly holds such interest or absolute title. Subject to Section 10.4, and provided that any Mortgagee (as defined in Section 11.1) shall also have the supplemental cure periods described in Section 11.4, Transferees shall be entitled to the same cure period (if any) granted to the defaulting party under this Lease. For any Transferee that holds an interest in less than all of the Tenant's rights and interests under this Lease or the Facilities, any default under this Lease shall be deemed remedied as to the Transferee's partial interest if the Transferee has cured its pro rata portion of the default, and thereafter Landlord shall not disturb the Transferee's possession of the Premises or enjoyment of its rights hereunder. However, any Transferee shall have the right, but not the obligation, to cure any default of any other holder of a portion of Tenant's interest in this Lease or the Facilities.

10.4 Cure Requiring Possession of an Interest. Notwithstanding Section 10.3 or Section 11.4, if any default under this Lease cannot be cured without obtaining possession of all or part of the Facilities or an interest in this Lease, then the default shall be deemed remedied if, within sixty (60) days after receiving notice of the default, the Transferee: (a) shall have acquired possession of the necessary interest, or shall have commenced and is diligently pursuing appropriate proceedings to obtain the same; and (b) performs all other obligations that are

capable of performance without being in possession of the Premises as and when due under this Lease during the pendency of any proceedings to gain possession and after gaining possession of the necessary interest. Further, a Transferee's deadline for any action under this Lease shall be extended to the extent the Transferee is prohibited from acting by any process or injunction issued as a result of any bankruptcy, reorganization, insolvency or other debtor-relief proceeding, provided that Transferee continues to perform all obligations under this Lease that are capable of performance during such process or injunction as they come due during the tolling period.

10.5 New Lease to Transferee. In the event of termination of this Lease for any reason, including without limitation foreclosure, conveyance in lieu of foreclosure, and rejection in any bankruptcy proceeding, any Transferee shall have the right to enter into a new lease with Landlord for the interest the Transferee held in the Premises prior to termination, on all the terms and conditions of this Lease and for the remainder of the Term as of the date of termination, and subject to any subleases existing as of the date of termination, provided that the Transferee: (a) is not then in default of this Lease; and (b) cures any existing default to the extent applicable to the Transferee's interest in the Lease or the Facilities (except that any defaults not susceptible of cure by the Transferee shall be deemed waived as to the Transferee). Any receipt of sublease rent by Landlord shall be for the account of the Transferee requesting a new lease. Any new lease shall maintain the same priority as to the Premises as this Lease. The provisions of this Section 10.5 shall survive termination of this Lease and shall continue in effect thereafter until execution and delivery of the new lease.

10.6 Landlord's Right to Assign. Except as set forth in Section 10.7, Landlord shall have the continuous right to assign or otherwise transfer its interest in and to this Lease and the underlying real property without the consent of Tenant; provided, however, that as a condition precedent to any transfer by Landlord, Landlord shall notify Tenant in writing of the transfer and the transferee shall first agree in writing to be bound by all the terms and conditions of this Lease.

10.7 Severance of Renewable Energy Rights. Landlord acknowledges that, as of the date of this Lease, the parties are aware of no legal authority either allowing or prohibiting the severance of the renewable energy rights from fee title to the underlying real property. Consequently, Landlord shall not assign or otherwise transfer an interest in the renewable energy rights to the Premises, or a portion thereof, separate from fee title to such real property, without Tenant's consent which Tenant may withhold in its sole discretion unless Landlord demonstrates to Tenant's reasonable satisfaction that such severance is permitted by applicable law and shall not materially affect Tenant's rights under this Lease, in which case Tenant shall consent to the severance. Further, notwithstanding Tenant's consent to any severance, Landlord assumes all risk that the severance of the renewable energy rights from fee title is invalid, and shall jointly and severally indemnify and hold Tenant harmless from and against any and all claims, losses, liabilities, damages, costs or expenses arising out of or related to the purported severance of renewable energy rights and fee title. Such indemnity shall survive any further conveyance of the renewable energy rights and/or fee title to the Premises or a portion thereof.

11. LENDER PROTECTION.

Renewable Energy Lease
County/State: _____, Wisconsin
Project Name: Tisch Mills

Landowner:

11.1 Right to Mortgage. Tenant or any Transferee may without the consent of Landlord transfer an interest in this Lease or the Facilities to any third party (a "**Mortgagee**") for security purposes, whether by mortgage, deed of trust, security agreement or otherwise (a "**Mortgage**"). As long as any Mortgage is in effect, the Mortgagee shall be entitled to the protections of this Section 11. Mortgagees shall include the successors and assigns, if any, of any original Mortgagees.

11.2 Consent to Modification or Termination. For the benefit of each Mortgagee, Landlord shall not, without the prior written consent of each Mortgagee amend, modify, or take any action consenting to or accepting the voluntary surrender or termination of this Lease by Tenant or any Transferee. This Lease shall not be terminated by Landlord as a result of any Tenant or Transferee default unless all Mortgagees have first been provided with notice and the opportunity to cure any such default in accordance with the provisions of this Lease.

11.3 Right to Perform. A Mortgagee shall have the right (but not the obligation) to perform any term, covenant, condition, or agreement and to remedy any default by Tenant or any Transferee hereunder, and Landlord shall accept such Mortgagee performance, payment and cure as if such performance had been made, done and performed by Tenant or any Transferee.

11.4 Extended Cure Periods. All cure periods provided to Tenant or a Transferee for a default under this Lease shall be extended for any Mortgagee: (a) by thirty (30) days if the default is a failure to pay money when due under this Lease; or (b) by ninety (90) days in the event of any other default. Nothing in this Section 11.4 modifies a Mortgagee's rights under Section 10.4, to the extent that Section applies.

11.5 Foreclosure and Conveyance after Foreclosure. A Mortgagee or its assigns may enforce its lien and acquire title to the Tenant's or Transferee's interest in the Lease in any lawful way and, pending foreclosure of such lien, the Mortgagee may take possession of Tenant's or Transferee's interest in this Lease and operate the Facilities, performing all obligations performable by Tenant or Transferee subject to all of the terms of this Lease. Any default not susceptible of being cured by the Mortgagee or party acquiring the Tenant's or Transferee's interest in the Lease shall be, and shall be deemed to have been, waived by Landlord upon completion of the foreclosure proceedings or acquisition of Tenant's or Transferee's interest in this Lease by any purchaser (who may, but need not be, Mortgagee) at the foreclosure sale, or who otherwise acquires the Tenant's or Transferee's interest in the Lease from the Mortgagee or by virtue of a Mortgagee's exercise of its remedies. Upon the sale or other transfer of an interest in this Lease or the Facilities acquired pursuant to foreclosure or conveyance in lieu of foreclosure, the Mortgagee shall have no further liabilities or obligations under this Lease.

11.6 Impact of Bankruptcy. Neither the bankruptcy nor the insolvency of Tenant or any Transferee shall be grounds for terminating this Lease or an interest therein, as long as the rent and all other monetary charges payable by Tenant or the Transferee are paid by a Mortgagee as required by this Lease.

11.7 New Lease. If more than one Mortgagee requests a new lease pursuant to Section 10.5, then Landlord shall enter into a new lease with the most senior Mortgagee.

11.8 Minor Modifications of Lease Terms. If requested by a Mortgagee, Landlord shall modify the Lease to include any supplemental Mortgagee protection provisions reasonably requested by the Mortgagee, provided such provisions do not impair Landlord's rights or increase the burdens or obligations of Landlord.

12. DEFAULT AND REMEDIES.

12.1 Default. Subject to any applicable notice and cure rights set forth in this Lease, the occurrence of any of the following events shall constitute a default and a breach of this Lease:

12.1.1 Either Tenant or Landlord fails to perform as required by any representation, warranty, covenant, term, or condition of this Lease;

12.1.2 Tenant files a petition in bankruptcy or insolvency or for reorganization or arrangement under the bankruptcy laws of the United States or insolvency act of any state, or is dissolved, or involuntary proceedings under any bankruptcy laws or insolvency act or for the dissolution of Tenant are instituted against Tenant; or

12.1.3 Tenant fails to make any payments required by this Lease when due.

12.2 Notice of Default and Cure. Notwithstanding Section 12.1, no party shall be in default under this Lease unless: (a) with respect to a failure to pay any rent, charges, or other amounts due and payable hereunder, Tenant fails to cure the default within sixty (60) days from receipt of notice from Landlord in writing that such amounts are due; (b) with respect to a default under Section 12.1.2, the petition is not dismissed within sixty (60) days of filing; or (c) with respect to any other default, the defaulting party fails either to cure the default within one hundred twenty (120) days after notice thereof or, if the failure to perform is such that it cannot reasonably be cured within one hundred twenty (120) days, to commence cure within the one hundred twenty (120) day period and to proceed diligently to cure the default in a manner reasonably acceptable to the other party.

12.3 Remedies - Landlord. In the event of any default by Tenant, and subject to any notice rights after the expiration of any applicable cure periods provided for in this Lease, Landlord shall have the following remedies, in addition to all other rights and remedies provided by law or equity:

12.3.1 Landlord may continue this Lease in effect as long as Landlord does not terminate Tenant's right to possession, and Landlord shall have the right to collect rent when due, plus interest on any unpaid sums at the Default Rate.

12.3.2 Landlord may cure any default by Tenant after Tenant's cure period has expired. If Landlord, at any time, by reason of Tenant's default, pays any sum or does any act

that requires the payment of any sum, the sum paid by Landlord shall be due and owing immediately from Tenant to Landlord as additional rent hereunder, together with any interest thereon at the Default Rate.

12.3.3 If Tenant does not cure a default in the payment of money within sixty (60) days after written notice thereof from Landlord, or in the case of any other default within one hundred twenty (120) days of such notice, then Landlord may by written notice to Tenant terminate this Lease. Landlord may not terminate this Lease or Tenant's right to possession of the Premises except as set forth in this Section 12.3.3. Upon termination Tenant shall restore the Premises as required by Section 16.2.

12.4 Remedies - Tenant. In the event of any default by Landlord of Landlord's duties, obligations, or covenants hereunder, Tenant may, in addition to all other rights and remedies provided by law or equity, terminate this Lease by written notice to Landlord and payment to Landlord of any payments then due and unpaid under this Lease.

13. FORCE MAJEURE.

13.1 Defined. An "Event of Force Majeure" includes without limitation flood, drought, earthquake, storm, fire, pestilence, lightning, or other natural catastrophe, unusually inclement weather, including but not limited to rain which falls earlier in the year, or in greater amounts, or for longer periods than has historically been experienced in the area of the Premises, epidemics, acts of God or the public enemy, war, riot, civil disturbance or disobedience, strike, labor dispute, delays by third parties in the delivery of materials to the Premises, expropriation or confiscation of facilities, changes of applicable law, compliance with any order of any governmental authority, or failure, threat of failure or sabotage of facilities which have been maintained in accordance with good industry engineering and operating practices, so long as the affected party makes good faith and reasonable efforts to remedy the delays or failures in performance caused thereby.

13.2 Limitations. The parties shall be excused for any delay or failure to perform their respective duties hereunder, except for obligations to pay money, only to the extent that such failure or delay is caused by an Event of Force Majeure. If an Event of Force Majeure causes a delay or failure in performance of only a portion of the obligations of a party under this Lease, then only that portion of performance which was delayed or prevented by such cause shall be deemed excused, and the performance of all other obligations of a party not so delayed shall not be excused. No such delay or failure in performance which is the result of an Event of Force Majeure shall be deemed excused for a period longer than the delay or failure in performance caused by such event.

14. LEGAL MATTERS.

14.1 Attorney Fees. In the event of any litigation, arbitration or alternative dispute resolution to interpret or enforce the provisions of this Lease, including any appeal, the prevailing party or parties in such litigation, arbitration or alternative dispute resolution shall be

entitled to reasonable attorney fees, expert witness fees, and costs as shall be fixed by the court or arbitrator.

14.2 Governing Law. This Lease shall be governed by and construed and enforced in accordance with the laws of the state in which the Premises are located.

14.3 Jurisdiction and Venue. Any action that may be instituted relating to this Lease shall be prosecuted in the federal courts of the state in which the Premises are located, to the extent federal jurisdiction is available. Landlord and Tenant each waive the right to object to the removal to federal court of any action instituted hereunder in state court, except on grounds of lack of federal jurisdiction.

14.4 Defense of Indemnity Claims. In connection with any indemnity provided under this Lease, the indemnifying party shall defend any Claims with legal counsel reasonably acceptable to the indemnified party.

14.5 Estoppel Certificates. Tenant or Landlord shall at any time upon not less than ten (10) days prior written notice from the other execute, acknowledge, and deliver a statement in writing: (a) certifying that this Lease is unmodified and in full force and effect (or, if modified, stating the nature of such modification and certifying that this Lease, as so modified, is in full force and effect) and the date to which the rent and other charges are paid in advance, if any; and (b) acknowledging that there are not to the certifying party's knowledge any uncured defaults on the part of the other party hereunder or specifying such defaults, if any are claimed. Any such statement may be conclusively relied upon by any prospective purchaser or encumbrancer of the Premises or encumbrancer of the interest of Tenant hereunder. A party's failure to deliver such statement within such time shall be conclusive upon such party: (i) that this Lease is in full force and effect without modification, except as may be represented by the party requesting the certificate, and (ii) that there are no uncured defaults in the requesting party's performance.

14.6 Waiver of Subrogation. Landlord and Tenant each hereby waive any and all rights of recovery against the other, or against the officers, employees, agents or representatives of the other, for loss of or damage to its property or the property of others under its control, if such loss or damage is covered by any insurance policy in force (whether or not described in this Lease) or required to be in force at the time of the loss or damage. Upon obtaining the required policies of insurance, Landlord and Tenant shall give notice to their respective insurance carriers of this mutual waiver of subrogation.

14.7 Jury Trial Waiver. EACH OF THE PARTIES KNOWINGLY, VOLUNTARILY AND INTENTIONALLY WAIVES THE RIGHT TO A TRIAL BY JURY IN RESPECT OF ANY LITIGATION BASED ON THIS LEASE, OR ARISING OUT OF, UNDER OR IN CONNECTION WITH THIS LEASE, AND ANY AGREEMENT CONTEMPLATED TO BE EXECUTED IN CONJUNCTION HEREWITH, OR ANY COURSE OF CONDUCT, COURSE OF DEALING, STATEMENTS (WHETHER VERBAL OR WRITTEN) OR ACTIONS OF ANY PARTY HERETO. EACH OF THE PARTIES TO

THIS LEASE WAIVES ANY RIGHT TO CONSOLIDATE ANY ACTION IN WHICH A JURY TRIAL HAS BEEN WAIVED WITH ANY OTHER ACTION IN WHICH A JURY TRIAL CANNOT OR HAS NOT BEEN WAIVED.

14.8 Waiver of Certain Damages. THE PARTIES' LIABILITY ARISING OUT OF OR RELATED TO THIS LEASE UNDER ANY LEGAL THEORY, WHETHER CONTRACT, TORT, STRICT LIABILITY, STATUTORY OR OTHERWISE, SHALL BE LIMITED TO DIRECT DAMAGES, AND IN NO EVENT SHALL LANDLORD, TENANT OR ANY OF THEIR RESPECTIVE OFFICERS, DIRECTORS, MEMBERS, PARTNERS, SHAREHOLDERS, EMPLOYEES, AGENTS OR AFFILIATES BE LIABLE FOR INDIRECT, EXEMPLARY, PUNITIVE OR CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER.

14.9 Arbitration of Certain Disputes. With respect to any provision of this Lease expressly identifying this Section 14.9 for the resolution of a dispute between Landlord and Tenant, the dispute shall be resolved by an arbitrator mutually acceptable to the parties. If the parties cannot agree on an arbitrator, then each party shall select an arbitrator, and the two arbitrators together shall select a third arbitrator to resolve the matter. The determination of the arbitrator shall be final and binding upon the parties. Landlord shall pay fifty percent (50%) and Tenant shall pay fifty percent (50%) of all costs of arbitration.

15. CONDEMNATION.

15.1 Complete Taking. If at any time during the Term of this Lease any authority having the power of eminent domain shall condemn all or substantially all of the interest of Tenant hereunder or the Facilities for any public use or otherwise, then the interests and obligations of Tenant under this Lease shall cease and terminate upon the earliest of: (a) the date of the condemnation judgment, (b) the date that the condemning authority takes physical possession of the interest of Tenant hereunder or the Facilities, and (c) the date that Tenant is, in its sole judgment, no longer able or permitted to operate the Project or the Facilities on the Premises in a commercially viable manner. Tenant shall continue to pay all amounts payable hereunder to Landlord until the termination date.

15.2 Partial Taking. If at any time during the Term of this Lease any authority having the power of eminent domain shall condemn less than substantially all of the Project or the interest of Tenant hereunder, then the interests and obligations of Tenant under this Lease as to such portion of the Project or the interest of Tenant hereunder so taken shall cease and terminate upon the earliest of: (a) the date of the condemnation judgment, (b) the date that the condemning authority takes physical possession of what is being condemned, and (c) the date that Tenant is, in its sole judgment, no longer able or permitted to operate the portion of the Project which is being condemned in a commercially viable manner, and, unless this Lease is terminated as hereinafter provided, this Lease shall continue in full force and effect as to the remainder of the Project on the Premises which can still be operated in a commercially reasonable manner. If the remainder of the Project or the interest of Tenant hereunder, in Tenant's sole judgment, is or

becomes insufficient or unsuitable for Tenant's purposes hereunder, then Tenant shall have the right to terminate this Lease in its entirety.

15.3 Apportionment; Distribution of Award. On any taking covered by Sections 15.1 or 15.2 above, all sums, including damages and interest, awarded shall be paid first to tenant in an amount equal to the aggregate of any costs or losses that Tenant may sustain in the taking, removal and/or relocation of the Facilities; and then to Landlord and/or Tenant consistent with the law of the state in which the Premises are located.

16. EXPIRATION OR TERMINATION.

16.1 Holding Over. This Lease shall terminate without further notice at the date of expiration of the Term. Any holding over by Tenant after expiration shall not constitute a renewal or extension of this Lease or give Tenant any rights in or to the Premises, except as set forth in Section 16.2.

16.2 Restoration of Premises. Upon expiration or termination of the Term, Tenant shall surrender and vacate the Premises within sixty (60) days; provided, however, that Tenant shall have a license to enter onto the Premises for eighteen (18) months following termination to: (a) remove or cause to be removed any and all Facilities from the Premises, except that any Facilities more than three (3) feet below the surface may be left in place, and Tenant shall leave in place any roads it constructed if requested to do so by Landlord and Tenant is not otherwise prohibited from doing so; (b) otherwise restore the Premises to substantially the same condition that existed on the Effective Date, to the extent it is commercially reasonable to do so; (c) reseed any areas that were vegetated prior to disturbance to commercially reasonable standards, in consultation with Landlord; and (d) implement commercially reasonable erosion control devices and procedures. If Tenant does not remove the Facilities and restore the Premises as required by this Section 16.2 within eighteen (18) months after termination, Landlord may do so and Tenant shall reimburse Landlord the reasonable and actual costs incurred by Landlord, less the salvage value of the Facilities, within thirty (30) days of receipt of an invoice from Landlord.

16.3 Removal Security. In the event that: (a) Tenant is not required to post a bond, letter of credit or similar financial assurance for decommissioning Facilities as a condition of approval from any governmental agency with jurisdiction over the Project; or (b) such a condition is imposed, but is then removed and any bond, letter of credit or similar financial assurance is actually released; then Tenant shall, on the fifteenth (15th) anniversary of the first day of the Operations Period or within one hundred and twenty days after release of the bond, letter of credit or similar financial assurance, whichever is later, post a bond, letter of credit or similar financial assurance to secure the cost of decommissioning the Facilities located on the Premises, in form and substance reasonably satisfactory to Landlord (the "**Removal Security**"). The Removal Security shall be equal to the estimated amount, if any (the "**Net Removal Costs**"), by which the cost of removing the Facilities exceeds the salvage value of such Facilities, to be determined by Tenant in its reasonable discretion. To the extent that the Net Removal Costs are zero (or negative), the Removal Security shall not be required; provided, however that Tenant shall re-evaluate the need for the Removal Security at least annually after

the fifteenth (15th) anniversary of the first day of the Operations Period. Tenant shall not be required to deliver such Removal Security to Landlord if Tenant is in the process of repowering or otherwise redeveloping the WTGs on the Property with new WTGs (or commits in writing with notice to Landlord to do so within two (2) years after the fifteenth (15th) anniversary of the Operations Date). Once in place, Tenant shall keep the Removal Security in force throughout the remainder of the Term, provided that Tenant shall have the option at any time to obtain a single Removal Security in favor of Landlord and other landlords in the Project to secure the decommissioning of Project Facilities. Landlord may resort to the Removal Security to recover any reasonable and actual costs of removing the Facilities and restoring the Premises incurred by Landlord in accordance with Section 16.2.

17. GENERAL PROVISIONS.

17.1 Confidentiality. Landlord shall maintain in the strictest confidence, for the benefit of Tenant: (a) all the terms and conditions of this Lease; (b) all information provided by Tenant pursuant to this Lease; and (c) all information obtained by or about Tenant's site or product design, methods of operation, and methods of construction, regardless of its source; unless such information either: (i) is in the public domain by reason of prior publication through no act or omission of Landlord or its employees or agents; or (ii) was already known to Landlord at the time of disclosure and which Landlord is free to use or disclose without breach of any obligation to any person or entity ("**Confidential Information**"). Landlord shall not use Confidential Information for its own benefit, publish or otherwise disclose it to others, or permit its use by others for their benefit or to the detriment of Tenant. Notwithstanding the foregoing, Landlord may disclose Confidential Information to Landlord's lenders, attorneys, accountants and other personal financial advisors solely for use in connection with their representation of Landlord regarding this Lease or to any prospective purchaser of the Premises who has made a written offer to purchase or otherwise acquire the Premises that Landlord desires to accept; provided that in making such disclosure, Landlord shall advise the party receiving the information of the confidentiality of the information. Landlord may also disclose Confidential Information pursuant to lawful process, subpoena or court order requiring such disclosure, provided that Landlord shall give Tenant reasonable advance notice of the required disclosure and will cooperate with Tenant in limiting such disclosure and in obtaining protective orders where appropriate. Landlord shall get Tenant's written consent before issuing a press release or having any contact with or responding to the news media with any operational, sensitive or confidential information with respect to this Lease or the Project. The provisions of this Section 17.1 shall survive the termination or expiration of this Lease.

17.2 Notices. All notices or other communications required or permitted by this Lease, including payments to Landlord, shall be in writing and shall be deemed given when personally delivered, or in lieu of such personal service, five days after deposit in the United States mail, first class, postage prepaid, certified, or the next business day if sent by reputable overnight courier, provided receipt is obtained and charges prepaid by the delivering party. Notices also may be sent by e-mail or facsimile with proof of delivery, and shall be deemed given upon delivery. Any notice shall be addressed as follows:

Renewable Energy Lease
County/State: _____, Wisconsin
Project Name: Tisch Mills

Landowner:

Page 22 of 26

(i) To Landlord:

(ii) To Tenant:

Element Power Wind Development, LLC
c/o Land Administration
421 SW Sixth Avenue, Suite 1000
Portland, OR 97204

with a copy to any Transferee if required by this Lease.

Any party may change its contact information by written notice thereof to the other party.

17.3 Successors and Assigns. This Lease shall run with the land and shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns.

17.4 Waiver. No delay or omission by the parties hereto in exercising any right or remedy provided for herein shall constitute a waiver of such right or remedy, nor shall it be construed as a bar to or a waiver of any such right or remedy on any future occasion.

17.5 Effect of Headings, Terms. Headings appearing in this Lease are inserted for convenience of reference only and shall in no way be construed to be interpretations of the provisions hereof. The term "Tenant" herein includes any Transferee to the extent the Transferee has an interest in this Lease.

17.6 Amendments. This Lease may be modified, amended, or supplemented only by the mutual written agreement of the parties hereto consented to by all Mortgagees, if any.

17.7 Further Assurances. The parties shall do such further acts and things and execute and deliver such additional agreements and instruments as the other may reasonably require to consummate, evidence, or confirm the agreements contained herein.

17.8 Consent. Where rights under this Lease are conditioned upon the consent of one of the parties hereto, it shall not be unreasonably withheld, unless expressly stated otherwise.

17.9 Entire Lease. This Lease constitutes the entire agreement between the parties and supersedes all prior agreements and understandings, oral and written, between the parties hereto with respect to the subject matter hereof.

17.10 Counterparts. This Lease may be executed by the parties in one or more counterparts, all of which taken together shall constitute one and the same instrument.

17.11 Time of Essence. Time and strict and punctual performance are of the essence with respect to each provision of this Lease.

17.12 Relationship of Parties. The relationship of the parties hereto is solely that of landlord and tenant, and nothing contained in this Lease shall be construed to create an association, joint venture, trust or partnership between them.

17.13 Hunting. All hunting rights and privileges on the Premises are reserved to Landlord. None of Tenant, its employees, agents or invitees shall have any hunting rights or privileges on the Premises. Tenant, in its discretion, may establish zones around the improvements on the Premises within which hunting shall be absolutely prohibited. Tenant may require that hunting be suspended completely during certain periods designated by Tenant such as initial construction and erection and other periods of higher-than-usual levels of activity on the Premises. Landlord and Tenant may jointly prepare reasonable hunting rules, which either party shall have the right to enforce.

17.14 Boundary Discrepancies. It is possible that the as-built fence lines of the Premises may not precisely match the boundaries of the Premises described in this Lease, and that these fence lines could create one or more encroachments onto adjacent property which could potentially entitle Landlord to claim the additional property within the fence lines by adverse possession and therefore affect the rights of the Landlord, Tenant and the neighboring landowners. Consequently, in the event any such fence line encroachment exists with respect to the Premises, the boundary of the Premises described in this Lease is now and shall always be recognized as that which is subject to the terms and conditions set forth therein, as it pertains to the Project, and for no other purpose. Landlord agrees on behalf of itself, its heirs, successors or assigns that if Landlord were to acquire any property adjacent to the Premises via an adverse possession claim based on the existing fence line, Landlord waives: (a) any claim that any additional compensation is due to Landlord for improvements placed on the acquired property as part of the Project; and (b) any claim that the acquired property is not subject to any lease and other instruments for the Project executed by the record owner of the acquired property as of the Effective Date of this Lease; provided that the waiver is limited in scope and relates only to the terms and conditions in this Lease, and not for any other purpose. Landlord shall indemnify and hold harmless Tenant against any Claims asserted by any person or entity arising out of an encroachment of any kind onto property adjacent to the Premises as described in this Lease.

17.15 Setback Waiver. To the extent that any applicable law, ordinance, regulation or permit establishes minimum setbacks from the exterior boundaries of the Premises for Facilities (including WTGs) constructed on the Premises or adjacent real property, then Landlord waives any and all such setbacks and setback requirements for the benefit of Tenant, the owner(s) of the adjacent real property, and their respective successors and assigns. Further, if requested by Tenant, Landlord shall execute and deliver to Tenant one or more separate setback waivers in a form provided by Tenant, which Tenant may then record at its expense. This waiver shall survive the termination of this Lease for so long as WTGs or other Facilities exist on real property adjacent to the Premises.

17.16 Memorandum of Lease. Concurrently with execution hereof, the parties shall execute and record a memorandum of this Lease.

17.17 Landlord as Public Official. Landlord acknowledges that its receipt of monetary and other good and valuable consideration hereunder may represent a conflict of interest if Landlord is a government employee or otherwise serves on a governmental entity with decision-making authority (a "**Public Official**") as to any rights Tenant may seek, or as to any obligations that may be imposed upon Tenant in order develop and/or operate the Project ("**Development Rights**"). Accordingly, Landlord shall (a) recuse him/herself from all such decisions related to Tenant's Development Rights unless such recusal is prohibited by law or is not reasonably practicable considering the obligations of such Public Official's position; and (b) recuse him/herself from all such decisions related to Tenant's Development Rights if such recusal is required by law. If Landlord is not required pursuant to (a) and (b) above to recuse him/herself from a decision related to Tenant's Development Rights, Landlord shall, in advance of any vote or other official action on the Development Rights, disclose the existence of this Lease (but not the financial terms therein) at an open meeting of the relevant governmental entity Landlord serves on as a Public Official. Additionally, if Landlord is a Public Official and any of Landlord's spouse, child or other dependent has a financial interest in the Project, Landlord shall disclose such relationship (but not the financial terms thereof) at an open meeting of the relevant governmental entity Landlord serves on as a Public Official, prior to participation in any decision related to Tenant's Development Rights.

[signatures on following page]

LANDLORD:

TENANT:

ELEMENT POWER WIND
DEVELOPMENT, LLC, a Delaware limited
liability company

By: Element Power US, LLC, a Delaware
limited liability company, Manager

By: _____
Its: _____

EXHIBIT A

LEGAL DESCRIPTION

<u>Parcel Number</u>	<u>County</u>	<u>Township/ Range</u>	<u>Section</u>	<u>Acreage</u>
----------------------	---------------	------------------------	----------------	----------------

Total

All that real property located in _____ County(ies), Wisconsin, more fully described as follows:

034640/00005/1790876v1

Renewable Energy Lease
County/State:
Project Name: Tisch Mills

Landowner:

1st page of many

2470211

CATHY WILLIQUETTE
BROWN COUNTY RECORDER
GREEN BAY, WI

RECORDED ON
05/19/2010 11:36:59AM

REC FEE: 17.00
TRANS FEE:
EXEMPT #
PAGES: 4

MORTGAGE
(Agricultural)

Document Number

Document Name

Daniel L. Mathies, a single person,

("Mortgagor," whether one or more) mortgages to Shirley Wind, LLC, a Wisconsin limited liability company, its successors or assigns ("Mortgagee," whether one or more), to secure payment of \$244,433.34 evidenced by a note or notes, or other obligation ("Obligation") dated April 28, 2010 executed by Daniel L. Mathies

to Mortgagee, and any extensions, renewals and modifications of the Obligation and refinancings of any such indebtedness on any terms whatsoever (including increases in interest) and the payment of all other sums, with interest, advanced to protect the Property and the security of this Mortgage, and all other amounts paid by Mortgagee hereunder, the following property, together with all rights and interests appurtenant thereto in law or equity, all rents, issue and profits arising therefrom, including insurance proceeds and condemnation awards, all structures, improvements and fixtures located thereon, in Brown County, State of Wisconsin ("Property"):

Recording Area

Name and Return Address
Attorney Carol Gorb
COLLEN WESTON FINES & RACH LLP
122 W. Washington Avenue, Suite 900
Madison, Wisconsin 53703

GL-397, GL-399, GL-400 and GL-401

Parcel Identification Number (PIN)

Title _____ homestead property.

(is) (is not)

This is not _____ a purchase money mortgage.

(is) (is not)

The South Half (S1/2) of the Southwest Quarter (SW1/4) and the South 45 acres of the North Half (N1/2) of the Southwest Quarter (SW1/4), EXCEPT Lot One (1) of Certified Survey Map No. 6961 as recorded in Volume 47 of Certified Survey Maps on Page 45 as Document No. 2084015 (being a part of the Northwest Quarter (NW1/4) of the Southwest Quarter (SW1/4) of Section Twenty-three (23), Township Twenty-two (22) North, Range Twenty-one (21) East, in the Town of Glenmore, Brown County, Wisconsin). Subject to highway right-of-way easements of record.

1. MORTGAGOR'S COVENANTS.

a. **COVENANT OF TITLE.** Mortgagor warrants title to the Property, except restrictions and easements of record, if any, and further excepting: Memorandum of Wind Energy Lease and Wind Easement Agreement by Daniel L. Mathies, Owner/Lessor, to Shirley Wind, LLC, Lessee, dated June 25, 2007 and recorded July 6, 2007 as Doc. No. 2321942; and Memorandum of Addendum to Wind Energy Lease and Easement Agreement made by Dan Mathies, Owner/Lessor, and Shirley Wind, LLC, Lessee, dated October 16, 2009 and recorded December 3, 2009 as Doc. No. 2450947.

b. **FIXTURES.** Any property which has been affixed to the Property and is used in connection with it is intended to become a fixture. Mortgagor waives any right to remove such fixture from the Property which is subject to this Mortgage.

c. **TAXES.** Mortgagor promises to pay when due all taxes and assessments levied on the Property or upon Mortgagee's interest in it and to deliver to Mortgagee on demand receipts showing such payment.

d. **INSURANCE.** Mortgagor shall keep the improvements on the Property insured against loss or damage occasioned by fire, extended coverage perils and such other hazards as Mortgagee may require, without co-insurance, through insurers approved by Mortgagee, in the amount of the full replacement value of the improvements on the Property. Mortgagor shall pay the insurance premiums when due. The policies shall contain the standard mortgage clause in favor of Mortgagee, and evidence of all policies covering the Property shall be provided to Mortgagee. Mortgagor shall promptly give notice of loss to insurance companies and Mortgagee. Unless Mortgagor and Mortgagee

State Bar Form 21-Page 1

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**KETTLE VIEW
RENEWABLE
ENERGY, LLC**

► Solar PV and Wind Site Assessments ► Installations ► Consultations

Feb 9, 2011

PSC 128 hearing, Madison , WI

Testimony submitted by: Randy Faller, Owner of Kettle View Renewable Energy, LLC.

Company Profile: Installation and maintenance of small wind energy systems up to 100 kW. Also providing wind site assessments.

As an installer of small wind energy systems we are in favor of PSC 128 and the setbacks from neighboring property lines of 1.1 times total system height for small wind systems.

We are not in favor of wind siting rules being drafted at the local level since most local government officials do not have adequate knowledge of the siting standards for wind turbines large or small.

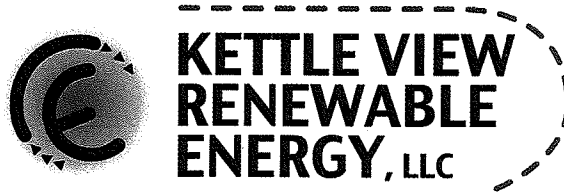
Allowing the local governments to seek direction on wind turbine regulations from the WI Towns Association has proven to be not effective, since many Towns where we have requested a permit do not even know of the current WI Statute 66.0401 that governs rule making on small wind energy systems.

Most Town officials have been referring to the draft of PSC 128 for rule making on the permitting of small wind energy systems and are happy to do so since they know nothing about it. PSC 128, even in draft form, has provided a great reference for local officials and will allow them to "wash their hands" of the decision making matter. We have seen PSC referenced for permitting of small wind energy systems in the Town of Wilson, Town of Freedom, Town of Neenah, Town of Lyndon and Winnebago County.

There has been plenty of opportunity for the public to speak on the wind siting regulations at six public hearings. A great deal of knowledge and effort has gone into the current PSC 128 with fair standards being drawn for all parties involved.

There is no reason to increase any setbacks of large or small wind in PSC 128. These setbacks have been debated by the siting council who drafted PSC 128 and are based on studies of existing farms and have proven to be adequate.

There is also no validity to the claim of wind systems of any size decreasing property values. The Poletti study of one of the oldest wind farms in Wisconsin in Kewaunee County has lengthy data showing there is no effect on property values. The WRA study shows unrealistic values comparing real estate pricing from booming years to our declining recession years. We are in a major recession and property values are expected



► Solar PV and Wind Site Assessments ► Installations ► Consultations

to keep declining for several years. This is the **reality** of the current housing market and wind turbines are simply being used as a scapegoat for declining values.

The wind industry, large and small, in WI is growing and can continue to keep growing and providing more jobs to our already idle workforce with PSC 128 kept in its current form.

If PSC 128 is changed from its current form, not only will you continue to have a declining real estate market, which is a reality, but you will also have a completely dissolved wind industry in WI that will lead to more lost jobs in our state.

Rejected List - page one

List of Articles, Papers, Press Releases, Reports and Other Publications filed by Persons not the Author of the Publication.

- 132409: Listening to Wind Farm Noise Concerns, Jim Cummings, Acoustic Ecology
- 132413: Acoustic Ecology Institute, re; Ontario
- 132685: UW Madison Long Term Study Links Chronic Insomnia to Increased Risk of Death
- 132686: Windmill lawsuit settled
- 132694: Noise Pollution-The Sound Behind Heart Effects, Source Pub Med
- 133200: Responses of the Inner Ear to Infrasound and Wind Turbines, Cochlear Fluids Research Lab
- 133562: Expert Says People are Suffering Health Problems
- 133593: Summary of Recent Research on Health Impacts of Wind Turbines
- 133616: Recent Analysis of Potential Health Impacts of Wind Turbines
- 133633: DeKalb Wind Farm Property Value Agreement
- 133838: Pilot Medical Study of Wind Turbine Health Effects
- 134007: Wind Turbines, Health, Ridgelines and Valleys, Dr. Nissenbaum
- 134013: Reflections on the Integration of Wind Energy into the Power Grid *Study commissioned by organisations & submitted by*
- 134172: Wind Lease Consideration for Land Owners
- 134173: Complications from Excessive and Unexpected Wind Turbine Noise
- 134174: McCann Appraisal Setbacks and Property Values
- 134210: NERC
- 134212: Wall Street Journal-People Living Near Wind Turbines
- 134213: Wall Street Journal-The Wrong Way to get Green
- 134219: CWEST-Property Rights *Submitted by member of organisation*
- 134220: Public Comment
- 134225: Trempealeau Ordinance - *Submitted by Author for Rule Subchapter III - Rejected Submission*
- 134274: Analysis of the Epidemiology and Related Evidence on the Health Effects of Wind Turbines on Local Residents *study Doctor retained by Brown County Citizens. Report directed to Rules*
- 134275: Wind Turbine Accidents
- 134280: Measurements of Audible Noise from Wind Turbines
- 134281: Kamperman and James-Noise Criteria for Siting Wind Turbines
- 134282: Dr. Pierpont-Case Study about Wind Turbines
- 134289: Incorporating Low Frequency Noise Legislation for the Energy Industry-Alberta Canada
- 134323: Siting Wind Turbines with Respect to Noise Emissions and there Health and Welfare Effects on Humans *study commissioned to respond to ESC - submitted by & rejected*
- 134329: Wind Turbine Noise, What Audiologists Should Know
- 134360: Bird Kills Alarm Group
- 134378: Wind Turbines, Dr Hanning
- 134379: The Magic Power of Sleep
- 134380: Lack of Sleep Linked to Early Death
- 134384: Lessons from Europe
- 134420: World Health Organization, Health Survey Report from Canada, Dr, Nina Pierpont, Vestas
- 134448: Physical Risks of Wind Turbines
- 134450: Wind Turbines at Night
- 134451: Wind Turbine Sound at Night
- 134482: Public Comment
- 134504: Science Daily
- 134505: Health Story, Blue Cross

Reflections on the Integration of Wind Energy into the Power Grid

Kevin F. Forbes, Ph.D
Associate Professor
Center for the Study of Energy and Environmental Stewardship
Department of Business and Economics
The Catholic University of America
Washington DC
Forbes@CUA.edu

**Prepared on behalf of Brown County Citizens for Responsible Wind Energy in connection
with Public Service Commission of Wisconsin docket no. 1-AC-231, Wind Siting Rules.**

Richard D. Horonjeff

81 Liberty Square Road #20-B

Boxborough, MA 01719

Voice: (978) 266-0344 Cell: (781) 929-3553 FAX: (978) 266-0344 E-mail: rhoronjeff@comcast.net

Consultant in Acoustics and Noise ControlPublic Service Commission of Wisconsin
RECEIVED: 07/06/10, 4:35:37 PM

06 July 2010

Edward S. Marion

Attorney-at-Law, L.L.C.

716 Ottawa Trail

Madison, Wisconsin, 53711

Subject: Siting of Wind Turbines With Respect to Noise Emissions and their Health and Welfare Effects on Humans

Reference: RDH Project No. 210004

Dear Mr. Marion,

Per your request, this letter presents an overview of the effects of large-scale wind turbines (greater than one megawatt) on people. It particularly addresses these effects with respect to residents living in the vicinity of wind turbine developments (often referred to as "wind farms").

Preface.

Of particular concern is the ability of the May 2010 Public Service Commission of Wisconsin (PSCW) sound and vibration guidelines¹ to protect the public health and welfare, and to do so with an adequate margin of safety². The three operative terms important to this discussion are:

- Welfare,
- Health, and
- Margin of Safety

In the present context the term welfare refers to the potential annoyance or nuisance effect of the noise. The word health refers to potential health effects of the noise having to do with sound level, frequency content, or temporal character. The term margin of safety relates specifically to the many unknown factors involved in predicting the health and welfare effects of wind turbine related sound. At present the A-weighted sound level is widely used in guidelines and regulations to place limits on residential sound exposure from industrial sources, and it has been

¹ Public Service Commission of Wisconsin, "Measurement Protocol for Sound and Vibration Assessment of Proposed and Existing Wind Electric Generation Plans," May 2010.

² Environmental Protection Agency (EPA), Office Of Noise Abatement And Control (ONAC), "Information On Levels of Environmental Noise Requisite To Protect Public Health and Welfare with an Adequate Margin of Safety," March 1974.

**An Analysis of the Epidemiology and Related Evidence on the Health Effects
of Wind Turbines on Local Residents**

prepared at the request of Brown County Citizens for Responsible Wind Energy in connection
with Public Service Commission of Wisconsin docket no. 1-AC-231, Wind Siting Rules

Carl V. Phillips, MPP PhD
epiphi Consulting Group
cvphilo@gmail.com

3 July 2010

Public Service Commission of Wisconsin
RECEIVED: 07/06/10, 10:47:49 AM

Personal background/credentials

My name is Carl V. Phillips. I am an expert in epidemiology and related health sciences, as well as scientific epistemology and methodology, and have been retained by attorney Edward Marion, representing Brown County Citizens for Responsible Wind Energy, to provide analysis and testimony in connection with Public Service Commission of Wisconsin docket no. 1-AC-231, Wind Siting Rules.

I earned a PhD in public policy (with an emphasis on economics-based decision making) from Harvard University, completing a dissertation on environmental policy and economics. I then completed the Robert Wood Johnson Foundation Scholars in Health Policy Research postdoctoral fellowship at the University of Michigan. Later I did a second fellowship in philosophy of science at the University of Minnesota. Before I returned to school for my PhD and began my career in public health science, I worked in consulting, primarily analyzing energy and environmental policy issues. Prior to that I earned a Master's in Public Policy from the Kennedy School of Government at Harvard, and *summa cum laude* undergraduate degrees in math and history from Ohio State University.

I spent most of my career as a professor of public health. I currently direct an independent academic-style research institute (a continuation of my university research lab) and a small consultancy. During my career as a professor, I taught at the schools of public health at University of Minnesota, University of Texas, and University of Alberta (Canada), the evidence based medicine program at University of Texas medical school, the University of Alberta medical school, and Harvard's Kennedy School of Government. My teaching focused on two subjects: how to make optimal public policy decisions based on scientific evidence and how to properly analyze epidemiologic data. This subject matter, as important as it is, is generally overlooked in health science and medical education, and students frequently reported that my teaching clarified their understanding of epidemiology, science more generally, and policy decision making for the first time in their educational careers.

My research during my academic career, and continuing in my private institute, has emphasized epidemiologic methods, environmental health, science- and ethics-based policy making, the nature and quality of peer review, and tobacco harm reduction (the main focus of the current institute). My work on epidemiologic methods focuses on recognizing and quantifying uncertainty, recognizing and correcting for biased analyses, and translating statistical results into decision-relevant information. My initial contributions in the area of quantifying uncertainty won several awards in the early 2000s and launched a new area of inquiry in the field.

Epidemiology is the study of actual health outcomes in people, and thus is the only science that can directly inform us about actual health risks from real-world exposures. Related biological and physical sciences often provide useful information about health risks, but they are ultimately trumped by epidemiology because real-world exposures and the human body and mind are so complex that we cannot effectively predict and measure health effects except by studying people and their exposures directly. My background in epidemiology methods, scientific epistemology,

CREATING THE WINDMILL GHETTO

They say a picture is worth a thousand words.

This map illustrates the property rights issue for neighbors of industrial wind turbines.

Under current PSC siting regulations, turbines can exist 1000' from a home and about 500' from a property line.

Thus the person that owns parcel "A" can site a turbine and collect the contracted payments from a wind developer.

The Owners of Parcels "B", "C", "D", and "E" have their **right to build a home anywhere in the yellow circle taken from them without any compensation.** Even worse, they cannot appeal to any local government or planning committee. They have no say whatsoever in this "taking"!

Thus an owner of 23 acres can "take" the right to build a home or office from an additional 50 acres that is owned by his neighbors.

Under current law, local governments do at least have the right to ensure public health and safety and many have used that authority to make sure that yellow circles don't pop up in their communities.

Statewide siting preemption would remove even this small amount of local control from our Wisconsin communities.

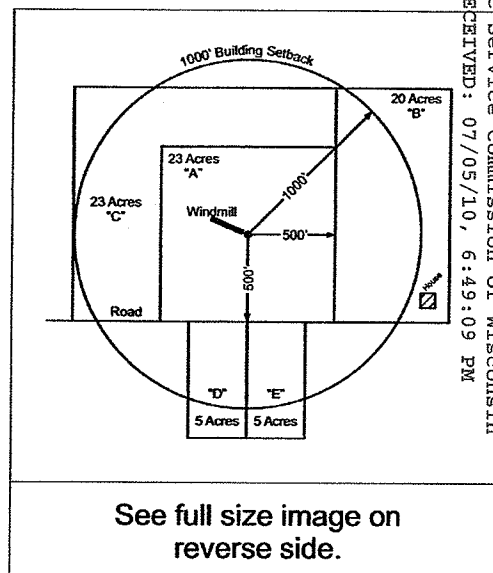
The theoretical environmental benefits of siting industrial wind turbines go to the entire planet. But the costs are overwhelmingly borne by neighboring landowners in terms of plummeting land values, loss of control over their property, and noise effects that can have long term health consequences.



The Wisconsin Legislature can assure that the cost/benefit distribution is done more fairly.

We should insist that siting decisions are consistent with comprehensive local planning.

And any consideration of a state preemption bill should make certain that neighbors are protected either through adequate setbacks or by requiring easements from those that will have to live with the windmills.



See full size image on reverse side.

For more information contact CWEST's representative Bob Welch at 608-819-0150

Below are some excerpts from a 2004 report by Energy Center of Wisconsin, Madison WI, titled: A Study of Wind Energy Development in Wisconsin. The report was prepared for the State of Wisconsin, Department of Administration, Division of Energy. The report contains a case study of the 5 wind projects that existed in Wisconsin at the time of the report, and what can be learned from these projects to further support the construction and operation of additional wind projects in Wisconsin. Michael Vickerman is listed as a contributing author for the report.

Some of the conclusions of the report are;

- The project must be acceptable to the people in the area.
- Proper turbine placement is crucial to success.
- Eastern Wisconsin has smaller farms and higher rural population density making it less suitable for successful wind projects.

The repeating conclusion from every project is that people living less than ½ mile from turbines will be negatively impacted by the turbines.

The entire report can be downloaded from www.ecw.org

Report excerpts start here;

Executive Summary CONCLUSIONS

Developing sustainable sources of energy for the future requires a broad understanding of these technologies within their working context. This does not simply mean a demonstration of their mechanical integrity, their economic feasibility, or an analysis of their impact on the natural environment, but also attention to how their presence affects existing social and economic structures. For a clean energy technology to be sustainable, it must be acceptable to the majority of people, and particularly to those who live near it.

There are many economic viewpoints involved in the average wind farm development. As indicated in Part 1 of this Study, Wind Power in Wisconsin: A Development Case Study, wind farm development in Wisconsin has shown that deeply rural communities, where the local economy is based in agriculture, are more receptive to wind farms because they are perceived as an economic boon. This is particularly true when local government shares in the revenues. On the other hand, for suburban residential housing developments whose economic base is primarily elsewhere, wind farms are often considered a visual blot on the bucolic landscape.

Glenmore project, 2 Tacke 600-kW turbines

(2) NOTICE TO POLITICAL SUBDIVISION. An owner shall provide a copy of the notice under sub. (1) to any political subdivision with jurisdiction over the wind energy system, and the owner shall keep the contact person and telephone number current and on file with the political subdivision.

Subchapter V – Commission Procedure

PSC 128.50 Standards established by the commission. (1) DETAILED APPLICATION FILING REQUIREMENTS. The commission shall establish detailed application filing requirements for applications filed for political subdivision review of a wind energy system, which shall contain a detailed description of the information required to satisfy the filing requirements for applications under s. PSC 128.30 (2). The commission may revise these requirements as necessary. The commission shall make the filing requirements available to the public on the commission's website.

(2) COMMISSION PROTOCOLS. (a) The commission may periodically create and revise measurement, compliance, and testing protocols as needed to provide standards for evaluating compliance with this chapter. These protocols may be created and revised to reflect current industry practice, changes in the state of the art, and implementation of new technologies. The commission may make protocols under this subsection available to the public on the commission's website.

(b) The commission may establish protocols in any of the following areas:

1. Noise measurement, compliance and mitigation.
2. Stray voltage testing and remediation.

3. Shadow flicker compliance and mitigation.
4. Communications interference testing and mitigation.
5. Other areas where protocols are appropriate.

PSC 128.51 Commission review. (1) APPEALS TO THE COMMISSION. An appeal under s. 66.0401 (5) (b), Stats., shall be treated as a petition to open a docket under s. PSC 2.07, except the time provisions of that section do not apply.

(2) PETITIONER FILING REQUIREMENTS. An aggrieved person under s. 66.0401 (5) (a), Stats., may file a petition with the commission. The petition shall be submitted to the commission in writing or filed using the commission's electronic filing system and shall contain all of the following:

- (a) The petitioner's name, address, and telephone number.
- (b) The name, address, and telephone number of the political subdivision that is the subject of the petition.
- (c) A description of the wind energy system that is the subject of the petition.
- (d) A description of the petitioner's relationship to the wind energy system.
- (e) The information specified in s. PSC 2.07 (2).

(3) POLITICAL SUBDIVISION FILING REQUIREMENTS. (a) A political subdivision shall file a certified copy of the information required under s. 66.0401 (5) (c), Stats., using the commission's electronic regulatory filing system.

- (b) The commission may require the political subdivision to file up to 5 paper copies of the record upon which it based its decision.
- (c) The commission may require the political subdivision to file additional information.

February 9, 2011

Committee Members,

To start, let me thank the committee for entertaining my testimony as it relates to the committees consideration of Uniform Wind Siting Rules in Wisconsin. If not for a wind conference in the state of Illinois, coupled with business meetings related to wind projects, I would be meeting with you today. Assuming the business climate in Wisconsin is supportive of renewable energy development I hope to expand my business in Wisconsin by partnering with a third party turbine supplier to expand the scope of renewable energy options available to Wisconsin: homeowners, commercial businesses, agricultural operations, and educational entities.

Outside of ready capital no single hurdle is greater for my business then the uncertainty related to the myriad of zoning rules and regulations that are currently promulgated by different cities and counties across the state of Wisconsin. In 2009 I welcomed Wisconsin Act 40 knowing full well the benefits of certainty in how wind energy systems, both large and small, could be installed in this state. I also welcomed accountabilities that would require, among other things, that non-functional, or abandoned wind energy systems, would be taken down in a timely fashion.

While it is certain that the PSC rules do not meet all of my expectations they are none-the-less a carefully considered balance of concerns, needs, and requirements. The PSC advisory board represented a broad array of interests and provided ample opportunity for public comment. To stop the implementation of the March 1, 2011 PSC Uniform Wind Siting Rules would damage my business interests, and no doubt the business interests of many others in this state. As I see this decision, the committee is presented with an opportunity to promote: private capital expenditures, job creation, and stability in an economy that is not expanding fast enough for the average Wisconsin worker.

Assuming the adoption of the PSC Uniform Wind Siting Rules, the benefits to this state are significant. First, the rules will reward the risk taking entrepreneurs in Wisconsin that are only asking for certainty in opportunity. Second, wind energy in this state is too valuable a natural resource to not be tapped in a responsible and transparent fashion. Third, now is the time for Wisconsin's legislative leaders to demonstrate that they will create, through their actions, a business climate in Wisconsin that is Open for "All" Businesses. In closing, I ask that the committee allow implementation of the PSC Uniform Wind Siting Rules on March 1, 2011.

Sincerely,

John Backus

St Croix Valley Sustainability Solutions LLC

516 232nd Ave

Somerset, WI 54025

TO: Joint Committee for Review of Administrative Rules
FROM: Tower Tech Systems, Inc., Manitowoc, WI
DATE: February 9th, 2011
RE: Testimony- Tower Tech Systems, Inc. **Support** of PSC 128

Ladies and Gentlemen of the Committee,

Good morning. My name is Chris Seider and I represent Tower Tech Systems, Inc. located in Manitowoc, Wisconsin. More specifically, I represent the families of the over 350 employees who work for our company.

Tower Tech Systems, Inc. manufactures Tower Support Structures for Wind Turbines. We have been in operation since 2004 and have proudly built over 800 towers since our founding. We are currently scheduled to build 90 towers for Wisconsin Wind Farms in 2011.

The bulk of our workforce is made up of highly skilled, good paying manufacturing positions. Over the past year, we have expanded our workforce by over 125 full-time employees and have capacity to add more in the future should the market allow us.

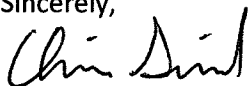
Tower Tech Systems, Inc. supports the current PSC 128 siting standards primarily because they were created collectively over a period of 2 years with all interested parties actively involved. The standards contained within help our industry to grow as it allows investors to know what to expect. Wisconsin has had a reputation of being difficult to do business within at times for wind farms and we fear that further uncertainty created by delaying or suspending these rules will only make matters worse.

Because of the large cost of transportation within our industry, the closer our plant is located to potential wind farm projects, the more likely we are to get the contracts. If PSC 128 is suspended and further uncertainty is put into the industry within Wisconsin, we may see projects, jobs and investments that we would have been able to get go to our competitors in other states.

The jobs and the livelihood of the 350+ families we support rest on our State and our Country supporting our industry and allowing PSC 128 to go into effect on March 1st, 2011. We are proud of what we do and believe in our product and only ask for fair and understood standards. We believe that the PSC 128 siting standards accomplish this goal.

Thank you for taking the time to hear the voices of our employees and have a great day!

Sincerely,



Chris Seider, PHR, ARM
Environmental, Health and Safety Manager

February 8, 2011

Dear Joint Committee for Review of Administrative Rules:

I am in favor of suspending the Wind Siting Rules. To ensure citizen's property rights, the setbacks from wind turbines should be a minimum of 1800' from a property line. Without these adequate setbacks from property lines, wind turbines will restrict economic development in the State of Wisconsin. This would be a JOBS KILLER! I've also attached a report that talks about how renewable energy will increase utility bills and what renewable energy will really cost Americans.

Please SUSPEND the Wind Siting Rules.

Sincerely,

A handwritten signature in black ink, appearing to read "Daryn & Martha Woelfel". The signature is written in a cursive, flowing style.

Daryn & Martha Woelfel

W2949 Hickory Hills Road

Chilton, WI 53014

1-920-849-2840

hhccwoel@msn.com

A REPORT OF THE HERITAGE CENTER FOR DATA ANALYSIS

A RENEWABLE ELECTRICITY STANDARD:
WHAT IT WILL REALLY COST AMERICANS

DAVID W. KREUTZER, PH.D., KAREN A. CAMPBELL, PH.D.,
WILLIAM W. BEACH, BEN LIEBERMAN, AND NICOLAS D. LORIS

CDA10-03

May 5, 2010



214 Massachusetts Avenue, NE • Washington, DC 20002 • (202) 546-4400 • heritage.org

NOTE: Nothing written here is to be construed as necessarily reflecting the views of The Heritage Foundation or as an attempt to aid or hinder the passage of any bill before Congress.

A RENEWABLE ELECTRICITY STANDARD: WHAT IT WILL REALLY COST AMERICANS

DAVID W. KREUTZER, PH.D., KAREN A. CAMPBELL, PH.D.,
WILLIAM W. BEACH, BEN LIEBERMAN, AND NICOLAS D. LORIS

Abstract: *Renewable energy—harnessing the power of the wind and the sun—sounds wonderful until confronted with the facts. While wind and sun are indeed free, turning their energy into consumer-accessible electricity is not. Nor is it easy. Wind power must be used at the moment the wind is blowing—which it generally does not do during blazing-hot summer days, the peak of electricity use. Both solar and wind power require costly installations and transmission mechanisms. Instead of saving money for Americans, renewable energy sources are much more likely to spike their utility bills. Nevertheless, Congress is considering a mandate for a nationwide renewable electricity standard (RES). Heritage Foundation energy policy experts explain why an imposed national RES would be bad for families, bad for business, and bad for the economy.*

Congress is once again considering major energy legislation, focused largely on promotion of energy sources that produce few or no greenhouse gases. This current concentration on promoting so-called renewable energy sources assumes that congressional action now will lead to such significant growth in renewable energy sources that the use of carbon-based energy will subside, thus reducing the expansion of atmospheric carbon dioxide and other global warming gases.

Congress's effort to expand renewable energy sources starts from a relatively meager production base. Nearly half of America's electricity is generated from coal, with natural gas and nuclear energy adding about 20 percent each.¹ Most of the rest is provided by renewable sources, primarily hydroelectric energy at 6 percent. Non-hydro renewables like wind and solar energy and biomass total only 3 percent.

For many years, federal energy and environmental policy has nudged production of some electricity sources over others, either through "sticks," such as costly air quality regulations targeting coal, or through "carrots" like tax credits and subsidies for wind. Proposed global warming legislation would alter the electricity mix to an unprecedented degree by putting a price on emissions of greenhouse gases, chiefly carbon dioxide from fossil fuel combustion. Coal is the most carbon-intensive energy source, and any stringent cap-and-trade provisions would significantly curtail its use in favor of other sources in the decades ahead. Such legislative measures, however, are very costly,² and the prospects for passage in 2010 are uncertain.

Congress is also considering achieving similar but less ambitious goals via a renewable electricity

1. U.S. Energy Information Administration, "Figure ES 1. U.S. Electric Power Industry Net Generation," January 21, 2010, at <http://www.eia.doe.gov/cneaf/electricity/epa/figes1.html> (April 29, 2010).

standard (RES). Twenty-nine states have versions of an RES, but Washington is considering a nationwide standard. Under this mandate, a growing percentage of electricity would have to be produced by approved renewable energy sources. Much of the RES would be met with increased energy generation from wind turbines.

It stands to reason that an RES would raise electricity prices. After all, if electricity created by wind and other renewables were cost competitive, consumers would use more of it without a federal law to force consumption. Recent experience with the mandate for renewable fuels like corn ethanol also suggests significant cost increases as well as technical shortcomings.³

While proponents argue that wind is free, harnessing it into useful electricity certainly is not. However, the question of how much an RES will affect electric bills does not have a straightforward answer.

Perhaps easiest to calculate is the direct cost of purchasing, installing, and operating the increasing number of wind turbines needed to meet the RES. A bit murkier are questions about the costs of the necessary additional transmission lines to deliver the electricity from where it is generated—the most desirable sites for wind are often remote mountain ridges or sparsely populated plains—to the cities where it is needed.⁴ The economics of an RES is further complicated by the legal and administrative objections to establishing appropriate sites for wind farms and transmission lines,

which already are quite common and would only grow with an RES.⁵

It is particularly difficult to take into account the substantial costs created by the intermittent and unreliable nature of wind. Simply put, the wind does not always blow, and it is difficult to predict and impossible to control. Given the need for electricity 24 hours a day seven days a week and the reality that times of peak demand—hot summer days—are precisely when the wind is usually still, a mandate for increased wind-generated energy is also a mandate for increased non-wind backup systems for balancing wind fluctuations.⁶ In effect, increased wind power cannot simply be added to the existing grid without transforming the grid in ways that introduce both significant costs and operational inefficiencies.

These shortcomings will not be overcome through increases in scale. Connecting a large number of widely dispersed wind farms to the grid will not smooth the overall supply enough to make balancing unnecessary. Though variability can be reduced, a recent analysis states, “These results do not indicate that wind power can provide substantial baseload power simply through interconnecting wind plants.”⁷

There are federal studies of the costs of an RES that conclude that it would add no more than a few percent to electric rates,⁸ but these studies do not take the full cost of wind and other renewables into account. This Center for Data Analysis (CDA) Report

2. For analysis of the Lieberman–Warner bill, see William W. Beach, David W. Kreutzer, Ben Lieberman, and Nicolas D. Loris, “The Economic Costs of the Lieberman–Warner Climate Change Legislation,” *Heritage Foundation Center for Data Analysis Report* No. CDA08-02, May 12, 2008, at <http://www.heritage.org/Research/Reports/2008/05/The-Economic-Costs-of-the-Lieberman-Warner-Climate-Change-Legislation>. For analysis of the Waxman–Markey bill, see David W. Kreutzer, Karen A. Campbell, William Beach, Ben Lieberman, and Nicolas Loris, “The Economic Consequences of Waxman–Markey: An Analysis of the American Clean Energy and Security Act of 2009,” *Heritage Foundation Center for Data Analysis Report* No. CDA09-04, August 6, 2009, at <http://www.heritage.org/Research/Reports/2009/08/The-Economic-Consequences-of-Waxman-Markey-An-Analysis-of-the-American-Clean-Energy-and-Security-Act-of-2009>. For analysis of the Boxer–Kerry bill, see David W. Kreutzer, Karen A. Campbell, William W. Beach, Ben Lieberman, and Nicolas D. Loris, “What Boxer–Kerry Will Cost the Economy,” *Heritage Foundation Backgrounder* No. 2365, January 26, 2010, at <http://www.heritage.org/Research/Reports/2010/01/What-Boxer-Kerry-Will-Cost-the-Economy>.
3. Ben Lieberman and Nicolas Loris, “Time to Repeal the Ethanol Mandate,” *Heritage Foundation WebMemo* No. 1925, May 15, 2008, at <http://www.heritage.org/Research/Reports/2008/05/Time-to-Repeal-the-Ethanol-Mandate>.
4. Joint Coordinated System Plan, *Report: Joint Coordinated System Plan '08*, 2008, at <http://www.jcspstudy.org/> (April 30, 2010).
5. U.S. Chamber of Commerce, “Project No Project: Energy—Back on Track,” at <http://pnp.uschamber.com/> (April 30, 2010).
6. Robert J. Michaels, “A Federal Renewable Electricity Requirement,” *Cato Institute Policy Analysis* No. 627, November 13, 2008, at http://www.cato.org/pub_display.php?pub_id=9768 (April 29, 2010).
7. Warren Katzenstein, Emily Fertig, and Jay Apt, “The Variability of Interconnected Wind Plants,” *Energy Policy*, April 18, 2010, at <http://www.citeulike.org/user/LondonAnalytics/article/7052831> (April 29, 2010).

provides such a comprehensive economic analysis.

CDA analysis projects that an RES as outlined below would:

- Raise electricity prices by 36 percent for households and 60 percent for industry;
- Cut national income (GDP) by \$5.2 trillion between 2012 and 2035;
- Cut national income by \$2,400 per year for a family of four;
- Reduce employment by more than 1,000,000 jobs; and
- Add more than \$10,000 to a family of four's share of the national debt by 2035.

The High Cost of Renewable Energy Systems

Using wind and solar energy systems to provide 100 percent of electricity could double or triple household electric bills.

Average Electricity Bill for a Family of Four, by Energy Source

Energy System	Costs		
	Monthly	Annually	
Coal	\$188.66	\$2,263.90	
On-shore wind	\$339.58	\$4,075.02	
Off-shore wind	\$403.65	\$4,843.75	
Solar thermal	\$504.03	\$6,048.34	
Solar photovoltaic	\$717.82	\$8,613.85	

Sources: Heritage Foundation calculations, and U.S. Energy Information Administration, "2016 Levelized Cost of New Generation Resources from the Annual Energy Outlook 2010," at http://www.eia.doe.gov/oiiaf/aeo/electricity_generation.html (March 30, 2010).

Chart 1 • CDA 10-03 heritage.org

COMPARING THE COSTS OF WIND AND COAL

The flow of wind is erratic and uncertain, which means that so is the power generated from wind. This unreliable nature is especially problematic when wind is used to generate utility-scale electricity for the power grid.

Keeping line quality, primarily voltage and frequency, within the necessarily close tolerances requires constant monitoring of demand and the constant monitoring and adjustment of supply.⁹ Even under the best of circumstances, these adjustments require a certain fraction of power to be delivered from generators that can be ramped up and down rapidly. For the most part, this easily ramped electricity comes from natural-gas fired turbines that are relatively expensive to operate compared to a baseload source such as coal, nuclear, or natural-gas combined-cycle power plants.

Though coal, nuclear, and gas combined-cycle power plants are much more sluggish in response to changing demand, their dependability is very high. Indeed, their output can be matched to size-

able, expected changes in demand when given sufficient lead time. Wind energy plants do not have this ability by themselves, so direct comparisons of wind costs per kilowatt hour to coal or gas costs are misleading.

Further, location choices for fossil and nuclear-fueled power plants have much greater latitude than those for wind turbines, which, like hydropower plants, must be located where the natural resource is best suited—not necessarily close to where the power is used. This feature adds additional transmission costs to wind energy.

With nuclear power not considered to be renewable, the least-cost renewable source for electricity is onshore wind. In an early-release version of its "Annual Energy Outlook 2010," the Energy Information Administration (EIA) lists the levelized costs of various sources of electricity projected for 2016 (in 2008 dollars).¹⁰

The EIA levelized costs per megawatt hour are \$78.10 for conventional coal power,¹¹ \$149.30 for onshore wind power, \$191.10 for offshore wind power, \$396.10 for photo-voltaic solar

8. U.S. Energy Information Administration, "Impacts of a 25 Percent Renewable Electricity Standard as Proposed in the American Clean Energy and Security Act Discussion Draft," April 2009, at [http://www.eia.doe.gov/oiiaf/servicerpt/acesa/pdf/sroiaf\(2009\)04.pdf](http://www.eia.doe.gov/oiiaf/servicerpt/acesa/pdf/sroiaf(2009)04.pdf) (April 29, 2010).

9. Electrical appliances operate on alternating current, which requires that all generators in the grid turn at the same frequency and be perfectly synchronized. Further, appliances are designed to operate at particular voltages. Exceeding the tolerances for these voltages, either too high or too low, can cause serious damage to the equipment.

10. U.S. Energy Information Administration, "2016 Levelized Cost of New Generation Resources from the Annual Energy Outlook 2010," at http://www.eia.doe.gov/oiiaf/aeo/electricity_generation.html (April 29, 2010).

power, \$256.60 for thermal solar power, and \$139.50 for power generated by natural-gas conventional turbines.

Even though the \$149.30 for the cheapest renewable power is already well above the cost of conventional power sources, it does not include any adjustment for reliability or additional transmission costs.

Wind cannot be turned on and off to match changes in demand. There are no feasible energy storage options for most wind farms. So, unlike power from conventional sources, wind power must be used when the wind is actually blowing.

Geography puts wind at another disadvantage. To keep the cost of wind power as low as possible, it is necessary to locate the wind farms in areas with the strongest and steadiest winds. As is the case with solar power, many of the best areas for wind power are located far from the major population centers. This requires construction of new, high-capacity transmission lines. A review of transmission costs suggests a median cost of \$15 per megawatt hour.¹²

The dependability problem is more complicated. Power-grid management requires constant and instantaneous balancing of supply and demand. Sophisticated analysis and long experience guide grid operators as they schedule the various sources of generation. Nevertheless, there will still be unanticipated changes in both supply and demand; further, there can be variations in demand that cannot easily be matched by the most efficient conventional sources (coal, nuclear power, and integrated combined-cycle gas) even if they are anticipated. The most common energy source for balancing these very short-run changes is natural gas turbines, which are less efficient than coal, nuclear power, or natural gas combined cycle.

Wind, like solar energy, is not a dispatchable power source; that is, it cannot be turned on at will. As a result, increasing dependence on wind adds variability and uncertainty to the power grid that must be offset by quick-ramping power sources like natural gas turbines to maintain a relatively constant flow of electricity.

This increased reliance on natural gas turbines comes from two sides of the balancing equation. When there is an unanticipated decline in wind generation, or when the decline is anticipated but is for too short a period to balance with coal, natural gas turbines fill the gap. On the other hand, when wind generation is low compared to capacity, there is need for power sources that can be quickly ramped down. In this case, there would be additional need for natural gas generation so that unanticipated increases in wind power can be accommodated by rapidly cutting power from the natural gas turbines.

Gas turbines are not a renewable energy source, so swapping a megawatt hour of wind power for a megawatt hour of coal power also requires swapping power from natural gas turbines for additional coal. Since coal power is cheaper than power generated by natural gas turbines, the difference must be added to the cost differential between wind and coal.

There is little research directly addressing the question of how much additional gas-turbine power will be needed. The theoretical limits are zero (all fluctuations are perfectly anticipated and balanced with the cheapest coal power) and the inverse of the capacity factor, which would imply three megawatt hours of additional gas-turbine power for every megawatt hour of wind power.¹³ In theory, this could add as much as \$179 per megawatt hour to the cost of wind power.

11. To adjust for regulatory uncertainty, the EIA added a premium to the capital cost for coal power plants. The EIA said that the premium has a cost impact similar to a \$15 per ton tax on CO₂ emissions. This would raise the cost of coal power by \$22.30 per megawatt hour. Since CDA analysts are interested in comparing the cost of electricity generated with coal and without CO₂ regulations to the cost under a renewable energy standard, the cost associated with the capital premium has been deducted here.
12. Andrew Mills, Ryan Wisser, and Kevin Porter, "The Cost of Transmission for Wind Energy: A Review of Transmission Planning Studies," Ernest Orlando Lawrence Berkeley National Laboratory, February 2009, at <http://eetd.lbl.gov/ea/emp/reports/lbnl-1471e.pdf> (April 29, 2010).
13. The capacity factor is the ratio of a generator's actual energy production for a year to its maximum potential production. The projected capacity factors are 34 percent for wind, 85 percent for coal, 87 percent for natural gas combined cycle, 90 percent for nuclear power, and 30 percent for natural gas turbines. These different capacity factors have already been incorporated into the EIA's levelized costs.

A study done for the National Renewable Energy Laboratory indicates that the spinning reserves must be increased about 0.2 megawatt capacity for each megawatt of wind power.¹⁴ “Spinning reserves” describes the power plants that must be warmed up and synchronized with the grid so that they can be brought online more quickly. They use fuel, but not as much as when they are called upon to supply power to the grid.

This measure is somewhat different from the necessary increase in actual gas-turbine electricity production, but it is very much related to the uncertainty and variability problem. Though 0.2 megawatt per hour may be a significant underestimate for the amount of additional gas-turbine power, it is the factor employed for this analysis. That is, for every megawatt hour of wind that is substituted for coal power, an additional 0.2 megawatt hour of gas-turbine power must be substituted for coal as well. Using this ratio adds \$12 per megawatt hour instead of the theoretical maximum of \$179 per megawatt hour to the cost of wind power.

After making these adjustments for transmission costs and additional gas-turbine generation, the cost of an additional megawatt of onshore wind power is \$177 per hour. This is 126 percent above the cost of a megawatt of coal power per hour.

Put another way, the electric bill for a typical family of four would be \$189 per month if it was powered entirely by coal, but it would rise to \$340 per month if it was supplied entirely by onshore wind power.¹⁵

Since onshore wind is the least expensive of the renewable electricity sources (ruling out conventional hydro and nuclear power), any plan that uses the more expensive renewable sources—such as off-shore wind (\$218 per megawatt hour); thermal solar power (\$284 per megawatt hour); or photovoltaic solar power (\$423 per megawatt hour)—would have even greater costs. As the mandated

renewable-fraction of electric power rises, so does the average cost of electricity.

Chart 1 shows the hypothetical family-of-four electric bill for different sources of electric power. Though former Vice President Al Gore has suggested moving the country entirely to renewable electricity generation in 10 years, few if any legislative proposals seek complete dependence on renewables. Nevertheless, Chart 1 illustrates the large cost differences between the cheaper conventional energy sources and various renewable energy sources.

With a standard that requires only a fraction of electricity to be generated by renewable sources, the adverse impact on electric bills will be diluted as the higher cost of renewable electricity is averaged with the lower-cost conventional power. However, as the relative amount of wind power grows, the impact on electricity prices grows as well.

A RENEWABLE STANDARD

Renewable energy standards typically stipulate a timeline of minimum levels of electricity that must be met by approved renewable sources. Usually, these minimum levels are expressed as a fraction of total electricity generation for each year.

For the purposes of this study, the RES starts at 3 percent for 2012 and rises by 1.5 percent per year. This profile mandates a minimum of 15 percent renewable electricity by 2020, a minimum of 22.5 percent by 2025, and a minimum of 37.5 percent by 2035, which is the end year for this analysis.

CDA analysts assume that the higher costs of the renewable power are averaged in with the lower costs of conventionally generated power so that within each of the sectors (industrial, commercial, and residential), all customers pay the same price per kilowatt hour. Further, for the purposes of this analysis, prices do not vary from one part of the country to another. In reality, an RES will have differential impacts from one market to another. In general, smoothing adverse impacts in economic

14. EnerNex Corporation, “Eastern Wind Integration and Transmission Study: Executive Summary and Project Overview,” prepared for the National Renewable Energy Laboratory, January 2010, at http://www.nrel.gov/wind/systemsintegration/pdfs/2010/ewits_executive_summary.pdf (April 29, 2010).

15. These numbers are based on the cost of substituting wind for coal, which requires additional natural-gas turbine power for balancing. It would be virtually impossible, and therefore much more expensive, to provide power that is generated entirely by wind farms. The average markup from cost to retail is assumed to be \$45 per megawatt hour. The average consumption is derived from U.S. Energy Information Administration, “Table 5: Average Monthly Bill by Census Division, and State 2008,” at <http://www.eia.doe.gov/cneaf/electricity/esr/table5.html> (April 29, 2010).

analysis reduces overall costs. So although the analysis may blur the pattern of economic distress, it is unlikely to have overestimated it.

ECONOMIC RESPONSES

When the cost of any commodity rises, actors in the economy respond in uncounted ways to offset the impact. Though specific responses cannot be predicted, general patterns and magnitudes can be estimated from past responses to price changes.

Electricity prices have risen and fallen over the decades, and businesses and households have adjusted. The adjustments can be as routine as parents reminding their children to turn off the lights or as entrepreneurial as an engineer setting up a firm to develop new technology. When electricity prices rise, heat-pump salespeople are more likely to emphasize the advantages of their more efficient (and more expensive) models; producers of electronic controls will see a greater market for programmable thermostats; people will turn down the thermostat and be more inclined to buy Energy Star-rated appliances.¹⁶ These impacts and more are reflected in the complex system of equations that have been estimated for the macroeconomic model and are reflected in the coefficients of the smaller energy model employed to estimate initial electricity price effects.¹⁷

Even when averaging the cost of the mandated renewable electricity with the cheaper conventionally sourced electricity, the price rises are noticeable. For residential consumers, the price increases start small (because the renewable mandate starts at only 3 percent), but by 2035, the price rises 36 percent above the baseline price. Forced to pay higher prices, households cut electricity use by 19 percent. Even after these consumption cutbacks, a family of four will see its annual electric bill rise by over \$300.

Because the cost of generation is a bigger fraction of the industrial electricity price than of the residential electricity prices, the RES causes a bigger percentage increase in industrial electricity prices than in residential electricity prices. The price increase is 5 percent in 2012 and rises to 60 percent in 2035. The higher prices force cutbacks in consumption that reach 23 percent below baseline in 2035. The net impact in 2035 is that industrial users will pay out 21 percent more dollars for 23 percent less electricity than if there were no RES.

Electric power is one of the most critical inputs to a modern economy. Thus, it is no surprise that forcing the cost of electricity to rise dampens economic activity. The cost increase for electricity can be viewed as a particularly damaging energy tax, because a renewable mandate, unlike the case of a normal tax, provides no revenue to at least partially offset the higher cost. By way of comparison, the highway use tax on gasoline raises the price of gasoline, but it also generates revenues for building and maintaining roads and bridges.¹⁸ On the other hand, a renewable energy standard raises costs in the form of less efficient production, which provides no economic benefit.

As an analogy, suppose a farmer is able to produce 10,000 bushels of wheat per year with the aid of irrigation from a nearby river. If a regulation prohibiting irrigation cuts production to 9,000 bushels, then, to the farmer, this is the same as a 10 percent tax. However, with an actual tax, the government would have 1,000 bushels to distribute, while with the prohibition on irrigation, those bushels simply disappear—providing benefits to no one.

THE MACROECONOMIC IMPACTS

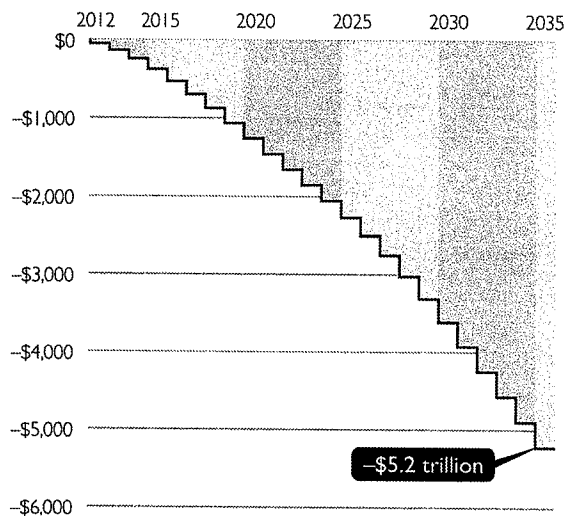
Analysis of cap-and-trade bills that impose economy-wide reductions in CO₂ emissions shows over-

16. For evidence that consumers are sensitive to and aware of differences in appliance efficiencies, see the surveys done for the EPA's Energy Star program. These surveys show that a large majority of households consider the Energy Star rating when purchasing an appliance. For the 2009 survey, see Energy Star, "National Awareness of Energy Star for 2009," at <http://www.energystar.gov/ia/partners/publications/pubdocs/National%20Awareness%20of%20ENERGY%20STAR%202009.pdf> (April 29, 2010).
17. See the Appendix to this report for a description of the CDA Energy Model and the IHS Global Insight U.S. Macroeconomic Model used to estimate the economic effects of RES.
18. In fact, however, these taxes are increasingly diverted to other uses. For a discussion of this diversion, see Wendell Cox and Ronald D. Utt, "Federal Transportation Programs Shortchange Motorists: Update of a USDOT Study," Heritage Foundation *Backgrounder* No. 2283, June 8, 2009, at <http://www.heritage.org/Research/Reports/2009/06/Federal-Transportation-Programs-Shortchange-Motorists-Update-of-a-USDOT-Study>.

Renewable Energy Standards: A \$5.2 Trillion Burden

Renewable energy standards would reduce annual GDP by an average of \$218 billion by 2035.

Cumulative Change in GDP Due to Renewable Energy Standards, in Billions of Inflation-Adjusted Dollars



Source: Heritage Foundation calculations using data from the IHS Global Insight U.S. macroeconomic model.

Chart 2 • CDA 10-03 heritage.org

all losses to the economy of \$5 trillion to nearly \$10 trillion between 2012 and 2035.¹⁹ Though renewable energy standards apply only to the power sector (electricity generation), they provide less flexibility in meeting the goals than does cap-and-trade and can lead to losses of the same order of magnitude as the more comprehensive cap-and-trade regulations.

The broadest measure of a country's economic activity is gross domestic product (GDP). As the mandated level of renewable energy rises over time, so does the cost of electricity and so do the losses imposed on the economy. Compared to the no-RES baseline, GDP drops by \$50 billion in 2012. The annual losses increase to \$197 billion by 2020, \$300 billion in 2030, and more than \$325 billion in 2035. Summing up the impacts for 2012 to 2035 yields a total loss of \$5.2 trillion. All of these impacts are adjusted for inflation to 2010 dollars.

On a family-of-four basis, this lost income averages over \$2,400 per year.

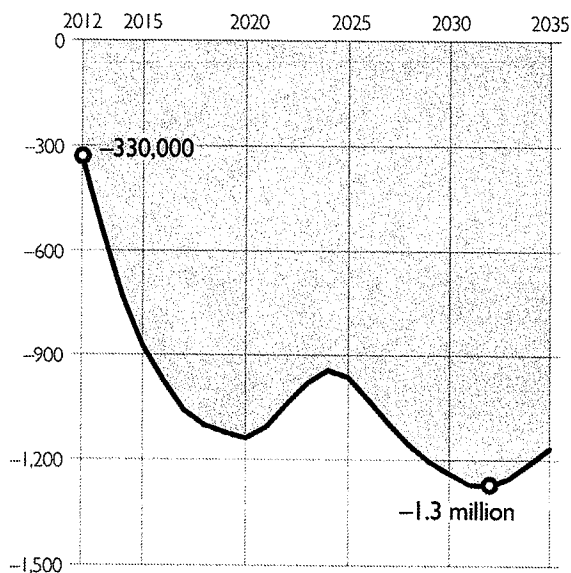
When the economy is shocked by the higher electricity prices, employment declines. In the first year (2012), employment drops 330,000 jobs below the baseline level. The battle between market adjustments and ever-rising electricity prices leads to periods of growing job losses interspersed with periods of relative stability. However, by 2017, employment falls 1,000,000 jobs below the baseline and at times is more than 1.2 million jobs below the baseline. On average, there will be 1,000,000 fewer people working with the RES in effect than if there were no RES.

Falling incomes and rising unemployment squeeze government finances from two sides: Tax

Renewable Energy Standards Would Eliminate Millions of Jobs

By 2012, renewable energy standards would have cost the U.S. more than 300,000 jobs. The total fluctuates and would reach 1.3 million by 2032.

Change in Employment Due to Renewable Energy Standards, in Thousands of Jobs



Source: Heritage Foundation calculations using data from the IHS Global Insight U.S. macroeconomic model.

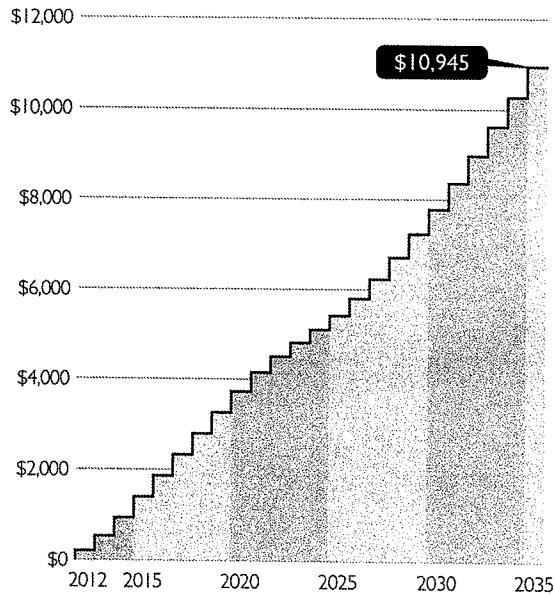
Chart 3 • CDA 10-03 heritage.org

19. See, Beach *et al.*, "The Economic Costs of the Lieberman-Warner Climate Change Legislation."


Renewable Energy Standards Would Increase the Federal Deficit

By 2035, a family of four would see its share of the federal deficit increase to nearly \$11,000.

Cumulative Change to a Family of Four's Share of the Federal Deficit Due to Renewable Energy Standards



Source: Heritage Foundation calculations using data from the IHS Global Insight U.S. macroeconomic model.

Chart 4 • CDA 10-03  heritage.org

revenues fall, and expenditures on such things as unemployment insurance rise. These two responses cause federal deficits to grow even faster than they are already projected to grow. The RES will add over \$10,000 to a family of four's share of the national debt by 2035.

CONCLUSION

Mandating that an ever-increasing fraction of electrical power must be generated from renewable

sources will raise the cost of electricity, force inconvenient and painful cuts in electricity use, and damage the economy. Households will see their electricity prices rise 36 percent by 2035, while industrial users will see their electricity prices rise 60 percent even after adjusting for inflation.

Since virtually every product and service depends on electricity to some extent, these price increases have pervasive impacts. Compared to projected levels without the RES, economic activity falls by \$5.2 trillion, which is an inflation-adjusted average annual loss of \$218 billion, or more than \$2,400 per family of four each year.

Declining economic activity is bad for employment. Implementing the RES cuts jobs. Compared to baseline projections (that is, without the RES), employment averages 1,000,000 jobs below the baseline projection.

Though the source of wind and solar energy is free, power delivered from these sources is very expensive. For now at least, onshore wind is the cheapest renewable energy source that can be scaled in significant fashion. But scaling up wind power simply lays bare the costly nature of harnessing wind and magnifies the economic losses. A renewable electricity standard is not a path to the new economy, but an example of the stale old thinking that will hobble the already damaged economy with job-killing cost increases.

—David W. Kreutzer, Ph.D., is Research Fellow in Energy Economics and Climate Change in the Center for Data Analysis; Karen A. Campbell, Ph.D., is Policy Analyst in Macroeconomics in the Center for Data Analysis; William W. Beach is Director of the Center for Data Analysis; Ben Lieberman is Senior Policy Analyst in Energy and the Environment in the Thomas A. Roe Institute for Economic Policy Studies; and Nicolas D. Loris is a Research Assistant in the Roe Institute at The Heritage Foundation.

APPENDIX METHODOLOGY

As described in the section “Comparing the Costs of Wind and Coal,” CDA analysts calculated the increase in the cost of wind power per megawatt hour. This cost is then translated to that for 1 percent of base-year power production. This 1 percent cost is multiplied by the RES percent for each year, and an average price increase is calculated from that. The price increases are then passed on to the macroeconomic model.

MACROECONOMIC SIMULATION OVERVIEW

Heritage analysts used the IHS Global Insight long-term macroeconomic model of the U.S. economy to estimate the effects of the Clean Energy Jobs and American Power Act (S. 1733) on the overall economy.²⁰ The simulation was implemented by changing variables in the macroeconomic model according to the changes predicted by a microeconomic model of the energy sector maintained by the CDA (see above). In order to estimate the policy impact, two main pieces needed to be simulated: price effects and energy efficiency effects.

The energy model estimated the change in energy production prices and retail energy prices that would result from changing the production mix from renewable energy and traditional energy sources. These prices were matched with their corresponding variables in the macroeconomic model to estimate the effect that these price changes would have on the economy overall.

The energy model projects changes in fuel efficiency and changes in total highway fuel consumption. Corresponding macro-model variables were changed. The effect of these changes helps to mitigate some of the total increased consumer expenditure on fuel.

The macroeconomic model does not have specific variables corresponding to alternative renewable fuel sources as does the CDA energy model. The macroeconomic simulation takes into account the increase in domestic alternative fuel source supply by adjusting the variable amount of residual energy demand that affects the amount of imported energy.

20. The February 2010 long-term baseline is used for this analysis. Heritage analysts relied on models maintained by IHS Global Insight, Inc., in developing the economic estimates reported in this paper. The IHS Global Insight model is used by private-sector and government economists to estimate how changes in the economy and public policy are likely to affect major economic indicators. The methodologies, assumptions, conclusions, and opinions presented here are entirely the work of analysts at The Heritage Foundation's Center for Data Analysis. They have not been endorsed by, and do not necessarily reflect the views of, the owners of the IHS Global Insight model. See “Description of the Global Insight Short-Term U.S. Macroeconomic Model,” at http://www.heritage.org/About/Staff/Departments/Center-for-Data-Analysis/-/media/CDA/CDA_models_data/globalinsightmodel.ashx.

The Effect of Renewable Energy Standards: Key Indicators

Gross Domestic Product

In Billions of Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	14,089.13	14,135.49	-46.36
2013	14,544.08	14,618.10	-74.02
2014	14,917.95	15,017.31	-99.36
2015	15,262.91	15,382.46	-119.54
2016	15,610.66	15,746.29	-135.63
2017	15,975.57	16,126.82	-151.24
2018	16,387.30	16,547.80	-160.50
2019	16,834.51	17,003.41	-168.90
2020	17,314.42	17,491.98	-177.56
2021	17,788.46	17,967.85	-179.38
2022	18,260.97	18,438.40	-177.43
2023	18,732.80	18,910.34	-177.54
2024	19,202.42	19,383.48	-181.06
2025	19,702.62	19,895.86	-193.23
2026	20,199.37	20,409.99	-210.61
2027	20,685.56	20,912.75	-227.19
2028	21,179.29	21,422.41	-243.12
2029	21,675.07	21,932.93	-257.86
2030	22,208.55	22,479.82	-271.27
2031	22,755.20	23,038.46	-283.26
2032	23,300.11	23,589.66	-289.55
2033	23,869.47	24,161.71	-292.24
2034	24,475.40	24,768.59	-293.19
2035	25,098.95	25,393.54	-294.59

Real GDP Growth Rate

Percent Change from Year Before

	Forecast	Baseline	+/-
2012	3.39	3.57	-0.18
2013	3.23	3.41	-0.19
2014	2.57	2.73	-0.16
2015	2.31	2.43	-0.12
2016	2.28	2.37	-0.09
2017	2.34	2.42	-0.08
2018	2.58	2.61	-0.03
2019	2.73	2.75	-0.02
2020	2.85	2.87	-0.02
2021	2.74	2.72	0.02
2022	2.66	2.62	0.04
2023	2.58	2.56	0.02
2024	2.51	2.50	0.00
2025	2.60	2.64	-0.04
2026	2.52	2.58	-0.06
2027	2.41	2.46	-0.06
2028	2.39	2.44	-0.05
2029	2.34	2.38	-0.04
2030	2.46	2.49	-0.03
2031	2.46	2.49	-0.02
2032	2.39	2.39	0.00
2033	2.44	2.43	0.02
2034	2.54	2.51	0.03
2035	2.55	2.52	0.02

Total Employment

In Thousands of Jobs

	Forecast	Baseline	+/-
2012	134,364.58	134,694.63	-330.04
2013	137,631.52	138,169.00	-537.48
2014	139,820.13	140,551.53	-731.39
2015	141,177.94	142,051.50	-873.56
2016	142,228.15	143,201.03	-972.87
2017	143,253.60	144,312.60	-1,059.00
2018	144,424.89	145,526.68	-1,101.79
2019	145,735.39	146,858.30	-1,122.91
2020	147,127.63	148,267.20	-1,139.57
2021	148,441.49	149,548.98	-1,107.48
2022	149,877.05	150,918.22	-1,041.18
2023	151,317.34	152,298.47	-981.13
2024	152,723.19	153,667.73	-944.53
2025	154,140.42	155,103.80	-963.38
2026	155,537.02	156,565.83	-1,028.80
2027	156,926.16	158,021.95	-1,095.79
2028	158,324.93	159,481.53	-1,156.59
2029	159,778.38	160,982.98	-1,204.60
2030	161,314.36	162,554.08	-1,239.71
2031	162,628.83	163,899.10	-1,270.27
2032	163,990.53	165,265.45	-1,274.92
2033	165,343.14	166,595.35	-1,252.21
2034	166,763.46	167,975.10	-1,211.64
2035	168,239.18	169,406.35	-1,167.17

Private Employment

In Thousands of Jobs

	Forecast	Baseline	+/-
2012	112,143.81	112,442.88	-299.07
2013	115,041.31	115,537.15	-495.84
2014	116,898.87	117,578.05	-679.19
2015	118,064.60	118,882.63	-818.02
2016	119,013.46	119,933.56	-920.11
2017	119,941.39	120,952.56	-1,011.17
2018	120,981.06	122,044.00	-1,062.94
2019	122,140.67	123,237.39	-1,096.72
2020	123,299.85	124,426.29	-1,126.45
2021	124,581.07	125,693.60	-1,112.53
2022	125,849.57	126,918.19	-1,068.62
2023	127,132.86	128,163.11	-1,030.25
2024	128,396.15	129,407.88	-1,011.73
2025	129,675.43	130,716.45	-1,041.02
2026	130,933.90	132,042.27	-1,108.37
2027	132,194.77	133,370.23	-1,175.46
2028	133,474.81	134,711.49	-1,236.68
2029	134,813.48	136,099.98	-1,286.50
2030	136,150.30	137,474.75	-1,324.45
2031	137,457.03	138,815.91	-1,358.88
2032	138,717.48	140,086.98	-1,369.50
2033	139,967.67	141,323.85	-1,356.19
2034	141,280.29	142,606.26	-1,325.97
2035	142,652.23	143,943.59	-1,291.35

Unemployment Rate

Percent of Civilian Labor Force

	Forecast	Baseline	+/-
2012	8.68	8.59	0.09
2013	7.75	7.62	0.13
2014	7.25	7.08	0.17
2015	7.03	6.84	0.19
2016	6.83	6.64	0.20
2017	6.61	6.41	0.20
2018	6.30	6.11	0.19
2019	5.91	5.75	0.17
2020	5.46	5.31	0.14
2021	5.15	5.04	0.12
2022	5.02	4.94	0.08
2023	4.92	4.87	0.05
2024	4.87	4.84	0.03
2025	4.88	4.84	0.03
2026	4.91	4.86	0.05
2027	4.93	4.86	0.07
2028	4.96	4.88	0.09
2029	5.01	4.91	0.10
2030	5.06	4.95	0.11
2031	5.10	4.99	0.11
2032	5.13	5.02	0.11
2033	5.15	5.06	0.09
2034	5.17	5.09	0.08
2035	5.18	5.12	0.06

Disposable Personal Income

In Billions of Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	10,568.93	10,595.06	-26.13
2013	10,792.58	10,835.41	-42.84
2014	11,120.32	11,181.33	-61.00
2015	11,476.27	11,555.25	-78.99
2016	11,781.65	11,877.49	-95.84
2017	12,096.60	12,209.28	-112.69
2018	12,435.10	12,560.71	-125.61
2019	12,819.88	12,955.88	-136.00
2020	13,243.93	13,390.12	-146.19
2021	13,657.50	13,810.45	-152.95
2022	14,034.99	14,192.00	-157.01
2023	14,381.92	14,543.02	-161.10
2024	14,703.83	14,870.34	-166.51
2025	15,071.86	15,247.73	-175.87
2026	15,424.10	15,612.38	-188.29
2027	15,799.59	16,001.25	-201.66
2028	16,183.54	16,398.98	-215.44
2029	16,544.16	16,772.78	-228.61
2030	16,924.29	17,165.83	-241.53
2031	17,320.51	17,574.87	-254.36
2032	17,717.74	17,981.96	-264.22
2033	18,101.82	18,372.74	-270.92
2034	18,526.40	18,802.86	-276.46
2035	18,969.47	19,250.37	-280.90

The Effect of Renewable Energy Standards: Key Indicators (cont.)

Disposable Income per Capita

In Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/- (Person)	+/- (Family of 4)
2012	33,431.19	33,513.84	-82.65	-330.58
2013	33,811.21	33,945.41	-134.20	-536.81
2014	34,504.06	34,693.33	-189.27	-757.09
2015	35,267.73	35,510.47	-242.74	-970.95
2016	35,860.70	36,152.41	-291.70	-1,166.82
2017	36,469.25	36,808.98	-339.73	-1,358.93
2018	37,134.89	37,510.02	-375.12	-1,500.49
2019	37,923.44	38,325.75	-402.32	-1,609.28
2020	38,811.04	39,239.44	-428.40	-1,713.62
2021	39,650.95	40,094.99	-444.04	-1,776.18
2022	40,371.16	40,822.78	-451.63	-1,806.50
2023	40,990.58	41,449.74	-459.16	-1,836.65
2024	41,527.92	41,998.20	-470.28	-1,881.11
2025	42,184.70	42,676.94	-492.24	-1,968.95
2026	42,786.07	43,308.38	-522.30	-2,089.21
2027	43,441.09	43,995.55	-554.46	-2,217.84
2028	44,107.93	44,695.10	-587.17	-2,348.67
2029	44,700.54	45,318.23	-617.69	-2,470.77
2030	45,335.49	45,982.49	-647.00	-2,588.01
2031	46,002.49	46,678.05	-675.57	-2,702.26
2032	46,661.01	47,356.87	-695.85	-2,783.42
2033	47,274.23	47,981.76	-707.53	-2,830.13
2034	47,981.95	48,697.95	-716.00	-2,864.00
2035	48,725.20	49,446.72	-721.52	-2,886.08

Personal Consumption

Expenditures in Billions of
Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	9,892.71	9,916.07	-23.36
2013	10,109.29	10,145.73	-36.44
2014	10,322.04	10,371.54	-49.49
2015	10,588.82	10,650.33	-61.51
2016	10,833.24	10,904.56	-71.31
2017	11,051.27	11,131.66	-80.39
2018	11,293.30	11,380.50	-87.20
2019	11,567.18	11,659.11	-91.93
2020	11,884.78	11,981.23	-96.45
2021	12,221.83	12,322.39	-100.56
2022	12,541.71	12,644.61	-102.89
2023	12,854.56	12,960.79	-106.23
2024	13,153.43	13,265.96	-112.53
2025	13,461.97	13,586.27	-124.30
2026	13,771.91	13,912.29	-140.39
2027	14,087.26	14,245.88	-158.62
2028	14,416.16	14,593.39	-177.23
2029	14,742.86	14,938.34	-195.49
2030	15,083.78	15,296.79	-213.01
2031	15,445.59	15,673.32	-227.73
2032	15,814.71	16,051.41	-236.69
2033	16,189.74	16,432.25	-242.51
2034	16,584.38	16,831.32	-246.94
2035	16,989.11	17,240.93	-251.82

Personal Savings

In Billions of
Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	335.19	336.68	-1.49
2013	320.87	325.19	-4.32
2014	414.27	422.83	-8.56
2015	479.93	493.69	-13.76
2016	518.24	538.60	-20.36
2017	597.05	624.81	-27.76
2018	678.91	712.53	-33.62
2019	774.52	813.78	-39.26
2020	864.81	909.77	-44.96
2021	924.27	972.16	-47.89
2022	966.71	1,016.84	-50.13
2023	987.15	1,038.58	-51.44
2024	999.52	1,050.43	-50.91
2025	1,049.27	1,097.84	-48.57
2026	1,082.24	1,126.87	-44.63
2027	1,132.71	1,172.02	-39.31
2028	1,177.56	1,211.49	-33.93
2029	1,201.49	1,229.81	-28.32
2030	1,230.93	1,254.21	-23.28
2031	1,254.41	1,275.47	-21.06
2032	1,270.80	1,292.70	-21.90
2033	1,268.01	1,291.04	-23.02
2034	1,285.64	1,310.17	-24.53
2035	1,311.30	1,335.89	-24.59

Personal Savings Rate

Percent of Disposable Personal Income

	Forecast	Baseline	+/-
2012	3.17	3.17	-0.01
2013	2.97	3.00	-0.03
2014	3.72	3.78	-0.06
2015	4.18	4.27	-0.09
2016	4.39	4.53	-0.14
2017	4.92	5.11	-0.19
2018	5.44	5.65	-0.22
2019	6.01	6.26	-0.25
2020	6.50	6.77	-0.27
2021	6.74	7.01	-0.28
2022	6.86	7.14	-0.28
2023	6.83	7.11	-0.28
2024	6.75	7.02	-0.27
2025	6.91	7.15	-0.24
2026	6.95	7.15	-0.20
2027	7.09	7.25	-0.16
2028	7.19	7.30	-0.11
2029	7.17	7.24	-0.07
2030	7.17	7.20	-0.03
2031	7.13	7.14	-0.02
2032	7.05	7.06	-0.02
2033	6.87	6.89	-0.02
2034	6.79	6.82	-0.03
2035	6.76	6.79	-0.03

Private Domestic Investment

Gross, in Billions of Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	2,153.34	2,165.74	-12.40
2013	2,380.96	2,401.28	-20.33
2014	2,486.02	2,512.31	-26.29
2015	2,528.40	2,558.74	-30.34
2016	2,598.61	2,630.08	-31.47
2017	2,671.67	2,705.31	-33.64
2018	2,761.19	2,795.36	-34.17
2019	2,865.32	2,897.98	-32.66
2020	2,969.56	3,005.15	-35.59
2021	3,056.00	3,090.77	-34.77
2022	3,139.42	3,171.01	-31.59
2023	3,229.51	3,259.97	-30.46
2024	3,311.98	3,343.28	-31.30
2025	3,414.21	3,448.62	-34.40
2026	3,523.20	3,564.12	-40.92
2027	3,622.07	3,666.70	-44.63
2028	3,720.36	3,767.39	-47.03
2029	3,820.31	3,869.21	-48.90
2030	3,942.88	3,992.44	-49.56
2031	4,076.91	4,126.88	-49.97
2032	4,196.50	4,245.52	-49.02
2033	4,327.63	4,374.42	-46.79
2034	4,481.89	4,527.06	-45.17
2035	4,646.08	4,690.04	-43.96

Non-Residential Investment

Fixed, in Billions of Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	1,534.60	1,543.09	-8.49
2013	1,710.88	1,725.41	-14.54
2014	1,819.65	1,839.12	-19.48
2015	1,875.02	1,898.22	-23.20
2016	1,916.16	1,941.56	-25.39
2017	1,980.56	2,008.40	-27.83
2018	2,061.72	2,090.74	-29.02
2019	2,154.40	2,183.85	-29.45
2020	2,246.62	2,278.48	-31.86
2021	2,334.28	2,366.34	-32.05
2022	2,422.47	2,452.90	-30.43
2023	2,511.96	2,541.68	-29.73
2024	2,601.62	2,631.87	-30.25
2025	2,698.89	2,731.53	-32.64
2026	2,803.00	2,840.12	-37.12
2027	2,910.96	2,950.85	-39.89
2028	3,024.16	3,065.67	-41.52
2029	3,140.71	3,183.48	-42.77
2030	3,265.35	3,308.73	-43.38
2031	3,398.76	3,442.84	-44.08
2032	3,531.92	3,575.63	-43.71
2033	3,675.86	3,718.37	-42.51
2034	3,829.36	3,870.96	-41.60
2035	3,993.88	4,034.76	-40.89

The Effect of Renewable Energy Standards: Key Indicators (cont.)

Residential Investment

Fixed, in Billions of Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	562.77	564.74	-1.97
2013	611.93	615.77	-3.84
2014	632.50	637.46	-4.96
2015	630.79	636.17	-5.38
2016	645.26	650.45	-5.19
2017	649.59	654.52	-4.93
2018	656.59	661.06	-4.46
2019	666.78	670.48	-3.70
2020	680.42	683.70	-3.28
2021	682.69	685.35	-2.67
2022	683.85	685.66	-1.80
2023	686.75	687.74	-1.00
2024	685.56	686.22	-0.66
2025	692.39	693.30	-0.90
2026	699.94	701.73	-1.79
2027	698.64	701.34	-2.70
2028	691.07	694.49	-3.42
2029	683.56	687.40	-3.85
2030	686.14	690.18	-4.04
2031	691.71	695.83	-4.12
2032	689.34	693.27	-3.94
2033	687.53	690.86	-3.33
2034	694.98	697.56	-2.58
2035	704.31	706.31	-2.00

Change in Business Inventories

Stock, in Billions of Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	60.90	62.73	-1.84
2013	63.82	65.68	-1.86
2014	41.40	43.15	-1.75
2015	31.23	32.90	-1.67
2016	45.49	46.39	-0.90
2017	50.72	51.66	-0.94
2018	53.58	54.36	-0.78
2019	56.65	56.31	0.34
2020	56.85	57.51	-0.66
2021	56.34	56.60	-0.26
2022	53.86	53.37	0.49
2023	55.19	55.09	0.10
2024	53.71	54.25	-0.54
2025	55.90	56.94	-1.04
2026	57.87	60.09	-2.22
2027	56.96	59.08	-2.12
2028	58.66	60.67	-2.01
2029	59.40	61.45	-2.05
2030	63.33	65.12	-1.79
2031	67.34	68.66	-1.32
2032	67.77	68.49	-0.73
2033	69.66	69.86	-0.20
2034	74.36	74.62	-0.25
2035	76.87	77.14	-0.27

Full-Employment Stock

Capital Stock, in Billions of Inflation-Adjusted Dollars
(Indexed to the 2005 Price Level)

	Forecast	Baseline	+/-
2012	14,938.15	14,950.93	-12.79
2013	15,368.06	15,401.47	-33.41
2014	15,863.11	15,924.60	-61.50
2015	16,353.39	16,448.12	-94.74
2016	16,815.35	16,947.26	-131.91
2017	17,279.80	17,452.21	-172.41
2018	17,766.02	17,981.63	-215.61
2019	18,286.30	18,545.39	-259.09
2020	18,836.86	19,142.09	-305.23
2021	19,407.80	19,760.56	-352.77
2022	19,990.99	20,388.11	-397.12
2023	20,585.96	21,024.66	-438.70
2024	21,191.13	21,670.55	-479.42
2025	21,811.84	22,333.27	-521.43
2026	22,455.15	23,023.35	-568.20
2027	23,120.99	23,739.98	-618.99
2028	23,808.27	24,479.28	-671.02
2029	24,516.75	25,240.81	-724.06
2030	25,249.96	26,027.53	-777.57
2031	26,011.03	26,842.43	-831.40
2032	26,799.61	27,685.00	-885.40
2033	27,616.97	28,555.93	-938.96
2034	28,465.71	29,458.38	-992.67
2035	29,350.65	30,396.95	-1,046.31

Consumer Price Index

Percent Change from Year Before

	Forecast	Baseline	+/-
2012	2.10	2.03	0.07
2013	1.96	1.90	0.06
2014	1.94	1.90	0.03
2015	2.01	1.99	0.02
2016	1.98	1.99	0.00
2017	1.94	1.96	-0.02
2018	1.91	1.95	-0.04
2019	1.81	1.86	-0.05
2020	1.66	1.72	-0.06
2021	1.56	1.61	-0.05
2022	1.58	1.62	-0.04
2023	1.63	1.65	-0.02
2024	1.75	1.75	0.00
2025	1.84	1.82	0.01
2026	1.88	1.85	0.03
2027	1.92	1.89	0.04
2028	1.97	1.93	0.04
2029	1.99	1.95	0.04
2030	1.98	1.94	0.04
2031	1.97	1.94	0.03
2032	1.95	1.93	0.02
2033	1.93	1.92	0.01
2034	1.94	1.93	0.01
2035	1.95	1.94	0.01

Treasury Bill, 3-Month

Annualized Percent

	Forecast	Baseline	+/-
2012	3.18	3.23	-0.04
2013	3.43	3.48	-0.05
2014	4.34	4.41	-0.07
2015	4.50	4.60	-0.10
2016	4.46	4.60	-0.14
2017	4.43	4.60	-0.17
2018	4.39	4.60	-0.21
2019	4.36	4.60	-0.24
2020	4.34	4.60	-0.26
2021	4.32	4.60	-0.28
2022	4.31	4.60	-0.29
2023	4.29	4.60	-0.31
2024	4.29	4.60	-0.31
2025	4.28	4.60	-0.32
2026	4.27	4.60	-0.33
2027	4.26	4.60	-0.34
2028	4.25	4.60	-0.35
2029	4.24	4.60	-0.36
2030	4.23	4.60	-0.37
2031	4.22	4.60	-0.38
2032	4.22	4.60	-0.38
2033	4.21	4.60	-0.39
2034	4.21	4.60	-0.39
2035	4.20	4.60	-0.40

Treasury Bond, 10-Year

Annualized Percent

	Forecast	Baseline	+/-
2012	4.45	4.46	-0.01
2013	4.61	4.60	0.01
2014	5.42	5.41	0.01
2015	5.57	5.57	0.00
2016	5.55	5.57	-0.02
2017	5.53	5.57	-0.04
2018	5.51	5.57	-0.06
2019	5.50	5.57	-0.07
2020	5.48	5.57	-0.09
2021	5.48	5.57	-0.09
2022	5.47	5.57	-0.10
2023	5.47	5.57	-0.10
2024	5.47	5.57	-0.10
2025	5.47	5.57	-0.10
2026	5.47	5.57	-0.10
2027	5.48	5.57	-0.09
2028	5.48	5.57	-0.09
2029	5.48	5.57	-0.09
2030	5.48	5.57	-0.09
2031	5.48	5.57	-0.09
2032	5.47	5.57	-0.10
2033	5.47	5.57	-0.10
2034	5.47	5.57	-0.10
2035	5.47	5.57	-0.10

The Effect of Renewable Energy Standards: Key Indicators (cont.)

Unified Federal Tax Revenue

In Billions of Dollars
(Not Adjusted for Inflation)

	Forecast	Baseline	+/-
2012	2,708.73	2,724.98	-16.25
2013	3,017.03	3,042.57	-25.54
2014	3,181.70	3,214.66	-32.97
2015	3,306.89	3,344.39	-37.50
2016	3,449.95	3,490.74	-40.79
2017	3,598.91	3,644.17	-45.26
2018	3,788.67	3,839.14	-50.47
2019	3,991.86	4,048.93	-57.07
2020	4,232.32	4,296.71	-64.40
2021	4,501.21	4,568.88	-67.68
2022	4,795.23	4,863.51	-68.28
2023	5,100.03	5,170.76	-70.73
2024	5,408.10	5,484.19	-76.10
2025	5,692.83	5,778.13	-85.30
2026	6,019.43	6,117.08	-97.65
2027	6,335.48	6,443.02	-107.54
2028	6,661.02	6,777.08	-116.07
2029	7,044.70	7,169.15	-124.45
2030	7,445.42	7,577.47	-132.04
2031	7,819.98	7,959.57	-139.58
2032	8,215.10	8,361.39	-146.29
2033	8,664.52	8,818.02	-153.50
2034	9,106.50	9,266.63	-160.13
2035	9,576.81	9,744.41	-167.60

Unified Federal Spending

In Billions of Dollars
(Not Adjusted for Inflation)

	Forecast	Baseline	+/-
2012	3,598.50	3,598.30	0.20
2013	3,700.86	3,698.11	2.75
2014	3,868.43	3,862.90	5.53
2015	4,072.11	4,064.74	7.37
2016	4,238.90	4,231.41	7.50
2017	4,442.80	4,436.86	5.94
2018	4,700.82	4,697.81	3.00
2019	4,994.96	4,996.15	-1.20
2020	5,299.74	5,305.55	-5.82
2021	5,610.38	5,620.52	-10.15
2022	5,933.14	5,947.63	-14.49
2023	6,260.92	6,279.98	-19.06
2024	6,576.99	6,599.88	-22.89
2025	6,909.94	6,935.50	-25.56
2026	7,260.14	7,286.83	-26.69
2027	7,625.94	7,652.07	-26.13
2028	8,010.33	8,034.86	-24.53
2029	8,413.53	8,435.87	-22.34
2030	8,838.67	8,858.56	-19.89
2031	9,257.29	9,274.87	-17.58
2032	9,695.42	9,711.35	-15.93
2033	10,147.10	10,161.90	-14.80
2034	10,616.96	10,630.55	-13.59
2035	11,112.83	11,124.18	-11.35

Unified Federal Surplus/Deficit

In Billions of Dollars
(Not Adjusted for Inflation)

	Forecast	Baseline	+/-
2012	-889.77	-873.32	-16.45
2013	-683.82	-655.53	-28.29
2014	-686.73	-648.24	-38.49
2015	-765.22	-720.35	-44.87
2016	-788.95	-740.67	-48.29
2017	-843.89	-792.69	-51.21
2018	-912.15	-858.68	-53.48
2019	-1,003.09	-947.22	-55.87
2020	-1,067.42	-1,008.84	-58.58
2021	-1,109.17	-1,051.64	-57.53
2022	-1,137.91	-1,084.12	-53.79
2023	-1,160.89	-1,109.22	-51.67
2024	-1,168.89	-1,115.69	-53.20
2025	-1,217.11	-1,157.37	-59.74
2026	-1,240.71	-1,169.75	-70.97
2027	-1,290.46	-1,209.05	-81.41
2028	-1,349.31	-1,257.78	-91.53
2029	-1,368.83	-1,266.72	-102.11
2030	-1,393.25	-1,281.10	-112.15
2031	-1,437.31	-1,315.30	-122.01
2032	-1,480.32	-1,349.96	-130.36
2033	-1,482.59	-1,343.89	-138.70
2034	-1,510.46	-1,363.92	-146.54
2035	-1,536.02	-1,379.77	-156.25

Source: Heritage Foundation calculations using data from the IHS-Global Insight U.S. macroeconomic model.

Appendix Table I • CDA 10-03  heritage.org

Can you please help us with the destruction of our community, and our family and neighbors. It is not because of the unknown, it is because of what we do know and what we have learned from other communities, and other countries who have these industrial turbines, that we know we do not want them here.

Just remember the answer is not blowing in the wind.

Ronald Eichhorst

Connie Eichhorst

Connie Eichhorst personally came before me on
this 28th day of
February 2011

Ken Jenks
Ken Jenks
Notary Public, Wisconsin
Commission Expires: 09/28/2014

I am writing my comment in the concern about the industrial wind turbines, that they want to put up in our small townships of Holland, Morrison, Wrightstown and Glenmore. I am concerned about the the safety and health of my family and friends that live in this small community.

I have learned that there are a lot of medical effects that come from the wind turbines, such as low frequency noise, decreased memory, concentration, upper respiratory illnesses, and fatigue are tributed to people who live with in one to half a mile away from these turbines. Also there is evidence of both endocrine and cardiovascular problems with cattle who live and graze near the turbines. The effects include aggressive and erratic behavior, increase of mastites , lower birth rates and still births. There is also flickering, shadows that come into your windows of your home from these huge 472 feet turbines.

Now you tell me do you really think it is safe for our community to be living 1000 to 1300 ft. from these monsters.

Thank You, Connie Eichhorst

Connie Eichhorst

Dear Joint Committee of Review,

I am writing to you to express my very sincere feelings on the setting rules concerning wind turbines.

I feel that alternative energy is important, but first we must consider the health and safety of the citizens of our great state of Wisconsin . This is a very important issue. I feel that a setback of 1800 feet from the property lines of a non participating home is adequate. The noise and shadow flicker from the turbines themselves have caused health problems. There have been extensive studies done to prove this issue.

Again, please consider the safety of the citizens of Wisconsin.

Thank you for your consideration

Karla Wiederholt

Karla Wiederholt

2185 Hill Road

Cuba City, WI 53807

608-744-2598

Notary: *J M Marshall*

Jennifer M Marshall

State of Wisconsin

Exp: 2-3-13

JERILYN J. FLETCHER
6215 County Rd. W, Greenleaf, WI 54126
920-864-7262
email: jerilynletcher@centurytel.net

February 9, 2011

To: Joint Committee for Review of Administrative Rules
State of Wisconsin


Re: PUBLIC HEARING – February 9, 2011
PSC 128 (CR 10-057)
Relating to the siting of wind energy systems

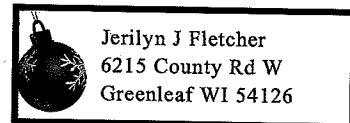
Committee Members:

I live in the Town of Glenmore (Wi), where the Shirley Wind Project was currently constructed. There are 6 turbines put up very close to my home with more proposed. I am a widowed senior citizen and have lived in my present home located in what use to be beautiful rural Wisconsin for 26+ years.

I DO NOT WANT TO DIE SURROUNDED BY WIND TURBINES AS A SCIENCE EXPERIMENT FOR CORPORATE GREED!!!!!! YOU MUST STOP THIS MADNESS NOW! NO MORE WIND TURBINES IN OUR BEAUTIFUL STATE OF WISCONSIN!!!!

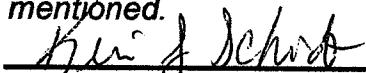
Sincerely,


Jerilyn J. Fletcher



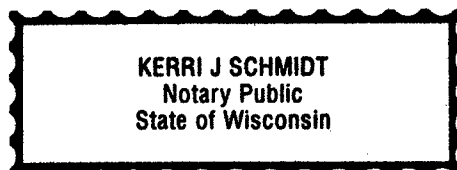
State of Wisconsin
County of Brown

On this day February 7, 2011, personally appeared before me,
Jerilyn Fletcher, to me known to be the person described
in and who executed the within and foregoing instrument, and acknowledged that he/she
signed the same as his/her voluntary act and deed, for the uses and purposes therein
mentioned.


Notary's Signature

10/20/13
Notary's Expiration Date

Notary's Seal



DEAR CO-CHAIRS & MEMBERS,

THANK YOU FOR COMING TOGETHER TO HAVE A PUBLIC HEARING ON THE RULES FROM THE PSC ABOUT THE WIND TURBINES.

THERE ARE A LOT OF CONCERNED CITIZENS IN WISCONSIN WHO WANT TO HAVE MORE OF A SET BACK FOR THE TURBINES TO PROTECT OUR CITIZENS HEALTH. THE HEALTH OF PEOPLE SHOULD BE THE FIRST CONCERN TO EVERYONE.

OF COURSE THE WIND COMPANIES WILL CREATE JOBS IN WISCONSIN. BUT, WHAT HAPPENS WHEN THE WORK IS DONE AND THE PEOPLE CLOSE TO THE TURBINES START HAVING HEALTH PROBLEMS ? WHO IS GOING TO TAKE CARE OF THEM, PAY THEIR MEDICAL BILLS AND BUY THEIR PROPERTY. WILL YOU HELP THEM OR IGNORE THEIR PROBLEM ?

THIS IS A VERY SERIOUS SITUATION THAT IS BEFORE YOU. I ASK THAT YOU LISTEN TO ALL OF THE CONCERNS AND DO WHAT IS RIGHT. I LOVE ABRAHAM LINCOLN'S QUOTE—"NOTHING IS POLITICALLY RIGHT WHICH IS MORALLY WRONG". PUTTING PEOPLE'S HEALTH IN JEOPARDY IS MORALLY WRONG.

SINCERELY,



DARLENE LAWRENCE
4621 PLEASANT VALLEY RD
PLATTEVILLE WI 53818
608.348.4142

Notary: Jennifer M Marshall
Jennifer M Marshall
Grant County, Wisconsin
Commission Expiration: 2-3-13

February 7, 2011

Dear Committee,

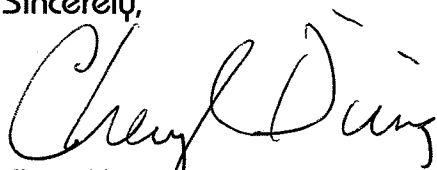
I am a longtime resident of the township of Glenmore. I would like to voice my concerns regarding the wind turbines which are already in our community and the wind turbines which are proposed. As a taxpayer of Glenmore, Brown County and the State of Wisconsin, I find it irresponsible of our elected officials to neglect several key points regarding these turbines and our farming community.

As a resident, I strongly suggest you take into account a setback of these wind turbines to a minimum of 1800 feet from any neighboring property line. And I stress **PROPERTY LINE!** I purchased my entire property, not just a portion of it. Anything less would infringe on my rights as a property owner.

I also have concerns regarding property values. It has been proven that property values decrease when wind turbines are brought into an area. A study by Appraisal One Group in 2009 showed a decrease of up to 40%! Just look at multiple homes in the Fond du Lac County wind complex. These homes have not sold because of their close proximity to wind turbines.

I strongly suggest you take these concerns into consideration. We need to protect the residents of Glenmore, Brown County and the State of Wisconsin!

Sincerely,

A handwritten signature in cursive script that reads "Cheryl Diring".

Cheryl Diring
4001 Langes Corners Road
DePere, WI 54115

TOWN OF HOLLAND, WISCONSIN – BROWN COUNTY

REPRESENTED BY:

STEVE DESLAURIERS

2889 WAYSIDE ROAD

GREENLEAF, WI 54126

(TOWN OF HOLLAND)

920-785-3186

My name is Steve Deslauriers and I am here representing the Town of Holland in Brown County.

I have talked about the points of our town's ordinance in many other hearings, so today I will focus on how the PSC rules, if not suspended, will adversely affect my town.

I will start with talking about the differential setbacks in the PSC Rules - how the rules specify one wind turbine setback from property lines and another from homes. It is clear to see how these differential setbacks result in nothing less than government endorsed property takings - eliminating the safe use and development of land in the wind turbine safety buffer without any meaningful compensation. This flies in the face of the property rights that built this country and alone should be enough to suspend the PSC rules as written.

Then there is the content of the rules themselves. These are substantially the same rules that have forced people to walk away from their homes in Fond du Lac, required that homes in Kewaunee be bulldozed, and continue to affect the health of those who cannot afford to abandon the homes they have invested their life savings in. The PSC rules are not based on science, completely ignore the experiences of current wind project residents, and were a bold faced manipulation of the law that you, our legislature, demanded they follow. The state-wide standards drafted by the PSC place the health and safety of some residents, and some entire communities in jeopardy. This last weekend I visited my neighbor in Glenmore who now lives within 3400 feet of three 500 foot tall wind turbines – the closest being about 2700 feet away. She wears industrial earmuffs while in the house due the pounding headaches that she gets when at home - a new problem since the turbines went up and one that disappears when she leaves the area. The doctors say there is nothing wrong - I have spent time in this house and I beg to differ.

Then there is the ongoing cost to the State of Wisconsin that will be caused by the current PSC siting rules and fiscal irresponsibility of wind development. The wind energy industry cannot sustain development or employment without perpetual artificial financial support from taxpayers. The job creation cited by wind developers is at a great taxpayer expense – we can artificially create as many jobs as we want if we do so on the backs of taxpayers. This takes no innovation, drive, or fiscal responsibility – just taxpayer dollars. The rise in energy prices associated with every wind project that goes online will cost far more manufacturing jobs than the few artificially created subsidy jobs in the wind industry. The PSC rules set to go in to effect will create another government supported subsidy industry that will weigh on Wisconsin taxpayers for at least the next 3 decades (anticipated life of a wind project). All of

regulation and resolutions that put the Health Wisconsin Families ahead of the greed and misleading, unethical behavior of wind developers. There was not a SINGLE dissenting vote by any of the many Brown County committees that reviewed the Brown County Resolutions, including the diverse Board of Supervisors - and yet these resolutions were never addressed or even recognized by the Wind Siting Council. Brown County officials did not have the huge financial conflicts of interests that 9 of the 15 members of the Wind Siting Council have.

That leads me to talk about how the staffing of the Wind Siting Council did not follow the explicit direction of the legislature. The most important member was supposed to be a doctor with experience with wind development and a faculty member of the University of Wisconsin. Doctor Jevon McFadden was neither. Or the council member that was supposed to represent the general public, a 'regular joe'. This position was filled by Jenny Heinzen - a person whose career is completely dependent on the subsidy dollars pumped in to the wind industry. Jenny is also the President of RENEW - a nonprofit quasi environmental group largely funded by wind developers. In all, 9 of the 15 members were heavily conflicted - An obvious stacked deck that led to little meaningful discussion and virtually no compromise on the most important topics - setbacks and noise levels.

Thank you for calling this hearing and allowing the real and substantial concerns of residents across the state to be heard. Please SUSPEND the PSC rules.

Steve Deslauriers
Town of Holland

Chairperson Vukmir, Chairman Ott and Committee Members:

My name is Kim Egan, I am a landowner in SW Wisconsin. Our family owns a 4 generation farm west of Cuba City. I have met, spoke to and have represented more than 300 landowners who support Home Grown Wind Energy. Over 90% of them are Farmers who live and work on 3-4 generation family farms.

Most of these farmers will NOT be here today. You may never see the local wind supporters (Note: Over 80% of all local residents support wind) at hearings like this. They simply do not have the time. They truly feel it is their personal, individual and lawful right or privilege to host Wind Turbines.

They have waited over three years to see results. Legislators did their job and the PSC Unanimously voted to adopt PSC 128. The anti-wind folks and all individual rights groups were heard loud and clear over and over again in hearings like this and at the PSC. There has never been any documented Health and Public Safety issues tied to Wind. Why are we revisiting this issue again...What Statutory Authority allows this to happen?

NOTE...See statute 66.0403 or revisit the Ecker Bros decision in Calumet County.

I'm sure the Governor never intended to create even more stringent barriers on a local industry that has paced itself and waited 3 years. State energy companies reported they will need 1000 megawatts of locally produced wind power to fill 2015 RPS standards... Those ELECTRONS can stay in Wisconsin. The 1000 megawatts (10-12 projects) total nearly \$3 billion, including \$800 million in local construction costs. (Note: that's a lot of concrete)...And over 1000 jobs...!!

Wisconsin has the 13th best Wind Capacity of all states but we are LAST in the entire Midwest in Wind Production. Wisconsin is also 8th in US in Wind Manufacturing, but we haven't built a wind project west of Beaver Dam since 1999....

The Monfort Wind Farm CELEBRATED its 10 year anniversary last year! Have you been to the Tower Junction Inn - Restaurant or the Windmill Mobil Station?

Today you will hear many of the same old arguments and a new one...real estate. There is little to no urban sprawl in SW Wisconsin. The little towns like the Patch Groves and the Kielers remain unchanged. Wisconsin is still AG country.

(Note; We surveyed the residences that lie within one mile of the planned White Oak wind project near our family farm. We found only 6, maybe 7 homes that have been built in this 50 square mile area since 1980.) There is no urban sprawl here...

The 1000 megawatts of state needed wind energy will generate nearly \$8-9 million dollars to farmers and landowners annually. Another \$4 million goes to local townships and counties. All revenues are recurring...



A Division of The Boldt Company

N21 W23340 Ridgeview Parkway
Waukesha, WI 53188

262-544-9118 phone
www.boldt.com

Testimony to PSC 128

The Boldt Company is a large General Contractor / Construction Manager headquartered in the State of Wisconsin. In 2010, we put in place \$340,000,000 of work in Wisconsin. We directly employ an average of 1000 construction craft workers and approximately the same amount of subcontract workers on projects.

In today's market, we all understand the economic impact created by providing manufacturing, construction, operations, maintenance, development, transportation, and other jobs to the State of Wisconsin. I would like to expand on the impact that the wind power industry has on construction jobs.

In 2008 and 2009, Boldt installed over 700 wind turbines in the upper Midwest. This equates to approximately 1050 MW of power and included projects in Dodge and Fond du Lac counties. We are currently installing turbines at the Glacier Hills project in Columbia County.

On average, each wind turbine equates to 1325 man hours of craft labor. On a 100 unit wind farm, this equates to a payroll of over \$10,000,000. In addition to payroll, the projects are supported by the community based vendors who provide materials such as ready-mix concrete, stone products, fuel, housing and meals for field workers.

From a personal perspective, I grew up in rural South Western Wisconsin where several projects are being proposed. Members of my family and I are land owners very near to where wind farms are currently sited, and where additional sites are being proposed. While none of our family's land is being proposed as a site, we fully support the development of wind farms. We fully understand and appreciate the economic benefit wind turbine income affords the local farmers who continue to struggle to make a reasonable living off the land.

John Hale

Group President – Central Operations

The Boldt Company

N21 W23340 Ridgeview Parkway

Waukesha, WI 53188

262-446-7130

Dear Administrative Rules Committee Members,

2-9-11

Thank you to Governor Walker for seeing the need to protect WI citizens.

Concerning PSC 128 wind siting rules:

These rules are written to protect the wind industry not the public:

- Please suspend these rules.
- Call for a moratorium on wind development.
- Please investigate the problems occurring at wind facilities at present.
- Study the impact on humans of industrial wind facilities in Wisconsin.
- Perform a cost benefit analysis.
- Perform an environmental impact study on wildlife.
- These studies need to be unbiased and based on sound science.
- No PSC involvement.

Please include in wind siting rules to protect the public:

- Require Setbacks from non hosting property lines of one and one quarter mile. (Dr.'s Hanning, Pierpont and Nissenbaum)
- Require Property value agreement guarantees for any property located within two miles of a wind facility. (**McCann Appraisal, LLC written testimony re Setbacks & property values June 8 2010**)
- Noise limits of 5 dBA over ambient (**Simple guidelines for siting wind turbines to prevent health risks - Kamperman and James**)
- Stop all subsidies, grants, tax shelters and Shared Revenue Payments for the wind industry.

http://www.powermag.com/issues/departments/speaking_of_power/Spain-Is-Tilting-at-Windmills_1851.html

Trempealeau County Wind Ordinance written by citizens and passed by the County Board is thoughtful and protects property rights, health and safety of people. The Town of Union, WI Wind Ordinance is fully footnoted. Read these and see the reasoning behind the need for protection. It is interesting people living in these and many other communities see a the need for protection from industrial wind development but the PSC is blinded and sees only the need for more wind development even at the levels of extreme incompetence and extreme negligence. Read the Wind Siting Council Minority Report.

Thank you,
Deloras Vind
N26992 Tolokken Rd
Arcadia WI, 54612
davevind@hotmail.com

Hearing on PSC 128 (Clearinghouse Rule #10-057)
PSCW Wind Siting Rules

Joint Committee for Review of Administrative Rules
February 9, 2011

Testimony by Glen R. Schwalbach, P.E.
for
Towns of Glenmore, Morrison, and Wrightstown of Brown County

Thank you, Co-chairs and Committee Members for providing us this opportunity to comment upon the wind siting rules which could go into effect next month.

Our towns support suspension of these rules for two reasons. The towns have existing wind siting ordinances in which they have invested hours and hours of effort to ensure the safety and health of their residents. A March 1st deadline to convert to the state rules is not possible since any local ordinance change requires an open process by the planning commissions and the town boards and, then, via town public hearings.

Secondly, the previous legislative committees sent the draft rules back to the Public Service Commission because of some key concerns about safety and health protections. Instead of providing for more stringent requirements, the PSCW relaxed the setback provisions and reduced payments to non-participating property owners. Then, as you know, the lame-duck committees did not provide for public hearings on those changes.

Our towns also support having an opportunity, after suspension of the rules, to explain the good, bad, and ugly in the proposed rules based upon our research and experience.

Progress has been made but an essential element is still lacking. Rules or standards intended to protect the health and safety of people must be based upon scientific fact rather than scientific opinion. We still lack statistically-controlled epidemiological studies to assess the wind turbine impacts on humans and animals. There are peer-reviewed scientific studies which say that significant evidence of negative impacts exists. On the other hand, there are peer-reviewed scientific reports which stress that there is no true scientific proof that turbines are harmful. Both groups of authors, including our own State Board of Health, are correct. There just are no controlled scientific studies except one which was recently published. That one was not considered in promulgating our state rules.

Wisconsin has an opportunity to do epidemiological studies in their existing wind farms. The University of Wisconsin and the State Board of Health is capable of doing such studies. The time is ripe because 1) there are complaints of health issues from Wisconsin residents in or near existing wind farms, 2) studies are necessary to determine setbacks which are adequate but not extreme and 3) all

indications are that the Wisconsin utilities already have enough renewable generation planned for meeting the state requirement for 10% by 2015.

We call upon the wind energy industry to help fund such studies because the use of better science would improve their designs, speed their project application process, and help reduce their liability. I, personally, call upon the licensed Professional Engineers in the wind industry to remind themselves that, as P.E.'s, they have an ethical responsibility to the public which goes beyond obligations to their employers or their clients. Their designs and operational procedures must be based on good science. They should voice support for controlled studies.

Such studies are also important to Wisconsin residents since it is more likely that, in the future, continuing federal subsidies will prompt wind development in Wisconsin but the power will be sold and used in other states.

That said, we offer comments on some key fixes needed in the proposed rules.

Historically and reasonably, setbacks have been defined as a distance from property lines for structures or other land use--until wind turbine projects came along. Ironically, the state decided to allow wind turbines, which greatly exceeded traditional height restrictions for structures, to also have direct impact beyond the property line as to the neighbors' use of their land. Adequate setbacks from property lines are necessary not only for safety and health reasons but also to minimize financial impact for non-participating landowners.

Another concern is that the proposed rules do not allow the towns to decide the acceptable means to provide financial collateral for future decommissioning. In the proposed rules, the wind turbine owners get to decide that.

A third concern is that when wind projects are sold, the towns should have some authority to approve the new owners. Most likely, if the statutes still require 10% renewable energy, it will be the utilities which will be forced to buy the projects from the developers. But, if not, the towns need to have better protection from irresponsible owners.

A fourth concern is that the rules do not provide explicitly for local authority to protect the environment such as groundwater. County experts often know the sensitive areas and the risks they represent better than the DNR. This is a huge concern for our towns because of the nature of the Niagara Escarpment and its many karst features. Karsts are rock fissures which often provide a direct pathway to groundwater. One University of Wisconsin expert estimates only 10% to 20% of karsts have been found and officially mapped in Brown County.

And, the last concern is that the rules only apply directly to wind energy systems less than 100 megawatts. Legislation should provide for explicit protections for residents near the largest wind developments as well.

Thank you for your consideration.

To: Joint Committee for Review of Administrative Rules (JCRAR)

Date: February 9, 2011

Subject: Requested Suspension and revision of PSC AC-231 Wind Siting Rules

I am requesting that the PSC rules AC-231 for large wind turbines not be implemented on March 1, 2011 and that the rules be revised to protect the health and safety of the adjacent property owners and maintain their property rights.

I am also requesting that this letter be placed into record.

I live in Manitowoc county, our current ordinance(Chapter 24) has turbine placement measured from adjacent property lines and has sound measurements that apply anywhere on the adjacent property. This protects the rights of property that does not have an existing structure built on it. Manitowoc residences along with many other counties residences fully understand the takings of property rights associated with the PSC rules. Attached are three drawings that show the extent of the property takings allowed by the PSC rules. These are not hypothetical situations. Emerging Energies and Navitas have proposed turbine placements that closely follow what is depicted in the attached drawings. Their proposed turbine placements are public record in Manitowoc County.

I want you to look at attached drawing #3. Specifically, this shows what could have happened to me and is happening to people who have purchased land in the county to build a future home or homes. I had two young couples ask me what they should do, they are still paying for the land but the farm next to the land signed-up for turbines. This is not right.

Engineering studies show a setback of 2640 feet from property lines is necessary for addressing the health and safety aspects of a wind turbine installation. Any setback distance less than this from the adjacent property line is a compromise of the adjacent land owner's health and safety.

Many engineering studies show that the PSC rules for allowable noise are inadequate. The current PSC rules have no technical basis that the setback distances used would even support the noise requirements used in the rules. Commissioner Azar provided input during a public meeting that the PSC staff determined it would take a setback of 2200 feet to meet a 45 dB noise limit. How could the PSC rules than have a setback of 1.1 times the height from a property line?

There is no alignment between the PSC random numbers used for setback distances and the noise requirements, BUT these random setback numbers would be used as criteria for local ordinances. The PSC has not pursued obtaining engineering studies for the calculated safe distance associated with turbine blade failures, attached is a calculation that can be produced for turbine blade failure.

Many supporters of the PSC rules say the proposed 1800 foot setback from property lines would stop turbine construction. This is simply not true. Landowners can allow turbines to be placed closer to their property and can give easements if they feel it appropriate.

Many supporters of the rules say this will kill jobs. This is also quit the overstatement. Most Wind projects built to date have been built by obtaining easements.

I want to point out how I feel CLEAN Wisconsin speaks out of both sides of its mouth. First they say greater setbacks will cost wind turbine jobs but then they file a law suit to try and stop Point Beach Nuclear Plant from performing the Power Uprate project. Point Beach is a nuclear plant that does not create CO2 emissions. Point Beach power uprate has already generated approximately a million man-hours of work and will generate nearly two million more man-hours of work before work is completed. Point Beach Nuclear Plant is a merchant plant, these costs are not being passed onto the Wisconsin rate payers.

People in this state voted in the republicans because I believe the state was not supporting real businesses. I don't think wind projects are real businesses. They are only being pursued because of the large subsidies specific to the power they generate (which is passed to the consumer in the form higher electric rates and taxes) and the large financial incentives such as double capital depreciation and other tax benefits.

I want the legislature to change the rules that limit the amount of hydroelectric output that can be used towards the randomly created Renewable Portfolio Standard (RPS). I feel all megawatts of power generated by hydro plants should be applied to the RPS.

I also feel that the additional capacity created at Point Beach Nuclear plant should also count towards the RPS.

Feel free to contact me if you would like clarification of information submitted.

Respectfully,



Jeff Roberts

12113 Tannery Road

Mishicot, WI 54228

(920) 755-2736

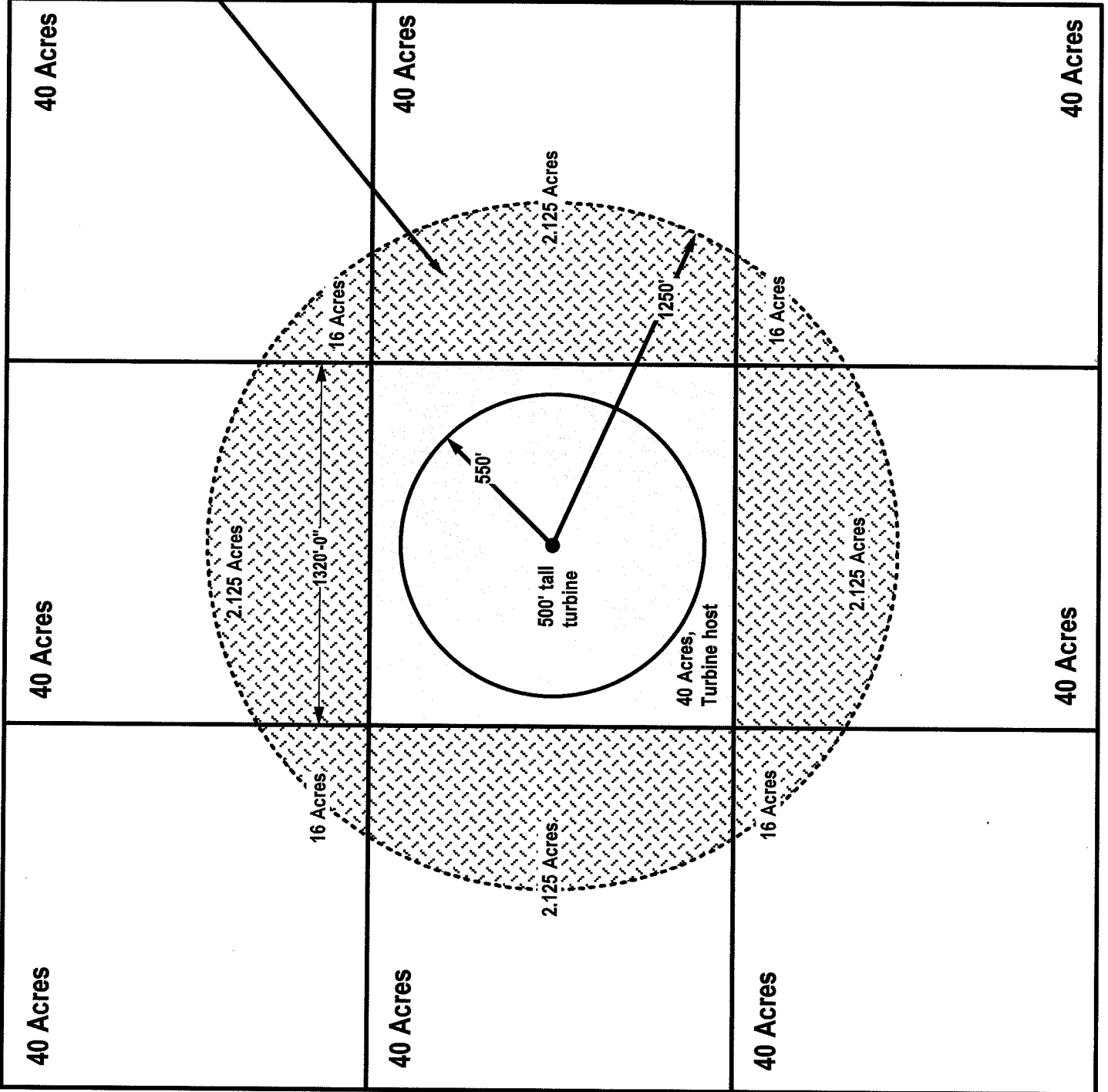
Attachments:

3 drawings showing PSC rule effect on land -3 pages

"Debris Thrown Analysis" by Jeff Roberts, 13 pages

Official Energy Statistics from the United States Government

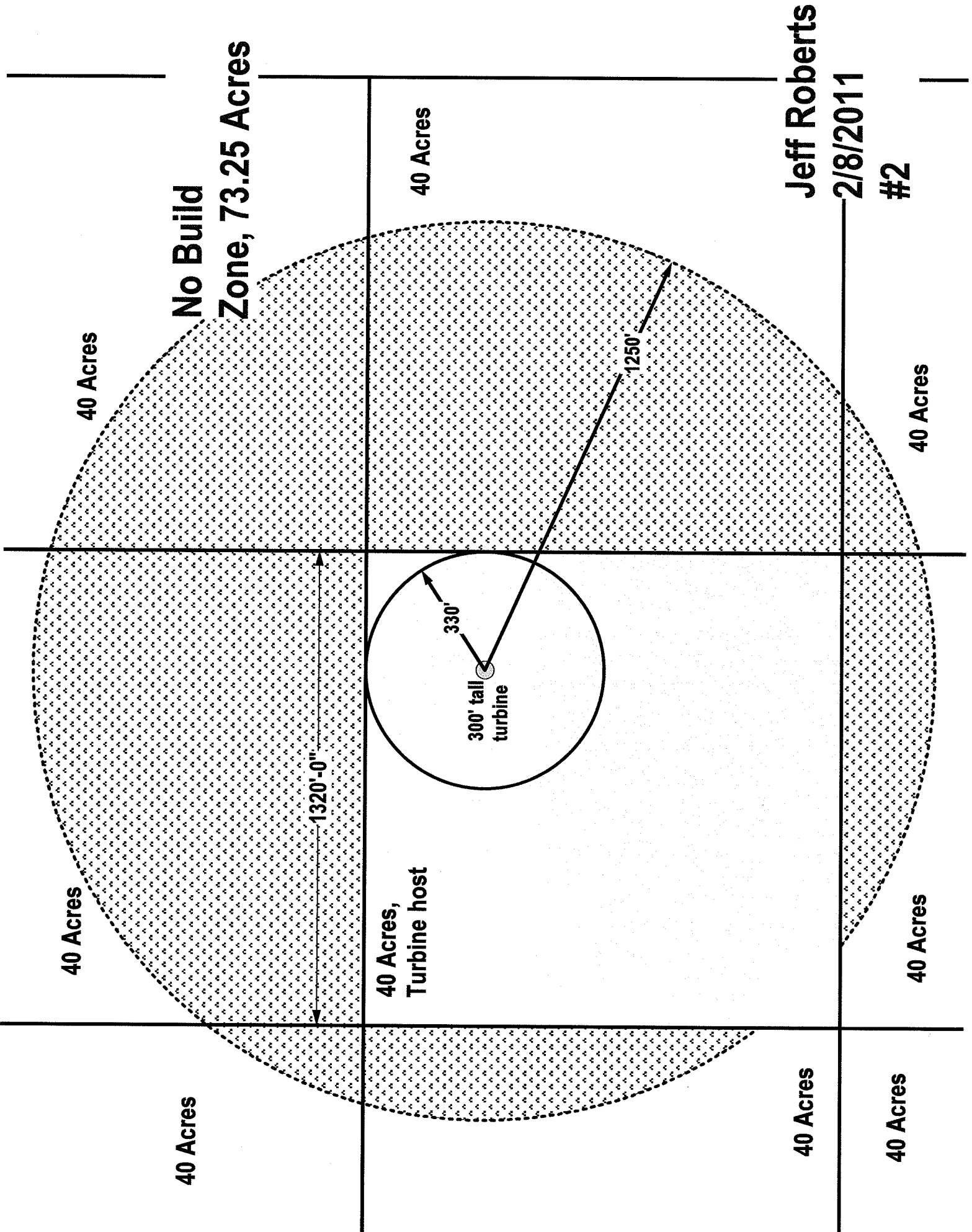
No Build Zone
72.5 Acres



Jeff Roberts
2/8/2011

#1

GRAPHIC ERROR 2,125 TRANSPOSED
WITH 16, JHR



Jeff Roberts

2/8/2011

#2

40 Acres

40 Acres

40 Acres,
Turbine host

40 Acres

40 Acres

40 Acres

40 Acres

40 Acres

40 Acres

No Build

Zone, 73.25 Acres

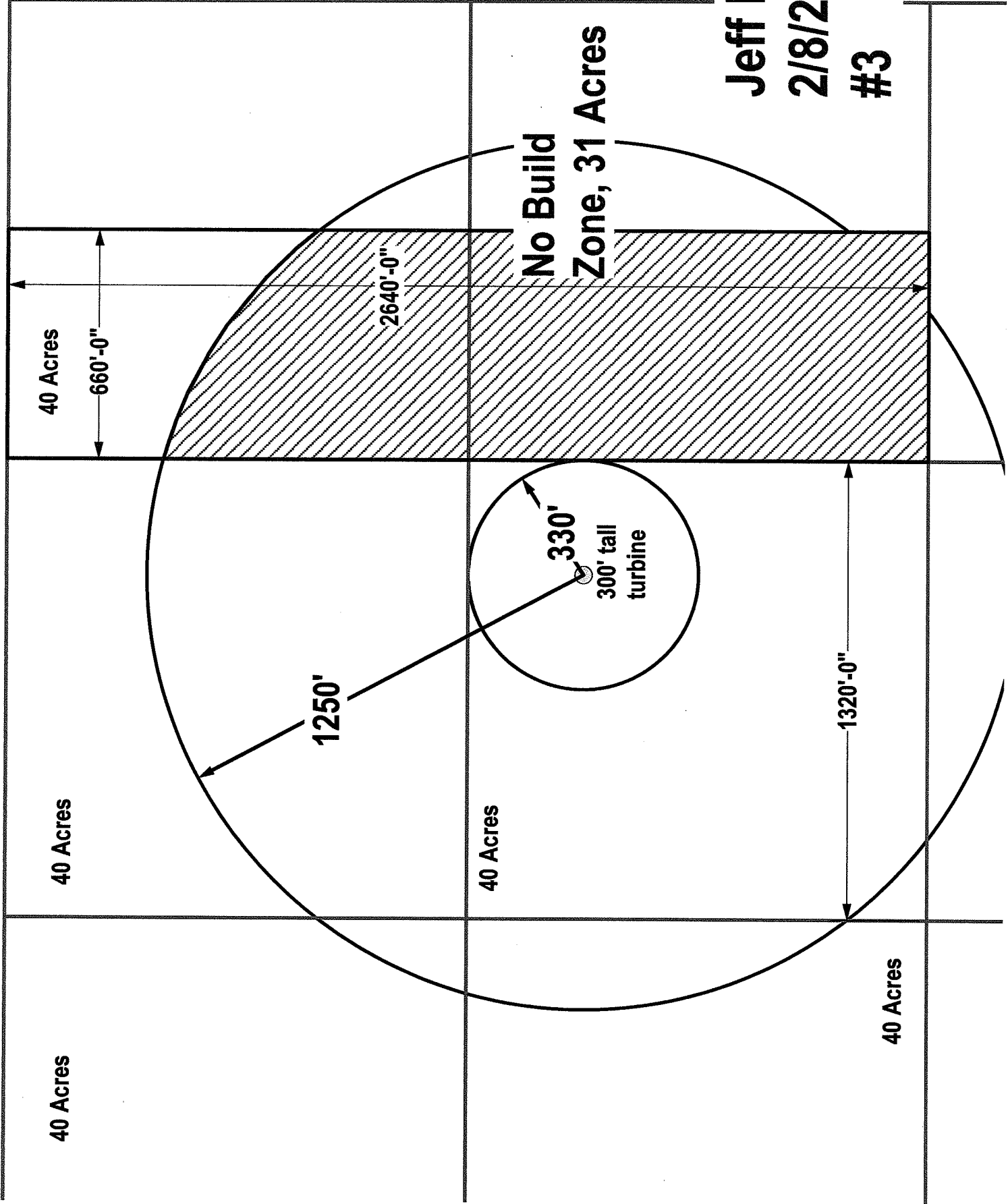
300' tall
turbine

330'

1250'

1320'-0"

Jeff Roberts
2/8/2011
#3

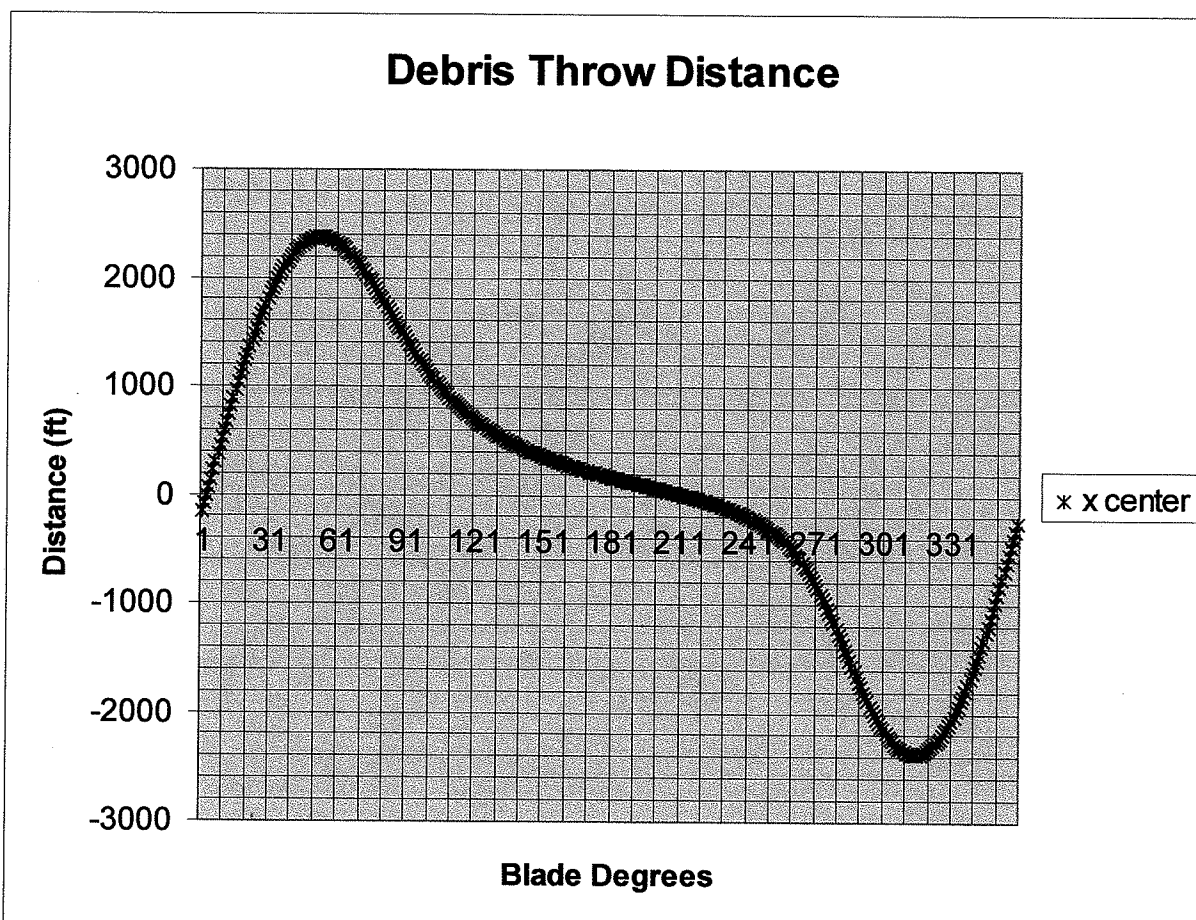


Debris Throw Analysis

Energy companies have come to our area and will not provide debris throw distances. Emerging Energies told me at the public meeting that the turbine blades do not fail and that debris throw is not a problem. There are many industry studies on debris throw distances for turbines, in fact guidance is provided by the turbine manufactures for safe distance based on debris throw. In an effort to provide a sanity check to numbers published by the turbine manufactures, a separate analysis is performed.

The analysis shows that debris thrown from the proposed turbine can travel significant distance.

There are 227 out of 360 degrees of debris release point that could possibly result in debris thrown greater than 1.1 times the height of the turbine (541.2 ft).



This chart is based on 328 foot (100 meter) diameter turbine with a hub height of 328 feet (100 meters) rotating at a speed of 15 rpm.

This is a worst case analysis and air resistance is not included. It should be noted that wind turbine blades are very aerodynamic.

The debris throw distances were calculated using standard principles of physics. The equation that describes motion is as follows.

$$\text{Distance} = V \times \cos(a) \times [V \times \sin(a) / G + [(v \times \sin(a))^2 / G^2 - 2 \times Y / G]^{.5}]$$

Where: V = is the tangential speed (ft/sec)
 a = the angle relative to horizontal
 G = the acceleration of gravity (32.2 ft/sec²)
 Y = the distance to the ground from the point of release

The distances of debris throw were corrected for the release point relative to the tower center. The distances are from the centerline of the tower base. The attached 11 pages (attachment 1) are the results of the calculation for each degree of blade angle.

The calculation was verified against available calculation provided at:
<http://hyperphysics.phy-astr.gsu.edu/hbase/traj.html#tra3>

The distance will increase upon an over speed event of the turbine.

This analysis shows that turbine size and rotor speed must be considered when placing turbines to meet the safety setbacks of the ordinance. Using a safe distance of 1.1 times the height of a turbine as a safety setback does not result in a safe installation.

This turbine will throw debris farther than a 1.1 time height distance 2 out of 3 times upon a blade failure.

The manufacturer numbers are not for the worst case debris throw distances.

Jeff Roberts

10/19/2008

Performed by:
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

Rotor Radius (ft)	Rotation angle (degrees)	Rotation angle (radians)	Tangential release angle (degrees)	Tangential release angle (radians)	Verticle Height relative to hub (ft)	Horizontal distance relative to hub (ft)	Rotor speed (rpm)	Rotor tip speed (ft/sec)	Total distance from release point (ft)	Release height to ground (ft)	Distance of travel from tower (ft)
164	0	0.000	90	1.571	0.00	164.00	15	257.61	0.00	-328.00	-164.00
164	1	0.017	89	1.553	2.86	163.98	15	257.61	77.30	-330.86	-86.67
164	2	0.035	88	1.536	5.72	163.90	15	257.61	154.60	-333.72	-9.30
164	3	0.052	87	1.518	8.58	163.78	15	257.61	231.82	-336.58	68.05
164	4	0.070	86	1.501	11.44	163.60	15	257.61	308.87	-339.44	145.27
164	5	0.087	85	1.484	14.29	163.38	15	257.61	385.67	-342.29	222.30
164	6	0.105	84	1.466	17.14	163.10	15	257.61	462.14	-345.14	299.03
164	7	0.122	83	1.449	19.99	162.78	15	257.61	538.18	-347.99	375.40
164	8	0.140	82	1.431	22.82	162.40	15	257.61	613.72	-350.82	451.31
164	9	0.157	81	1.414	25.66	161.98	15	257.61	688.67	-353.66	526.69
164	10	0.175	80	1.396	28.48	161.51	15	257.61	762.97	-356.48	601.46
164	11	0.192	79	1.379	31.29	160.99	15	257.61	836.51	-359.29	675.52
164	12	0.209	78	1.361	34.10	160.42	15	257.61	909.23	-362.10	748.82
164	13	0.227	77	1.344	36.89	159.80	15	257.61	981.05	-364.89	821.25
164	14	0.244	76	1.326	39.68	159.13	15	257.61	1051.89	-367.68	892.76
164	15	0.262	75	1.309	42.45	158.41	15	257.61	1121.68	-370.45	963.26
164	16	0.279	74	1.292	45.20	157.65	15	257.61	1190.33	-373.20	1032.69
164	17	0.297	73	1.274	47.95	156.83	15	257.61	1257.79	-375.95	1100.96
164	18	0.314	72	1.257	50.68	155.97	15	257.61	1323.99	-378.68	1168.01
164	19	0.332	71	1.239	53.39	155.07	15	257.61	1388.84	-381.39	1233.77
164	20	0.349	70	1.222	56.09	154.11	15	257.61	1452.29	-384.09	1298.18
164	21	0.367	69	1.204	58.77	153.11	15	257.61	1514.27	-386.77	1361.16
164	22	0.384	68	1.187	61.44	152.06	15	257.61	1574.72	-389.44	1422.66
164	23	0.401	67	1.169	64.08	150.96	15	257.61	1633.58	-392.08	1482.61
164	24	0.419	66	1.152	66.70	149.82	15	257.61	1690.79	-394.70	1540.97
164	25	0.436	65	1.134	69.31	148.63	15	257.61	1746.29	-397.31	1597.66
164	26	0.454	64	1.117	71.89	147.40	15	257.61	1800.04	-399.89	1652.64
164	27	0.471	63	1.100	74.45	146.13	15	257.61	1851.98	-402.45	1705.85
164	28	0.489	62	1.082	76.99	144.80	15	257.61	1902.06	-404.99	1757.26
164	29	0.506	61	1.065	79.51	143.44	15	257.61	1950.24	-407.51	1806.80

Performed by:
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	30	0.524	60	1.047	82.00	142.03	15	257.61	1996.47	-410.00	1854.45
164	31	0.541	59	1.030	84.47	140.58	15	257.61	2040.72	-412.47	1900.15
164	32	0.559	58	1.012	86.91	139.08	15	257.61	2082.95	-414.91	1943.87
164	33	0.576	57	0.995	89.32	137.54	15	257.61	2123.12	-417.32	1985.58
164	34	0.593	56	0.977	91.71	135.96	15	257.61	2161.21	-419.71	2025.24
164	35	0.611	55	0.960	94.07	134.34	15	257.61	2197.17	-422.07	2062.83
164	36	0.628	54	0.942	96.40	132.68	15	257.61	2231.00	-424.40	2098.32
164	37	0.646	53	0.925	98.70	130.98	15	257.61	2262.66	-426.70	2131.69
164	38	0.663	52	0.908	100.97	129.23	15	257.61	2292.14	-428.97	2162.91
164	39	0.681	51	0.890	103.21	127.45	15	257.61	2319.43	-431.21	2191.98
164	40	0.698	50	0.873	105.42	125.63	15	257.61	2344.50	-433.42	2218.87
164	41	0.716	49	0.855	107.59	123.77	15	257.61	2367.35	-435.59	2243.58
164	42	0.733	48	0.838	109.74	121.88	15	257.61	2387.98	-437.74	2266.11
164	43	0.750	47	0.820	111.85	119.94	15	257.61	2406.38	-439.85	2286.44
164	44	0.768	46	0.803	113.92	117.97	15	257.61	2422.56	-441.92	2304.58
164	45	0.785	45	0.785	115.97	115.97	15	257.61	2436.51	-443.97	2320.54
164	46	0.803	44	0.768	117.97	113.92	15	257.61	2448.24	-445.97	2334.32
164	47	0.820	43	0.750	119.94	111.85	15	257.61	2457.77	-447.94	2345.93
164	48	0.838	42	0.733	121.88	109.74	15	257.61	2465.12	-449.88	2355.38
164	49	0.855	41	0.716	123.77	107.59	15	257.61	2470.28	-451.77	2362.69
164	50	0.873	40	0.698	125.63	105.42	15	257.61	2473.30	-453.63	2367.89
164	51	0.890	39	0.681	127.45	103.21	15	257.61	2474.20	-455.45	2370.99
164	52	0.908	38	0.663	129.23	100.97	15	257.61	2472.99	-457.23	2372.02
164	53	0.925	37	0.646	130.98	98.70	15	257.61	2469.72	-458.98	2371.02
164	54	0.942	36	0.628	132.68	96.40	15	257.61	2464.41	-460.68	2368.02
164	55	0.960	35	0.611	134.34	94.07	15	257.61	2457.11	-462.34	2363.05
164	56	0.977	34	0.593	135.96	91.71	15	257.61	2447.86	-463.96	2356.15
164	57	0.995	33	0.576	137.54	89.32	15	257.61	2436.70	-465.54	2347.38
164	58	1.012	32	0.559	139.08	86.91	15	257.61	2423.68	-467.08	2336.77
164	59	1.030	31	0.541	140.58	84.47	15	257.61	2408.85	-468.58	2324.38
164	60	1.047	30	0.524	142.03	82.00	15	257.61	2392.26	-470.03	2310.26
164	61	1.065	29	0.506	143.44	79.51	15	257.61	2373.97	-471.44	2294.46
164	62	1.082	28	0.489	144.80	76.99	15	257.61	2354.04	-472.80	2277.04
164	63	1.100	27	0.471	146.13	74.45	15	257.61	2332.53	-474.13	2258.07

Performed by:
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	64	1.117	26	0.454	147.40	71.89	15	257.61	2309.50	-475.40	2237.61
164	65	1.134	25	0.436	148.63	69.31	15	257.61	2285.03	-476.63	2215.72
164	66	1.152	24	0.419	149.82	66.70	15	257.61	2259.17	-477.82	2192.47
164	67	1.169	23	0.401	150.96	64.08	15	257.61	2232.01	-478.96	2167.93
164	68	1.187	22	0.384	152.06	61.44	15	257.61	2203.62	-480.06	2142.19
164	69	1.204	21	0.367	153.11	58.77	15	257.61	2174.07	-481.11	2115.30
164	70	1.222	20	0.349	154.11	56.09	15	257.61	2143.44	-482.11	2087.34
164	71	1.239	19	0.332	155.07	53.39	15	257.61	2111.80	-483.07	2058.40
164	72	1.257	18	0.314	155.97	50.68	15	257.61	2079.23	-483.97	2028.55
164	73	1.274	17	0.297	156.83	47.95	15	257.61	2045.82	-484.83	1997.88
164	74	1.292	16	0.279	157.65	45.20	15	257.61	2011.65	-485.65	1966.45
164	75	1.309	15	0.262	158.41	42.45	15	257.61	1976.79	-486.41	1934.35
164	76	1.326	14	0.244	159.13	39.68	15	257.61	1941.33	-487.13	1901.66
164	77	1.344	13	0.227	159.80	36.89	15	257.61	1905.35	-487.80	1868.45
164	78	1.361	12	0.209	160.42	34.10	15	257.61	1868.92	-488.42	1834.82
164	79	1.379	11	0.192	160.99	31.29	15	257.61	1832.13	-488.99	1800.83
164	80	1.396	10	0.175	161.51	28.48	15	257.61	1795.05	-489.51	1766.57
164	81	1.414	9	0.157	161.98	25.66	15	257.61	1757.76	-489.98	1732.10
164	82	1.431	8	0.140	162.40	22.82	15	257.61	1720.33	-490.40	1697.51
164	83	1.449	7	0.122	162.78	19.99	15	257.61	1682.84	-490.78	1662.86
164	84	1.466	6	0.105	163.10	17.14	15	257.61	1645.36	-491.10	1628.22
164	85	1.484	5	0.087	163.38	14.29	15	257.61	1607.95	-491.38	1593.65
164	86	1.501	4	0.070	163.60	11.44	15	257.61	1570.67	-491.60	1559.23
164	87	1.518	3	0.052	163.78	8.58	15	257.61	1533.59	-491.78	1525.01
164	88	1.536	2	0.035	163.90	5.72	15	257.61	1496.76	-491.90	1491.04
164	89	1.553	1	0.017	163.98	2.86	15	257.61	1460.24	-491.98	1457.38
164	90	1.571	0	0.000	164.00	0.00	15	257.61	1424.08	-492.00	1424.08
164	91	1.588	-1	-0.017	163.98	-2.86	15	257.61	1388.31	-491.98	1391.18
164	92	1.606	-2	-0.035	163.90	-5.72	15	257.61	1353.00	-491.90	1358.72
164	93	1.623	-3	-0.052	163.78	-8.58	15	257.61	1318.16	-491.78	1326.74
164	94	1.641	-4	-0.070	163.60	-11.44	15	257.61	1283.84	-491.60	1295.28
164	95	1.658	-5	-0.087	163.38	-14.29	15	257.61	1250.06	-491.38	1264.36
164	96	1.676	-6	-0.105	163.10	-17.14	15	257.61	1216.86	-491.10	1234.00
164	97	1.693	-7	-0.122	162.78	-19.99	15	257.61	1184.25	-490.78	1204.24

Performed by:
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	98	1.710	-8	-0.140	162.40	-22.82	15	257.61	1152.25	-490.40	1175.08
164	99	1.728	-9	-0.157	161.98	-25.66	15	257.61	1120.89	-489.98	1146.54
164	100	1.745	-10	-0.175	161.51	-28.48	15	257.61	1090.16	-489.51	1118.63
164	101	1.763	-11	-0.192	160.99	-31.29	15	257.61	1060.07	-488.99	1091.37
164	102	1.780	-12	-0.209	160.42	-34.10	15	257.61	1030.65	-488.42	1064.74
164	103	1.798	-13	-0.227	159.80	-36.89	15	257.61	1001.88	-487.80	1038.77
164	104	1.815	-14	-0.244	159.13	-39.68	15	257.61	973.76	-487.13	1013.44
164	105	1.833	-15	-0.262	158.41	-42.45	15	257.61	946.31	-486.41	988.75
164	106	1.850	-16	-0.279	157.65	-45.20	15	257.61	919.50	-485.65	964.71
164	107	1.868	-17	-0.297	156.83	-47.95	15	257.61	893.34	-484.83	941.29
164	108	1.885	-18	-0.314	155.97	-50.68	15	257.61	867.83	-483.97	918.50
164	109	1.902	-19	-0.332	155.07	-53.39	15	257.61	842.94	-483.07	896.33
164	110	1.920	-20	-0.349	154.11	-56.09	15	257.61	818.67	-482.11	874.76
164	111	1.937	-21	-0.367	153.11	-58.77	15	257.61	795.01	-481.11	853.78
164	112	1.955	-22	-0.384	152.06	-61.44	15	257.61	771.95	-480.06	833.39
164	113	1.972	-23	-0.401	150.96	-64.08	15	257.61	749.48	-478.96	813.56
164	114	1.990	-24	-0.419	149.82	-66.70	15	257.61	727.58	-477.82	794.28
164	115	2.007	-25	-0.436	148.63	-69.31	15	257.61	706.23	-476.63	775.54
164	116	2.025	-26	-0.454	147.40	-71.89	15	257.61	685.43	-475.40	757.33
164	117	2.042	-27	-0.471	146.13	-74.45	15	257.61	665.17	-474.13	739.62
164	118	2.059	-28	-0.489	144.80	-76.99	15	257.61	645.41	-472.80	722.41
164	119	2.077	-29	-0.506	143.44	-79.51	15	257.61	626.17	-471.44	705.67
164	120	2.094	-30	-0.524	142.03	-82.00	15	257.61	607.41	-470.03	689.41
164	121	2.112	-31	-0.541	140.58	-84.47	15	257.61	589.12	-468.58	673.59
164	122	2.129	-32	-0.559	139.08	-86.91	15	257.61	571.29	-467.08	658.20
164	123	2.147	-33	-0.576	137.54	-89.32	15	257.61	553.91	-465.54	643.23
164	124	2.164	-34	-0.593	135.96	-91.71	15	257.61	536.96	-463.96	628.67
164	125	2.182	-35	-0.611	134.34	-94.07	15	257.61	520.44	-462.34	614.50
164	126	2.199	-36	-0.628	132.68	-96.40	15	257.61	504.31	-460.68	600.71
164	127	2.217	-37	-0.646	130.98	-98.70	15	257.61	488.59	-458.98	587.28
164	128	2.234	-38	-0.663	129.23	-100.97	15	257.61	473.24	-457.23	574.21
164	129	2.251	-39	-0.681	127.45	-103.21	15	257.61	458.26	-455.45	561.47
164	130	2.269	-40	-0.698	125.63	-105.42	15	257.61	443.64	-453.63	549.06
164	131	2.286	-41	-0.716	123.77	-107.59	15	257.61	429.37	-451.77	536.97

Performed by:
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	132	2.304	-42	-0.733	121.88	-109.74	15	257.61	415.44	-449.88	525.17
164	133	2.321	-43	-0.750	119.94	-111.85	15	257.61	401.82	-447.94	513.67
164	134	2.339	-44	-0.768	117.97	-113.92	15	257.61	388.53	-445.97	502.45
164	135	2.356	-45	-0.785	115.97	-115.97	15	257.61	375.54	-443.97	491.50
164	136	2.374	-46	-0.803	113.92	-117.97	15	257.61	362.84	-441.92	480.81
164	137	2.391	-47	-0.820	111.85	-119.94	15	257.61	350.43	-439.85	470.38
164	138	2.409	-48	-0.838	109.74	-121.88	15	257.61	338.30	-437.74	460.18
164	139	2.426	-49	-0.855	107.59	-123.77	15	257.61	326.44	-435.59	450.21
164	140	2.443	-50	-0.873	105.42	-125.63	15	257.61	314.84	-433.42	440.47
164	141	2.461	-51	-0.890	103.21	-127.45	15	257.61	303.50	-431.21	430.95
164	142	2.478	-52	-0.908	100.97	-129.23	15	257.61	292.39	-428.97	421.63
164	143	2.496	-53	-0.925	98.70	-130.98	15	257.61	281.53	-426.70	412.51
164	144	2.513	-54	-0.942	96.40	-132.68	15	257.61	270.90	-424.40	403.58
164	145	2.531	-55	-0.960	94.07	-134.34	15	257.61	260.50	-422.07	394.84
164	146	2.548	-56	-0.977	91.71	-135.96	15	257.61	250.31	-419.71	386.27
164	147	2.566	-57	-0.995	89.32	-137.54	15	257.61	240.33	-417.32	377.88
164	148	2.583	-58	-1.012	86.91	-139.08	15	257.61	230.56	-414.91	369.64
164	149	2.601	-59	-1.030	84.47	-140.58	15	257.61	221.00	-412.47	361.57
164	150	2.618	-60	-1.047	82.00	-142.03	15	257.61	211.62	-410.00	353.65
164	151	2.635	-61	-1.065	79.51	-143.44	15	257.61	202.44	-407.51	345.88
164	152	2.653	-62	-1.082	76.99	-144.80	15	257.61	193.44	-404.99	338.24
164	153	2.670	-63	-1.100	74.45	-146.13	15	257.61	184.62	-402.45	330.74
164	154	2.688	-64	-1.117	71.89	-147.40	15	257.61	175.97	-399.89	323.38
164	155	2.705	-65	-1.134	69.31	-148.63	15	257.61	167.50	-397.31	316.13
164	156	2.723	-66	-1.152	66.70	-149.82	15	257.61	159.19	-394.70	309.01
164	157	2.740	-67	-1.169	64.08	-150.96	15	257.61	151.04	-392.08	302.00
164	158	2.758	-68	-1.187	61.44	-152.06	15	257.61	143.05	-389.44	295.11
164	159	2.775	-69	-1.204	58.77	-153.11	15	257.61	135.21	-386.77	288.32
164	160	2.793	-70	-1.222	56.09	-154.11	15	257.61	127.52	-384.09	281.63
164	161	2.810	-71	-1.239	53.39	-155.07	15	257.61	119.98	-381.39	275.04
164	162	2.827	-72	-1.257	50.68	-155.97	15	257.61	112.58	-378.68	268.55
164	163	2.845	-73	-1.274	47.95	-156.83	15	257.61	105.32	-375.95	262.15
164	164	2.862	-74	-1.292	45.20	-157.65	15	257.61	98.19	-373.20	255.83
164	165	2.880	-75	-1.309	42.45	-158.41	15	257.61	91.19	-370.45	249.60

Performed by:
Jeff Roberts

Attachment 1

Date: 10/19/2008

Turbine Debris Throw Distance

164	166	2.897	-76	-1.326	39.68	-159.13	15	257.61	84.32	-367.68	243.45
164	167	2.915	-77	-1.344	36.89	-159.80	15	257.61	77.58	-364.89	237.38
164	168	2.932	-78	-1.361	34.10	-160.42	15	257.61	70.96	-362.10	231.38
164	169	2.950	-79	-1.379	31.29	-160.99	15	257.61	64.46	-359.29	225.44
164	170	2.967	-80	-1.396	28.48	-161.51	15	257.61	58.07	-356.48	219.58
164	171	2.985	-81	-1.414	25.66	-161.98	15	257.61	51.80	-353.66	213.78
164	172	3.002	-82	-1.431	22.82	-162.40	15	257.61	45.64	-350.82	208.04
164	173	3.019	-83	-1.449	19.99	-162.78	15	257.61	39.58	-347.99	202.36
164	174	3.037	-84	-1.466	17.14	-163.10	15	257.61	33.64	-345.14	196.74
164	175	3.054	-85	-1.484	14.29	-163.38	15	257.61	27.79	-342.29	191.16
164	176	3.072	-86	-1.501	11.44	-163.60	15	257.61	22.04	-339.44	185.64
164	177	3.089	-87	-1.518	8.58	-163.78	15	257.61	16.39	-336.58	180.17
164	178	3.107	-88	-1.536	5.72	-163.90	15	257.61	10.84	-333.72	174.74
164	179	3.124	-89	-1.553	2.86	-163.98	15	257.61	5.37	-330.86	169.35
164	180	3.142	-90	-1.571	0.00	-164.00	15	257.61	0.00	-328.00	164.00
164	181	3.159	-91	-1.588	-2.86	-163.98	15	257.61	-5.29	-325.14	158.69
164	182	3.176	-92	-1.606	-5.72	-163.90	15	257.61	-10.49	-322.28	153.41
164	183	3.194	-93	-1.623	-8.58	-163.78	15	257.61	-15.61	-319.42	148.17
164	184	3.211	-94	-1.641	-11.44	-163.60	15	257.61	-20.65	-316.56	142.95
164	185	3.229	-95	-1.658	-14.29	-163.38	15	257.61	-25.61	-313.71	137.76
164	186	3.246	-96	-1.676	-17.14	-163.10	15	257.61	-30.50	-310.86	132.60
164	187	3.264	-97	-1.693	-19.99	-162.78	15	257.61	-35.32	-308.01	127.46
164	188	3.281	-98	-1.710	-22.82	-162.40	15	257.61	-40.06	-305.18	122.34
164	189	3.299	-99	-1.728	-25.66	-161.98	15	257.61	-44.74	-302.34	117.24
164	190	3.316	-100	-1.745	-28.48	-161.51	15	257.61	-49.36	-299.52	112.15
164	191	3.334	-101	-1.763	-31.29	-160.99	15	257.61	-53.91	-296.71	107.08
164	192	3.351	-102	-1.780	-34.10	-160.42	15	257.61	-58.40	-293.90	102.01
164	193	3.368	-103	-1.798	-36.89	-159.80	15	257.61	-62.84	-291.11	96.96
164	194	3.386	-104	-1.815	-39.68	-159.13	15	257.61	-67.22	-288.32	91.91
164	195	3.403	-105	-1.833	-42.45	-158.41	15	257.61	-71.55	-285.55	86.87
164	196	3.421	-106	-1.850	-45.20	-157.65	15	257.61	-75.83	-282.80	81.82
164	197	3.438	-107	-1.868	-47.95	-156.83	15	257.61	-80.06	-280.05	76.78
164	198	3.456	-108	-1.885	-50.68	-155.97	15	257.61	-84.25	-277.32	71.73
164	199	3.473	-109	-1.902	-53.39	-155.07	15	257.61	-88.40	-274.61	66.67

Performed by:
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	200	3.491	-110	-1.920	-56.09	-154.11	15	257.61	-92.51	-271.91	61.60
164	201	3.508	-111	-1.937	-58.77	-153.11	15	257.61	-96.58	-269.23	56.52
164	202	3.526	-112	-1.955	-61.44	-152.06	15	257.61	-100.63	-266.56	51.43
164	203	3.543	-113	-1.972	-64.08	-150.96	15	257.61	-104.64	-263.92	46.32
164	204	3.560	-114	-1.990	-66.70	-149.82	15	257.61	-108.63	-261.30	41.19
164	205	3.578	-115	-2.007	-69.31	-148.63	15	257.61	-112.60	-258.69	36.04
164	206	3.595	-116	-2.025	-71.89	-147.40	15	257.61	-116.55	-256.11	30.85
164	207	3.613	-117	-2.042	-74.45	-146.13	15	257.61	-120.48	-253.55	25.64
164	208	3.630	-118	-2.059	-76.99	-144.80	15	257.61	-124.40	-251.01	20.40
164	209	3.648	-119	-2.077	-79.51	-143.44	15	257.61	-128.32	-248.49	15.12
164	210	3.665	-120	-2.094	-82.00	-142.03	15	257.61	-132.23	-246.00	9.80
164	211	3.683	-121	-2.112	-84.47	-140.58	15	257.61	-136.14	-243.53	4.43
164	212	3.700	-122	-2.129	-86.91	-139.08	15	257.61	-140.06	-241.09	-0.98
164	213	3.718	-123	-2.147	-89.32	-137.54	15	257.61	-143.99	-238.68	-6.45
164	214	3.735	-124	-2.164	-91.71	-135.96	15	257.61	-147.93	-236.29	-11.97
164	215	3.752	-125	-2.182	-94.07	-134.34	15	257.61	-151.89	-233.93	-17.55
164	216	3.770	-126	-2.199	-96.40	-132.68	15	257.61	-155.87	-231.60	-23.20
164	217	3.787	-127	-2.217	-98.70	-130.98	15	257.61	-159.89	-229.30	-28.91
164	218	3.805	-128	-2.234	-100.97	-129.23	15	257.61	-163.94	-227.03	-34.70
164	219	3.822	-129	-2.251	-103.21	-127.45	15	257.61	-168.03	-224.79	-40.58
164	220	3.840	-130	-2.269	-105.42	-125.63	15	257.61	-172.17	-222.58	-46.53
164	221	3.857	-131	-2.286	-107.59	-123.77	15	257.61	-176.36	-220.41	-52.58
164	222	3.875	-132	-2.304	-109.74	-121.88	15	257.61	-180.61	-218.26	-58.73
164	223	3.892	-133	-2.321	-111.85	-119.94	15	257.61	-184.93	-216.15	-64.99
164	224	3.910	-134	-2.339	-113.92	-117.97	15	257.61	-189.33	-214.08	-71.36
164	225	3.927	-135	-2.356	-115.97	-115.97	15	257.61	-193.81	-212.03	-77.84
164	226	3.944	-136	-2.374	-117.97	-113.92	15	257.61	-198.38	-210.03	-84.46
164	227	3.962	-137	-2.391	-119.94	-111.85	15	257.61	-203.06	-208.06	-91.21
164	228	3.979	-138	-2.409	-121.88	-109.74	15	257.61	-207.85	-206.12	-98.11
164	229	3.997	-139	-2.426	-123.77	-107.59	15	257.61	-212.76	-204.23	-105.16
164	230	4.014	-140	-2.443	-125.63	-105.42	15	257.61	-217.80	-202.37	-112.38
164	231	4.032	-141	-2.461	-127.45	-103.21	15	257.61	-222.99	-200.55	-119.78
164	232	4.049	-142	-2.478	-129.23	-100.97	15	257.61	-228.34	-198.77	-127.37
164	233	4.067	-143	-2.496	-130.98	-98.70	15	257.61	-233.85	-197.02	-135.16

Date: 10/19/2008

Turbine Debris Throw Distance

164	234	4.084	-144	-2.513	-132.68	-96.40	15	257.61	-239.56	-195.32	-143.16
164	235	4.102	-145	-2.531	-134.34	-94.07	15	257.61	-245.46	-193.66	-151.40
164	236	4.119	-146	-2.548	-135.96	-91.71	15	257.61	-251.58	-192.04	-159.88
164	237	4.136	-147	-2.566	-137.54	-89.32	15	257.61	-257.94	-190.46	-168.62
164	238	4.154	-148	-2.583	-139.08	-86.91	15	257.61	-264.55	-188.92	-177.65
164	239	4.171	-149	-2.601	-140.58	-84.47	15	257.61	-271.44	-187.42	-186.97
164	240	4.189	-150	-2.618	-142.03	-82.00	15	257.61	-278.62	-185.97	-196.62
164	241	4.206	-151	-2.635	-143.44	-79.51	15	257.61	-286.12	-184.56	-206.61
164	242	4.224	-152	-2.653	-144.80	-76.99	15	257.61	-293.97	-183.20	-216.97
164	243	4.241	-153	-2.670	-146.13	-74.45	15	257.61	-302.18	-181.87	-227.73
164	244	4.259	-154	-2.688	-147.40	-71.89	15	257.61	-310.80	-180.60	-238.91
164	245	4.276	-155	-2.705	-148.63	-69.31	15	257.61	-319.85	-179.37	-250.54
164	246	4.294	-156	-2.723	-149.82	-66.70	15	257.61	-329.37	-178.18	-262.66
164	247	4.311	-157	-2.740	-150.96	-64.08	15	257.61	-339.38	-177.04	-275.30
164	248	4.328	-158	-2.758	-152.06	-61.44	15	257.61	-349.94	-175.94	-288.50
164	249	4.346	-159	-2.775	-153.11	-58.77	15	257.61	-361.07	-174.89	-302.30
164	250	4.363	-160	-2.793	-154.11	-56.09	15	257.61	-372.83	-173.89	-316.74
164	251	4.381	-161	-2.810	-155.07	-53.39	15	257.61	-385.26	-172.93	-331.87
164	252	4.398	-162	-2.827	-155.97	-50.68	15	257.61	-398.41	-172.03	-347.73
164	253	4.416	-163	-2.845	-156.83	-47.95	15	257.61	-412.33	-171.17	-364.39
164	254	4.433	-164	-2.862	-157.65	-45.20	15	257.61	-427.08	-170.35	-381.88
164	255	4.451	-165	-2.880	-158.41	-42.45	15	257.61	-442.71	-169.59	-400.27
164	256	4.468	-166	-2.897	-159.13	-39.68	15	257.61	-459.29	-168.87	-419.61
164	257	4.485	-167	-2.915	-159.80	-36.89	15	257.61	-476.87	-168.20	-439.98
164	258	4.503	-168	-2.932	-160.42	-34.10	15	257.61	-495.51	-167.58	-461.42
164	259	4.520	-169	-2.950	-160.99	-31.29	15	257.61	-515.29	-167.01	-484.00
164	260	4.538	-170	-2.967	-161.51	-28.48	15	257.61	-536.26	-166.49	-507.78
164	261	4.555	-171	-2.985	-161.98	-25.66	15	257.61	-558.48	-166.02	-532.82
164	262	4.573	-172	-3.002	-162.40	-22.82	15	257.61	-582.01	-165.60	-559.18
164	263	4.590	-173	-3.019	-162.78	-19.99	15	257.61	-606.90	-165.22	-586.91
164	264	4.608	-174	-3.037	-163.10	-17.14	15	257.61	-633.20	-164.90	-616.06
164	265	4.625	-175	-3.054	-163.38	-14.29	15	257.61	-660.96	-164.62	-646.67
164	266	4.643	-176	-3.072	-163.60	-11.44	15	257.61	-690.20	-164.40	-678.76
164	267	4.660	-177	-3.089	-163.78	-8.58	15	257.61	-720.94	-164.22	-712.36

Performed by:
Jeff Roberts

Attachment 1

Turbine Debris Throw Distance

Date: 10/19/2008

164	268	4.677	-178	-3.107	-163.90	-5.72	15	257.61	-753.19	-164.10	-747.47
164	269	4.695	-179	-3.124	-163.98	-2.86	15	257.61	-786.96	-164.02	-784.09
164	270	4.712	-180	-3.142	-164.00	0.00	15	257.61	-822.19	-164.00	-822.19
164	271	4.730	-181	-3.159	-163.98	2.86	15	257.61	-858.88	-164.02	-861.74
164	272	4.747	-182	-3.176	-163.90	5.72	15	257.61	-896.96	-164.10	-902.68
164	273	4.765	-183	-3.194	-163.78	8.58	15	257.61	-936.37	-164.22	-944.96
164	274	4.782	-184	-3.211	-163.60	11.44	15	257.61	-977.03	-164.40	-988.47
164	275	4.800	-185	-3.229	-163.38	14.29	15	257.61	-1018.84	-164.62	-1033.14
164	276	4.817	-186	-3.246	-163.10	17.14	15	257.61	-1061.70	-164.90	-1078.85
164	277	4.835	-187	-3.264	-162.78	19.99	15	257.61	-1105.49	-165.22	-1125.48
164	278	4.852	-188	-3.281	-162.40	22.82	15	257.61	-1150.09	-165.60	-1172.91
164	279	4.869	-189	-3.299	-161.98	25.66	15	257.61	-1195.35	-166.02	-1221.01
164	280	4.887	-190	-3.316	-161.51	28.48	15	257.61	-1241.15	-166.49	-1269.63
164	281	4.904	-191	-3.334	-160.99	31.29	15	257.61	-1287.34	-167.01	-1318.64
164	282	4.922	-192	-3.351	-160.42	34.10	15	257.61	-1333.79	-167.58	-1367.88
164	283	4.939	-193	-3.368	-159.80	36.89	15	257.61	-1380.34	-168.20	-1417.23
164	284	4.957	-194	-3.386	-159.13	39.68	15	257.61	-1426.86	-168.87	-1466.53
164	285	4.974	-195	-3.403	-158.41	42.45	15	257.61	-1473.20	-169.59	-1515.65
164	286	4.992	-196	-3.421	-157.65	45.20	15	257.61	-1519.23	-170.35	-1564.43
164	287	5.009	-197	-3.438	-156.83	47.95	15	257.61	-1564.81	-171.17	-1612.76
164	288	5.027	-198	-3.456	-155.97	50.68	15	257.61	-1609.82	-172.03	-1660.50
164	289	5.044	-199	-3.473	-155.07	53.39	15	257.61	-1654.12	-172.93	-1707.52
164	290	5.061	-200	-3.491	-154.11	56.09	15	257.61	-1697.60	-173.89	-1753.69
164	291	5.079	-201	-3.508	-153.11	58.77	15	257.61	-1740.13	-174.89	-1798.90
164	292	5.096	-202	-3.526	-152.06	61.44	15	257.61	-1781.61	-175.94	-1843.04
164	293	5.114	-203	-3.543	-150.96	64.08	15	257.61	-1821.92	-177.04	-1886.00
164	294	5.131	-204	-3.560	-149.82	66.70	15	257.61	-1860.97	-178.18	-1927.67
164	295	5.149	-205	-3.578	-148.63	69.31	15	257.61	-1898.65	-179.37	-1967.95
164	296	5.166	-206	-3.595	-147.40	71.89	15	257.61	-1934.87	-180.60	-2006.76
164	297	5.184	-207	-3.613	-146.13	74.45	15	257.61	-1969.54	-181.87	-2044.00
164	298	5.201	-208	-3.630	-144.80	76.99	15	257.61	-2002.59	-183.20	-2079.58
164	299	5.219	-209	-3.648	-143.44	79.51	15	257.61	-2033.92	-184.56	-2113.43
164	300	5.236	-210	-3.665	-142.03	82.00	15	257.61	-2063.47	-185.97	-2145.47
164	301	5.253	-211	-3.683	-140.58	84.47	15	257.61	-2091.17	-187.42	-2175.63

Turbine Debris Throw Distance

Date: 10/19/2008

164	302	5.271	-212	-3.700	-139.08	86.91	15	257.61	-2116.94	-188.92	-2203.85
164	303	5.288	-213	-3.718	-137.54	89.32	15	257.61	-2140.73	-190.46	-2230.05
164	304	5.306	-214	-3.735	-135.96	91.71	15	257.61	-2162.48	-192.04	-2254.19
164	305	5.323	-215	-3.752	-134.34	94.07	15	257.61	-2182.14	-193.66	-2276.21
164	306	5.341	-216	-3.770	-132.68	96.40	15	257.61	-2199.66	-195.32	-2296.05
164	307	5.358	-217	-3.787	-130.98	98.70	15	257.61	-2214.99	-197.02	-2313.68
164	308	5.376	-218	-3.805	-129.23	100.97	15	257.61	-2228.09	-198.77	-2329.06
164	309	5.393	-219	-3.822	-127.45	103.21	15	257.61	-2238.92	-200.55	-2342.13
164	310	5.411	-220	-3.840	-125.63	105.42	15	257.61	-2247.46	-202.37	-2352.88
164	311	5.428	-221	-3.857	-123.77	107.59	15	257.61	-2253.67	-204.23	-2361.26
164	312	5.445	-222	-3.875	-121.88	109.74	15	257.61	-2257.53	-206.12	-2367.26
164	313	5.463	-223	-3.892	-119.94	111.85	15	257.61	-2259.01	-208.06	-2370.86
164	314	5.480	-224	-3.910	-117.97	113.92	15	257.61	-2258.10	-210.03	-2372.02
164	315	5.498	-225	-3.927	-115.97	115.97	15	257.61	-2254.78	-212.03	-2370.74
164	316	5.515	-226	-3.944	-113.92	117.97	15	257.61	-2249.04	-214.08	-2367.01
164	317	5.533	-227	-3.962	-111.85	119.94	15	257.61	-2240.88	-216.15	-2360.82
164	318	5.550	-228	-3.979	-109.74	121.88	15	257.61	-2230.29	-218.26	-2352.16
164	319	5.568	-229	-3.997	-107.59	123.77	15	257.61	-2217.27	-220.41	-2341.04
164	320	5.585	-230	-4.014	-105.42	125.63	15	257.61	-2201.82	-222.58	-2327.46
164	321	5.603	-231	-4.032	-103.21	127.45	15	257.61	-2183.96	-224.79	-2311.41
164	322	5.620	-232	-4.049	-100.97	129.23	15	257.61	-2163.69	-227.03	-2292.92
164	323	5.637	-233	-4.067	-98.70	130.98	15	257.61	-2141.02	-229.30	-2272.00
164	324	5.655	-234	-4.084	-96.40	132.68	15	257.61	-2115.97	-231.60	-2248.65
164	325	5.672	-235	-4.102	-94.07	134.34	15	257.61	-2088.57	-233.93	-2222.91
164	326	5.690	-236	-4.119	-91.71	135.96	15	257.61	-2058.83	-236.29	-2194.79
164	327	5.707	-237	-4.136	-89.32	137.54	15	257.61	-2026.78	-238.68	-2164.32
164	328	5.725	-238	-4.154	-86.91	139.08	15	257.61	-1992.45	-241.09	-2131.53
164	329	5.742	-239	-4.171	-84.47	140.58	15	257.61	-1955.87	-243.53	-2096.45
164	330	5.760	-240	-4.189	-82.00	142.03	15	257.61	-1917.08	-246.00	-2059.11
164	331	5.777	-241	-4.206	-79.51	143.44	15	257.61	-1876.12	-248.49	-2019.56
164	332	5.794	-242	-4.224	-76.99	144.80	15	257.61	-1833.03	-251.01	-1977.83
164	333	5.812	-243	-4.241	-74.45	146.13	15	257.61	-1787.84	-253.55	-1933.97
164	334	5.829	-244	-4.259	-71.89	147.40	15	257.61	-1740.61	-256.11	-1888.02
164	335	5.847	-245	-4.276	-69.31	148.63	15	257.61	-1691.39	-258.69	-1840.03

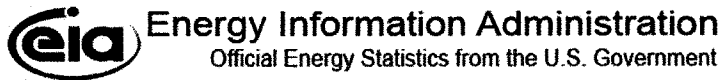
Performed by:
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	336	5.864	-246	-4.294	-66.70	149.82	15	257.61	-1640.23	-261.30	-1790.05
164	337	5.882	-247	-4.311	-64.08	150.96	15	257.61	-1587.18	-263.92	-1738.14
164	338	5.899	-248	-4.328	-61.44	152.06	15	257.61	-1532.30	-266.56	-1684.35
164	339	5.917	-249	-4.346	-58.77	153.11	15	257.61	-1475.64	-269.23	-1628.75
164	340	5.934	-250	-4.363	-56.09	154.11	15	257.61	-1417.27	-271.91	-1571.38
164	341	5.952	-251	-4.381	-53.39	155.07	15	257.61	-1357.26	-274.61	-1512.32
164	342	5.969	-252	-4.398	-50.68	155.97	15	257.61	-1295.66	-277.32	-1451.63
164	343	5.986	-253	-4.416	-47.95	156.83	15	257.61	-1232.54	-280.05	-1389.37
164	344	6.004	-254	-4.433	-45.20	157.65	15	257.61	-1167.97	-282.80	-1325.62
164	345	6.021	-255	-4.451	-42.45	158.41	15	257.61	-1102.03	-285.55	-1260.44
164	346	6.039	-256	-4.468	-39.68	159.13	15	257.61	-1034.78	-288.32	-1193.91
164	347	6.056	-257	-4.485	-36.89	159.80	15	257.61	-966.31	-291.11	-1126.10
164	348	6.074	-258	-4.503	-34.10	160.42	15	257.61	-896.67	-293.90	-1057.09
164	349	6.091	-259	-4.520	-31.29	160.99	15	257.61	-825.96	-296.71	-986.95
164	350	6.109	-260	-4.538	-28.48	161.51	15	257.61	-754.25	-299.52	-915.76
164	351	6.126	-261	-4.555	-25.66	161.98	15	257.61	-681.62	-302.34	-843.60
164	352	6.144	-262	-4.573	-22.82	162.40	15	257.61	-608.14	-305.18	-770.55
164	353	6.161	-263	-4.590	-19.99	162.78	15	257.61	-533.91	-308.01	-696.69
164	354	6.178	-264	-4.608	-17.14	163.10	15	257.61	-459.00	-310.86	-622.10
164	355	6.196	-265	-4.625	-14.29	163.38	15	257.61	-383.50	-313.71	-546.87
164	356	6.213	-266	-4.643	-11.44	163.60	15	257.61	-307.48	-316.56	-471.08
164	357	6.231	-267	-4.660	-8.58	163.78	15	257.61	-231.04	-319.42	-394.81
164	358	6.248	-268	-4.677	-5.72	163.90	15	257.61	-154.25	-322.28	-318.15
164	359	6.266	-269	-4.695	-2.86	163.98	15	257.61	-77.21	-325.14	-241.19



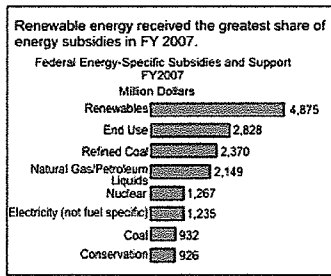
Energy in Brief — *What everyone should know about energy*

Last Reviewed: September 8, 2008

How much does the Federal Government spend on energy-specific subsidies and support?

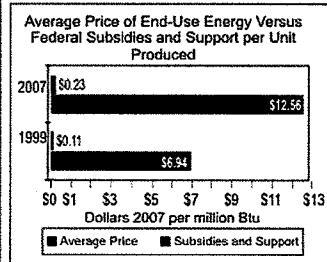
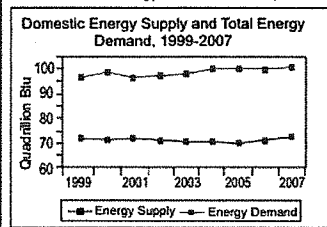
The Federal Government spent an estimated \$16.6 billion in energy-specific subsidies and support programs in Fiscal Year (FY) 2007. Energy-specific subsidies have more than doubled since FY 1999.





Source: Energy Information Administration, *Federal Financial Interventions and Subsidies in Energy Markets 2007* (April 2008).

U.S. energy production has remained roughly unchanged since 1999, despite increases in energy subsidies and prices.



Source: Energy Information Administration, *Federal Financial Interventions and Subsidies in Energy Markets 2007* (April 2008).

A **subsidy** represents a transfer of Federal Government resources to the buyer or seller of a good or service that has the effect of reducing the price paid, increasing the price received, or reducing the cost of production of the good or service. Put simply, the Federal Government promotes targeted energy outcomes, such as production of a specific fuel or promotion of conservation and energy efficiency by energy consumers through incentives such as tax credits, grants, and low interest loans.

Did You Know?

The estimated value of production tax credits to wind producers in FY 2007 was \$666 million. The benefit was distributed over an estimated 27.7 million megawatthours, making wind power the largest beneficiary of production tax credits among all renewable technologies.

In FY 2007, most primary energy production received some type of energy-specific subsidy, as did conservation- and efficiency-related activities.¹ Subsidies to renewable energy resources² have been growing most rapidly. In FY 1999, renewable energy received \$1.4 billion in subsidies. By FY 2007, subsidies to renewable energy of all forms grew to \$4.9 billion. Ethanol production received \$3.0 billion in blender's credits under the Volumetric Ethanol Excise Tax Credit, exceeding any conventional or renewable fuel. Certain fossil fuels are also heavily subsidized. In FY 2007, refined coal (chemically enhanced to reduce certain emissions) received about \$2.4 billion. Subsidies for refined coal are expected to decline as a result of modifications to the Internal Revenue Code that were enacted in the Energy Policy Act of 2005.

Have Subsidies Affected Prices or Production?

Between 1999 and 2007, the average real price of total energy per British thermal unit (Btu)³ consumed increased more than 80%. Meanwhile, total energy consumption or demand, including imports, grew by about 5%. Most subsidies and support to energy producers should stimulate supply; so too should higher prices and rising energy demand. Yet in 2007, the United States supplied roughly 72 quadrillion Btu from domestic resources, about the same amount as in 1999. This leaves the impression that energy subsidies had little effect on net domestic production other than to help prevent further declines. But the enactment of various production-oriented tax incentives in the Energy Policy Act of 2005 and subsequent legislation may have contributed to the slight increase in primary energy production over the last two years.

Some portion of production-related subsidies may result in one primary energy source being substituted for another. Between 1999 and 2007, the only primary energy source for which production increased every year was wind power. Over this period, the Btu equivalent of electricity produced by wind increased at a yearly rate of almost 32%, compared with 0.1% per year for coal and 0.3% per year for natural gas.⁴ Other subsidies like loan guarantees for financing power plants require lengthy lead times: often there is a lag between the Federal government's expenditure and commercial production. The \$3.8 billion of conservation and end-use efficiency subsidies reduce energy demand and do not promote primary energy or electricity production.

How Do Federal Subsidies and Support Affect Market Behavior?

Subsidies and support can encourage producers to bring new technologies to market until manufacturers are able to produce the new technology in large quantities at costs competitive with established commercial technologies.

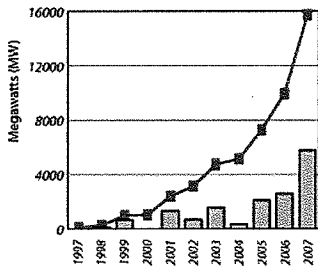
The periodic expiration and extension of the production tax credit (PTC) for wind power since 1992 illustrates the effect of tax incentives. Between 1997 and 2007, nearly 16,000 megawatts (MW) of wind capacity have been installed. The Energy Policy Act of 2005 extended the PTC to wind facilities placed in service before January 1, 2008. Subsequently, 8,438 MW of wind capacity was placed in service in 2006 and 2007.

There are several alternative ways to compare subsidies across fuels. In FY 2007, wind power received subsidies and support valued at \$23.37 per megawatthour (MWh). Refined coal and solar had even higher subsidies per MWh produced. The estimated subsidies for traditional primary energy sources used for electricity production were significant in total dollars. It is estimated that coal received \$854 million, nuclear received \$1,267 million, and natural gas and petroleum liquids received \$227 million. However, these traditional forms of generation produce most of the Nation's electricity, resulting in subsidies and support per unit of production of between \$0.25 and \$1.69 per megawatthour.

Up to now, the PTC has been a significant factor in encouraging wind capacity. In the future, other factors will also influence the decision to build wind capacity. Twenty-seven States have adopted mandatory renewable portfolio standards requiring that 4% to 25% of electricity sales be provided from renewables by certain dates ranging from 2009 to 2025. Technological improvements resulting in larger wind turbines, as well as higher prices for fossil fuels used in traditional generation, should enhance the financial feasibility of wind power.

Following the extension of the production tax credit in 2005, wind capacity increased 8,438 Megawatts (MW) in 2006 and 2007.

Annual and Cumulative Wind Capacity Additions from 1997 to 2007



■ Annual Wind Capacity Additions Since 1997
 ■ Cumulative Wind Capacity Additions Since 1997

Source: Energy Information Administration, *Federal Financial Interventions and Subsidies in Energy Markets 2007* (April 2008).

Rankings of subsidies and support based on absolute amount and amounts per megawatthour of generation differ widely, reflecting substantial differences in the amount of generation across fuels.

Subsidies and Support to Electric Production by Selected Primary Energy Sources

Primary Energy Source	FY 2007 Net Generation (billion kilowatthours)	Subsidies and Support Allocated to Electric Generation (million FY 2007 dollars)	Subsidies and Support per Unit of Production (dollars/megawatthour)
Natural Gas and Petroleum Liquids	919	227	0.25
Coal	1,946	854	0.44
Hydroelectric	258	174	0.67
Biomass	40	36	0.89
Geothermal	15	14	0.92
Nuclear	794	1,267	1.59
Wind	31	724	23.37
Solar	1	174	24.34
Refined Coal	72	2,156	29.81

Energy Information Administration, *Federal Financial Interventions and Subsidies in Energy Markets 2007*, SR/CNEAF/2008-1 (Washington, DC, 2008).

Learn More

- Report to Congress: *Federal Financial Interventions and Subsidies in Energy Markets 2007*
- Facts and Figures on Ethanol Production

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1 In addition to benefitting from the energy-specific subsidy and support programs considered in this brief, energy activities may also benefit from subsidies and programs available to a broad range of energy and non-energy sectors.
 2 Renewable energy resources are energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include biomass, hydropower, geothermal, solar, wind, ocean thermal, wave action, and tidal action
 3 A Btu equals the quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).
 4 Energy Information Administration, *Monthly Energy Review*, May 2008, Tables 1.2, DOE/EIA-0035(200805) (Washington, DC, May 2008).

PTC 2007	MWH Produced	KWH Produced	Value of PTC per KWH
\$666,000,000	27,700,000	27,700,000,000.00	\$ 0.0240433212996

February 9, 2011

Joint Committee for Review of Administrative Rules

RE: PSC Wind Turbine Siting Rules

I am here today to express serious concerns about the Wind Siting Rules created by the Wisconsin Public Service Commission, and the effect it will have on well being of the citizens of Wisconsin. The regulating of wind turbines has been a contentious issue for some time, not only in Wisconsin, but the rest of the world as well. There is growing body of evidence that these industrial machines are not as benign as the wind energy advocates would have you believe.

The State Legislature passed a model wind ordinance (Section 66.0403) in the 1997-98 session with minimal discussion. Wind energy advocates, with little input from the public wrote this model ordinance. At the time, the largest wind turbines proposed for the State were less than 200 feet tall, and very few people envisioned the 400 to 500 foot turbines now being installed in Wisconsin.

The Wisconsin Legislature passed Act 40 which gave wind turbine siting authority to the PSC, and required them to develop State-wide rules for the siting of the turbines. The Legislature also mandated the formation of a Wind Siting Council to advise the PSC. However, the PSC stacked the Council with wind developers and wind advocates, and refused to consider other points of view.

The Public Service Commission proved once again that they are more accountable to the utilities than individual citizens, and are not a neutral player in the wind energy discussion.

The PSC has already approved several large wind turbine installations in Dodge and Fond du Lac and Columbia Counties, without regard to the impact these facilities have on the local environment. For example, the PSC did not consider recent scientific evidence suggesting that setbacks of less than 2640 feet from residences will not protect people. The National Academy of Sciences on a study released in May 2007 titled "Environmental Impacts of Wind-Energy Projects" recommended a minimum of one half-mile setback from residences to minimize noise problems. Instead, the PSC applied the industry driven standards from a model written by wind energy advocates that has no basis in any scientific or medical data.

There has been a lot of talk about the need to have thousands of wind turbines in Wisconsin to stimulate the economy and create jobs. There is no reason to believe that wind turbine manufacturing jobs will leave the State of Wisconsin if we don't put up thousands of wind turbines. That logic would require Wisconsin to buy all the trucks produced by Oshkosh Company, or all the paper produced by the paper industry in the State.

The fact is, wind turbines will stifle growth and jobs in Wisconsin. The attached page is a planned industrial wind turbine complex in the Township of Brothertown in Calumet County. The developer, Midwest Wind Energy wants to put 52 turbines in this 16 square mile area. The circles represent the turbine locations based on data from the FAA web site. The Brown dots represent existing homes and businesses. As you can see, there is very little land left to build a house on, or even expand an existing business. Of course, this assumes that someone would actually want to live and work about 1,000 feet from a noisy, 500 foot moving structure. The developer has repeatedly called this phase one of several. One can only imagine where they will stuff even more turbines in this congested area.

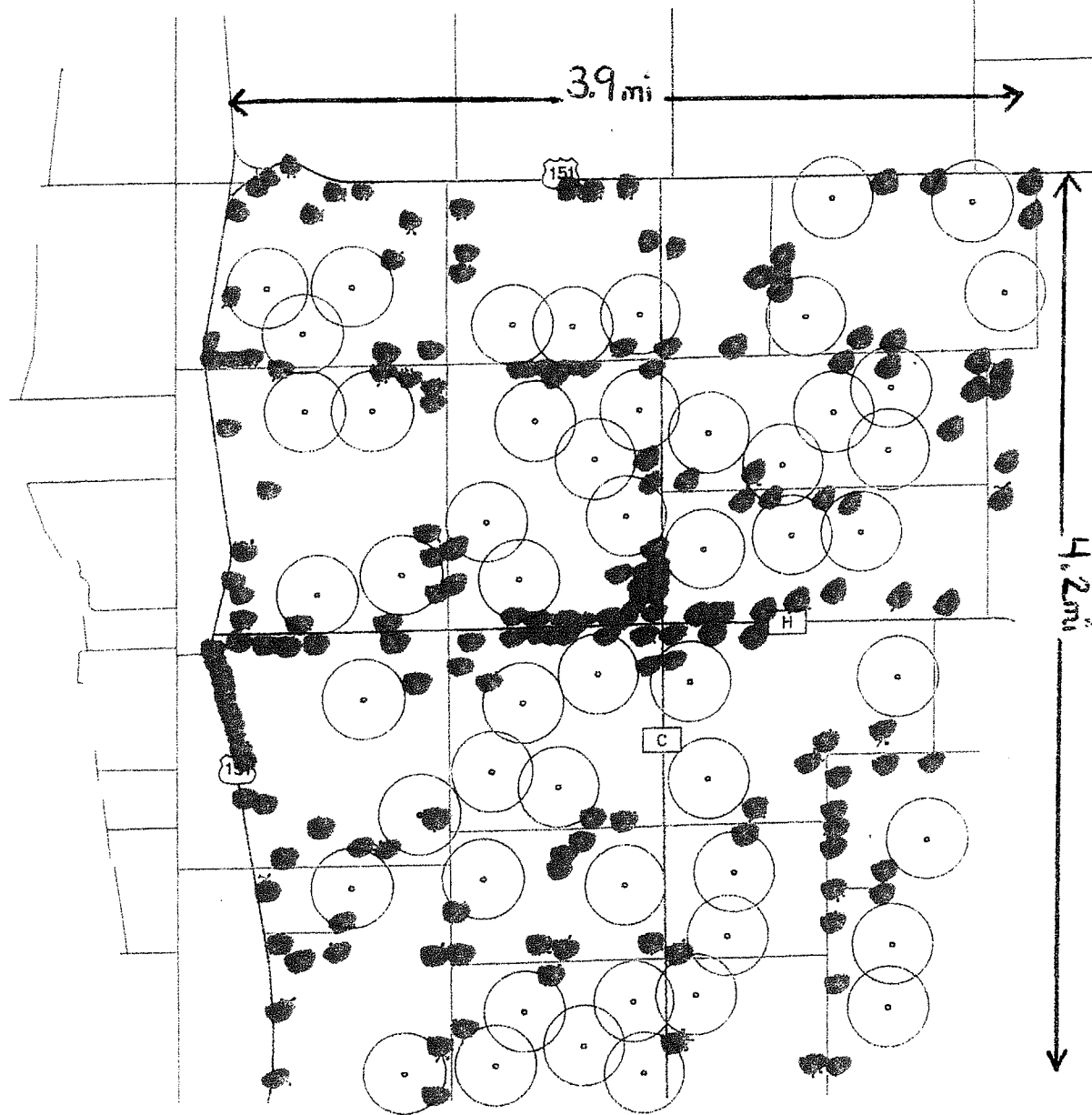
This density of turbines is not unique to Brothertown. The wind developers have convinced their friends on the PSC that turbines need to be closely spaced to make the project economically viable for them. What about the existing residences and businesses? The PSC has abdicated their responsibility to the citizens of rural Wisconsin in favor of the big wind developers, many of which are owned by foreign companies.

Decisions made by this Committee and the Legislature will affect the people of this State for at least thirty years (the expected life span of a wind turbine). This decision must be reasoned and carefully studied to protect future generations, and the rural environment of Wisconsin. You must not rush this proposal through the legislative process. Implementing the proposed PSC wind siting rules will only benefit the wind energy companies, not the majority of your constituents. I urge you not to compound the mistakes made by the PSC, and do the responsible thing for your constituents. You must object to these wind siting rules and allow a reasoned, rational approach to this issue.

Thank you,

Ervin Selk
W4821 Dick Road
Chilton, WI 53014

Proposed Brothertown, WI Industrial Wind Factory Layout
Locations From FAA Website
Circles are 2000 feet in diameter



Disclaimer: to the best of our knowledge these proposed turbines are accurate.
They are mapped according to the latitude and longitude locations from the FAA website.

52 TURBINES

PSC 128 Wind Siting Rule

To: Joint Committee for Review of Administrative Rules

Fr: Gary Haltaufderheide
2222 Wisconsin Avenue
Sun Prairie, WI 53580

Position: **Support PSC 128 Wind Siting Rule**

Date: February 9, 2011

Summarization of My Letter to Governor Walker Dated January 27, 2011 **(Attached)**

I have been an advocate for energy conservation & renewable energy

In the late 1980's former Governor Tommy Thompson made the following statement

“There is no issue more crucial or critical to Wisconsin future right now than energy. We're running out of it. Plain & simple.”

My past tours to Iowa & Minnesota

During my recent tour to Greensburg, Kansas I saw a 50 kw wind turbine outside their local hospital (about 300 ft from the building).

We have reached a world population of over 7 billion. By 2030, the world will consume 60% more energy than today. And while the demand for energy grows, the supply of fossil fuels will not.

Providing energy to the needs of a growing population will require many people working together.

We need leaders like you to step forward and have the vision and commitment to face the challenges of the future energy needs not only for Wisconsin, but the Midwest, the country, and the world.

We need your support for PSC 128 and we also need you leadership & vision

Conclusion

If we are going to create 250,000 new jobs in the next few years, we are going to need a balance of fossil fuels & sustainable alternatives to meet the demands for energy. As former Governor Thompson said, “Plain & Simple.”

January 27, 2011

Governor Walker
Governor's Office
115 E. State Capitol
Madison, Wisconsin 53702

Re: Proposed Legislation on Administrative Rule-Making & the Wind Siting Rule

Time for Leadership with Vision

Dear Governor Walker:

I have been an advocate for energy conservation and renewable energy for the past twenty five years. During the early 1980's I was involved in several statewide energy conservation programs which met a lot of resistance from both the residential and commercial sectors. Today, those same energy conservation programs have become part of our daily lives in our homes and the places we work.

About ten years I began to study and evaluate the technologies of renewable energy with my focus on wind. Here was a source of energy that was clean and I use the word free or maybe a better expression, "a gift from God." Yes, even at that time there were articles about health concerns, so what I did was to travel to western Iowa and Minnesota. I not only toured the wind farms, but I talked to people from all walks of life (farmers, teachers, housewives, business people, retired people, etc.). Never did I receive a negative statement pertaining to wind energy. Many felt they were blessed to receive their power from wind. My most recent visit was to Greensburg, Kansas which was almost totally destroyed by a tornado. In their re-building efforts they have embraced wind power plus energy conservation programs. In fact, they have a 50 kw wind turbine outside their community hospital (about 300 ft from the building). All of my discussions with the hospital personnel have been positive. Actually, one person stated that the city government is encouraging more installation of wind turbines throughout the community.

Governor Walker may I asked you to take a few minutes to re-think the benefits of wind energy & other alternative sources of energy not only in the state of Wisconsin, but globally. We have reached a world population of over 7 billion, the challenges facing humanity have never been greater. The earth's population will increase by 150,000 people per day for the next 40 years. By 2030, the world will consume 60% more energy than today. And while the demand for energy grows, the supply of fossil fuels will not. Fortunately, the solutions to many of the most fundamental challenges can be found in science. But providing energy to the needs of a growing population will require more than science alone. It will require many people working together. People who can collaborate across borders, companies, governments, organizations and cultures to devise solutions-both large & small- that improve the lives of people in Wisconsin and around the world.

We need leaders like you to step forward and have the vision and commitment to face the challenges of the future energy needs not only for Wisconsin, but the Midwest, the country, and the world. Wind energy is not the total solution, but it is a step forward to help make possible the transition from fossil fuels to more sustainable alternatives. Today, through the evening, and tomorrow scientist and engineers will constantly direct their expertise to find solutions, but they need leaders with vision. Governor Walker are you that leader?

I would appreciate an opportunity to share my vision with you.

Sincerely,

Gary Haltaufderheide

Address:

2222 Wisconsin Ave.
Sun Prairie, Wisconsin 53590

608-825-4581



14 Marsh Court • Madison, WI 53718-8805 • Phone 608-222-0105

P.O. Box 7428 • Madison, WI 53707-7428 • Fax 608-222-0230

February 9, 2011

Attention: Public Hearing Committee – PSC 128

Good Morning;

I'd like to thank the committee for allowing this opportunity to speak on behalf of the Wind and Renewable Energy industries and in support of PSC 128 as approved and amended in December 2010.

My name is John Desens and I am with Westphal & Company. Westphal & Company is an electrical contractor headquartered in Madison, WI with branch offices in Janesville, WI and Dubuque, IA.

Westphal employs many trades' people throughout the state of WI, many of which have been laid-off for several months and in some cases in upwards of one year. Renewable energy projects, in particular Wind Energy, are an opportunity for our company to create lots of jobs. These are good paying jobs located right here in our own backyard. These are jobs that Wisconsinites need and cannot allow to disappear or go elsewhere.

On a typical Wind project, at any one time we could employ electricians working inside the tower installing cable, trenching the cabling for the collection system between the towers, and working on the substation. In some cases these projects will last several months or in upwards of one year. Thus guaranteeing a regular income for those fortunate enough to work on one of these great projects.

Again these projects create good paying jobs. Jobs for Wisconsin families. Any regulation which prohibits the development of these projects here in Wisconsin effectively kills the job creation process that is desperately needed to support our local economy.

Respectfully Submitted;
WESTPHAL & CO., INC.

John C. Desens
Director – Business Development
idesens@westphalec.com
www.westphalec.com

February 9, 2011

Attention: Joint Committee for Review of Administrative Rules (JCRAR)

Representative Jim Ott, Co-chair

Senator Leah Vukmir, Co-chair

Subject: Suspend the PSC wind siting rules

I am writing this letter to ask the JCRAR committee to suspend the PSC wind siting rules set to take effect March 1, 2011.

I have been involved with this issue for the past 6 years. How much more of my life, my time, my money do these wind developers take. I am a citizen of this state and my government should not be compromising my health and safety along with giving the use of my property to a business which I feel cannot sustain itself. I cannot understand why health and safety as well as property rights are being compromised with the current PSC rules. The setbacks should be from a property line and not a home. The setback from a property line should be at least 2640 feet to protect the nonparticipating property owner.

I felt the wind siting committee as well as the PSC were only concerned with making turbines easier to site in Wisconsin. These are huge industrial wind turbines being placed haphazardly among homes and property. I have "nuclear in my back yard". The nuclear plant is highly regulated by the NRC. The current PSC rules allow the turbine owners to keep their own log of complaints and come to a "reasonable" solution. The way the PSC has written the rules the persons that commits the offense gets to determine how they are going to resolve and also track the problem. A third party needs to be involved. This is the proverbial, fox guarding the henhouse. These wind projects produce power that cannot be stored, is not available much of the time, and costs the taxpayer dearly.

I have requested information and submitted written questions multiple times to the PSC and have not gotten answers to all of the questions. I have also submitted in writing some of these same questions to turbine developers (Element Power, Emerging Energies- one of the Emerging Energies Partners, (Bill Rakocy) was a member of the wind siting council) some of these same questions and have not received answers. I have received elusive responses or none at all to some of the questions. I have listed below the questions of which I would like answers to:

Question: Why are there no limits on low frequency noise in the PSC rules?

PSC did not answer this question.

Question: What is the technical supporting documentation for the setback distances?

I believe the 1.1 times the height of the turbine distance set back has no basis. I was told to look at the Glacial Hills report. I could not find any information on the technical basis in the Glacial Hills report.

I believe the 3.1 times the height from a residence also has no basis. I was told to look at the Glacial Hills report. All that was found was an economic determination on the number of turbines that could be placed using this setback. This does not answer the question about the technical basis of the distance.

Question: What was the rationale for measuring from a residence versus the property line?

No answer was provided to this question by the PSC.

Question: Does the PSC have a debris throw distance for a blade failure associated with uncontrolled turbine operation as a result of a brake failure and supporting calculation from turbine manufacturer?

No answer was provided to this question and no manufacturer calculations were provided.

Question: Does the PSC have the blade throw distance at normal operating speed and supporting calculation from manufacturer?

No answer was provided to this question and no manufacturer calculations were provided.

I also question whether or not the PSC did an environmental impact statement.

I don't understand: why don't the wind developers openly answer questions since they claim this "green" energy is good. Why are they keeping things so secretive? What are they trying to hide? I believe that landowners who lease their land to a turbine developer have a gag order written into the contract. What are they trying to keep quiet? Usually people are allowed to speak freely if a product or idea is so good. I feel these turbine developers are offering a mere pittance back to the community for the short and long term damage they are doing..

One last question, if there were two identical houses for sale for the same price on two identical lots, but one house had 500 foot turbines 1250 feet from the house and turbines any direction you looked, which house would you buy?

Please suspend the PSC rules and look at placing health and safety along with property rights ahead of what I feel is an unregulated irresponsible wind turbine industry. Send the rules back to the PSC to do what Act 40 was intended to do: promulgate rules that protect Wisconsin residents.

I would like this letter to be included as part of the record.

Respectfully,



Anita Roberts, 12113 Tannery Road, Mishicot, WI 54228

920-755-2736

To: Joint Committee for the Review of Administrative Rules (JCRAR)

From: Michael J. Exum,

Re: Clearinghouse Rule #10-057; PSC Wind Siting Rules proposed Chapter 128

Date: February 9, 2011

"It is difficult to get a man to understand something, when his salary depends upon his not understanding it!" Upton Sinclair

Dear Honorable members of the Joint Committee for Review of Administrative Rules,

I write asking you to take action to stop the implementation of PSC 128 (CR 10-057) and once stopped, to rewrite the rules in a responsible manner, taking into account the legitimate issues raised in the Wind Siting Council's minority report and at the Senate public hearing on Clearinghouse Rule 10-057, some of which I outline below.

There are a multitude of reasons to rewrite the wind siting rules, but underlying each of them is the PSC's flawed Wind Siting Council's make-up, which ultimately led to wind siting rules that do not adequately protect the public, do not adequately protect the environment and will do little towards meeting the wind industry's stated goal of reducing carbon emissions from coal-fired power plants. The 15-member (16 if council "volunteer" member from Foley & Lardner, wind industry Attorney Elizabeth Hanigan is counted) Wind Siting Council had 8 members (a voting majority) who make their living off the taxpayer-subsidized wind energy business. Of those 8, at least 5 are members of Renew Wisconsin, a wind energy business lobbying group. Of those 5, two work directly for Renew (Renew Lobbyist Michael Vickerman & then Renew President, Jennifer Heinzen).

Wisconsin has over 5 million people living in it, but yet our government, when charged with finding 15 people to represent the entire state on an issue that will indelibly change our rural environment, chose 5 of those 15 from a single wind industry lobbying group out of Madison - Renew Wisconsin. At a time when citizen's faith in their government is waning, how a governmental, rule-making body could so blatantly stack the deck with self-serving wind energy interests, is beyond the pale.

Inadequate health protections: The majority of council members' financial interest in quickly building as many turbines as possible in Wisconsin prevented them from understanding the legitimate health concerns of citizens caused by placing turbines too close to homes. Although not addressed by the majority of Council members, PSC Commissioner Luran Azar acknowledged the problem in her

comments regarding the siting rules. Unfortunately, the issue was not adequately addressed in the final rules. Fortunately, you have the opportunity to remedy that error with the suggested 1800' setback in Governor Walker's latest bill.

Environmental Problems: Even though the legislature required two environmentalists be represented on the council, the two chosen, Michael Vickerman and Ryan Schryver were both registered lobbyists who represent the wind industry (see WI Government Accountability Board). This conflict of interest prevented them from understanding the importance of WE Energies' Greenfield/Blue Sky Post-Construction Bat and Bird Fatality Study (WE Energies is a member of Michael Vickerman's Renew WI). In this study, conducted by We Energies (independent studies have not been allowed) the utility's own, underestimated bat kill rates are shockingly high, as the DNR states in a letter to WE Energies, "The bat fatality rate at BSGF is similar to the highest values observed to date in the United States, and exceed the estimates presented by the Department and We Energies before the PSCW during technical testimony for this project" (PSC Ref# 127878, 3/4/2010). Based upon the study result, the estimated number of bats killed annually at the 88-turbine facility is upwards of 3500. If the heavily wind industry-influenced siting rules are left to stand as they are, and turbines continue to be built towards the wind industry's lobbied-for renewable portfolio standard objective of 5,562 GWh with up to 15,000 wind turbines, the bat deaths would climb to a staggering 600,000+ per year. The legitimate threat to bats from wind turbines, coupled with the threat from White Nose Syndrome poses a serious risk to the survivability of the species that neither "environmental representative" on the Wind Siting Council could see from their wind industry-lobbyist perspective. It is an exercise in Orwellian verbal gymnastics to speak of "protecting" the environment, while in actual deed acting in a manner that destroys it.

Property rights. The citizens of rural Wisconsin have followed the rules as they've built their homes and lives in their respective rural areas. Many have put their life's effort and savings into their homes. But now, through the heavy influence of financially-motivated wind energy groups and their over-simplified, unsubstantiated claims that wind turbines will solve our carbon emission and energy problems, the rules of rural life are being hastily rewritten. And worse, the citizens most impacted are left out of the process. Gone, with the PSC's rule that a turbine can be placed 500 ft. from a property line but 1250 ft. from a house, is the right of enjoying one's own property. Given the current PSC rules, a turbine can be placed in such a manner that an owner would be prohibited from building or planting trees on their own property. If a founding father had been asked if it might be permissible that in the future the pursuit of profits and greed would trump an individual's right to use their own property, it is doubtful the founding father would have approved. But again, the Wind Siting Council majority's industry driven perspective prevented an understanding of the basic, fundamental American value of private property rights. Consequently, if you live in a rural area, have followed the rules, have invested your life's work in your home & property, the rules have changed, and you are now unprotected and at risk of losing the right to use, enjoy and do well by your own property.

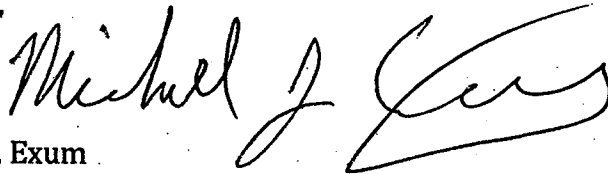
Please stop the PSC wind siting rules from taking effect and take the time to reestablish fairness by giving rural Wisconsin citizens their private property rights back.

There may be legitimate reasons for having state-wide, uniform rules. However, as the opportunity for local citizens to participate in the wind siting process is decreased (as happened when the state took away from our local units of government the right to site wind turbines), there are equally legitimate and entirely necessary reasons to ensure the integrity of whatever new process is developed. Loading rule-making committees with members on a single side of any issue does not instill a sense of integrity for the process. Furthermore, a one-sided, self-serving rule making body ultimately leads to a poor outcome, as evidenced by the PSC rules that do not adequately protect citizens, the environment, or the tax payer's pocket book.

Please stop the PSC's wind siting rules from being implemented on March 1, and give the citizens of Wisconsin a new set of rules that do not diminish our property rights, put us in harms way or destroy our environment in the name of saving it. Wisconsin citizens deserve better, and, for an energy policy to be truly effective and sustainable, we must do better.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Exum". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Michael J. Exum
17532 CTH C
Evansville, WI 53536
608-882-3986

WHAT HAVE I DONE?

Now each morning when I awake, I pray and then ask myself, "What have I done?"

I am involved with the BlueSky/GreenField wind turbine project in N.E. Fond du Lac County. I am also a successful farmer who cherishes his land. My father taught me how to farm, to be a steward of my fields, and by doing so, produce far better crop production. As I view this year's crops, my eyes feast on a most bountiful supply of corn and soybeans. And then my eyes focus again on the trenches and road scars leading to the turbine foundations. What have I done?

In 2003, the wind energy company made their first contacts with us. A \$2000 "incentive" started the process of winning us over, a few of us at a time. The city salesman would throw out their nets, like fishermen trawling for fish. Their incentive "gift" lured some of us in at first. Then the salesmen would leave and let us talk with other farmers. When the corporate salesmen returned, there would be more of us ready to sign up; farmers had heard about the money to be made. Perhaps because we were successful farmers, we were the leaders and their best salesman. What have I done?

Sometime in 2004 or 2005, we signed \$4000.00 turbine contracts allowing them to "lease" our land for their needs. Our leases favored the company, but what did we know back then? Nobody knew what we were doing. Nobody realized all the changes that would occur over which we would have no control. How often my friends and I have made that statement! What have I done?

I watched stakes being driven in the fields and men using GPS monitors to place markers here and there. When the cats and graders started tearing 22 foot wide roads into my fields, the physical changes started to impact not only me and my family, but unfortunately, my dear friends and neighbors. Later, a 4 foot deep by 2 foot wide trench started diagonally across my field. A field already divided by their road was now being divided again by the cables running to a substation. It was now making one large field into 4 smaller, irregularly shaped plots. Other turbine hosts also complained about their fields being subdivided or multi cable trenches requiring more land. Roads were cut in using anywhere from 1000 feet to over a 1/2 mile of land to connect necessary locations. We soon realized that the company places roads and trenches where they will benefit the company most, not the land owner. One neighbor's access road is right next to some of his out buildings. Another right next to his fence line. What have I done?

At a wind company dinner presented for the farmers hosting the turbines, we were repeatedly told - "nicely and indirectly" - to stay away from the company work sites once they start. I watch as my friends faces showed the same concern as I had, but none of us spoke out. Months later, when I approached a crew putting in lines where they promised me they would definitely would not go, a representative told me I could not be here. He insisted that I leave. The line went in. The company had the right. I had signed the lease. What have I done?

Grumbling started almost immediately after we agreed to a 2% yearly increase on our 30 year lease contracts. Some felt we should have held out for 10%. What farmer would lock in the price of corn over the next 5 years, yet alone lock one in at 2% yearly for 30 years? Then rumors leaked that other farmers had received higher yearly rates, so now contracts varied. The fast talking city sales folk had successfully delivered their plan. Without regard for our land, we were allowing them to come in and spoil it. All of the rocks we labored so hard to pick in our youth were replaced in a few hours by miles of roads packed hard with 10 inches of large breaker rock. Costly tiling we installed to improve drainage has now been cut into pieces by company trenching machines. What have I done?

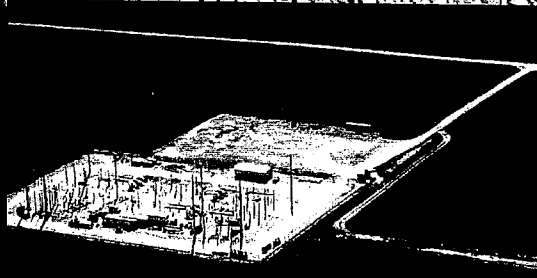
Each night, a security team rides down our roads checking the foundation sites. They are checking for vandals and thieves. Once, when I had ventured with guests to show them foundation work, security stopped us and asked me, standing on my own property, what I was doing there. What have I done?

Now, at social functions, we can clearly see the huge division this has created among community members. Suddenly, there are strong-sided discussions and heated words between friends and, yes, between relatives about wind turbines. Perhaps this is of greater consequence than the harm caused to my land! Life is short and my friendships precious. What have I done?

I tried, as did some of the other farmers, to get out of our contracts, but we had signed a binding contract and a contract is a contract. If you are considering placing wind turbines on your property, I strongly recommend that you please reconsider. Study the issues. Think of the all the harm versus benefits to your land and, in the future, to your children's land by allowing companies to lease your land for turbines.

WHAT HAVE I DONE?

PLEASE DO NOT DO WHAT I HAVE DONE!



This was written by Don Bangert of Chilton after he interviewed a landowner in Fond du Lac County for two hours. Don wrote this story and then showed it to the landowner who wishes to remain anonymous. The landowner approved this story.

Thank you for this opportunity to express my concerns.

I would like to comment on the process by which the Wind Siting Rules were developed.

It is widely perceived among those familiar with the wind siting rulemaking process that the process was far less than an objective, scientific inquiry, seeking to identify the real problems associated with siting large scale industrial wind turbines, and then formulating rules which provide for adequate protections for WI residents living near them. The public perception is that the process was pre-arranged, so as to make possible the creation of rules that would **somehow allow** for liberal wind turbine siting, even in relatively highly populated rural areas, and even though this may cause collateral damage to rural residents health, property rights, and property values. Current rules with setbacks of merely 1250' from a home, 1.1 times the height from a property line, and noise levels that are up to 4 times louder than pre-turbine nighttime noise levels, support these perceptions, especially in light of studies worldwide indicating that 1/2 mile is the **minimum** distance needed to avoid negative health effects.

The very composition of the Wind Siting Council made this outcome rather predictable, being heavily weighted with members who would benefit from, and therefore favor, liberal wind siting rules. The process is seen as severely flawed, being driven by special interests and political agendas while ignoring science, personal testimony from WI (including that of one Council member living in a wind project), and global testimony that industrial wind turbines, near to people, lead to serious problems.

The Wind Siting Council Minority Report also reflects these public perceptions. This 17 page appendix to the originally proposed wind siting rules goes into considerable detail in laying out the deficiencies of the process and its results. It was written by four of the members of the Wind

Siting Council, whose concerns and experiences were largely ignored in the final recommendations. No one is better qualified than these four men to give an inside look at how the process was conducted and why its conclusions are unacceptable.

Issues of concern discussed in the Minority Report include:

- The composition of the Wind Siting Council
- Health
- Noise
- Shadow Flicker
- Property Values

The report concludes with recommendations regarding:

- Health
- Safety Setback
- Property Values

Please carefully review the Minority Report. I can think of no better single document for understanding why the Wind Siting Rules need to be immediately suspended and how they need to be modified.

For your convenience I have provided 10 printed copies.

Thank you,

Jim Vanden Boogart
7463 Holly-Mor Rd.
Greenleaf, WI 54126

Thank you for calling this Public Hearing to listen to the concerns of WI residents, taxpayers, and voters.

The health and safety of WI residents needs to be the highest priority in the rulemaking process.

The Wind Siting Council claims that it does not have adequate evidence that industrial wind turbines are **unsafe** for those living near them. However, they also admit that they do not have evidence that industrial wind turbines are **safe** for those living near them.

There have been widespread health-related complaints from residents in existing WI wind projects. However, these complaints have not been given serious consideration. Council member Dr Jevon McFadden, at a meeting of the Brown County Board of Health, referred to these real life experiences as "self-reporting" and stated that such evidence is not considered to be reliable enough.

While dismissing these "self-reported" problems, WI has not chosen to put the issue to the acid test by conducting epidemiological studies in its existing wind projects. And, it appears that it does not intend to so, despite requests from a multitude of residents and towns.

Yet, lacking such real-life evidence, rather than follow the precautionary principle, Dr McFadden and the Council majority would have WI surge forward and address the problems later. He suggested that **when** people get sick from exposure to wind turbines, that they go to their doctor, and after the doctor has eliminated any other possible cause, that the doctor then voluntarily, at his own expense, report such findings to the county and state health departments. He further stated that after the State received enough such reports, adjustments could then be made to the rules. In a conversation following that meeting, Dr McFadden admitted that such reports were unlikely to be made voluntarily. Of course, even if they were made and the

setbacks were increased, those living too close to existing wind turbines would continue to be victimized, unless the State required these to be shut down or moved farther away.

I will draw an analogy to illustrate the recklessness of this approach:

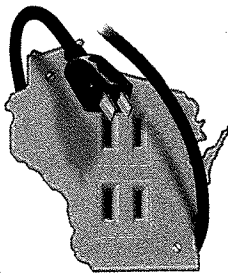
Imagine that the State decides to purchase a pond and open it up as a diving and swimming pool for its resident. It decides to **not** check for submerged rocks or logs, even though the seller of the pond has noted that former swimmers have reported such dangers. Instead, it decides that if enough people receive head injuries or broken necks, it will purchase a different, safer pond for new swimmers. However, the first pond must still be used by those who had been using it before, and the rocks and logs would not be removed.

Such a scenario would be hard to imagine in real life, yet this is how the Doyle appointed PSC and its self-appointed Wind Siting Council are proposing that WI proceed with wind development, forcing wind turbines to be placed where they simply don't belong. And it's not the *Not-In-My-BackYard* syndrome, because industrial wind turbines don't belong right up close to **anyone's** backyard where their health is threatened, their property rights are taken, and their property values are destroyed.

Please suspend the current harmful and irresponsible Wind Siting Rules so that residents' concerns can be examined objectively by scientifically qualified individuals who do not have a conflict of interest.

Thank you,

Barbara Vanden Boogart
7463 Holly-Mor Rd.
Greenleaf, WI 54126



Customers First! *Plugging Wisconsin In*

TO: Members, Joint Committee for Review of Administrative Rules

FROM: Matt Bromley, Executive Director, *Customers First!* Coalition

DATE: 2/09/11

RE: Support PSC 128 – siting of wind energy systems

A Coalition
to Preserve
Wisconsin's
Reliable
and Affordable
Electricity

The *Customers First! Coalition* is an alliance of consumer organizations, municipal electric utilities, rural electric cooperatives, wholesale energy providers, an investor owned utility, renewable energy advocates and labor organizations.* We come together out of a shared interest to preserve Wisconsin's reliable and affordable electricity.

This wind siting rule, PSC 128, is the result of 2009 WI Act 40 that passed last session with strong bipartisan support. The *Customers First! Coalition* supported Act 40 and support the rule before you today because we feel that having workable statewide uniform siting standards will help hold down costs for electricity ratepayers as the state moves towards meeting its renewable energy goals.

PSC 128 was developed through an inclusive, transparent, and fact-based process that balanced the interests of many stakeholders. The rule gives clear direction to local governments on the procedures and standards for siting wind energy systems in their communities, and should help avoid the delays, litigation and regulatory burden that have plagued many projects and have saddled them with additional and significant costs – costs that are ultimately passed on to the ratepayers of this state.

If the rule is not allowed to become effective, we're concerned that there will be very real negative implications for the development of cost-effective renewable energy projects in our state. At a minimum, it would lead to a loss of construction and manufacturing jobs. It would also deny potential host landowners and municipalities here the opportunity to generate supplemental income as project hosts.

For more information, contact Matt Bromley, Executive Director, *Customers First!* Coalition, Ph: 608-286-0784; mbromley@customersfirst.org

*Founding members of the *Customers First!* Coalition include the Municipal Electric Utilities of WI, Cooperative Network, WPPI Energy, IBEW Local 2150, Madison Gas & Electric, Dairyland Power Cooperative, Citizens Utility Board, and RENEW Wisconsin.

14 West Mifflin Street

Suite 310

Madison, WI 53703

608.286.0784

www.customersfirst.org



Forest Township
Feb. 8, 2011

Dear Sirs,

We need your support in objecting to the PSC rules that allow a 1250 foot setback of wind turbines from our homes.

There are so many health, safety, property value and quality of life issues that I feel these issues should be addressed before more turbines are erected in Wisconsin. These turbines are being discontinued because they are not efficient. More research needs to be done on wind energy.

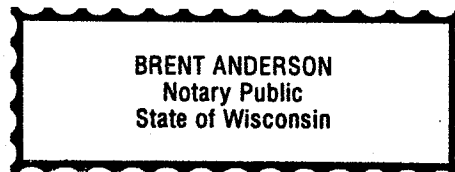
Thank you for your consideration.

Dale L Logan

2880 Ctp Rd Q
Clear Lake, WI
54005
715-263-2711

Sworn before me
Feb. 8, 2011





**Public Hearing: Joint Committee for Review of Administrative Rules
PSC 128 (CR 10-057) Relating to the siting of wind energy systems**

Senator Leah Vukmir, Senate Chair
Representative Jim Ott, Assembly Chair

My name is Betty Wolcott. I am a Sister of St. Francis of Assisi and live near Osseo, Wisconsin where I am director of a small land preserve. I serve on Trempealeau County's Wind Ordinance Committee. We completed our county ordinance governing the siting of wind turbines in November of 2007 and the county board approved it in December of 2007. I have testified here and elsewhere many times concerning the research, conferences, visits to wind farms and conversations with those living near them, that culminated in our wind ordinance for Trempealeau County. Of course we opposed a state-wide law to impose uniform wind turbine siting rules since Wisconsin is so varied in its terrain and neighborhoods. Also, many of our counties and townships had taken seriously Wisconsin's Smart Growth initiative to promote sound land use planning and zoning that are appropriate for our areas and reflect the will of local citizens. All of this has been ignored just as our testimony has been. We invited a critique of our ordinance based in ecology, science and lived experience but no one ever seriously responded. *It was dismissed as being too strict.*

I am appalled and saddened by this whole process. Why, if we wanted to reduce greenhouse gas emissions, wouldn't we do an environmental assessment of what is possible and does no harm. And why wouldn't we require that homes and businesses in areas that would receive clean energy be made energy efficient and retrofitted so energy wouldn't just be wasted. Doing this first would also give us an idea of just how much energy is needed and would create a lot of jobs and boost small businesses. And we could think of other ways wind energy might be supplemented, for example, by solar panels. My little solar chime works just fine when there is no sign of the sun.

The proposed PSC rules for siting wind turbines are unacceptable. The distances of wind turbines from homes and property lines are much too short and undermine health, safety and good living. The rules take away citizens' rights. I hope you will consider other voices that care and have worked long and hard to keep Wisconsin healthy, strong and beautiful. The present PSC rules are unworthy of the citizens and natural areas of Wisconsin. *We can do better.*
and should be suspended.

Thank you.

Betty Wolcott, OSF
N47475 Woodland Lane
Osseo, WI 54758 (715) 597-2711

Betty Wolcott - also speaking for The Director of The Office of Justice, Peace and Integrity of Creation for the Arch. of St. Francis of Assisi.

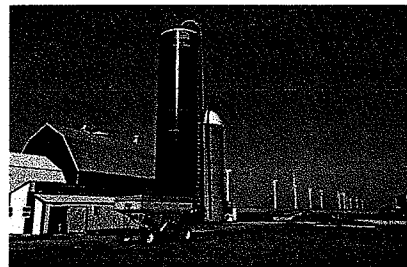
February 10, 2011

Kewaunee, Red River and Montfort landowners reflect on living next to a wind farm

By Mark Hirsch, 2076 Airport Road, Platteville, WI 53818

Emerging from the corn and soybean fields like a row of majestic trees, 20 wind turbines dominate the horizon along Highway 18 in Montfort, Wis. In this small town historically supported by agriculture, a wind farm is harvesting a different type of crop.

Owned by FPL Energy, the Montfort Wind Energy Center produces enough electricity to power approximately 9,000 average Wisconsin homes. When they went online in 2001, they were among the largest turbines manufactured in the U.S.



Don Leix farm, Montfort Wind Energy Center, WI

Sitting at the lunch counter of the Tower Junction Restaurant across from the wind farm, Laverne Clifton reflects on the impact the FPL Energy wind farm has had on this small community in Southwestern Wisconsin. "When they first came to me about installing windmills on my property, it seemed too good to be true. Now it's just another good cash crop you don't have to worry about. You don't plant it, and it uses little land," said Clifton, a retired farmer who has three turbines on his property.

Whether they have turbines on their property or not, Clifton's neighbors share a similar sentiment. Evelyn Mueller, 82, lives next to three of the Montfort Wind Energy Center turbines and says, "I'm all for it. We should use our natural resources. They are not noisy. I don't think anyway. At night when it's quiet, it's a quiet swish. It almost lulls you to sleep."



From her patio, Evelyn Mueller can see three of the Montfort Wind Energy Center turbines. Mueller said, "It has absolutely no impact on my quality of life."

The Montfort site generated little controversy. Clifton could only remember one person initially opposed to the project because they were concerned it would scare their horses when riding near them. Seven years later, Clifton can think of no one who opposes them.

According to FPL Energy, owners of the Montfort Wind Energy Center, wind is the fastest growing renewable energy resource in the world. Supporters promote wind energy as a nonpolluting resource that

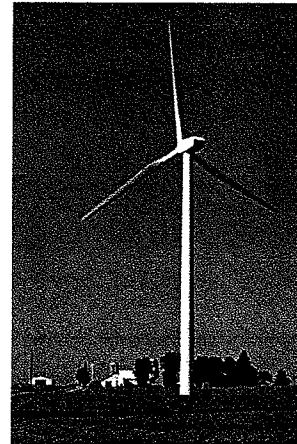
can supplement other energy sources reducing our dependence on fossil fuels.

Montfort residents like Larry Johnsen understand and appreciate the value of wind energy. Johnsen who has three turbines on his property says, "Everyone wants to turn on a light switch and have electricity. I mean do we want another coal plant? Look at how many electrical devices we use today, cell phones, ipods, you name it."

Down the road from the Johnsen farm, Jen Thomas moved next to the wind farm in 2005.

"I can see the windmills from all four sides of my house and I'm not getting a paycheck from the power company so I don't have to say nice things, but the windmills don't bother me," said Thomas. Visiting homes along the wind farm site, it was difficult to find anyone who opposes or has any concerns about its impact on their quality of life.

Jonas Gingerich, an Amish farmer who operates a goat dairy operation beside the wind farm currently has his farm listed with a local real estate company. Gingerich does not use electricity supplied by the public power grid. Because of rules dictated by his Amish lifestyle, his electricity comes from a diesel-powered generator that operates belt driven equipment. Regarding his proximity to the windmills, he said, "The windmills won't have anything to do with my farm sale. In fact, I wish I had one on my land."



Turbines at the Montfort Wind Energy Center blend in well with the Larry Johnsen farm. Johnsen has three of the wind turbines on his property and farms up to the base of each tower.



Horses on the Jonas Gingerich farm graze in a pasture near the Montfort Wind Energy Center. Commenting about the windmills, Gingerich said, "I seldom hear them. They make no noise hardly at all. I hear the highway more than the windmills."

Acceptance of wind farm projects across the country has varied greatly. While the Montfort Wind Energy Center went up without much fanfare; other Wisconsin sites have generated more controversy. Two wind farm projects in Kewaunee County, Wis. initially generated significant opposition.

Visual impact as well as health and safety issues are among the concerns raised by wind energy opponents. Additionally, flicker, noise concerns and perceived reduction in real estate values dominate arguments against wind farms.

For residents of Red River and Lincoln in Kewaunee County, Wis., the meetings leading up to passage of conditional use agreements were divisive. Jule Famaree, 81, a Red River board member for 41 years said at the meetings, "Some was for it, some was against it. But now, eight years later, most are ok with it."

Life near wind turbines is what you make of it according to Rich Lohrey. Lohrey's home is the only residential dwelling on Cedar Road and sits in the middle of the 14 Wisconsin Public Service wind turbines at the Lincoln Wind Energy Facility.



Mary and Rich Lohrey, Algoma, Wis. Live in the only residential dwelling on Cedar Road near the WPS wind farm. They purchased their home after the wind farm was in operation and say they are very comfortable living beside the wind farm.

In the five years they have lived in the shadows of the Lincoln wind farm, they have responded to questions about all of the usual wind farm complaints. "Lots of folks stop to ask us about them if they will have them in their area. They want our thoughts about them," Rich said, adding, "The wind farm doesn't bother me, I think it's great."

Rich and Mary have heard all the horror stories about problems associated with windmills from noise issues to reduced property value. "They can't say they make that much noise because they don't. We lived next to Lake Michigan for nine years; if you want to hear noise, live next to the lake. We wanted a country place with buildings for our toys. The windmills had no impact on our purchase price, none at all," Mary said.

The issue of flicker or strobing caused by sunlight passing through the rotating blades is a very real problem depending on location of the turbines. It is also a problem that can be avoided when turbine installations are properly sited. For some residents, flicker is tolerable, for others, it can cause serious concerns.

"We have it very early in the morning in our bedroom. It's only like twice a year for a very short time. I can't even complain about that," says Mary Lohrey.

The impact of wind farms on wildlife, specifically bats and birds is often identified as another problem. Rich Lohrey is quick to dispel the fear of bird deaths saying, "As far as killing birds, I've walked around them many times and never seen a dead bird yet."

For wind farm construction, there are currently no standard guidelines for setbacks from dwellings. Many opponents feel there should be a minimum setback of 1000' from an occupied dwelling.

Another concern raised by opponents involves doing business with the energy companies. According to residents around the Montfort, Red River and Lincoln energy sites, the power companies have been responsible business partners and good neighbors.



An access road leads to turbines in the WPS wind farm off of Pheasant Road at the Town of Lincoln in Kewaunee County, Wis. The turbine roads double as field access for farm equipment.

Lonnie Fenendael operates a 700 head dairy operation near the Lincoln wind farm. He also has five of the WPS wind turbines on his property and rents additional cropland from Jeff and Wallace Pelnar who have the other nine WPS turbines on their property. He plants crops right up to the base of all 14 WPS turbines.

When his family was approached by WPS, Lonnie said, "They were a local company and wanted a contract. There were a lot of things I wanted too, like putting the turbines in a line if possible. They were very good about working it out. We negotiated on price and any land damage. They pay for damage to crops, etc. They are very good about it."

Several miles away at the MG&E Kewanee County Wind Farm, Kevin LeFevre had a similar experience. "They treated us good on everything. It was a good business deal for us. They altered the access road to satisfy us."

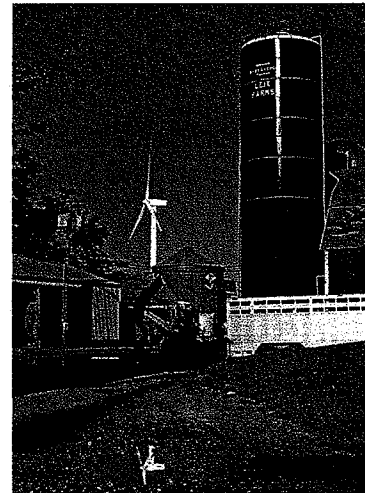
Opponents fear the impact construction of wind farms will have on roads and infrastructure. As a town board supervisor, LaVern Clifton is very happy with his experience. During construction of the Montfort wind farm, "They were very good about correcting any damage to roads, land, etc. The company paid the township for the cost of road repairs, etc. They bent over backwards to make things right." said Clifton.

As a landowner, Clifton has no regrets about his business relationship with the owner of the wind farm. "As neighbors, we don't even know they are around."

Wisconsin is rated as one of the top 20 states with the highest wind energy potential. Based on a report published by FPL Energy, Wisconsin is capable of producing 58 billion kilowatt-hours annually. Despite opposition, the growth of wind power as an alternative to fossil fuel energy will continue in Wisconsin.

Don Leix, a farmer with three wind turbines on his property operates a 450 cow dairy operation near Montfort. Leix said, "We were skeptical at first, with the dairy and stray voltage, but we've had no problems." As far as impact on local real estate, "They have not affected anything here, its all good farm land."

When people ask Leix what he thinks about the wind turbines, he likes to ask them this question. "Do you use electricity?" Leix adds emphatically, "Nobody has told me no yet."



A turbine at the Montfort Wind Energy Center is framed by buildings on the Don Leix farm. Leix operates a 450 cow dairy operation, and is very happy with his business relationship with the owner of the wind farm.

My name is Mark Hirsch. I am a resident and landowner of Smelser Township in Grant County. Our township is the site of the proposed White Oak Wind Farm.

We have spent the last three years dealing with the challenges that accompany the siting of a wind farm.

I am here today to ask you to implement PSC 128, the reasonable wind siting rules that were developed by consensus in an open, fair and balanced environment last year.

Despite the governor's efforts to subvert this process with the help of this committee, I ask you to rethink this goal and implement PSC 128.

The rules as established by PSC 128 create a level playing field for developing our wind resources while still protecting the health and safety of our citizens and neighbors.

We have waited patiently during the process of drafting PSC 128. Now it seems that some of you want to ignore these rules and go backwards by putting the rule making process back into the hands of local government. That is a bad idea.

If you think accomplishing things at the capital is a challenge, you can't imagine the difficulty of legislating such a complex emotional issue at the town level? Town government's have no staff, limited resources, and they have the added challenge of mediating a very emotional issue with a small constituency made up of their friends, neighbors and relatives. It is much easier to enforce rules drafted in Madison than to write them.

The governor's plan to rewrite the rules essentially stripping landowners of the right to harvest their wind resource is an even worse idea.

Our town supervisors have been waiting patiently for the state and the PSC to empower them with a set of consistent wind siting rules like those in PSC 128.

Of our three board members, two support allowing the PSC and the appointed committee to establish wind siting rules that would then shield them from the decision making process. One town supervisor who was elected due to his opposition to the wind farm seems to prefer keeping control at the local level.

For 3 years now, the wind farm has been a contentious issue at our town board meetings. I can tell you that because of the emotional aspect of wind siting and the vast amount of misinformation on the Internet, we are no farther ahead than we were when the White Oak Wind farm was announced.

I'm on my towns Planning commission and as part of our comprehensive planning process, the Southwest Regional Planning Commission sent a non-partisan survey to every landowner in Grant County including those in our township.

One question on the survey specifically addresses renewable energy. The question asks if our county and townships should pursue energy alternatives like wind, solar and ethanol as a form of economic development?

In response to the pursuit of wind energy specifically as a form of economic development, 91% of the respondents strongly agree or agree that we should develop our wind resource. 4% disagree or strongly disagree, and 6% have no opinion.

Based on those responses, I would challenge each of you to recognize that developing our wind energy resource has strong community support. I think all of you would be surprised by the

outcome if the issue of supporting wind energy were actually put to a public vote.

Please take the time to review and consider this survey data when you make your decision. Hopefully this truthful data will inspire you to do the right thing by implementing the rules as established by PSC 128.

Thank you for your time.

Mark Hirsch
2076 Airport Road
Platteville, WI 53818
563-590-2710
markhirschphoto@gmail.com



M. A. Mortenson Company
17975 West Sarah Lane
Brookfield, WI 53045

main 262.879.2500
fax 262.879.2510
www.mortenson.com

February 9, 2011

To: Members of the Joint Committee for the Review of Administrative Rules

From: Mortenson Construction

RE: PSC Rule 128

On behalf of Mortenson Construction, we respectfully request the Joint Committee for the Review of Administrative Rules not to suspend PSC Rule 128 relating to wind siting regulations.

Mortenson Construction entered the renewable energy market in 1995 and since, has become a leading builder of wind power projects in North America, capturing 25 percent of that market. Mortenson has been at the center of constructing nearly 100 wind power projects, totaling approximately 10,000 megawatts (5500 wind turbines) across the U.S. and Canada.

When Special Session Bills AB 9 and SB 9 were introduced, we were concerned with the ramifications of the legislation, which would effectively shut down the wind energy industry in Wisconsin. We are equally concerned the potential action to suspend PSC 128 could signal and create unpredictability in the market, driving investors and developers who depend on market stability out of Wisconsin. According to the American Wind Energy Association, there are over 3,000 Wisconsin residents currently employed by the state's wind industry, many of which could be put at risk should unreasonable regulations be mandated.

Thank you for allowing us the opportunity to comment on this matter and we respectfully ask that you allow PSC 128 to be implemented and give the rule an opportunity to work before seeking to make further modifications.

Sincerely,

A handwritten signature in black ink, appearing to read "M Sherry". The signature is stylized and somewhat cursive.

Mark Sherry
Vice President and General Manager
Mortenson Construction, Wisconsin Operations



W2874 Graylog Road
Iron Ridge, WI 53035
920-387-5840 - Fax 920-387-4734
info@wondraconstruction.com

February 9, 2011

My name is Roger Thimm. I'm the controller and part owner of Wondra Construction. We are a heavy/highway, underground utility construction company located in Iron Ridge and were involved in the construction of the Butler Ridge Wind Farm located in Dodge County in 2008. In 2009 and 2010 we constructed the Armena Mountain Wind Farm in Mainsburg, PA.

Currently we have 30 of our 35 employees on layoff while we look for new construction opportunities. We have been following the wind sitting rule process in Wisconsin for the past two years. The proposed 1,800 foot setback from a property line would have a negative impact on the construction of wind farms in Wisconsin. From our experience of working on and bidding other wind farm projects in other states we have seen a setback distance of around 1,200 feet from an occupied residence. The setback rule change from an occupied residence to a property line is a very big difference. In Wisconsin a rule like this is not required for any other type of construction project. Why is the wind industry being singled out? Would this rule be expanded if someone wants to build a new factory, farm expansion, industrial park, subdivision or home?

In regard to the new rule requiring an 1,800 foot setback from property lines I was wondering how was this number arrived at? Is this distance used in other states? Is this an industry standard? What the business purpose of this distance?

The PSC spent the last two years studying the wind energy sitting rules. They took into account input from all major stakeholder groups and had six rounds of public hearings. The rulemaking process was open, balanced and fair and will allow developers to site projects efficiently while protecting the public.

As passed the wind sitting rule will support economic development in the state by providing manufacturing, construction, operation, maintenance, development and transportation jobs. Wind energy is a major source of local revenue. Wisconsin's four largest wind farms paid around \$1.2 million to Fond du Lac and Dodge County landowners and almost \$1.6 million to local governments in 2010.

Unpermitted projects jeopardized by a possible suspension and alteration of PSC 128 represents 572 megawatts, \$1.5 billion in investment and approximately 1.6 million job-hours. Our employees would be directly impacted by this rule.

Suspending the rule now, before it has a chance to work, would send the worst possible signal for those considering investments in the wind industry in Wisconsin. We need to create regulatory certainty now to retain and capture the jobs created by this industry.

Sincerely

Roger W. Thimm
Controller



February 9, 2011

Wisconsin Joint Committee for Review of Administrative Rules
Public Hearing on PSC 128
Testimony of Beth Flaherty, Renewegy, LLC

My name is Beth Flaherty from Neenah, WI and I am a Renewable Energy Advocate with Renewegy, LLC of Oshkosh, WI. Renewegy is a manufacturer of 20 kw small wind turbines we like to call "urban turbines." Renewegy is exactly the kind of business our state is looking to nurture to create jobs and fuel economic recovery. The President of Renewegy, Jeff Ehlers, is the kind of entrepreneur and innovator that our state should be proud of and support. Through the vision and innovation of Jeff and his team, Renewegy has created 20 direct jobs since July 2008 and 100 supplier jobs. Renewegy conducts business with about 100 Wisconsin businesses and suppliers and has installed 25 turbines, with 23 of those being in The New North, such as SCA Tissue, Menasha Corporation and JJ Keller; and Renewegy is just getting started. Just take a drive through the Fox Valley to see the businesses that have invested in urban turbines. They are sprouting up in front of businesses along the Highway 41 corridor evidencing our thriving and progressive business environment.

It is in that exciting context of business development, innovation and growth that Renewegy asks you to allow the PSC 128 Wisconsin Wind Siting Rules to take effect. As I am sure you are all well aware, in order for a business to thrive in our state, it needs a fair and predictable regulatory system. That is what the Wind Siting Rules provide to Renewegy, other wind energy businesses and businesses they support. These Rules provide a statewide framework for these businesses to continue to grow and thrive and compete in the growing field of wind energy across our country.

Renewegy understands that there are many considerations when determining an appropriate site for a wind turbine and that each consideration should be given thorough and fair review. We are confident that the extensive work put into the PSC 128 Wind Siting Rules evidences an extremely fair and in depth process. These rules were 2 years in the making, developed by consensus in an open, balanced and fair process which included fact-finding, technical hearings, public hearings, an Environmental Impact Statement and advice from a 15 member advisory body. This is the kind of rule making our state should be proud of and Renewegy is confident the rules will protect all interested parties while allowing Wisconsin to compete in this innovative industry.

The number one priority of our state is economic growth and jobs, as it should be. Renewegy is doing its part to bring Wisconsin to the forefront in growing jobs in a critical new industry. We urge you to allow the Wind Siting Rules to take affect rather than stall such promising innovation and economic growth. Thank you.

Beth Flaherty
Renewable Energy Advocate
Renewegy, LLC
3650 Jackson St.
Oshkosh, WI 54901
920-385-0673
beth.flaherty@renewegy.com

My name is Jay Mundinger and I am a principal owner in Emerging Energies of Wisconsin, LLC and a wind developer in the Midwest. I have lived in Wisconsin for 35 years as have my two other partners Bill Rakocy and Tim Osterberg. We have a deep appreciation for our state and people that call it their home.

7 years ago my partners and I embarked on our journey as developers and have met many great people within communities, town leaders, manufacturing, construction and other services that we use to develop our project pipeline. I believe like anything different or unique, wind development has had its own set of issues with education of how a wind farm is developed, rule changes at every turn, and gossip that has slightly tainted our industry. In these 7 years my partners and I have had a conditional use permit approved and revoked for a smaller community wind project of 7 turbines, an approved 8 turbine community project just south of Green Bay, as well as 5 more projects in various stages of development. During that time we have had the privilege of working with many Wisconsin businesses including Michels Construction and Tower Tech. Our state does have a rich wind resource in specific areas that should be developed as part of our stewardship of harvesting the next generation of energy for Wisconsin and in order to provide employment and economic developments to our local communities.

The PSC 128 rulemaking process last year was open to all. There were no exclusions and anybody who was interested could have attended the meetings to gain a greater knowledge base of guidelines and processes. Several site visits were conducted of utility sized wind turbines along with an overview at each of the sites by the owner's representatives. Nothing should have been left unquestioned as there was always someone around that could offer a comment.

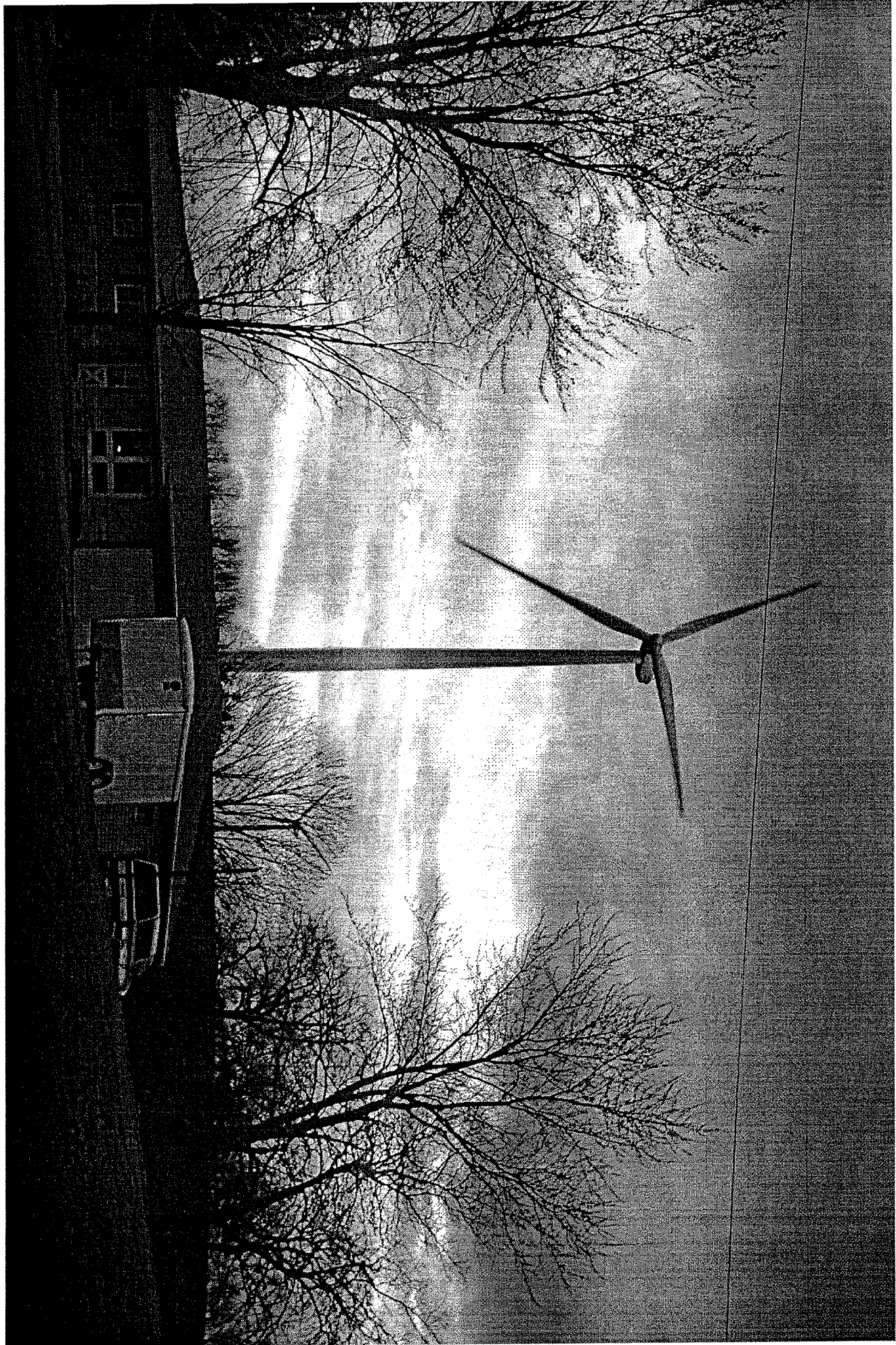
The guidelines in the PSC 128 are balanced and fair as both parties for and against wind development in the state had to make concessions along the way to find a middle ground. These balanced interests of host and non-host landowners should be given an opportunity to work as already a significant amount of time by the PSC and the public has been invested in the process. Protections for all landowners in the form of strict sound and shadow criteria will ensure safe setback distances and are stronger than states on our immediate borders.

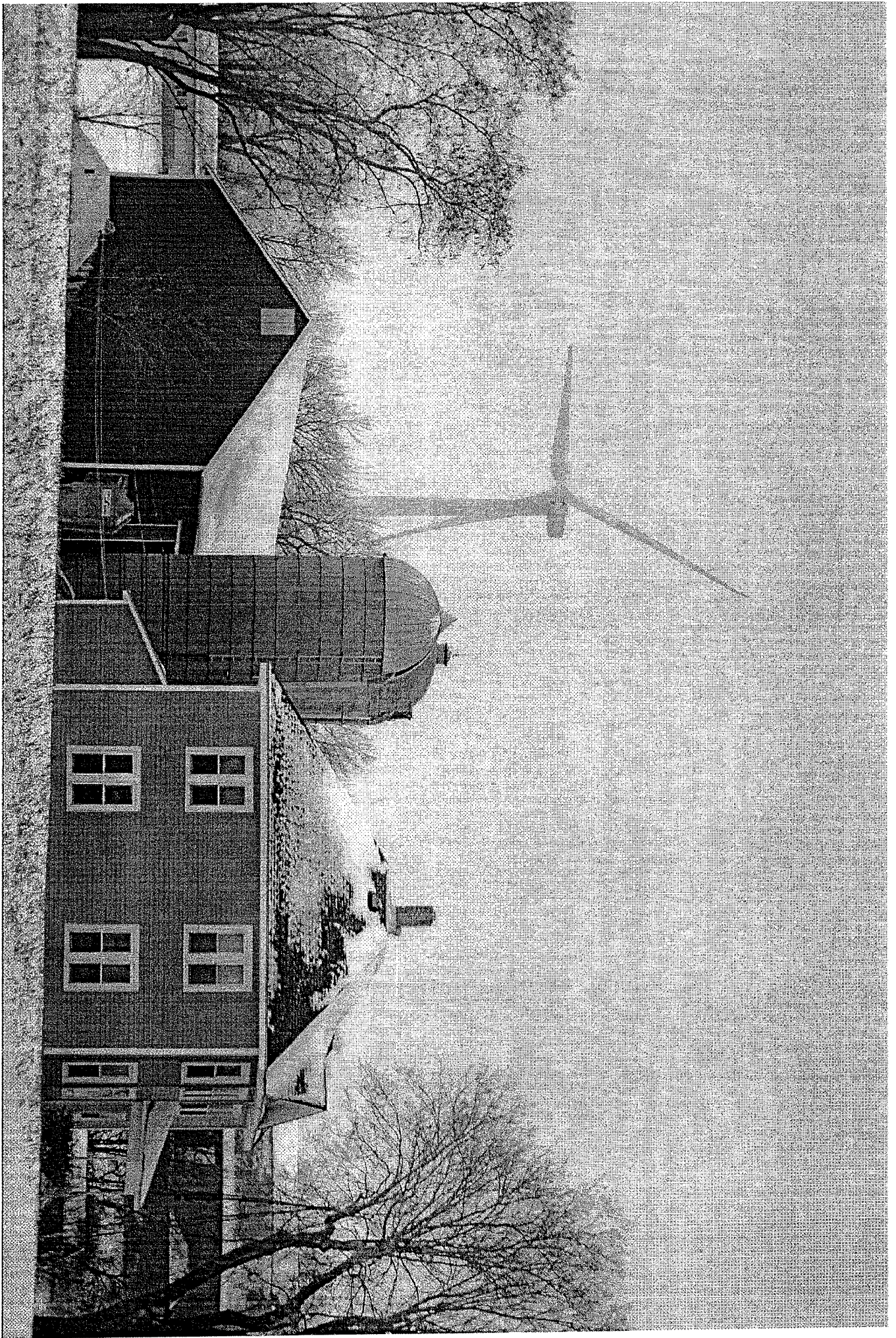
The regulatory certainty that would be created by this rule would bring to the state continued job growth, increased revenues to local governments, manufacturing strength, and a long term positive outlook that would make Wisconsin strong for years to come. In the highly unlikely event that a problem does arise with the rule, the Public Service Commission and the legislature can always act to remedy those problems at that time.

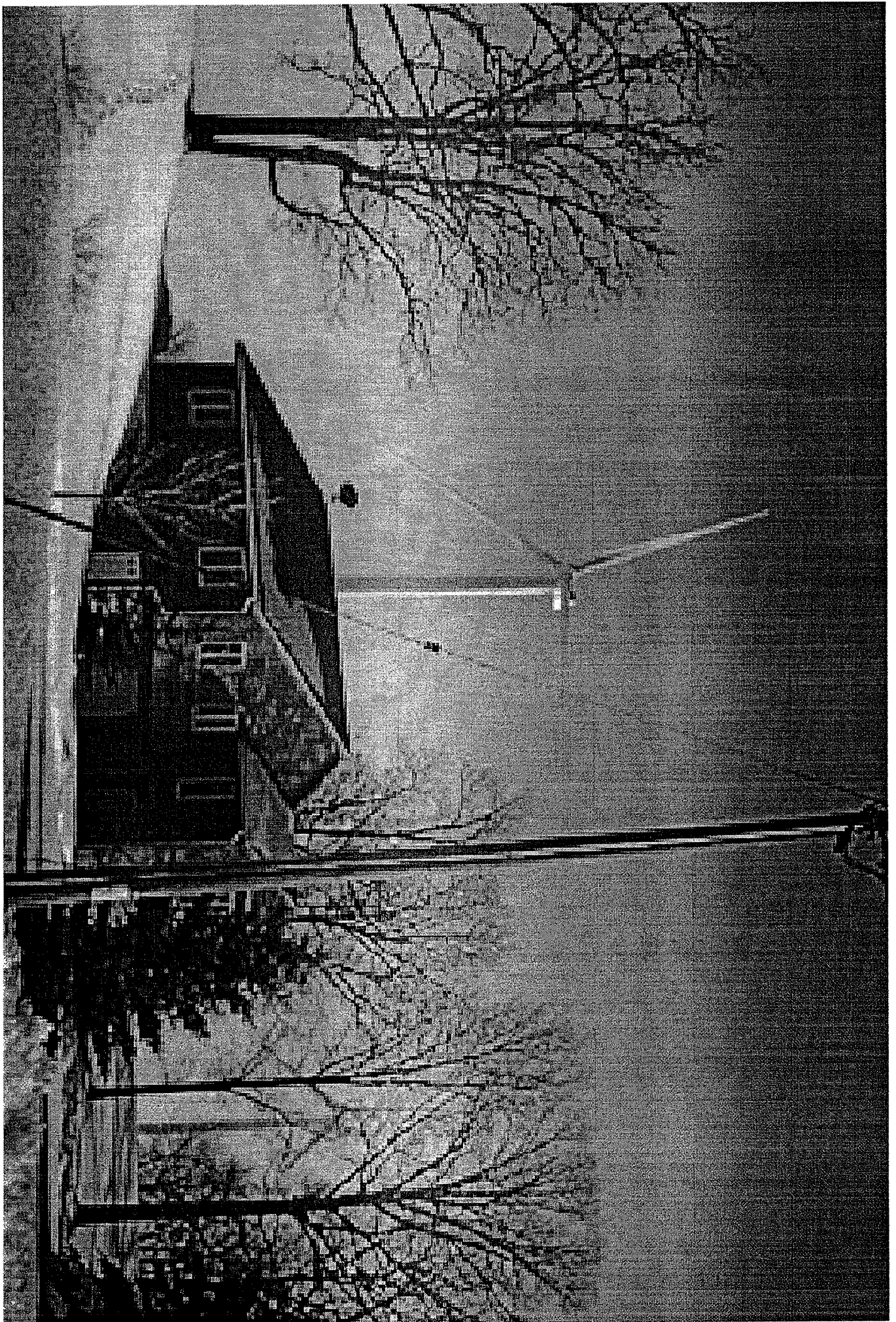
The other day I had heard of the statistic that our great state ranks #5 in the country in coal importing from states like Illinois, Indiana, and Wyoming. Why do we continue to send jobs and dollars outside of our state when our economy is in need of stimulation and long term growth? These jobs that are created by the development of wind projects are long term and we do need to develop them in order to provide our state with clean energy for today and the future, to benefit local governments where the

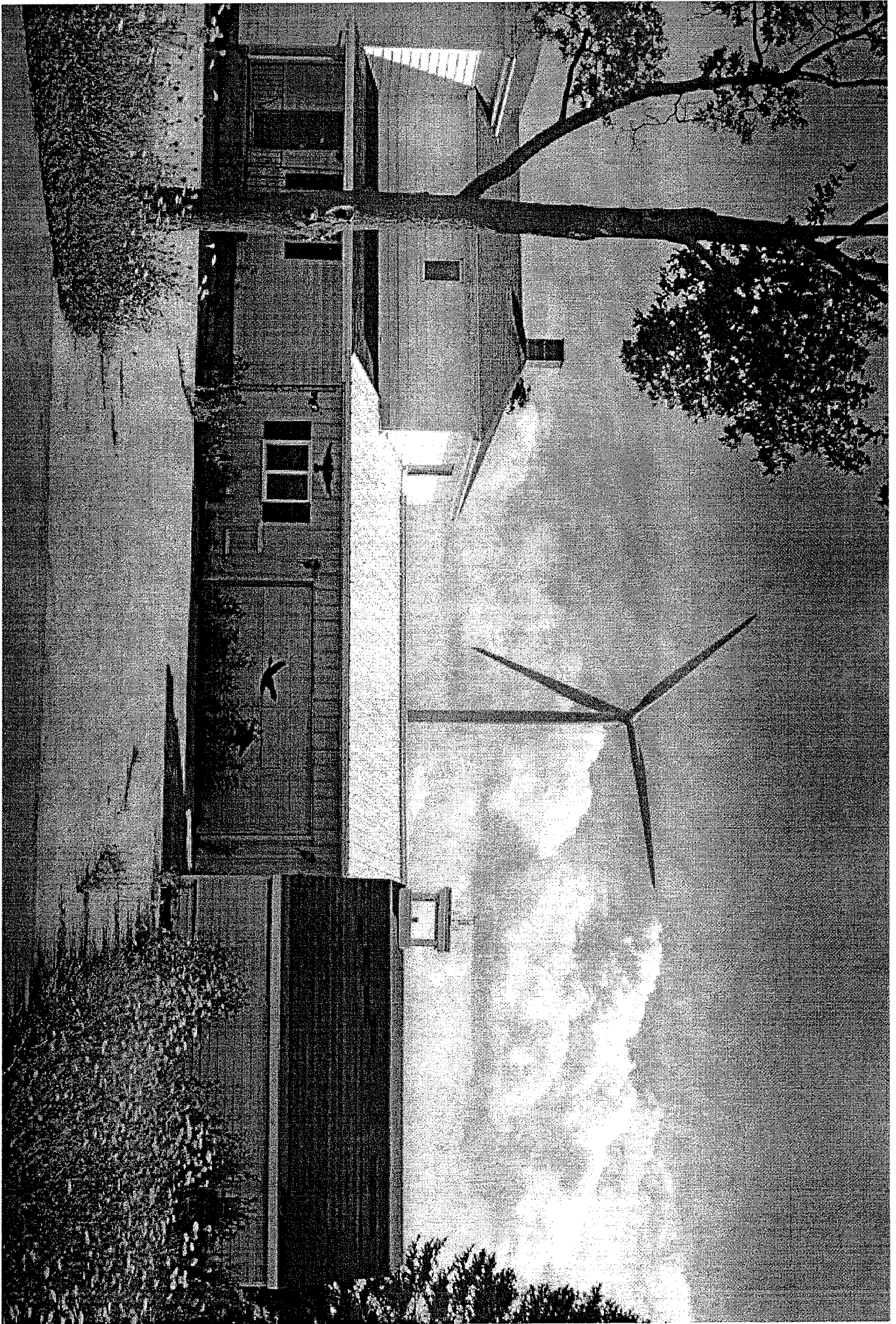
projects are located, and finally to give landowners that are typically farmers who have always used wind for some type of power the opportunity to harvest an additional crop.

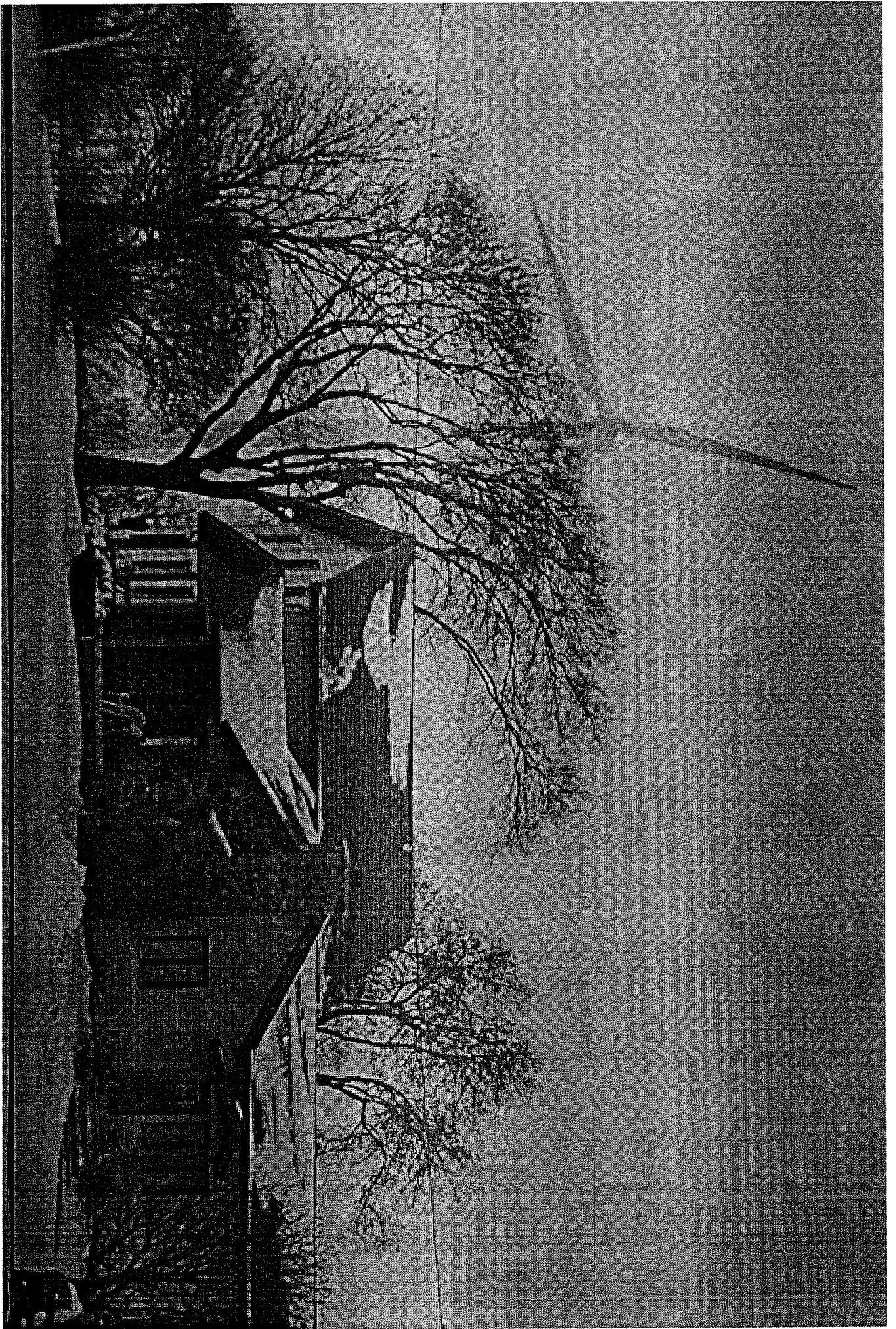
Emerging Energies respectfully urges this Committee to allow PSC 128 to go into effect on March 1st.

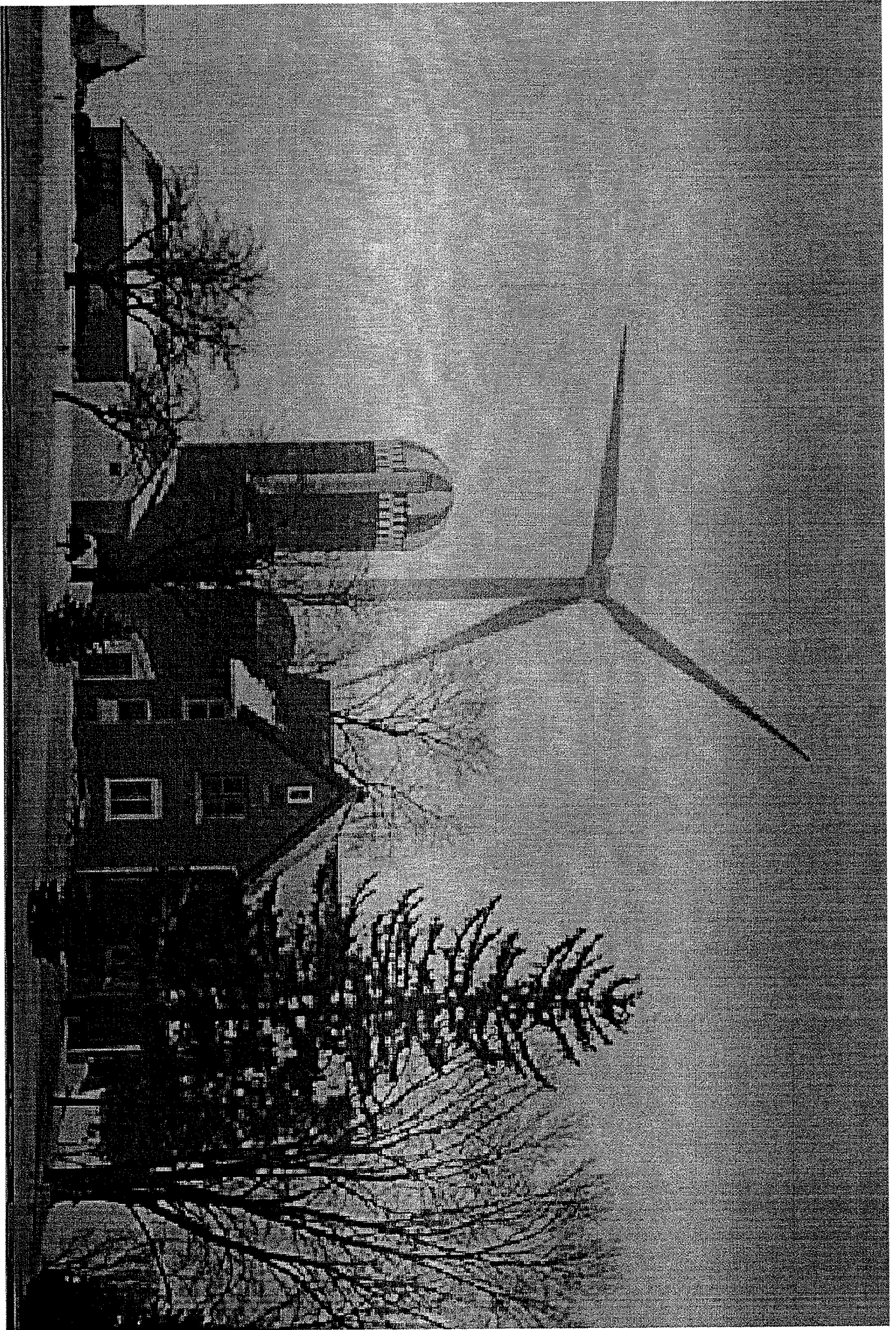


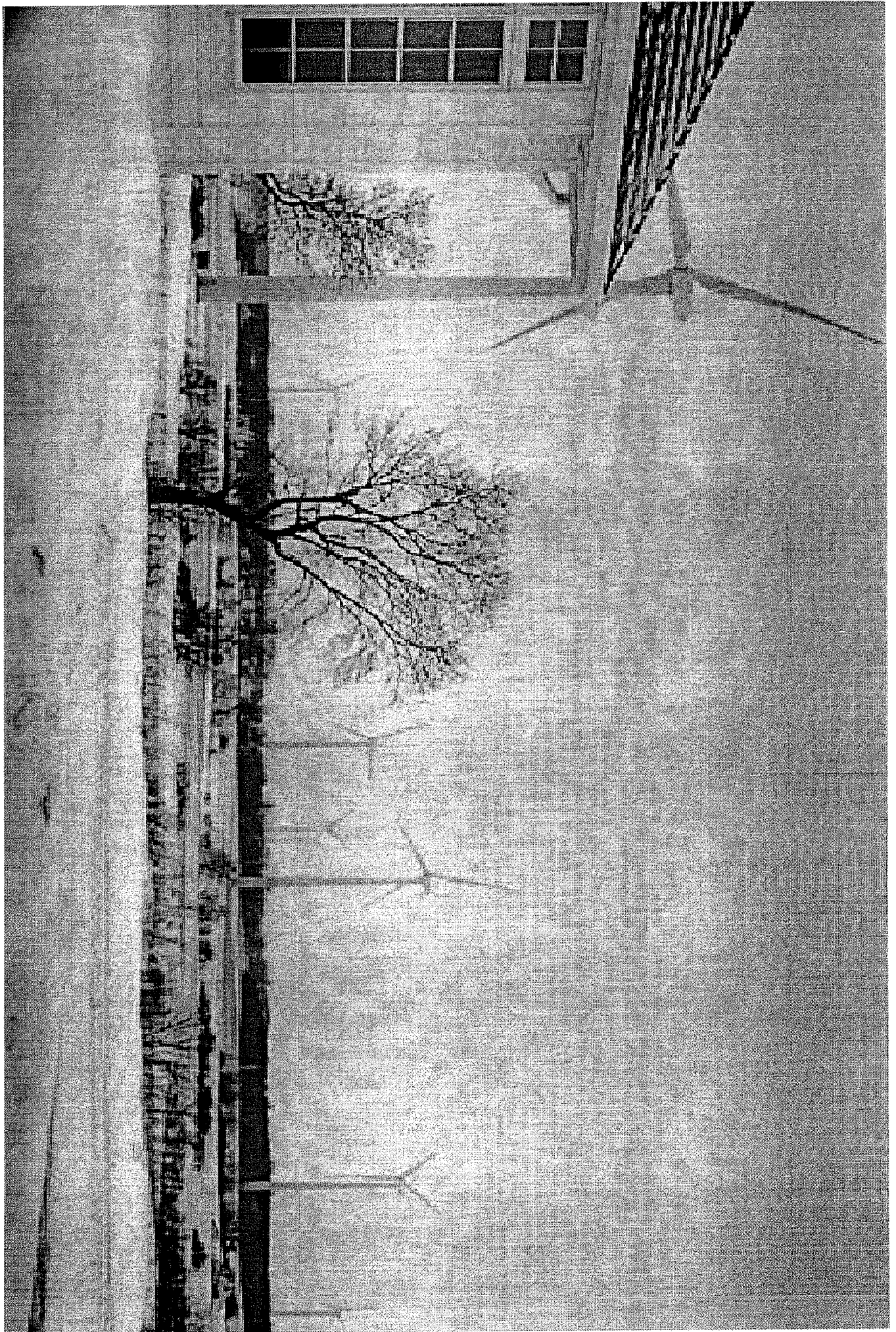




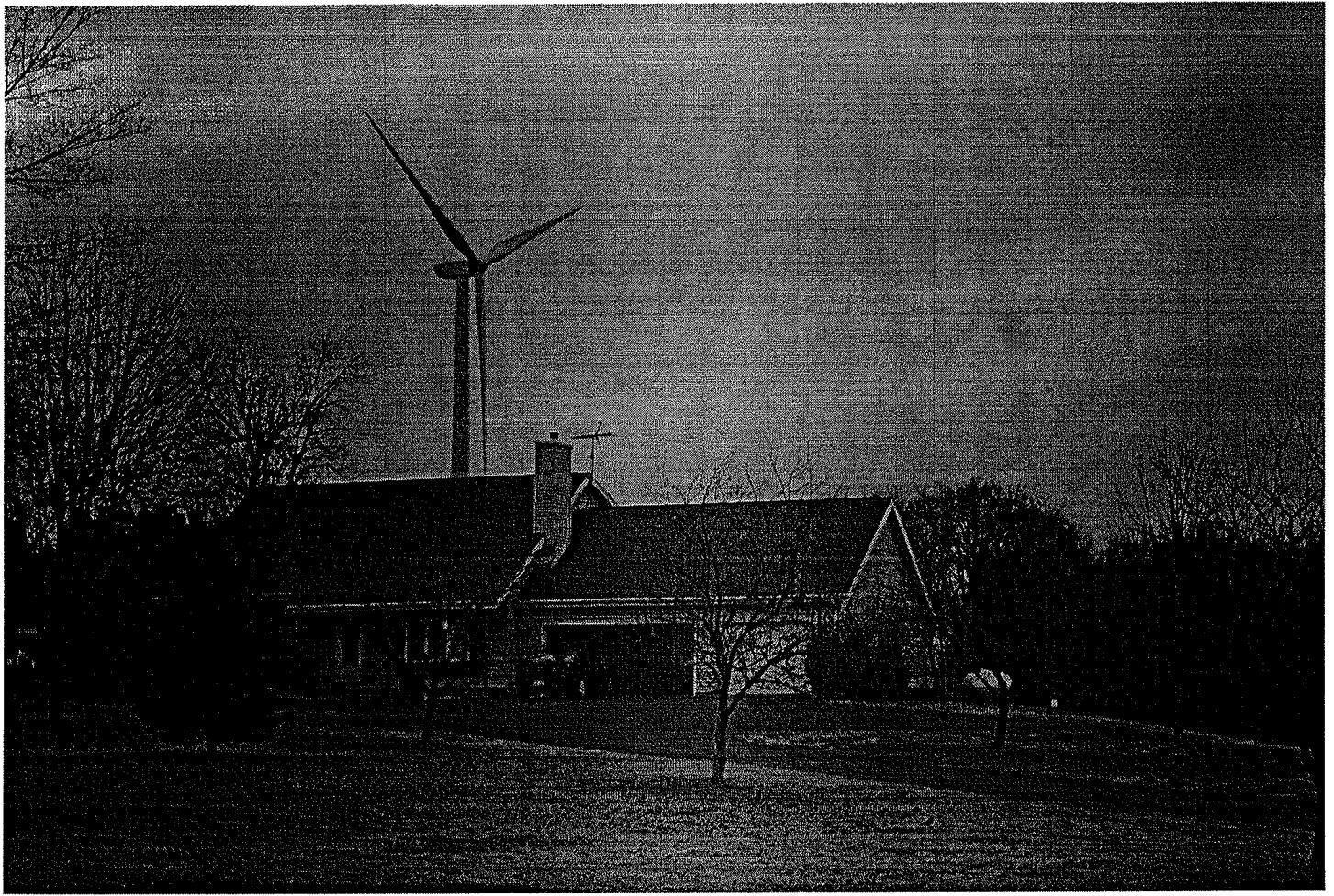












Hello, My Name is David Korinek and I am a county board supervisor in Manitowoc County.

I served on the committee that created our Industrial Wind Turbine ordinance. We spent 1 ½ years creating our rules. Our committee had balanced membership, including the current president of Renew WI.'s board of directors. The PSC's wind siting council membership did not achieve that balance, with 70% of members owing their livelihood to the wind industry. That is not a recipe for good rule making.

I would like to express my concerns with the rules the PSC has created. Manitowoc County decided to use the worldwide standard of 5 DBA over ambient for our noise restriction. It adjusts with background noise, rather than picking an arbitrary number for the standard, as the PSC has done, which is higher than what the World Health Organization recommends. Manitowoc County's Board of Health has passed a resolution through our county board supporting the 5dba over ambient standard and I will submit it with my testimony.

Manitowoc County believes in property rights!! Siting a 500 ft. industrial turbine 550 ft. from my property line and 1250 from my home could take 700 ft of my property for a corporation's turbine safety setback. Worse yet the PSC has determined in their own research, that to meet their 45 dba. night time noise restriction, that same turbine should be 2200 ft from my home! That puts my home 950 feet on the wrong side of the PSC's noise setback. That is a Taking of Property by a Govt. Agency without compensation, using contradictory rules not designed to protect citizens but to promote industry.

The bottom line is that siting Turbines in WI. is tougher than in states with large open areas and few homes. If a turbine company needs to buy some property or sign neighbors to easements to place turbines, so be it. To sacrifice citizen's safety, health, and property values for a wind companies profit margin is just wrong. 2640 ft. should be the minimum setback; 1800 ft is already a compromise!!

Thanks for your time

**David Korinek
1316 Rockledge rd.
Mishicot WI. 54228
920-755-4644**

Lori Morehouse

4432 Mill Road

Denmark Wisconsin 54208

I have been a special education teacher in the Freedom Area School District for over 20 years. Part of my job there is to be an advocate for my high school students with learning disabilities and to instill in them self-advocacy skills. I'm here today in Madison, as I was last October, to do just that, to advocate for myself, my family, and my neighbors as to why the current rules proposed by the very biased Wind Siting Council and approved by the PSC are inadequate and need to be suspended. These proposed rules do not address the health and safety concerns of those living in a wind turbine project.

For the past 21 years I've lived in Morrison Township in the southeastern part of Brown County where my husband and I own 140 acres. I am not against renewable energy, nor is my husband. We had the first totally geothermally heated and cooled home in the state of Wisconsin.

We live in the area of the proposed Ledge Wind Project of Invenergy. There is the possibility of 54, 400 foot industrial wind turbines being built in our rural township. I have been called a NIMBY. They are correct in saying I do not want a 400 foot mechanical monster in my backyard, but, I also don't want it in anyone else's backyard either. They don't belong there. The current proposed wind siting rules would have these turbines in my backyard, as well as in the backyards of my neighbors and friends. The setbacks need to be changed to 1/2 mile, 2640 feet, from a property line, not 3.1 times a height of the turbine.

These turbines do not belong in anyone's backyard until the state health department conducts an epidemiological study of existing residents who live in wind project areas. I'm not willing to live in the largest proposed wind turbine project in the state until there is unbiased, reliable, valid health studies done to prove that myself, husband, my children, or our seven young grandchildren will not be harmed. There presently is no objective health studies done that prove living with turbines in your backyard is safe.

How precious is your drinking water? The Ledge wind energy project in our township creates a risk for groundwater contamination from the manure spreading on fields where turbines are being hosted. Due to the karst features in the project, the impact of the excavations and 81 miles of trenches, puts our groundwater supply at substantial risk. The proposed turbine locations are adjacent to shallow bedrock karst fractures, spring heads, and sinkholes. Over 100 wells in Morrison Township were contaminated in 2006. 23 wells were replaced at a total cost of over \$300,000. Why would we continue to risk damaging our water supply by developing a wind turbine project when the geological features of the Niagara Escarpment puts us at significant risk for contamination of our groundwater?

Would you be willing to risk your property values being lowered by 40% or more because of turbines being sited too close to your home? If the wind developers say there is no loss of property value, then a

property protection plan for these impacted areas should be provided by the wind turbine project developers. This should be included in the siting rules.

Should town officials be able to sign contracts with wind developers while at the same time working on local ordinances that affect the town, its residents, and the wind developers? This scenario has happened across the state. New statewide siting rules should address the need for wind developers to disclose their intentions of developing a project publicly before any town officials sign contracts with them. There is a continued climate of deception, greed, mistrust, and personal self-interest surrounding this entire wind development process. This biased atmosphere has also lent itself to the Wind Siting Council, where nine of the fifteen members were directly conflicted.

Last fall my husband and I attended the First International Symposium on The Global Wind Industry and Adverse Health Effects held in Ontario, Canada. Like all of the presenters, including doctors, specialists, lawyers, authors, and professors, who came from all over the world including Canada, the United Kingdom, Australia, and various states in the US, we paid for all our own expenses. These experts presented three days worth of information, studies, and research on the negative effects of living close to wind turbines. These adverse health effects include noise concerns, especially low frequency noise concerns, sleep deprivation, and mental health issues. I will be presenting further written documentation from this conference to this Joint Administrative Committee.

The current rules proposed by the PSC are inadequate, seriously lacking, and need to be suspended. Please take more time to study the concerns presented today and error on the side of safety. Remember your constituents who are living or will be living in a wind turbine ghetto for years and years. The wind developers don't live in the wind turbine ghettos. I thank you for the opportunity to speak today. What a real life civics lesson that we get to experience today at the Capital. It is one I can share with my high school students tomorrow at school. Thank you for listening to my concerns.

Lori Morehouse

4432 Mill Rd.

Denmark, WI 54208

920-864-2223 Home

INTERNATIONAL SYMPOSIUM

THE GLOBAL WIND ENERGY AND
ADVERSE HEALTH EFFECTS

Loss of Social Justice?

SPEAKERS

October 29 to 31, 2010 in Picton, The Waring House,
Prince Edward County, Ontario, Canada

THE SOCIETY FOR
WIND VIGILANCE

WWW.WINDVIGILANCE.COM

MESSAGES OF SUPPORT

Many from around the world wanted to attend the FIRST INTERNATIONAL SYMPOSIUM: THE GLOBAL WIND INDUSTRY AND ADVERSE HEALTH EFFECTS: Loss of Social Justice? but were unable to do so. Support has been received from individuals and organized groups.

In an effort to acknowledge these, a snapshot of these messages is provided to Symposium attendees. A comprehensive list will be posted on The Society website after the Symposium. www.windvigilance.com

The comments and messages received represent the opinions and concerns expressed by the individual and groups submitting them. Any errors or omissions are unintended.

TO THE CHAIR - NEW ZEALAND

Daniel Shepherd
Department of Psychology
Auckland University of Technology
Auckland
New Zealand
daniel.shepherd@aut.ac.nz

Robert Y. McMurtry, M. D., F.R.C.S.(C), F.A.C.S.
Chair
The Society for Wind Vigilance
23.08.2010

Dear Dr McMurtry,

Ténā koutou.

I regretfully write to inform you that I am unable to attend the Society's conference planned for the end of October. In lieu of attendance I send words of support for both the conference and the Society at large. The line up of presenters hints at a stimulating and dynamic conference, and the success of the event seems assured. I sincerely hope this meeting will not be isolated, and I will keep a keen eye open for future conferences.

The output of the society has been of great utility to many communities in New Zealand faced with the decision of supporting or opposing wind turbine installations. The Society has consistently provided critiques of research and review documents that are laudable for both their balance and impartiality, and the level of insight afforded by the expertise of their creators. The ability of these works to inform communities of the risks and benefits of wind power cannot be overstated, and I suspect their impact goes far beyond any metrics you might currently use to track their use.

Of those speaking at the conference I note a number who have given up time to assist community groups in New Zealand. On behalf of these groups I would like to extend an expression of immense gratitude to these individuals, who include Richard R. James, Nina Pierpont, Christopher Hanning, and Michael A. Nissenbaum. To all members of the Society a message, keep up the good work, your efforts are appreciated by many.

Kia ora
(be well, be healthy)

Daniel Shepherd
Auckland, New Zealand

ONTARIO

Congratulations on the First International Symposium on the Adverse Health Effects of Industrial Wind Turbines. This is a great opportunity for members of our organization to hear from a wide range of international experts on topics of importance to our fight.

Those participating will no doubt leave armed with even more information that will assist in convincing neighbours and hopefully communities that they have a stake in this. It should also help us as we work with local councils and health organizations.

International medical experts will join with renowned academics from North America and other public figures to share much needed information in a format that is credible and valuable to us and the broader public. Wind Concerns Ontario is proud to support this symposium.

*John Laforet, President,
Wind Concerns Ontario*

AUSTRALIA

From all over the world we will be watching the discussions and the information presented at your symposium about the health effects of wind turbines. We are so grateful that you are all doing this. Only two days ago I was at a protest rally against two turbines going up at Leonards Hill, near Daylesford in Victoria, Australia. The nearest home to these turbines will be only 500 metres away. People there are desperate. Our governments just keep signing the rights of the rural residents away to wind developers.

Governmental Planning Panels ignore legitimate claims and worries from country residents, worries about health effects from turbines...We are so grateful for the time you are putting in at the symposium about health effects from turbines.

...Good luck with your investigations. We are all behind you.

*Renate Metzger,
Smeaton, Victoria, Australia*

EPAW (European Platform Against Windfarms)

EPAW supports the first International Symposium...427 federations and associations from 21 European countries (representing hundreds of thousands of citizens) have united into a European platform (EPAW) to transmit the following demands to the European authorities:

- a moratorium suspending all wind farm projects
- a complete assessment of the economic, social, and environmental impacts of wind farms in Europe.

EPAW objects to industrial wind farms that...are degrading the quality of life of those living in their vicinity, affecting the health of many...

We applaud and support the first International Symposium gathering so famous expert speakers. Wind power endangers the health of people who live near wind turbines and some affected residents can only try to sell their homes and move away! We thank you for your commitment to this important cause.

*Jean-Louis Butré,
Chairman of EPAW*

GERMANY

Dear Carmen, dear members of the Society for Wind Vigilance, dear organizers, scientists, experts and visitors of this important symposium in Canada!

The members of EPAW - European Platform against Windfarms - in Germany support your International Symposium and your struggle to protect the health of human beings, social structures and nature against industrial wind energy by exposing the dangers caused by wind power plants for health and social justice.

Today there are some 22.000 wind turbines in Germany and the number is increasing all the time... We represent thousands of German victims...including those in the northernmost region in Germany, where once was the cradle of the German wind power, who are suffering since

more than two decades from the impact of wind turbines. The symptoms, which Nina Pierpont calls WTS...many of us already know very well... Many people are too frightened to speak openly for their civil rights...I speak from painful, personal experience!...Living beside wind turbines between 300 to 1000 m away is like a trip to hell!

We, the German members of EPAW, want to thank you for this important international Symposium and your dedication to uncover the danger of the emissions by wind turbines for health and social life!"

*Jutta Reichardt from
"Windwahnmarsch",
Schleswig-Holstein, Germany
Spokeswoman of EPAW
(European Platform against Windfarms)
for Germany*

JAPAN

We are Japanese concerning about wind farm developments. Big wind is destroying nature and local communities in Japan too. People near wind farms are suffering from low-frequency noise from the turbines.

Although the Japanese government has just started a survey on the low-frequency noise, we suspect they will not solve the problem seriously.

We support the First International Symposium. We are really sorry not to be able to join you. But we believe it will be successful. And we believe it will be a great step for us all.

Yuki Tsuruta Oike

NOVA SCOTIA, Canada

To Carmen Krogh, Members of Windvigilance, Dr Nina Pierpont, Participating Scientists and Everybody at the Symposium!

We want to express our full support for this Symposium...Our social peace is gone by recklessly acting wind companies, who "successfully" were splitting communities and even friends and families. Local politicians were turning their backs on us and united with the wind lobby.

Whom shall we trust in difficult times to come?

We wish you all the best in achieving the necessary breakthrough for the inconvenient truth regarding wind power.

Anna Fabigan, Member of Concerned Residents against Industrial Wind Power - Digby Neck, & Member of EAS - Eco Awareness Society, Pictou County - Digby County NS

SPAIN Co-founder, European Platform Against Windfarms

I am writing to you from Spain. I wish to say how concerned we are, my European colleagues and I, about the ill-effects wind turbines are having on the health of nearby residents. In Europe as in North America, there is no effective legislation imposing minimum setbacks between these noisy, vibrating structures and human habitations. The collusion between the windfarm industry and the political class is such that the health issue is simply being negated. Yet, more and more victims of the Wind Turbine Syndrome are making their voices heard, and many of their poignant letters can be read on the Internet. Sadly, the mainstream media has largely ignored the problem, for it's not politically correct to tell the truth about windfarms.

But truth is remarkable in that it can't be covered up forever. Sooner or later it comes to the surface, and class action suits inevitably follow. May this First International Symposium go a long way in raising public awareness on the adverse health effects of windfarms. May the media bring it to their attention, and may governments finally legislate to impose a minimum distance between wind turbines and people's homes.

God bless you all.

Mark Duchamp, Co-founder, European Platform Against Windfarms

SWEDEN

Being Editor-in-chief of the Danish nurses journal for 30 years (1974-2004) I understand deeply the concerns about adverse health effect caused by wind turbines close to humans.

Therefore, it is an extremely important conference, you have arranged. We need much more initiatives like this in order to make the impact on humans visible for the political decision makers, who seems to be totally controlled by the wind power industry. Wind turbines near to humans and in sensitive landscapes is a peace time crime against humanity. On behalf of all Nordic and Baltic campaigners and victims I express my strongest support. Make the conference a eye opener. Good luck. Contre nous de la tyrannie.

Peter Skeel Hjorth, Journalist, Spokesman for EPAW in the Nordic and Baltic Countries.

UNITED KINGDOM

I have been following the work of the organisers of the Symposium closely and I urge everyone to take cognisance of the important work which has been done to expose the dangers of industrial wind turbines. There is now ample evidence from the most eminent scientists to show the link between wind turbines and ill health.

It is important that all Authorities and Medical Services recognise that industrial wind turbines do cause ill health to those people unfortunate enough to have them in their neighbourhoods...

I know, from people I have spoken to, of the serious problems wind turbines have caused for people here in England; some of whom have had to abandon their homes.

*Kind regards,
Michael Addison*

UNITED STATES OF AMERICA:

Vinalhaven, Maine

I fully support further research and study into the impact of wind turbine noise on individuals as well as on communities. The Maine's noise regulations that were developed in the 1970's for urban industrial areas, do not pretend to protect individuals. Current regulations in Maine are not adjusted according to rural, suburban, or urban areas. There is no doubt that the impact of a 55/45 dBA noise limit in a rural island community is vastly different than it would be in a busy urban environment. Low frequency sound is not measured or regulated. Gigantic wind turbines are built within a short distance of homes. People should not and can not be asked to live under these kinds of conditions. I support the International Symposium and hope very much that their efforts will help to correct an unethical wrong.

*Sally Wylie,
Fox Island Wind Neighbors,
Vinalhaven, Maine.*

COUNTRIES

- | | |
|---------|--------------------------|
| Belgium | Italy |
| Canada | Japan |
| Crete | Netherlands |
| Denmark | New Zeland |
| EPAW | Poland |
| Estonia | Scotland |
| France | Spain |
| Germany | Sweden |
| Greece | United Kingdom |
| Hungary | United States of America |
| Ireland | |



THE SOCIETY FOR WIND VIGILANCE

FIRST INTERNATIONAL SYMPOSIUM THE GLOBAL WIND INDUSTRY AND ADVERSE HEALTH EFFECTS: Loss of Social Justice?

REAL PROPERTY TAKINGS

I was listening to a discussion on "takings" in relationship to noise, shadow flicker and property values during a recent wind siting council meeting. There was some disagreement as there is on many of the topics and it was decided to refer the question on takings to legal counsel. The following meeting it was stated that "staff" had determined that unless 100% of the property or the value of the property was taken, that it would not be considered a "takings". What I found interesting was why legal counsel did not give his opinion on the matter (he seemed to be in the room for some of the meeting as he commented on something later), but yet staff gave their "opinion" and the matter was dropped.

AWEA siting handbook refers to "an assessment of potential impacts to neighbors and other sensitive receptors is often prudent" and refers to property boundaries for noise limits, not homes.

Developers should be forced to sign a property value protection agreement. If they are adamant that the turbines do not affect property values, they should not have a problem signing an agreement. There can be no takings without compensation. NO ONE should be allowed to diminish another's quality of life and property value for their own financial gain. This includes all property, improved or vacant land. I did some research myself and came up with the following on takings. A zoning regulation that deprives the land owner of the economic value of the property might be challenged as a constructive taking.

PARTIAL TAKINGS

It is often the case that a landowner is not completely deprived of his property, but instead suffers a restriction or impairment of his or her right to use it. For example (and as is frequently the case), a government may need to run a utility through private property, or need to alter a shoreline such that the property is no longer on the waterfront. The property may need to be flooded to create a dam, or a building on the property may need to be relocated to make access to another point. In such cases, a partial taking may be effected, and the landowner is entitled to proportional compensation. (Source: What Constitutes a "Taking", Find Law)

"CONSTRUCTIVE" TAKING OR REVERSE CONDEMNATION

Still another form of taking may occur when there is no actual property being taken from a person. Instead, governmental activity on one property may so severely deplete the value of adjacent or neighboring property so as to constitute a "constructive taking," often referred to as inverse or reverse condemnation. Fumes, noises, vibrations, changes in flow of ground water, or toxic pollutants are some of the more common interferences that may constitute constructive takings. Examples include properties affected by airport noise and fumes, waterfront properties affected by rerouted water, or livestock farms affected by nearby noise or ground vibration. In each of these circumstances, property owners may be entitled to compensation from the governmental entity. (Source: What Constitutes a "Taking", Find Law)

TEMPORARY TAKINGS

Finally, a taking need not be permanent; it may be effected and justified only under limiting circumstances. For example, in time of war or insurrection, a government may need to exercise control and dominion over lands otherwise not needed for public welfare or safety. Again, a landowner may be compensated for the temporary impairment or deprivation in his or her use of private property. (Source: What Constitutes a "Taking", Find Law)

"NOR SHALL PRIVATE PROPERTY BE TAKEN FOR PUBLIC USE, WITHOUT JUST COMPENSTION"

THE FIFTH AMENDMENT TO THE UNITED STATES CONSTITUTION

**"THE PROPERTY OF NO PERSON SHALL BE TAKEN FOR PUBLIC USE WITHOUT JUST COMPENSATION THEREFORE"
THE WISCONSIN CONSTITUTION**

In regards to some in the wind energy industry referring that those that are being negatively affected by noise, shadow flicker, infrasound, and loss of property values as being collateral damage and should make a sacrifice for the greater good:

The United States Supreme Court has also stated that the Fifth Amendment to the United States Constitution is "designed to bar government from forcing some people alone to bear burdens which, in all fairness and justice, should be borne by the public as a whole". If the damage to an individual property owner is so great "that he ought not to bear it under contemporary standards, then the courts are inclined to treat it as a "taking" of the property". (Armstrong v. United States 1960)

Private property is held in subordination to the rights of society. Although one owns property, they may not do with it as they please, any more than they may act according to their personal desires. As the interest of society justifies restraints upon individual conduct, so also does it justify restraints upon the use to which property be devoted. It was not intended by these constitutional provisions to so far protect the individual in the use of his property as to enable him to use it to the detriment of society. (State v. Harper 1923)

I think we should all do our part and practice good conservation, something we all can do, without any negative effect on our neighbors. Let's put Wisconsin on the map for being a leader in responsible energy usage and conservation, but more importantly that we place more value on the health and safety of our residents than profits and politics.

While most takings involve the actual physical occupation of private land, it has long been recognized that private property may also be taken as a result of the enactment of statutes and regulations. In the seminal case of *Pennsylvania Coal Co. v. Mahon*, Justice Oliver Wendell Holmes, Jr., speaking for the Court, specified that "while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a 'taking'.

We are in danger of forgetting that a strong public desire to improve the public condition is not enough to warrant achieving the desire by a shorter cut than the constitutional way of paying for the change." (*Pennsylvania Coal Co. v. Mahon*)

"When . . . [the] power [of eminent domain] is exercised it can only be done by giving the party whose property is taken or whose use and enjoyment of such property is interfered with, full and adequate compensation, not excessive or exorbitant, but just compensation." The Fifth Amendment's guarantee "that private property shall not be taken for a public use without just compensation was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." Just compensation in partial taking condemnation cases must include compensation for the part of a property that is actually taken, as well as compensation for any damage that the taking causes to the part of the property that is not taken. (Find Law, Just Compensation)

Under the constitutional definition of "just compensation," all factors that make up market value must be taken into account in determining just compensation in direct condemnation cases.

Under the Michigan and United States constitutions, a condemning agency must pay a property owner "just compensation" when the agency takes the owner's property for a public purpose. Generally, just compensation is measured by determining the market value of the property that is taken. But when only part of a property is taken, the part that is not taken, sometimes called the "remainder," can experience a decrease in value attributable to the taking. The condemning agency must compensate the owner for any such decreases, because just compensation must leave the property owner in as good a position as the owner would have been had the taking never occurred. Numerous Michigan decisions have discussed the decreases in value attributable to partial takings that must be part of just compensation, and on occasion have discussed using the "cost to cure" some or all of the negative effects of a partial taking as an appropriate measure of compensation. Regardless of the approach that is taken to the problem, the property owner must always receive "just compensation" for losing its property.

This rule requires that the property's market value before the taking be compared with its market value afterward, and the difference serves as the amount of just compensation.

In cases like the present one, where there is a partial taking, just compensation is measured by the amount that the value of the remainder of the parcel has been diminished. This loss is usually expressed in terms of the diminution of the fair market value of the remainder of the property. And, fair market value is found by considering and evaluating all the factors and possibilities that would have affected the price that a willing buyer would have offered to a willing seller for the land under the circumstance. (Source: Calculating Just Compensation in Partial Taking Condemnation Cases by Jerome P. Pesick)

COST OF NOISE ANNOYANCE

The socio-economic impact of noise: A method for assessing noise annoyance.

Numerous attempts have been made to calculate a "cost" or to set a "price" on community noise annoyance. Factors that influence this "price" include the following:

- psycho-physiological effects, stress, etc.
- sleep disturbances (and resulting productivity loss)
- communication problems
- (possible) hearing damage

The price is likely to be reflected in a depreciation of property values. Studies have revealed that there is a linear relationship between noise level and change in property value (in Norway, roughly 0.5% per dBA). In other words, the change in value per decibel is independent of the absolute level.

A similar relationship has been found for the annoyance score. A given change in noise exposure is related to a certain change in annoyance score regardless of absolute noise level or degree of annoyance. By using noise exposure data as a common parameter, it is possible to relate annoyance directly to a sum of money, and any given change in annoyance can be expressed in monetary terms. (Source: Noise and Health, A quarterly inter-disciplinary International Journal)

Lynn Korinek
1316 Rockledge Rd
Mishicot, WI 54228

The wind siting rules were created to take away the "Patchwork" effect of local control despite the fact a state appeals court told Calumet County **they** could not use "blanket" standards. We now have a one size fits all set of rules that will have negative health effects and financial impacts on landowners, because it was written by a council stacked with those having a financial interest in the industry.

Claims are made about loss of jobs if setbacks are increased to protect our health, safety and property rights. At what personal and financial cost to the landowner, ratepayer and taxpayer should we "provide subsidized jobs"?

An important point needs to be made clear. Act 40 does not direct rules to be written to create or save jobs or to make sure wind turbines are sited regardless of negative effects, it distinctly states to set rules that provide reasonable protection from any health effects.

The PSC is responsible to protect us from rate increases and Clean Wisconsin and the Citizens Utility Board promote themselves as advocating on behalf of ratepayers for affordable rates. Knowing we have a glut of electrical capacity, they actively promote industrial wind energy aware that it increases utility rates. In a recession, we the taxpayers and consumers are being forced to subsidize energy we do not need. Wind is not free.

Wisconsin already has higher electric costs than all but 5 states, yet a utility rate increase requested by the PSC to subsidize the cost of renewable energy, was passed by the Joint Finance Committee during the lame duck session, resulting in a rate increase of \$740 million dollars to rate payers over the next 4 years. Asking for responsible siting rules to protect us is not a jobs killer. Increasing utility rates, that's a jobs killer.

Wind is not the only renewable. Act 40 fails by not addressing whether wind is the best solution to the energy needs of the area being served. Utilities are forced to create power we do not need to meet the RPS, resulting in industrial wind turbines being forced into areas they do not belong. Wisconsin should be promoting safe, reliable, low cost, energy efficient renewable solutions to residential and commercial customers that will not have negative health effects and lower property values. How many jobs would be created if ACT 40 were repealed, and the state would promote nuclear, geothermal, solar, and most of all energy efficiency? Instead Clean WI and Cub are fighting the expansion of Point Beach, because they say, we do not need the power. If they want to make it about jobs, that expansion would create many high paying sustainable jobs.

Clean, RENEW, CUB and the PSC know that WE Energies has excess capacity until 2024 even without the Glacier Hills turbines, and that the project would literally have no impact on reducing emissions, but the project was permitted regardless. WE Energies ratepayers will now be paying over \$525 million for energy that is not needed to satisfy demand, and those forced to live within the boundaries will be new victims of the PSC allowing turbines too close to homes.

Commissioner Azar commented that staff informed her based on research and computer modeling it would take a 2200 ft setback to meet the 45dba nighttime noise limit sited in the wind siting rules. I would like to submit the response I received from the records request I submitted regarding that statement. I also received a map of the Glacier Hills project, showing the noise setbacks if anyone is interested in viewing it.

I would like to ask that you suspend the rules as they fail to do so. I ask for a 2640 ft setback, a 5dba over ambient noise limit, a property value protection agreement and a moratorium on any new construction due to excess capacity in the state. Thank you for allowing me to speak here today.

Lynn Korinek
1316 Rockledge
Mishicot, WI 54228
920-755-4644

ACT 40 FLAWS AND REASONS TO SUSPEND THE WIND SITING RULES

- 1) Commissioner Callisto choose the members of the wind turbine committee by himself and only after complaints, the list of members was taken to the other two commissioners for their vote.
- 2) The committee was stacked with wind energy proponents that will benefit financially from development of wind turbines.
- 3) One of the "public" members is the President of RENEW, which resulted in two members of RENEW being on the council.
- 4) The rules do not include a property value agreement. If the developer is so determined that the turbines do not lower property values, they have no excuse to refuse an agreement.
- 5) No engineering studies were submitted to prove that a 1.1 setback is adequate for turbine collapse, blade throw or ice fling.
- 6) Leases are not regulated.
- 7) The language related to the noise restriction does not exclude ambient. The 45dba limit is too high and well below the 5dba over ambient recommended by the WHO.
- 8) Developers are allowed to self test.
- 9) All setbacks must be from property lines.
- 10) Conflict of Interest with local officials has been a problem and is not addressed.
- 11) PSC staff stated it would take 2200 foot setback to meet the 45dba noise limit, the 1250 feet setback is meaningless.
- 12) ACT 40 does not address the fact that Wisconsin has an excess electrical capacity.
- 13) Renewable energy cost is too high and impedes job growth in industry. Using data from the U.S. Energy Information Administration, the average family of four would have household electric bills in 2016 of \$188.66 if the power was supplied by coal. If wind were used to supply 100% of the electricity used by this family, the cost would be \$339.58, an increase of 55%. These numbers would devastate the industries in Wisconsin that rely on large amounts of electricity in their manufacturing process.
- 14) Wind Turbine projects requires huge taxpayer subsidies to be profitable to the developer
- 15) Wind projects will inhibit new development in the area. This will eliminate hundreds of jobs for new home and business construction and erode the tax base by decreasing the appraised value of the existing homes.
- 16) Wind turbines do not decrease emissions from other electricity generating sources. In studies in California and Colorado, the wind turbine projects actually increased emissions because of the cycling of coal and natural gas power plants to ensure a steady flow of electricity during periods of little wind. World-wide, not a single coal plant has been shut down because of wind turbines.
- 17) Eliminate the Renewable Portfolio Standard. Wisconsin business cannot afford the addition cost of subsidized renewable energy. Force the marketplace to innovate and engineer new solutions to the problem. We should not be throwing money at the wrong solution simply because it is here. Force the wind industry to prove scientifically that they are the long term solution.
- 18) Wisconsin currently has about 300 wind turbines in operation or under construction. To meet the 2025 RPS mandate an additional 12,000 turbines will be required. Where will the state put them? The marginal wind available is in the Eastern quarter of the state, which is also the most densely populated area of Wisconsin. The experiences of residents in Fond du Lac County have proven that wind turbines do not mix well in populated areas.



Public Service Commission of Wisconsin

Eric Callisto, Chairperson
Mark Meyer, Commissioner
Lauren Azar, Commissioner

610 North Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

September 30, 2010

Lynn Korinek
1316 Rockledge Road
Mishicot, WI 54228

Re: Public Records Request ORR 2010-026

Dear Ms. Korinek:

I am writing again in response to one of your letters that the Public Service Commission received September 13, 2010, addressed to Deborah Erwin. In this letter you make a Public Records Request for:

[A]ny and all specific calculations, studies and data including but not limited to sound study research and data, computer modeling research and data and testimony related research and data pertaining to the comments made by Commissioner Azar during the August 19th 2010 PSC meeting, stating that staff informed her based on research and computer modeling, it would take a 2200 ft setback to meet the 45dba nighttime noise limit sited in the wind siting rules.

The Commission's initial response to your letter was dated September 15, 2010. Enclosed with that response was a map that Commission staff had prepared for Commissioner Azar. This map used the Glacier Hills Wind Project as an example and showed how a 45 dBA maximum noise limit would have affected turbine siting for that project.

After receiving the map and reviewing other research materials that the Commission had earlier sent to Ms. Anita Roberts of Mishicot, you called me to explain your Public Records Request further. You stated that you wanted any further records of the Commission, demonstrating how the noise contour lines were drawn on the Glacier Hills map that show the 45 dBA noise threshold and its distance from each turbine.

Commission staff creates these maps by using the ArcGIS computer program, which is commercially available software from:

esri
380 New York St.
Redlands, CA 92373-8100

ArcGIS produces the map based on data stored in electronic files known as "shapefiles." To produce a wind farm map, different shapefiles contain information about a host of relevant subjects, such as turbine locations, roads, municipal boundaries, railroad lines, electric collector

Lynn Korinek
Page 2

circuits, church locations, home locations, and noise contours at different dBA levels. The information from each shapefile can be inserted into the map.

A computer model creates the shapefile that contains noise contour data. For its Glacier Hills Wind Project, Wisconsin Electric Power Company contracted with Hessler Associates to develop noise contour data. Hessler Associates produced a report, which is Appendix R to the Glacier Hills project application. That report explains the computer model that Hessler Associates used, the input data, and the results. You can find the report from Hessler Associates on the Commission's Electronic Regulatory Filing system, at PSC REF#: 103302.

Hessler Associates then produced the shapefile with noise contour data and delivered it to the Commission. Because this shapefile consists of electronic data, a user needs the ArcGIS software to make it meaningful.

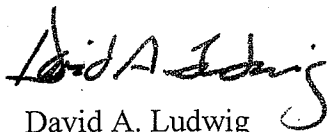
In summary, the Commission records that are the basis for the noise threshold lines on Commissioner Azar's map are the Commission's copy of the ArcGIS program, the Hessler Associates report and the noise contour shapefile. For the purposes of the Public Records Law, "record" is defined in Wis. Stat. 19.32(2). That statute excludes "materials to which access is limited by copyright, patent or bequest; and published materials in the possession of an authority other than a public library which are available for sale." Because the ArcGIS program is copyrighted material and commercially available for sale, it is not a "record" under the Public Records Law. The Hessler Report is on the Commission's website, so you can download a copy of it at your leisure.

I can e-mail a copy of the noise contour shapefile to you on request. Please recognize that it is meaningless without the necessary ArcGIS program, but if you are interested in viewing this record feel free to contact me and provide me with your e-mail address. If I don't hear from you to request a copy of the shapefile, this letter concludes the Commission's response to your Public Records Requests.

Please do not hesitate to contact me at (608)266-5621 if you have any further questions or concerns.

This determination is subject to review by mandamus under Wis. Stat. § 19.37(1) or upon written application to the Dane County District Attorney or the Wisconsin Attorney General.

Sincerely,



David A. Ludwig
Acting Deputy General Counsel



CROPP COOPERATIVE

INDEPENDENT *and* FARMER-OWNED

RE: Public Comments for PSC 128 Wind Siting Rules
Before the Joint Committee for Review of Administrative Rules.
Wednesday, February 9 at 10:00 a.m.
Capitol, 412 East

I am submitting these comments on behalf of CROPP Cooperative ("CROPP"), a farmer-owned cooperative. With 1,625 farmers nationwide, CROPP Cooperative encourages a farming future emphasizing ecological and economic stability. CROPP's Organic Valley® brand is the nation's largest farmer-owned certified organic brand, used to market organic dairy, juice, soy, and produce products.

Not only is CROPP one of the largest employers in Southwest Wisconsin, over 500 of our farmer-owners are located in Wisconsin. Despite a down economy, CROPP's revenue reached \$622 million in 2010 and we expect a 19% growth in 2011. Our farmers and our consumers are committed to our renewable energy efforts including our Cashton Community Wind project for which we have been working on for the past 2 years. We have partnered with Gunderson Lutheran and Wisconsin Western Technical College to create a community wind project that supports the local economy while providing a job training site and electricity to 1,000 homes in the area.

We also have 64 farmers in the state of Wisconsin that are committed to using renewable energy sources on their farms. Wind turbines provide our farmers with a reliable, homegrown source of energy as well as a consistent source of income. Suspending or reworking PSC 128 will significantly impact our ability to move forward on our Cashton Wind Project as well as our farmer's abilities to move forward with many of their wind turbine projects in a timely manner.

We have participated in the public hearing process for the past year and a half and we strongly urge you to support the PSC rules as it was passed in December. As passed, the wind siting rule will support economic development in the state by providing manufacturing, construction, operation, maintenance, and development while providing

sources of revenue and energy for our rural communities and our farmers. Not only have our farmers shown strong interest in the installation of renewable energy systems; our customers demand sustainably-grown products. Suspending the rule now, before it has an opportunity to work, would send a mixed signal to our farmers and partners considering investing in the wine industry in Wisconsin. We need to create regulatory certainty now to restore confidence and create jobs in rural Wisconsin.

We thank you for the opportunity to consider CROPP Cooperative's comments on this very important issue.

2-9-11

My name is Dean Anhalt. I am a Supervisor with the Town of Mishicot in Manitowoc County. I have been dealing with wind turbine issues for more than 6 years.

In May of 2010 the Town's of Mishicot, Two Rivers, and Two Creeks in Manitowoc County and the Towns of Carlton and West Kewaunee in Kewaunee County drafted a joint letter expressing our concerns with proposed wind siting rules. which was submitted to the PSC for consideration.

The concerns are:

Setbacks should be taken from the property lines of the adjoining non-participants.

Setbacks should be large enough so as not to create shadow flicker or excessive ambient noise on adjacent property.

Setbacks should be large enough not to create a loss of wind or property rights for the adjoining property.

Decommissioning expenses should be backed by a bond fund from the developer.

Town road damage needs to be addressed during decommissioning as well as during construction.

Emergency Communication Interference caused by wind turbines will be corrected by the developer in conjunction with the political sub-divisions.

We also concur and endorse the concerns set forth by the Towns of Morrison, Wrightstown, and Glenmore in Brown County in their submission to the PSC, document # 133746, requesting World Health Organization standards for turbine noise.

We are not people whose daily employment is to promote wind energy. We are not wind farm developers. We are not individuals who seek to promote their ideals on people living elsewhere.

We are elected officials responding to citizen concerns looking to protect our constituent's health and safety and personal and property rights. We are educated on this subject and have seen the results of wind farms elsewhere.

According to the January 28, 2011, edition of the Wisconsin State Farmer, "Walker's wind siting proposal strips local control." "This unreasonable proposal is a steamroller driven by anti-wind special interests bent on denying local governments the ability to decide what's in their best interests" says Michael Vickerman of RENEW Wisconsin.

What kind of statement is this? Wind promoters have been working to take local control away for years. It began with state statute 66.0401 which was a legislative restriction on the ability of municipalities to regulate wind and solar except for issues that dealt with health and safety. So my county, Manitowoc County like others, wrote an ordinance which protected health and safety. Wind supporters lobbied that ordinances like these were too restrictive and got local control taken away and put in the hands of the PSC.

Through all this, property and wind rights have been lost. Wind developers have always pushed for minimal lot line setbacks so turbines can be legally placed on small parcels. With this they only have to come to terms with one landowner while using wind over the neighboring parcels free of charge. When using wind over adjacent lands, the developer, through State statutes, can control what is done on that land in order to protect wind access to their turbine. These lands may become unviable to host turbines of their own as the wind is already being used by someone else. Unsafe zones are also cast over these properties.

We need setbacks large enough to protect wind and property rights. Each landowner should be able to decide if their rights are for sale and then negotiate compensation. The State should not be deciding this for them.

Where I live we have two nuclear plants providing base load power to our state day in and day out. The plants provide good jobs to our area. These people spend money locally and have built homes adding to our tax base. We need to open up our state to new nuclear expansion.

We need economical power, especially in this day and age.

The promotion of conservation and efficiency is very important.

Do we actually need more power production in the State?

Are we siting wind turbines solely to meet State renewable guidelines?

According to the developer in our area this is what allows them to build their project.

According to the recent Strategic Energy Assessment prepared by the PSC, Wisconsin has a very significant and potentially expensive excess capacity.

Are we going to stop using facilities we currently have in exchange for wind power?

I want our leaders to make fiscally responsible decisions and use common sense when addressing our energy needs. We need to revamp and rethink our renewable goals.

We need to make changes to the wind siting rules.

Dean Anhalt
Supervisor, Town of Mishicot
Manitowoc County

Comments by the Towns of Mishicot, Two Creeks, Two Rivers,
Manitowoc County, Wisconsin, and the
Towns of Carlton and West Kewaunee,
Kewaunee County Wisconsin

The towns of Mishicot, Two Creeks, Two Rivers, Manitowoc County and the towns of Carlton and West Kewaunee, Kewaunee County respectfully submit our comments and concerns in regard to the May 14, 2010, draft of the Chapter 128 rules for wind energy systems.

The towns concur and endorse the concerns set forth by the Towns of Morrison, Wrightstown and Glenmore, Brown County, Wisconsin - Ref. PSC REF# 133746.

We submit the following for consideration by the PSCW when developing rules for Wind Energy Systems so that public safety and health are preserved.

Setbacks should be taken from the property line of the adjoining non-participants.

Setbacks should be large enough so as not to create shadow flicker or excessive ambient noise on adjacent property.

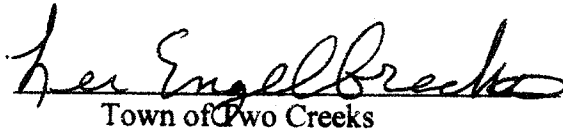
Setbacks should be large enough not to create a loss of wind or property rights for the adjoining property.

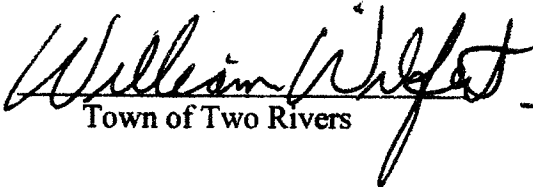
Decommissioning expenses should be backed by a Bond Fund from the developer.

Transportation should also include damage caused to roads from the decommissioning of the wind turbines.

EMS - Emergency Communication Interference caused by Wind Turbines should be corrected by the developer in conjunction with the political sub-divisions within a year.


Town of Mishicot


Town of Two Creeks


Town of Two Rivers


Town of Carlton


Town of West Kewaunee

10. <uniscouseu-recipients:>
Sent: Wednesday, October 06, 2010 8:57 AM
Subject: Wi electricity supply [W.eb.bd]

Study says state has more electricity supply than it needs

By JUDY NEWMAN | jnewman@madison.com | 608-252-6156 | Posted: Tuesday, October 5, 2010 5:35 pm | (2) Comments

Wisconsin has more electricity supplies than it needs, thanks to a buildup of generation and the effects of the recession, but getting power to customers is "an ongoing challenge," a new report says.

The recession has dramatically cut projections for future energy needs, according to a draft version of the Strategic Energy Assessment, a review conducted every two years by the Wisconsin Public Service Commission.

Peak energy demand is now expected to grow 1 percent a year statewide between 2011 and 2016, a sharp drop from projected annual increases of 2.1 percent in the 2008 report.

In individual comments, commissioner Lauren Azar said the recent phase of adding power generation has been "prudent" but coupled with the recession, Wisconsin has "very significant (and potentially expensive) excess capacity." Azar repeated her call for the Legislature to give the PSC more authority for long-term, comprehensive energy planning, rather than the current utility-by-utility assessment.

The draft report, which will be open for public comment until Jan. 7, also said Wisconsin is "well on its way" toward getting 10 percent of its electricity needs from renewable sources by 2015.

Posted in Govt-and-politics, Govt_and_politics on Tuesday, October 5, 2010 5:35 pm Energy Assessment, Electricity Supply, Psc, Public Service Commission, Lauren Azar

10/7/2010

Public Service Commission of Wisconsin (PSC)

Submitted: 6/24/2010 11:08:34 PM

COMMENTS FILED ELECTRONICALLY IN

Wind Siting Rules

1-AC-231

Commentor Information:

Name: Glen R. Schwalbach, P.E. for towns of Morrison, Wrightstown, and Glenmore
Address: 1090 Moonriver Dr
City: De Pere State:WI Zip:54115
E-mail: glenschwalbach@netzero.com
Phone: 920-680-2436

Comment:

Submitted to: Public Service Commission of Wisconsin
Docket No. 1-AC-231 Draft Chapter 128--Wind Energy Systems

Request by the Towns of Morrison, Wrightstown and Glenmore
Brown County, Wisconsin
June 23, 2010

Issue: Request to delay issuing the PSCW wind siting standards until epidemiological studies of health complaints from Wisconsin's current wind farms are thoroughly completed.

The towns of Morrison, Wrightstown, and Glenmore in Brown County are very concerned about the mounting evidence that there are serious negative impacts on human and animal health caused by wind turbines. It appears it is not only reasonable to delay the issuance of wind siting standards but it would be irresponsible to not do so in light of new studies and ongoing complaints of residents in and near Wisconsin's existing wind farms.

In general, scientifically and statistically relevant studies have been limited. But, a very important report was published March 2010 by the World Health Organization (WHO) entitled "Night Noise Guidelines for Europe" (available at euro.who.int/en/what-we-publish/abstracts/night-noise-guidelines-for-europe).

The report is based on a six-year evaluation of scientific evidence by thirty-five scientists from medical and acoustical disciplines. WHO indicated that now governments have justifications to regulate noise exposure at night. WHO sets the limit for annual average exposure to not exceed 40 decibels (dB) outside of a residence.

WHO stated, "Recent research clearly links exposure to night noise with harm to health. Sleep disturbance and annoyance are the first effects of night noise and can lead to mental disorders. Just like air pollution and toxic chemicals, noise is an environmental hazard to health". WHO stated that they hope their new report will prompt governments to invest effort and money in protecting health from this growing hazard.

Our towns ask the PSCW to acquire the WHO report and evaluate its application to setting appropriate sound levels for wind turbines.

The PSCW's draft rules do not address low frequency noise levels. It is not known whether the WHO report addresses this issue but other studies have described the likely effects. This is another area where epidemiological studies are needed before wind turbine setbacks can be reasonably proposed.

Besides sleep disturbance, there are complaints of other physiological problems. It is not acceptable to ignore or minimize the significance of these impacts as just quirks of human imagination.

Also, there is evidence that existing wind farms in Wisconsin are negatively affecting farm animals. Whether it is noise or some other physical phenomena, studies and testing should be done before setting siting standards.

At a public meeting of the Brown County Health Department and the Brown County Human Services Committee, reputable medical and health experts stressed the importance of epidemiological studies to determine the true nature of health impacts of wind turbines.

The State Board of Health pointed out that the lack of funding is a hurdle. But a conviction to do the right thing should prompt the PSCW to make a case to pursue the money issue with state legislators as well as our U.S. senators and representatives. Certainly, our towns would help in this endeavor. That said, it is even more appropriate for the wind developers and their associations to offer funding for independent studies since such studies should reduce future litigation. Electric utilities should have a stake in this effort as well. This is an opportunity to involve the University of Wisconsin research capabilities in both human health and animal health.

It appears that Act 40 does not set a deadline for completing the siting rules. This week a state senator who was one of the leaders in passing the wind siting law agreed that studies should be done to be sure the rules are adequate. If one or two years were used to study the existing wind farms while delaying any new installations, the developers would still have time to help utilities meet their 15% RPS by 2015. Again, if needed, our towns would help in getting the support of legislators.

Our towns implore the PSCW and the Wind Siting Council to not ignore the evidence of potentially serious health impacts and to not set standards until they have done the obvious and reasonable step of studying the health impacts of existing wind turbine installations in Wisconsin. Professional ethics demands no less. We believe our request aligns with the PSCW's responsibility to protect the citizens of Wisconsin.

Submitted for the towns by Glen R. Schwalbach, P.E.

I affirm that these comments are true and correct to the best of my knowledge and belief.
Glen R. Schwalbach, P.E. for towns of Morrison, Wrightstown, and Glenmore

4) NON-SEVERABILITY OF WIND RIGHTS FROM SURFACE RIGHTS

Recommendation: Wind rights should not be severed from the land.

Explanation: The intent of this policy recommendation is to ensure that the economic benefits of wind energy development stay connected to the land, and thus the local community as much as possible. The impact of this policy would be that wind rights cannot be sold or leased in perpetuity separately from the land.

Note that a similar provision is included in South Dakota statute (§ 43-13-17 to 43-13-19; Source: SL 1996, ch 260, § 4).

5) DECOMMISSIONING AND SITE CLEAN UP FUND

Recommendation: Wind project owners should be required to maintain a fund with adequate resources to cover the costs of decommissioning and site clean up.

Explanation: Many wind agreements are vague and include minimal incentives to ensure that the project owners follow through with site clean up after decommissioning. Provisions in many contracts leave too much chance that landowners will be left with the responsibility of removing equipment.

6) INSURANCE AND INDEMNITY PRACTICES

Recommendation: Wind developers must maintain liability insurance at a minimum level specified in the land agreement. The developer must indemnify the landowner against liabilities for injuries or claims caused by the developer's exercise of rights granted in the lease or easement.

Explanation: Landowners should not be held liable for issues related to the wind project.

7) GUIDELINES FOR SETBACKS

Recommendation: Turbines should be sited no less than five times their rotor diameter from property lines, unless written permission is given by the neighbor. An easement or lease on the neighbor's land would be considered written permission.

Explanation: This recommendation is designed to protect wind rights of all landowners and minimize the impact of

wind turbines on neighbors. Wind turbines produce wake effects 8-11 rotor diameters downwind. Requiring a setback of 5 rotor diameters from property lines provides a buffer that will protect the wind rights of all landowners in the vicinity of a wind project. We believe clear standards for property line setbacks are critical to preventing disputes over wind rights now and in the future. Without standards, conflicts among neighbors and among wind developers can arise. A prolonged or heated conflict over wind rights could delay or limit wind project development opportunities for a community.

This recommendation is based on the Minnesota Environmental Quality Board's wind access buffer rule that requires turbines to be placed 5 rotor diameters or more away from a project site's perimeter as a condition for granting permits on wind projects greater than 5 MW.

Alternative Recommendation: Establish a *Resource Based Compensation Model* for wind energy development where compensation is provided based on both real estate and wind resource usage.

Explanation: Wind energy development engages two primary natural resources: land and the wind blowing across it. Current models for compensating landowner hosts of wind projects are based on the use of the land for the placement of turbines, associated equipment and access roads. The wind resource consumed by a wind turbine extends approximately 8-11 rotor diameters downwind and approximately half as far laterally. A resource based compensation model for wind energy development would compensate all landowners in this "wind pool" or "wind print" in addition to the landowner providing real estate for the turbine. The need for mandated setbacks could be eliminated if all landowners providing wind resource are compensated. This model has the advantages of encouraging more collaboration within a community, preventing taking of anybody's wind resource without compensation, and providing the developer with maximum flexibility in siting turbines in the best wind locations. Disadvantages of this model include the possibility of complicating the land agreement process by the need for developers to negotiate with more landowners.

A fuller explanation of the Resource Based Compensation Model for Wind Energy Development will be available on the Windustry website later in the fall of 2005.



MICHELS CORPORATION

817 W. Main Street • P.O. Box 128 • Brownsville, WI 53006-0128
920/583-3132 • Fax 920/583-3429
www.michels.us

February 9, 2011

Senator Leah Vukmir
Representative Jim Ott
Joint Committee for Review of Administrative Rules
State Capitol
Madison, WI 53708

RE: PSC 128 (CR 10-057)

Dear Sen. Vukmir and Rep. Ott:

Michels Corporation supports the development and construction of wind energy projects in the state of Wisconsin. As background, Michels Corporation recently constructed the Forward Energy Center in Brownsville, WI. This 129 MW project had over 200 people employed as laborers, operators, ironworkers, and electrical workers, in addition to many support personnel who all worked together to get this project built safely and on time. Michels is proud of our environmental record on this project situated near the Horicon Marsh. We performed electrical construction for the Blue Sky Green Field, Butler Ridge and Glacier Hills projects, in addition to complete construction of the Shirley Wind project. While Michels is a diversified utility contractor, wind farm construction is an important part of our business.

We support the process the PSC used to identify the wind tower siting setback of 1,250 ft. The process was fair, balanced, and including various key stakeholders. Restricting the setback further would negatively impact the ability of wind developers to build wind generation projects in Wisconsin, and drive jobs and income to surrounding states. If given the opportunity, Michels, and our work force, would much rather work close to home and see the direct economic benefits of these projects enjoyed by Wisconsin businesses and Wisconsin workers – not those in a neighboring state.

The economic benefit of these projects goes all the way down to the local gas station. The BP station near the Forward Energy project daily sold hundreds of extra sodas and coffees during construction and Cunningham's Feed Mill restaurant and bar in Knowles had full lunch tables virtually every day during the 6-month peak construction period.

For each 100 MW wind project we employ on average 125 people over the duration of project, with 6-8 employed long term for maintenance. There are four 100 MW projects that likely would not be built if the 1,250 ft. setback is increased. This directly affects Michels and our employees.

Thank you for allowing us to offer our comments supporting wind farm development right here in America's Dairyland!

Sincerely,

Christopher J. Deschane
Business Development Manager

"BUILDING AMERICA, CHANGING THE WORLD"

BROWNSVILLE, WI • SEATTLE, WA • MILWAUKEE, WI • HARRISBURG, PA • NEENAH, WI • TOPEKA, KS
GREEN BAY, WI • EDMONTON, AB • PEORIA, AZ • BURNSVILLE, MN • SALEM, OR • WOODLAND, CA

"AN EQUAL OPPORTUNITY EMPLOYER"

February 9, 2011

Joint Committee for Review of Administrative Rules
Room 412 East
State Capital, Madison WI

My name is Larry Lamont and I regrettably live in an industrial wind turbine area.

I have three minutes to describe some of the situations I will live with the rest of my life.

I was a supporter of wind generation until after they were put up in my back yard. I learned so much. The impact has been a lot bigger and more intrusive than they had been portrayed.

Where do I begin?

Constant noise – even when not turning we hear the energy wasting transformer hum, continuous distracting motion, shadow flicker, environmental impacts, loss of “flight for life”, real and potential health problems, very obnoxious red flashing FAA warning lights, interference of radio reception, and according to the Wisconsin Realtors Association, up to a 40% reduction in property value.

Living inside the perimeter of a wind farm I can address all these problems. I bought 78 serene acres 40 years ago thinking I would be safe from intrusion by others. Not so. We have many omnipresent intruders. Three near the 1250-foot limit recommended by the PSC, one only 1101 feet from my house. Way to close.

I will first address the most persistent problem – noise, specifically the post-construction noise study. It seems that once the test is passed they will never be checked again and they are free to roar. I would like to make comment to three troubling statements in this study. First – The lead engineer is hard of hearing. After spending the better part of a week on site he said he did not witness the often described “whoosh-whoosh” of the turbines. Say what? Second – The report is very hard to understand. They even had trouble because they reported the cut in speed at 3m/sec when it should be 3.6m/sec. The significant of this is that the turbines were not producing electricity 71% of the time that day, just spinning slowly in the breeze. Thirdly – what is really meant by the engineer hired by the utility requiring all parties to meet before the test “to ensure a successful test”?

I borrowed a noise meter; on this meter I have had turbine noise readings as high as 63dbA. This is 20 TIMES the recommended 50dbA level. Remember these are on a logarithmic scale. Nobody is monitoring these abuses. Does anybody care – other than the people that have to live with under these conditions?

Monitoring should be continuous, unannounced and with no per-agreements. Noise is noise.

I passed my drivers test because I stayed under the posted speed. Does this exempt me from further monitoring – Hell no. Nobody is monitoring turbine noise. Why have guidelines if nobody gives a rip if they are ignored.

Our township has a nuisance ordinance. There are five definitions of causing or being a nuisance. The turbines are blatant violators of four of these categories. Here again the wind farms are beyond the law. They are not being monitored or held accountable. And they think they are good neighbors.

Another issue that bothers me is Vickermans band of 15 members that were selected to advise the PSC on wind tower placement. What a folly. Judging from their job descriptions who would ever have predicted this select group would support wind energy almost without reservation. What a waste of time and money. This is like asking a select group of tavern owners if they favor prohibition or not.

And I'm not totally buying into the green energy thing. Proponents say that the energy is carbon free. Nobody has talked about the large trail of energy and carbon that it takes to build, deliver and maintain these behemoths. It is the most expensive and least dependable way to generate electricity. 10 cents per kwh as opposed to 3-4 for coal and 2-3 for nuclear. And we still have to maintain all our other forms of generation because of there undependability.

If this information doesn't slow down the green theme a little check out some towers. Many are covered with dark splotches from a lubricant or something. Many blades are streaked with the same stuff. How much of this stuff are they splattering around the countryside?

These are a financial boon to those few that 'host' these things. \$175,000 per tower over the life span is nothing to sneeze at. The rest of us put up with all these conditions for nothing. Many of the "hosts" are unhappy also but they cannot be too vocal.

And finally, I get so frustrated when the press and media buys into how great these things are as told to them by the well funded industry that build them or distributes there product. When affected residents try to explain their problems with living near the towers we get the "some people just do not like these things" explanation. I challenge them to come live with us for a while and then try to think of anything you do like about them.

I would welcome any response to my comments. Did you hear them, do you understand? Any questions?

Larry Lamont
W 2362 Ash Rd
Malone, WI 53049

9 February 2011

PSC128 Hearing

My name is Matt Pugh, Customer Service Operations Manager from American Superconductor Corporation. We are a global electrical power technologies company with approximately 200 employees here in Middleton and New Berlin, Wisconsin.

Over the course of the past five years – through the economic downturn – we have grown our local employee base by more than 156%. We have plans to continue growing here in the years ahead. But if the state's policy on wind power changes, we might very well have to focus our hiring efforts elsewhere.

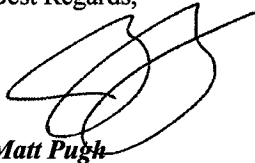
A vast majority of AMSC's revenues today come directly from the wind power market, and Wisconsin serves as our center of excellence for wind turbine power electronics and controls. We also manufacture grid interconnection solutions for wind farms and solar plants at our facilities here in the state.

Our company currently is planning to erect a wind turbine in Wisconsin. This will serve as a qualification bench for our next-generation power electronics, blade technology, generators and turbine controls, enabling AMSC to remain at the forefront of the wind industry. This is critical to our company's success and will help us continue to grow our headcount in the state.

AMSC also is uniquely positioned to bring a new wind turbine manufacturer into this state. We currently are working with a dozen wind turbine manufacturers worldwide, including two of the world's top ten producers. Some of these companies are looking to establish operations here in the U.S. A manufacturer like this would create hundreds of new green collar jobs and also would require a host of partners who could supply towers, blades and other critical components. A strong local market will foster new manufacturers and their suppliers. Wisconsin is one logical locale for this new manufacturer and supply chain, but only if support for the industry remains strong.

We urge this Committee to uphold PSC 128 for the sake of our company, our employees and our state.

Best Regards,



Matt Pugh
Customer Service Operations Manager
American Superconductor Corp.

8401 Murphy Drive
Middleton, WI 53562
Ph: +1 608.828.9236
Mobile: +1 608.215.4307
mpugh@amsc.com
www.amsc.com

AMERICAN SUPERCONDUCTOR CORPORATION
8401 MURPHY DR, MIDDLETON, WI 53562
TEL: +1 608.828.9236 FAX: +1 608.831.4609

Why are we promoting Wind Energy in Wisconsin?

(negative impacts to Property owners)

Tim Harmann
4544 Mill Road
Denmark, WI 54208

Running for Town Supervisor in the Town of Morrison, Brown County, Wisconsin

Property owners

What is the Return on Investment (ROI) on Subsidizing Wisconsin Wind Energy with Tax Dollars?

- Carbon Emissions
 - Bentek Energy Study
 - http://www.bentekenergy.com/files/userfiles/file/BENTEK%20-%20Executive%20Summary%20-%20How%20Less%20Became%20More_100416.pdf
 - 3 Page Executive Summary
 - RPS (renewable portfolio standards) "must take" mandate on wind energy causes cycling of coal plants to accommodate inconsistent wind power and therefore has had minimal or no impact on reducing carbon emissions. In some cases emissions are actually increased due to introduction of wind energy.
 - ROI: Basically little, no, or negative benefit on emissions
- Wisconsin Wind Class
 - Department of Energy
 - http://www.windpoweringamerica.gov/maps_template.asp?stateab=wi
 - Wisconsin is a Class 1 (Poor) and Class 2 (Marginal) wind state
 - Large subsidies of tax dollars to support wind projects that can never break even
 - 35% overcapacity of power in Wisconsin (why create more expensive power?)
 - Wind Averages 20% of installed name-plate capacity in Wisconsin
 - Do the math...It doesn't make any sense
 - ROI: Huge unnecessary spending, Negative payback
- Targeting Niagara Escarpment (class 2 - marginal)
 - Bedrock and Aquifers are only a few feet from the surface on the Niagara Escarpment causing runoff pollution and well issues. This is already a fragile area.
 - http://www.co.brown.wi.us/departments/page_1efd5d9c60d3/?department=097c0e79486a&subdepartment=7c17181709a3
 - Wells in the Town of Morrison have a history of issues
 - In 2006, over 34% of the wells tested exceeded the state drinking water standard for nitrate/nitrite (ppm N) of 10 ppm and 19% tested positive for bacteria.
 - ROI: Negative benefit to our health and water supply

- Health issues are one of the negative returns on this investment
 - Need a ½ mile setback from a property line and 5 dba over ambient to protect Wisconsin citizens who pay these taxes to subsidize wind that has no positive ROI
 - I've personally interviewed 10 people in the Blue Sky Green Fields WE Energies project near Fond Du Lac and they are experiencing sleep and noise issues
 - 4 of 10 allowed me to video our interviews
 - <http://www.youtube.com/watch?v=34oOPKNJv-E>
 - <http://www.youtube.com/watch?v=9PvPXU0io A>
 - <http://www.youtube.com/watch?v=pzh106w1IRA>
 - <http://www.youtube.com/watch?v=GlbzYXSM0zs>
 - Overall ROI: Negative impacts and not enough citizen protection
- Our new Governor Scott Walker
 - Realizes that expensive wind energy and the resulting costly expansion of our over-taxed transmission lines will increase the cost of energy to manufacturers who are considering Wisconsin
 - We're restricting job creation in Wisconsin by promoting negative ROI, expensive, and inefficient wind energy.
 - Isn't responsible spending needed by ALL IN THIS ECONOMY(or any economy)?
 - We need to get on a single course/mission, working together to get out of this recession and emerging strong and moving forward
 - We cannot allow minimal setbacks which will allow more wind turbines and more wasteful tax spending with no ROI
 - ROI: Wisconsin Unattractive for Manufacturing/Business creation
- What about the Property Value Loss for homes near wind turbines
 - <http://www.wind-watch.org/documents/wind-turbine-impact-study/>
 - Appraisal Group One Study of Wind Turbines on Property Values
 - 24% - 47% loss in property value depending on size of parcel, improvements, and proximity to wind turbine
 - Why "Wind Farm Ghetto"?
 - Each turbine has a circle of Property Value "Taking" around it.
 - Shorter Setbacks = greater number of homes in the "Taking" circle
 - I personally quit making improvements to my beautiful home because my property improvement ROI has become negative due to the proposed wind turbines around my home.
 - Area Contractors suffer because large projects aren't started
 - Area retailers suffer because improvements ^{aren't} are made
 - Apprehensiveness to invest due to uncertainty about the wind projects (very much like the recession and struggling stock market)
 - Hard enough to attract talent to cold weather states now we're making it difficult for them to buy or build homes in Wisconsin rural areas
 - ROI: Huge loss to Property owners in the "Taking" circle.

Where is the positive return on our Tax investment? It doesn't exist!

What do we need to stop doing?

- Quit forcing more expensive power on our struggling businesses.
- Quit splitting up communities over wind. We need to work together.
- Quit killing the property values and property rights of citizens near wind turbines.
- Quit trying to reduce setbacks to force wind turbines too close to people
- Quit impacting health and sleep
- Quit killing the retailer's and contractor's businesses near wind ghettos.

What are some solutions?

- Reject subsidies on projects that don't have an ROI and do little of nothing to reduce emissions
- Put subsidies into research grants to find an innovative renewable energy replacement for coal that doesn't have all the side effects of wind power.
 - Wind companies could use their experience in renewable energy to find a viable solution that has an ROI and reduces emissions.
 - Solution could even create less expensive power than coal
 - Create jobs in Wisconsin and put us on the map
- Give subsidies/incentives to coal plants to install cleaner emission systems.
 - Wouldn't that solve everyone's problems?
- If we must subsidize wind turbines (and I would like a logical explanation of why we would invest tax dollars here) we must provide protection to Wisconsin citizens and businesses:
 - ½ mile setbacks from property lines and 5 dba over ambient to reduce the negative impacts of wind turbines

Sources are below that were referenced above:

http://www.windpoweringamerica.gov/maps_template.asp?stateab=wi

Department of Energy:

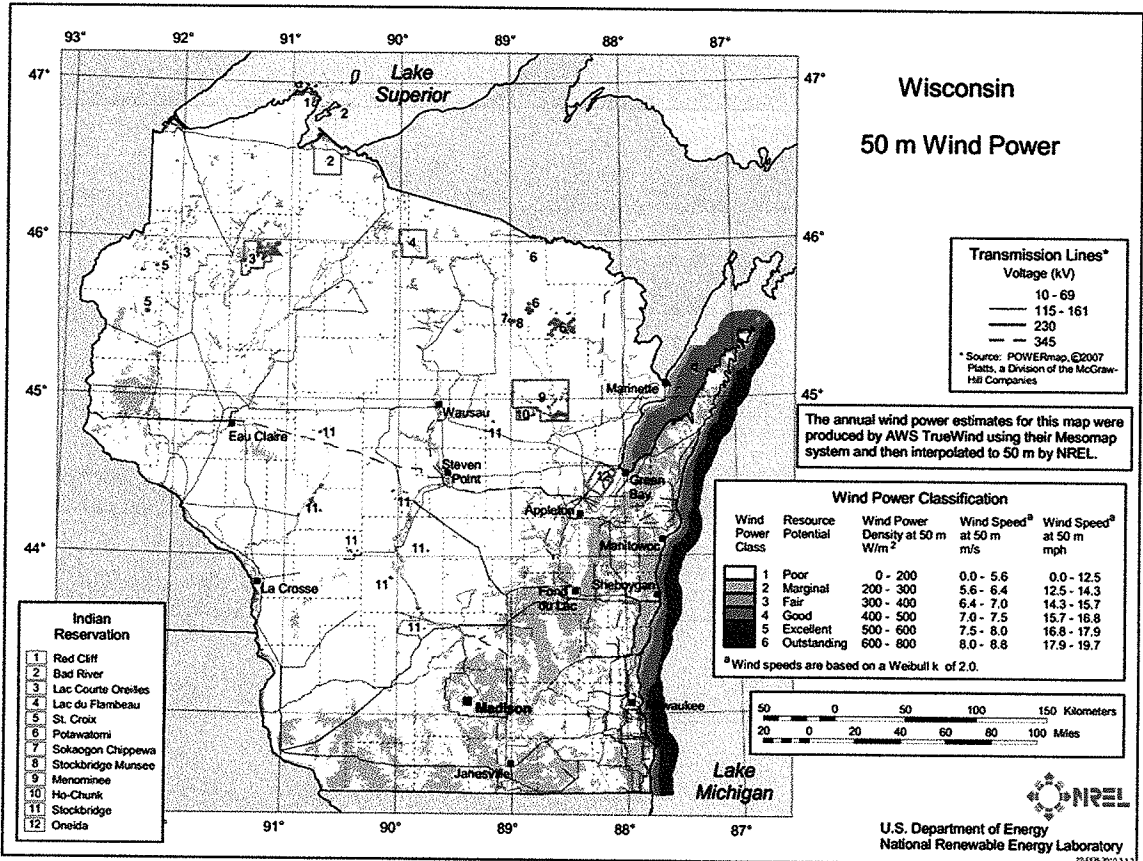
The Department of Energy's Wind Program and the National Renewable Energy Laboratory (NREL) published a wind resource map for the state of Wisconsin. This resource map shows wind speed estimates at 50 meters above the ground and depicts the resource that could be used for utility-scale wind development. Future plans are to provide wind speed estimates at 30 meters, which are useful for identifying small wind turbine opportunities.

As a renewable resource, wind is classified according to wind power classes, which are based on typical wind speeds. These classes range from Class 1 (the lowest) to Class 7 (the highest). In general, at 50 meters, wind power Class 4 or higher can be useful for generating wind power with large turbines. Class 4 and above are considered good resources. Particular locations in the

Class 3 areas could have higher wind power class values at 80 meters than shown on the 50-meter map because of possible high wind shear. Given the advances in technology, a number of locations in the Class 3 areas may be suitable for utility-scale wind development.

This map shows the highest wind resources in Wisconsin are concentrated in the southern and eastern part of the state. Class 3 areas are predominately located on capes and exposed coastal locations along Lake Michigan and Green Bay. Particular locations in the Class 2 and Class 3 areas could have higher power class values at 80 meters than shown on the 50-meter map because of high wind shear. Given the advances in technology a number of locations in the southern and eastern part of Wisconsin may be suitable for utility-scale applications.

Note: Wind resource at a micro level can vary significantly; therefore, you should get a professional evaluation of your specific area of interest.



Wisconsin

50 m Wind Power

Transmission Lines*
Voltage (kV)

- 10 - 69
- 115 - 161
- 230
- 345

* Source: POWERmap, ©2007
Flatts, a Division of the McGraw-Hill Companies

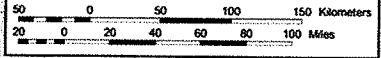
The annual wind power estimates for this map were produced by AWS TrueWind using their Mesomap system and then interpolated to 50 m by NREL.

Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m ²	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
1	Poor	0 - 200	0.0 - 5.6	0.0 - 12.5
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7

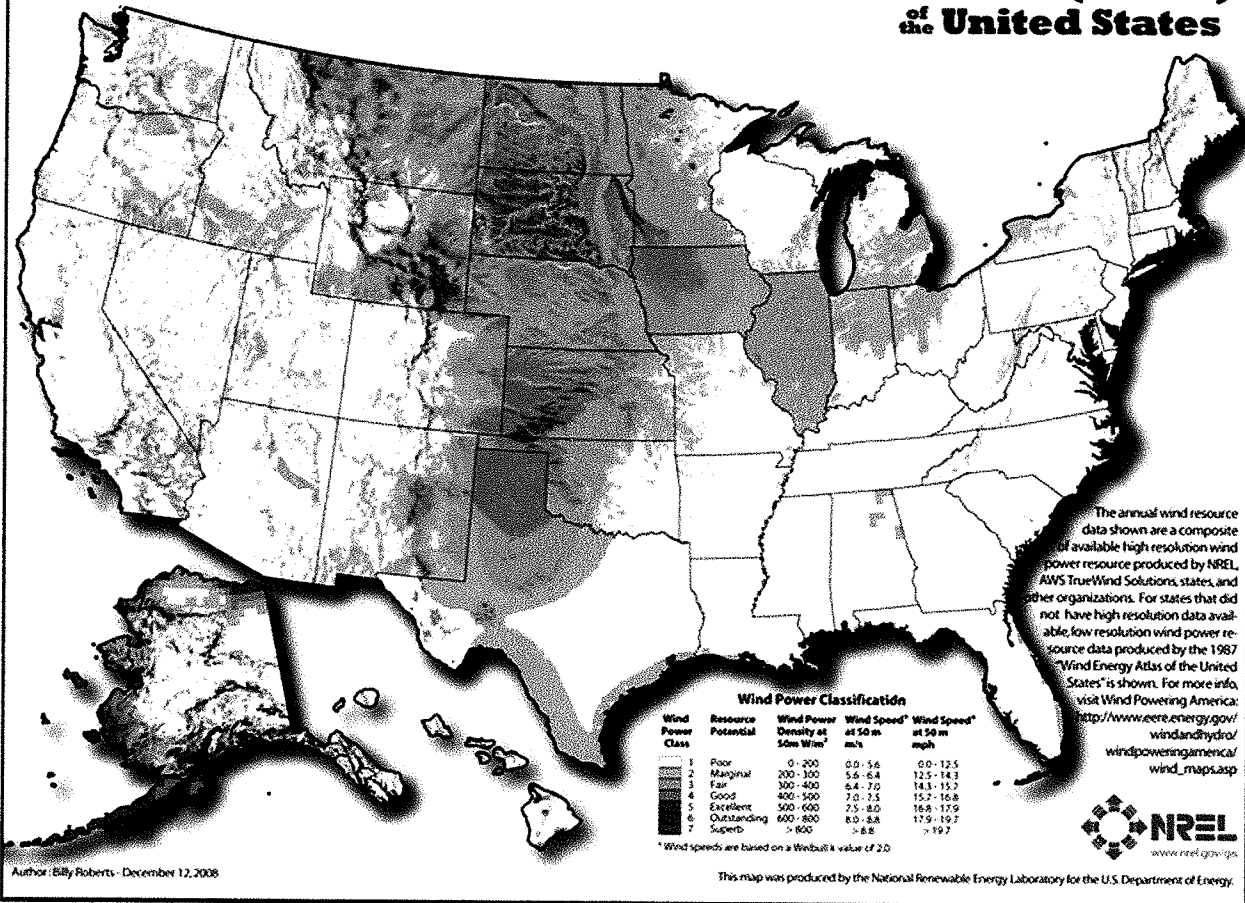
^a Wind speeds are based on a Weibull k of 2.0.

- Indian Reservation**
- 1 Red Cliff
 - 2 Bad River
 - 3 Lac Courte Oreilles
 - 4 Lac du Flambeau
 - 5 St. Croix
 - 6 Potawatomi
 - 7 Sokaogon Chippewa
 - 8 Stockbridge Munciee
 - 9 Menominee
 - 10 Ho-Chunk
 - 11 Stockbridge
 - 12 Oneida



NREL
U.S. Department of Energy
National Renewable Energy Laboratory
22156-20-0-113

Wind Resource (50m) of the United States



The annual wind resource data shown are a composite of available high resolution wind power resource produced by NREL, AWS TrueWind Solutions, states, and other organizations. For states that did not have high resolution data available, low resolution wind power resource data produced by the 1987 Wind Energy Atlas of the United States is shown. For more info, visit Wind Powering America: http://www.eere.energy.gov/windandhydro/windpoweringamerica/wind_maps.asp

Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50m W/m ²	Wind Speed* at 50 m m/s	Wind Speed* at 50 m mph
1	Poor	0-200	0.0-5.6	0.0-12.5
2	Marginal	200-300	5.6-6.4	12.5-14.3
3	Fair	300-400	6.4-7.0	14.3-15.7
4	Good	400-500	7.0-7.5	15.7-16.8
5	Excellent	500-600	7.5-8.0	16.8-17.9
6	Outstanding	600-800	8.0-8.8	17.9-19.7
7	Superb	> 800	> 8.8	> 19.7

* Wind speeds are based on a Weibull k value of 2.0



Author: Billy Roberts - December 12, 2008

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy.



Groundwater and Well Information

In 2006, the Town of Morrison experienced a never before seen well contamination problem. Over 34% of the wells tested exceeded the state drinking water standard for nitrate/nitrite (ppm N) of 10 ppm and 19% tested positive for bacteria. While the Department of Natural Resources officially stated that the source of the problem was undetermined, the karst features in the area proved that significant well contamination issues could continue to plague the area.

Karst is any terrain based on a layer of soluble bedrock, usually, though not always, of carbonate rocks. In Brown County, and most of northeast Wisconsin, karst forms on limestones (calcium carbonate) and dolomites (magnesium calcium carbonate), found primarily along the Niagara Escarpment or as locally referred to as "the ledge". Common natural Karst features include:

1. **Sinkholes** - Depressions in the ground surface caused when sediment overlying the bedrock washes into bedrock into bedrock channels and cavities or by the collapse of cave roofs. Sinkholes vary in size and have slopes ranging from gradual to severe. Surface water draining into sinkholes can enter nearby wells quickly.
2. **Bedrock outcroppings** - Limestone or dolomite bedrock protruding from the

ground surface.

3. **Springs** - Water flowing out of the ground from subsurface flow paths.
4. **Disappearing or sinking streams** - Small surface streams that enter subsurface flow paths.
5. **Earth cracks** - Cracks from a few inches to several feet formed when a limestone formation leans toward an unsupported area such as a valley.
6. **Flaggy soil** - Soil with "flags" of small limestone pieces mixed with the soil. The mapping of flaggy soils is a useful identifier of limestone bedrock a short distance beneath the surface.

Karst makes for beautiful scenery, but it is very vulnerable to groundwater pollution, due to ease of water flow. Natural filtration is nearly non-existent in karst areas. To make matters worse, cave conduits act as natural sewer lines, and sinkholes become personal garbage dumps in small towns and rural areas, which puts the local drinking water supplies at risk. It is only recently that these problems are beginning to be addressed.

<http://www.wind-watch.org/documents/wind-turbine-impact-study/>

Wind Turbine Impact Study

[[Alternate short URL for linking](#) • [HOME](#)]

Author: Appraisal Group One

This is a study of the impact that wind turbines have on residential property value. The wind turbines that are the focus of this study are the larger turbines being approximately 389ft tall and producing 1.0+ megawatts each.

The study has been broken into three component parts, each looking at the value impact of the wind turbines from a different perspective. The three parts are: (1) a literature study, which reviews and summarizes what has been published on this matter found in the general media; (2) an opinion survey, which was given to area Realtors to learn their opinions on the impact of wind turbines in their area; and, 3) sales studies, which compared vacant residential lot sales within the wind turbine farm area to comparable sales located outside of the turbine influence.

The sponsor for this study was the Calumet County Citizens for Responsible Energy (CCCRE) (Calumet County, Wisconsin), which contracted our firm, Appraisal Group One, to research the value impact that wind turbines have on property value. Appraisal Group One (AGO) protected against outside influence from CCCRE by having complete independence to the gathering of facts, data and other related material and the interpretation of this data to the purpose of this study. AGO chose the location of the study, the search parameters, the methodology used and the three-step approach to the study. AGO does not enter into any contract that would espouse any preconceived notion or have a bias as to the direction of the study and its findings. The purpose of the study was to investigate the value impacts of large wind turbines, the issues influencing these impacts and to report these findings on an impartial basis. ...

The geographic area of this study was focused in Dodge and Fond du Lac Counties. These two counties have three large wind farms. They are:

- WE Energies – Blue Sky Green Field wind farm which has approximately 88 wind turbines and is located in the northeast section of Fond du Lac County, bordering Calumet County to the north.
- Invenergy – Forward wind farm which has approximately 86 wind turbines and is located in southwest Fond du Lac County and northeast Dodge County.
- Alliant – Cedar Ridge wind farm which has approximately 41 wind turbines and is located in the southeastern part of Fond du Lac County.

Of these three wind farms, only the WE Energies and Invenergy wind farms were used in the sales study since the Alliant – Cedar Ridge wind farm did not have enough viable sales within the turbine influence area to use as a base of comparison. The Realtor survey was limited to Fond du Lac and Dodge Counties, that being the area which had the three wind farms. ...

Summary of Findings & Conclusion of Impact

The survey indicated that in all but two scenarios (those being Questions #8 and #9), over 60% the participants thought that the presence of the wind turbines had a negative impact on property value. This was true with vacant land and improved land. Where the group diverted from that opinion is when they were presented with a 10-20 acre hobby farm being in close and near proximity. In these cases 47% (close proximity) and 44% (near proximity) of the participants felt that the wind turbines caused a negative impact in property value.

The answers showed that bordering proximity showed the greatest loss of value at -43% for 1-5 acre vacant land and -39% for improved properties. Next in line was the close proximity showing a -36% value loss for 1-5 acre vacant land and -33% for improved property. Last in line was the near proximity, showing a -29% loss of value for a 1-5 acre vacant parcel and -24% loss in value for improved parcels. These losses show a close relationship between vacant land and improved land. This pattern was replicated regarding the bordering proximity for a hobby farm, whereas 70% believed it would be negatively impacted. Lastly, the opinions regarding the impact of the wind turbines due to placement, that being in front of the residence or behind the residence, showed that in both situations most participants believed there would a negative impact (74% said negative to the front placement and 71% said negative to the rear placement).

In conclusion, it can be observed that: (a) in all cases with a 1-5 acre residential property, whether vacant or improved, there will be a negative impact in property value; (b) with 1-5 acre properties the negative impact in property value in bordering proximity ranged from -39% to -43%; (c) with 1-5 acre properties the negative impact in property value in close proximity ranged from -33% to -36%; (d) with 1-5 acre properties the negative impact in property value in near proximity ranged from -24% to -29%; (e) in all cases the estimated loss of value between the vacant land and improved property was close, however the vacant land estimates were always higher by a few percentage points; (f) it appears that hobby farm use on larger parcels would have lesser sensitivity to the proximity of wind turbines than single family land use; and (g) placement either in front or at the rear of a residence has similar negative impacts.

My name is Sandra Johnson, and I wish to thank you for the opportunity to ask this committee to "Suspend the Rules" as sent to you by the PSC. I am a resident of the Holland township in southern Brown County.

As a retired Green Bay science teacher, several questions came to mind when a proposed wind turbine project in our community jumped from 4 or 5 turbines as told to our town board to 100 1.5 Megawatt 40-story turbines in four townships.

Why would a wind energy corporation keep the real number of turbines in their project quiet for over 2 years, and how did they accomplish that? Often turbine contracts have a confidentiality clause which prohibits a participating landowner to speak to anyone -- not the press, not their neighbors.

And the second clause often included is the "Right of First Refusal". If that landowner finds that for whatever

reason-- health or economic -- after the turbines go online that his family cannot live there, the wind project owner or investors get first bid on that home and the land that goes with it. And who ends up with that land?? It's a win for the wind corporation and a loss to the local community.

About ten years ago, when the Lincoln Township wind project in Kewaunee County went online, ground current problems rose and Scott Srynka said that "...trucks have grown more frequent hauling away the (cow) carcasses." He added, "Thirteen turbines were proposed for my land, but we decided to wait. Thank goodness we did, or we'd be out of farming." Is Wisconsin the "dairy state" or isn't it??

Some citizens are no longer waiting for answers. They are taking action. In the Dec. 7th. 2010 Contra Costa Times it was reported that a judge in California settled a two year case brought against NextEra Resources by that state and environmental groups. The 1,300 plus annual raptor

deaths (Golden Eagles, hawks, falcon and owls) in the Altamont Pass in the northern part of the state was unacceptable. NextEra got a \$2.5 million fine, must replace 2,400 old turbines over the next 4 years. If that does not reduce greatly the bird kills, NextEra must remove even those newer turbines. High bird and bat kill numbers as reported here by our state DNR in 3 Wisconsin wind projects can't be seen as an asset to tourism which is another big Wisconsin industry.

Tom Tanton, engineer and former member of the California State Energy Board for 35 years says, “. . .most of the ‘stimulus’ cash grants to wind. . .actually ended up overseas. . . Wind energy is not economically competitive and utilities are forced . . .to pass along the higher costs to their customers. . .”.

Finally, in a December show on Late Night with David Letterman, his guest reported that Texas billionaire T. Boone Pickens is working to get back \$200 million dollars

that he invested in an order for industrial wind turbines. He has shifted away from wind to a focus on natural gas. What does he know about wind energy that you do not?

Thank you for your time.

Sandra Johnson

1893 Wayside Rd.

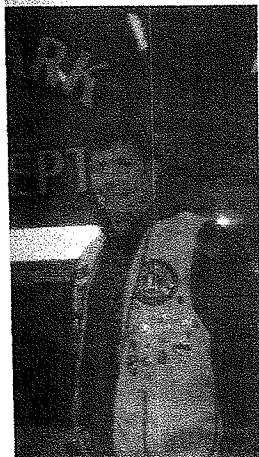
Greenleaf, WI 54126

(920) 532-4725

Project

now it is for sale again.

ns Club 5,000 Volunteer ment



ts a \$5,000 donation from
(nt). The donation will be put

rapped or is unable to exit
r own.

e 24 inch and the 48 inch
tabilizer struts, plus related
and straps, also purchased
e donation, will be used at
accidents when any ex-
n needs to be performed.
its when in place will hold
e steady, whether it is on
on its roof, or even on top
her vehicle. This will keep
icle from moving while
s of Life are used during a
ion, to prevent any further
to occupants and lessens
ger of the firefighters per-
the rescue.

IT teams were formally
ed in Brown County a
of years ago, after the
f Green Bay Firefighter
Voulf in a house fire on
Bay's east side. Much
and practice is done on a
asis to participate on the
he Denmark RIT team
ipment is assigned to En-
12 at station one, located
illage of Denmark.. Den-
re responded to 38 acci-
it of 90+ calls in the last
ir.

Shirley 'Un-Winds'

Shirley Wind Project for sale, developers
still keen on addressing residents' concerns



Shadow flicker is the effect caused by sun-
light shining through the spinning blades of a
wind turbine. This effect is most dramatic when
it falls on windows, causing strobe-like light-
ing conditions. While this effect is typically
minimized during the planning phase of a wind
project by carefully selecting the locations of
turbines, as wind farms move into more heavily
populated areas, it becomes nearly impossible to
avoid shadow flicker entirely.

Current zoning in the Town of Glenmore,
where Shirley Wind LLC is nearing completion
of the much debated 20 megaWatt wind farm,
limits shadow flicker on residential structures,
where it can most bother people, to 20 cumula-
tive hours per year. Upon hearing complaints
from one area resident about shadow flicker,
Shirley Wind looks to take the high road.

According to sources at the wind farm, the
renewable energy developer is investing in soft-
ware upgrades that can read all of the variables
that determine whether or not shadow flicker
will fall on residences. John Maserjian of Cen-
tral Hudson Gas & Electric (CHG&E) which
owns roughly 90 percent interest in the facility
says, "Shad-

Central Hudson Gas & Electric Corpora-
tion (CHG&E) of Poughkeepsie, NY, which
owns roughly ninety percent of the Shirley Wind
Project, has begun the process of selling the 20
megaWatt energy production facility. The project
has yet to even be completed, and already the
utility is courting buyers, although they say the
move has more to do with a shift in corporate
strategy versus the pros and cons of the Shirley
installation itself.

John Maserjian, CHG&E spokesman for
the Shirley Wind project confirms, "That is true.
In October our Board of Directors announced
a change in strategy for CH Energy Group,
and we're looking to refocus the company on
our utility operations in New York and also our
fuel distribution operations in the Mid-Atlantic
area. So we're looking also to 'unwind' our in-
vestments in renewable energies including the
Shirley Wind investment. We're moving in that
direction. We're not at the point where we can
announce any prospects or interest, but we're
taking the preliminary steps."

CHG&E also has minority investments of
about \$5 million in two other wind projects, a

Continued on page 3

Continued on page 3

Continued from page 1

ow flicker is something that occurs during certain times of the day, certain times of the year. There's a lot of variables—cloud cover, wind direction, things like that. We anticipate that some residents may be affected for a limited time during limited times of the year. There are several options and ways that we can reduce shadow flicker, and we'll certainly employ those once the wind project testing is finished and we're actually running the wind farm."

Shirley Wind appears to have been prompt and responsive to residents' concerns. While many area residents have voiced concern over the project for various reasons—including property values, health and safety risks, and aesthetic conflicts, many wind advocates cite the Glenmore project as an example of how to do wind project responsibly. Maserjian notes, "One of the things that interested us (CHG&E) in the Shirley Wind Project from the beginning was that the initial developer had really done an admirable job in laying out the ground work for the project—in involving the property owners and the community at large."

That initial developer, Emerging Energies LLP, says they are very proud of the project, and have plans in the works for additional projects in the state.

Shirley Wind has also received at least one complaint from a resident about the noise produced by the turbines. Shirley Wind officials report they met directly with the affected residents to discuss the issue. Project manager Jo in Roberts says they are working on an adapted baffle for the nacelle, or rear generator housing part of the turbine, to abate some of the noise produced by the motor. Upon final completion of the construction phase of the project, developers will, as required by the town, measure noise levels to determine compliance with current ordinances.

Maserjian explains, "As with any project like this there may be some concerns raised, and of course it's always our goal to address those concerns head-on and to the best of our ability satisfy those citizens. We're going to work with the property owners on a case by case basis to see how we can satisfy them best. Some may have issues that may require us to do something else. We'll take that into consideration as we work with them."

Continued from page 1

7.5-megawatt wind farm located in Atlantic City, NJ and a 24-megawatt facility in Bear Creek, PA. Maserjian says CHG&E is 'unwinding' (a fancy term for selling) all of their investments in renewable, not just the Shirley project. "There's a biomass plant in upstate New York that produces steam and electricity from wood products that's located near a lumbering site that's for sale as well. We also have an interest in an ethanol plant in Nebraska that will be sold," he said.

In a press release dated October 28, 2010, just under two weeks before the quiet ribbon cutting for the Shirley Wind facility, CHG&E Chairman of the Board, President and C.E.O. Steven V. Lant said, "[W]e have concluded that we do not possess the same strong competencies and competitive advantages in renewable energy. These investments do not typically display the risk and return profiles that are consistent with our financial objectives, requiring higher levels of leverage and more volatility than we are comfortable with. As we announced last quarter, we have discontinued development efforts in this area, and we will now begin to unwind the existing investment portfolio in an orderly manner."

The unexpected news will probably excite wind farm critics, who in addition to any number of personal concerns, have called wind turbine development a costly mistake. Many critics of the subsidized fledgling wind industry claim the costs associated with wind energy raise the flag of increased electricity prices as well as irrecoverable tax moneys used to spur development.

Bill Rakocy, one of the founders of project developer Emerging Energies LLP, declined comment on the impending sale, but the move appears somewhat unexpected. Maserjian continues, "It was not our intention to sell the project when we first made the investment, but over the course of the year we reevaluated our strategy and our operations, and decided that it would be in the best interest of our investors to sell, or 'unwind', our renewable energy investments."

...man Jr, Andy Nicholson and Troy Streckenbach, will be present.

In addition to the County

The Denmark Lit

The Denmark Library had a special visitor for story time on Wednesday, January 26. Corduroy the Bear joined the library's little friends for bear stories,

Brown County Ve

Brown County Veterans Services has changed the schedule for the Denmark Out Station Days. Beginning in 2011 Jerry Plolus, Veterans' Service

All Saints P

All Saints Catholic Grade School proudly announces their 2nd Quarter Honor Roll.

Grade 8: "High A" Jared Phillips;

"A" Nick Kufalk, Jacolyn Younk & Victoria Younk

"B" Duncyn Neta & Heather Schaefer

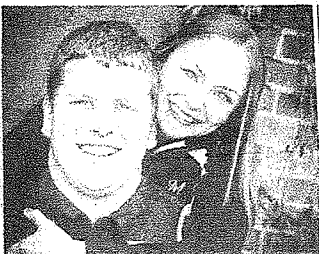
Grade 7: "A" Nathan Ciriacks

"B" Colin Kafka, Chad Kropp, Johan Rau, Evan Rys

Our Savior's S

Our Savior's Lutheran Church is once again hosting their Sunday "Soup To Go". Chili and Creamy Chicken &

ENGAGEMENT



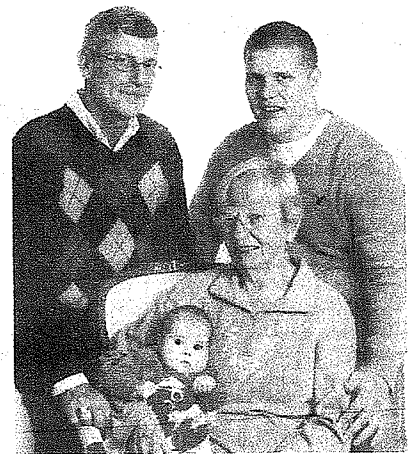
Jeff and Char Marcell of Schofield announce the engagement of their daughter Tara Ann Marcell to Garrett James Lancelle son of Paul and Nancy Lancelle of Denmark.

Tara graduated from D.C.E.

Elementary Education from St. Norbert College. Tara is currently employed at D.C. Everest School District teaching first grade at Rothschild Elementary School.

Garrett graduated from Denmark High School and earned a Bachelor's degree in Elementary Education from St. Norbert College. Garrett is currently a substitute teacher in the Edgar and D.C. Everest school districts.

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**Altamont wind energy company to pay \$2.5 million and
replace turbines to reduce raptor deaths**

By Denis Cuff

Contra Costa Times

Posted: 12/06/2010 12:11:30 PM PST

Updated: 12/06/2010 05:20:18 PM PST

The largest wind energy producer in the Altamont Pass area of eastern Alameda and Contra Costa counties has agreed to replace 2,400 wind turbines within four years and pay \$2.5 million in a legal settlement to reduce deaths of eagles, hawks and other raptors hacked by turbine blades.

The settlement between NextEra Energy Resources, the state, and several environmental groups was announced Monday by the state Attorney General Jerry Brown.

One environmental leader praised the deal as a model for producing wind energy while minimizing the heavy toll the whirling turbine blades take on hundreds of raptors each year.

"We think that is a landmark agreement that balances the need for clean energy with protections for wildlife," said Michael Lynes, conservation director for the Golden Gate Audubon Society. "This is an aggressive schedule for replacing turbines with new ones. It will go a long way toward reducing the kills in the Altamont area."

The settlement resolves a debate about whether the company was making sufficient progress toward a previous legal pledge to reduce bird kills by 50 percent from 2007 to 2010.

"Rather than focus on the 50 percent debate, we agreed to get something in place that uses modern technology to

increase protections for the birds," Lynes said. "This does not resolve all the problems with avian mortalities, but it is a big step forward toward reducing them."

New wind turbines are much larger and produce much more energy than old ones, reducing the number of blades that birds can fly into.

Under the deal, NextEra agreed to replace 2,400 of its turbines within four years. If it falls behind schedule, the company also pledges to shut down all its existing turbines no later than 2015.

The company also pledged to put the new turbines in environmentally friendly locations. Many turbines installed in the Altamont Pass in the 1970s and 1980s were placed in swales between ridges where golden eagles like to soar while looking for prey, biologists say.

The wind company said it would contribute \$1.25 million to the California Energy Commission for research on reducing bird kills at Altamont Pass.

The wind company will give another \$1.25 million to the East Bay Regional Park District and the Livermore Area Recreation and Park to improve and protect raptor habitat.

According to an 2004 state study, wind turbines at Altamont Pass kill an estimated 1,766 to 4,271 birds annually, including 880 to 1,330 raptors such as golden eagles, hawks, falcons and owls.

The Altamont Pass is a prime breeding and migratory area for raptors.

Thomas Tanton



Mr. Tanton is President of T² & Associates, a firm providing consulting services to the energy and technology industries. T² & Associates are active primarily in the area of renewable energy and interconnected infrastructures, analyzing and providing advice on their impacts on energy prices, environmental quality and regional economic development. Mr. Tanton has 40 years direct and responsible experience in energy technology and legislative interface, having been central to many of the critical legislative changes that enable technology choice and economic development at the state and federal level. Mr. Tanton is a strong proponent of free market environmentalism and consumer choice, and frequently publishes and speaks against alarmist and reactionary policies and government failures.

As the General Manager at EPRI, from 2000 to 2003, Mr. Tanton was responsible for the overall management and direction of collaborative research and development programs in electric generation technologies, integrating technology, market infrastructure, and public policy. From 2003 through 2007, Mr. Tanton was Senior Fellow and Vice President of the Houston based Institute for Energy Research. Mr. Tanton was also a Senior Fellow in Energy Studies with the Pacific Research Institute until 2010. Until 2000, Mr. Tanton was the Principal Policy Advisor with the California Energy Commission (CEC) in Sacramento, California. He began his career there in 1976. He developed and implemented policies and legislation on energy issues of importance to California, and U.S. and International markets, including electric restructuring, gasoline and natural gas supply and pricing, energy facility siting and permitting, environmental issues, power plant siting, technology development, and transportation. Mr. Tanton completed the first assessment of environmental externalities used in regulatory settings. Mr. Tanton held primary responsibility for comparative economic analysis, environmental assessment of new technologies, and the evaluation of alternatives under state and federal environmental law. Mr. Tanton served as Guest Lecturer for the Master in Environmental Science program at California State University Sacramento (CSUS), lecturing on power plant and electric grid technologies and their comparative environmental impacts.

Main Concerns with Wind Energy Development

Tom Tanton 10/6/2010

Wind energy is primarily built for tax purposes

During the past decade, the wind and other renewable energy industries have been incredibly successful in getting federal and state government officials to grant them generous tax breaks and subsidies, including state Renewable Portfolio Standards. The wind industry, which has received nearly \$4.5 billion in "stimulus" program cash grants during the past year from the Obama Administration, apparently has plenty of cash to finance its intense lobbying. Most of that money actually ended up overseas. Wind energy is subsidized 20-30 TIMES conventional sources per unit of production. Even so, it is not economically competitive, and utilities that are forced to produce or buy electricity from renewable energy facilities pass along the higher costs to their customers via their monthly bills.

Wind energy does not offset any petroleum or petroleum imports

A persistent myth is that increasing wind- and solar-generated electricity will reduce our dependence on foreign oil and thus boost our energy security. Less than 1% of our electricity is generated using petroleum, so any renewable generation will have no appreciable effect on petroleum demand.

Wind energy can easily INCREASE emissions of greenhouse gasses

As shown in several recent engineering studies the volatility (short term fluctuations in output on the order of minutes due to gusty winds) forces other power plants connected to the grid to operate in "mirroring" mode ramping quickly up and down. Just like your car in stop and go traffic, as opposed to thoroughfare speed, this drastically reduces those plants efficiency, leading to increased fuel consumption and GHG emissions. Only by sophisticated "dispatch" modeling of an individual grid along with wind data can it be determined whether, on net, fuel use and GHG emissions increase or decrease. To date, no wind developer have ever done such a modeling effort subject to peer or regulatory review.

Wind energy is a threat to wildlife and endangered species

Wind resource areas often are coincident with critical habitat and/or migratory flyways. Many of these conflicts are for protected, threatened and endangered species. Wind energy development has long had significant issues with avian and bat mortality, even given the relatively few wind turbines installed to date. More wind turbines will pose greater threats. For example, in California's Altamont Pass area, one of the nation's oldest development area, over 500 Golden Eagles are slaughtered each year. Further, the additional transmission lines necessary to serve wind developments pose special threats as well.

Living too close to wind turbines imposes health and safety risks to the public

The tip speed of modern wind turbines approaches 200 MPH when operating. Ice and blade throw, from the top of a 300 foot tower, while infrequent, poses serious safety risks to the public within about ¾ to a mile. Further, the noise from wind turbines can cause health effects, as documented by Dr. Nina Pierpont and others. Industrial wind turbines produce significant amounts of audible and low-frequency noise. Dr. Oguz A. Soysal, Professor and Chairman of the Dept. of Physics and Engineering at Frostburg State University in Maryland, measured sound levels over half a mile away from the Meyersdale, PA, 20-turbine wind farm. Typical audible (A-weighted) dB (decibel) levels were in the 50-60 range, and audible plus low-frequency (C-weighted) dB were in the 65-70 range. 65-70 dB is the loudness of a washing machine, vacuum

cleaner, or hair dryer. A difference of 10 dB between A and C weighting represents a significant amount of low-frequency sound by World Health Organization standards. The noise produced by wind turbines has a thumping, pulsing character, especially at night, when it is more audible. The noise is louder at night because of the contrast between the still, cool air at ground level and the steady stream of wind at the level of the turbine hubs. This nighttime noise travels a long distance. It has been documented to be disturbing to residents 1.2 miles away from wind turbines in regular rolling terrain, and 1.5 miles away in Appalachian valleys. At night, the World Health Organization (WHO) recommends, the level of continuous noise at the outside a dwelling should be 45 dB or less, and inside, 30 dB or less. These thresholds should be even lower if there is a significant low-frequency component to the sound, – as there is for wind turbines. Higher levels of noise disturb sleep and produce a host of effects on health, well-being, and productivity. Effects of noise-induced sleep disturbance include fatigue, depressed mood or well-being, decreased performance, and increased use of sedatives or sleeping pills. Measured physiologic effects of noise during sleep are increased blood pressure and heart rate, changes in breathing pattern, and cardiac arrhythmias.

The decibel is logarithmic. Increasing the dB level by 10 multiplies the sound pressure level by 10. Increasing the dB level by 20 multiplies the sound pressure level by 100 (and 30 dB multiplies by 1000, etc.). Thus the 65 dB measured day and night half a mile from the Meyersdale wind farm, for example, has a measured intensity 100 times greater than the loudest continuous outdoor nighttime noise (45 dB) recommended by the WHO.

Savage, Bill

From: BOB & KEVIN GEHRING [jordanelectric@nconnect.net]

Sent: Wednesday, February 09, 2011 10:02 AM

To: Rep.Pridemore

Subject: PSC 128 Hearing

February 9, 2011

State Representative Don Pridemore
Madison WI

Re: Public Hearing PSC 128 (CR-057)

Please present the following at the referenced hearing relating to siting of wind energy systems. I will be unable to attend the hearing.

I have lived in the Town of Herman southeast Dodge County for the past 19 years on my 150-acre farm. My family and I have lived within the Butler Ridge Wind Energy system for the past two years it has been operational. There are six 410' turbines within 2000 feet of our home.

We have been subjected to a never-ending assault on our quality of life. We are subjected to noise from the operation of the 1.5-mw gearbox GE turbines and blade noise. The continual whine of the 2000 horsepower equivalent motor perched 200 feet in the air is unavoidable. Only the proper setbacks from dwelling spaces would eliminate this continual scourge. The existing setbacks do not provide adequate protection from this noise, the proposed rule change would.

We are subjected to shadow flicker from the rotating blades. It is just like placing a ceiling fan under a light bulb. Increasing the required setback distances would eliminate this problem.

The current setbacks were not scientifically developed but were advanced as a workable model by the wind turbine industry to get the projects built. I would not mind sacrificing if the wind energy system would provide a common benefit for the people. Wind energy does nothing to lessen our dependence on reliable, dispatchable electricity. It cannot be stored and creates a redundant expensive unreliable electric distribution system. The taxpayers and ratepayers have been forced to pay for an antiquated, unreliable form of energy, which was abandoned 80 years ago. Wind has not changed since.

The current setback is inadequate and does not protect my rights as a property owner.

Sincerely,

Kevin Gehring
W2017 Illinois Road
Iron Ridge, WI 53035

2/9/2011



***How Less Became More:
Wind, Power and Unintended Consequences
in the Colorado Energy Market
BENTEK Energy, LLC***

Executive Summary

Study Objectives:

- To improve understanding of the electricity markets in Colorado and the Intermountain West
- To understand how wind, coal, and natural gas interact and what that interaction means for future natural gas use in electricity generation
- To help generate productive and informed discussions on how our nation will meet its future energy needs through the integration of various energy resources

Key Findings:

- State renewable portfolio standards (RPS) mandate that wind energy be considered a "must take" resource. As such, when wind blows, generation from coal and natural gas must be adjusted to accommodate wind generation. This adjustment, called cycling, is defined as the sudden increase or decrease in generation.
- Most coal plants are not designed to be cycled, and doing so makes their operations inefficient, increasing SO₂, NO_x and CO₂ emissions.
- Contrary to their stated goals, implementation of RPS in Colorado and Texas appear to be adding to the air pollution problem, especially in areas where older plants are cycled more frequently. This is particularly problematic when cycled coal facilities are located near major urban centers.
- Emissions issues related to cycling can be minimized by careful design of the generation mix. Inadequate flexible resources, such as that provided by natural gas, exacerbate the need to cycle coal, resulting in increased emissions. Alternatively, incorporating adequate flexible fuel capacity facilitates the goals of RPS without increasing emissions.

Summary

In 2004, Colorado became the 17th state to adopt renewable energy standards when voters passed Amendment 37. Colorado reaffirmed its commitment to wind and solar energy in 2007 when the Legislature passed HB 1281, increasing the requirement for utilities to purchase renewable energy

by 100%. Colorado also approved the *Climate Action Plan*, which relies on renewable energy to play a central role in the state's strategy of reducing "greenhouse gas emissions by 20% below 2005 levels by 2020"¹.

Policymakers' stated hope was that renewable energy would not only be a major tool to reduce carbon emissions, but also, by displacing conventional fuels, would reduce smog and other air pollution, presumably by reducing sulfur dioxide (SO₂) and nitrous oxides (NO_x), the principal components of ozone and smog.

This report, which examines four years of Public Service Company of Colorado (PSCO) hourly operational history, illustrates how coal cycling, which in part results from wind generation, negates the emission benefits of wind energy. Integrating an intermittent, must take resource, such as wind energy, requires PSCO to cycle its coal and natural gas-fired plants². The incidents of coal cycling have risen markedly with the introduction of 775 MW of wind capacity since 2007.

Coal-fired power plants are designed to run most efficiently at stable rates and are not well-suited to accommodate the load variability imposed by the integration with wind generation. Cycling causes coal-fired power plants to operate less efficiently, and reduces the effectiveness of their environmental control equipment, which together drive up emissions. Paradoxically, using wind energy in such a way that it forces utilities to cycle their coal generation often results in greater SO₂, NO_x and CO₂ emissions than would have occurred if less wind energy were generated and coal generation was not cycled.

An analysis of the Electric Reliability Council of Texas (ERCOT), which also operates under a RPS mandate to utilize wind energy, validates the emissions findings for PSCO. The underlying problem is the same for both PSCO and ERCOT: wind generation frequently cannot be accommodated without forcing coal-fired units to cycle.

Whereas natural gas-fired combustion turbines and combined-cycle facilities are designed to accommodate cycling, coal equipment is not. Coal boilers are designed to be operated as a base load resource – in other words, to operate at a consistent output level all the time. Because gas resources are not fully utilized to offset wind energy produced in PSCO and ERCOT, coal units are being cycled. Emission levels are increasing, not decreasing, at PSCO and ERCOT coal units because the units are being cycled to compensate for wind generation.

The results of this study help explain why PSCO's coal-fired plants located in the Denver non-attainment area have experienced an increase in SO₂, NO_x and CO₂ over the past few years. Four of the five most frequently cycled coal plants are located in proximity to Denver. The results also suggest that this problem will worsen over time unless more gas generation is utilized to absorb wind generation variability.

¹ "Colorado Climate Action Plan: A Strategy To Address Global Warming", November, 2007. P10.
http://www.colorado.gov/energy/in/uploaded_pdf/ColoradoClimateActionPlan_001.pdf

² As used in this report the term cycling refers to sudden increases or decreases in power generation output. Cycling occurs for a variety of reasons including making way for alternative generation, maintenance and/or equipment failure or sudden changes in load size.

There are national implications as well. Congress and the Obama Administration are considering a national RPS. Before such a national standard is implemented, there is a compelling need to better understand how intermittent sources of energy such as wind can be integrated with existing nuclear, coal and natural gas capacity without producing cycling-induced emissions problems.

Conclusions:

- The use of wind energy by PSCO has resulted in increased levels of SO₂, NO_x and CO₂ from coal plants in the non-attainment area. Wind-induced coal cycling in ERCOT has resulted in increased SO₂ and NO_x with only minimal savings of CO₂.
- The mechanism driving increased emissions is the need to cycle coal facilities in order to accommodate wind generation, which is considered a "must take" resource due to the RPS mandates.
- When coal plants are cycled, the heat rate rises, resulting in higher emissions of SO₂, NO_x and CO₂ than would have been the case if the units had not been cycled. This problem can persist for up to 24 hours after cycling the facility, increasing emissions even further.

Recommendations:

Effective wind energy requires sufficient flexible natural gas generation in order to avoid cycling coal facilities. Enacting RPS's that require more than 5-10% of wind energy for electricity generation will significantly add to emissions unless more flexible natural gas generation is utilized. The report recommends:

1. Short term. (1-2 years)

Limit the utilization of wind generation to that which can be offset by cycling existing natural gas facilities.

2. Long term (Beyond 2012)

Utilities operating under RPS should consider adding significantly more combined cycle and combustion turbine gas plants to their generation mix. Adding more natural gas plants will reduce the need to cycle coal facilities in all but the most extreme situations.

This report was prepared for the Independent Petroleum Association of Mountain States (IPAMS).

About BENTEK Energy, LLC

BENTEK Energy, LLC, is the leading energy markets information company. Based in Evergreen, Colorado, BENTEK brings customers the analytical tools and competitive intelligence needed to make time-critical, bottom-line decisions in today's natural gas and power markets. Additional information about BENTEK Energy is available on the Web at www.bentekenergy.com.



HOW LESS BECAME MORE...

Wind, Power and Unintended Consequences in the Colorado Energy Market

Wind energy promises a clean, renewable resource that uses no fossil fuel and generates zero emissions. Careful examination of the data suggests that the numbers do not add up as expected.

The "must take" provisions of Colorado's Renewable Portfolio Standard require that other sources of generation, such as coal plants, must be "cycled" to accommodate wind power. This cycling makes coal generating units operate much less efficiently... so inefficiently, that these units produce significantly greater emissions.

This study reviews the data that supports this conclusion, outlines mitigation measures which can be used to realize the full potential of wind generation, and provides recommendations for policy makers.

April 16, 2010



**How Less Became More:
Wind, Power and Unintended Consequences in the
Colorado Energy Market**

Prepared for

Independent Petroleum Association of Mountain States

April 16, 2010

About BENTEK Energy, LLC

BENTEK Energy, LLC, is the leading energy markets information company. Based in Evergreen, Colorado, BENTEK brings customers the analytical tools and competitive intelligence needed to make time-critical, bottom-line decisions in today's natural gas and power markets. Additional information about BENTEK Energy is available on the Web at www.bentekenergy.com. Questions? Contact BENTEK Energy at 303-988-1320.

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I. Introduction

Sometimes things are not what they seem. Nowhere is this more evident than in the realm of state and federal energy policies. In 2004, Colorado became the 17th state to adopt renewable energy standards when voters passed Amendment 37. Colorado reaffirmed its commitment to wind and solar energy in 2007 when the state legislature passed HB 1281, increasing the requirement for utilities to purchase renewable energy by 100%, and by adopting the Climate Action Plan in which renewable energy plays a central role in the state's strategy of reducing "greenhouse gas emissions by 20% below 2005 levels by 2020."¹ The expected environmental benefit of these measures is perhaps best summarized in this quote from Environment Colorado:

"Smog and air pollution continue to plague much of Colorado and part of the problem is caused by coal-fired power plants. Requiring a modest 10 percent of our electricity to come from renewable energy sources is equivalent to eliminating the pollution from 600,000 cars per year, thereby reducing smog and easing costly health problems."²

According to advocates, renewable energy will not only be a major tool to reduce our carbon output, but also, by displacing coal and natural gas, renewable energy will reduce smog and other air pollution, presumably by reducing sulfur dioxide (SO₂) and nitrous oxides (NO_x), principal components of ozone and smog.

This report, sponsored by the Independent Producers Association of Mountain States, concludes that the emissions benefits of renewable energy are not being realized as planned based on examination of four years of Public Service Company of Colorado (PSCO) operational history. Integrating erratic and unpredictable wind resources with established coal and natural gas generation resources requires PSCO to cycle its coal and natural gas-fired plants.³ Cycling coal plants to accommodate wind generation makes the plants operate inefficiently, which drives up emissions. Moreover, when they are not operated consistently at their designed temperatures, the variability causes problems with the way they interact with their associated emission control technologies, frequently causing erratic emission behavior that can last for several hours before control is regained. Ironically, using wind to a degree that forces utilities to temporarily reduce their coal generation results in greater SO₂, NO_x and CO₂ than would have occurred if less wind energy were generated and coal generation were not impacted.

¹ Colorado Climate Action Plan <http://www.coloradoclimate.org/>

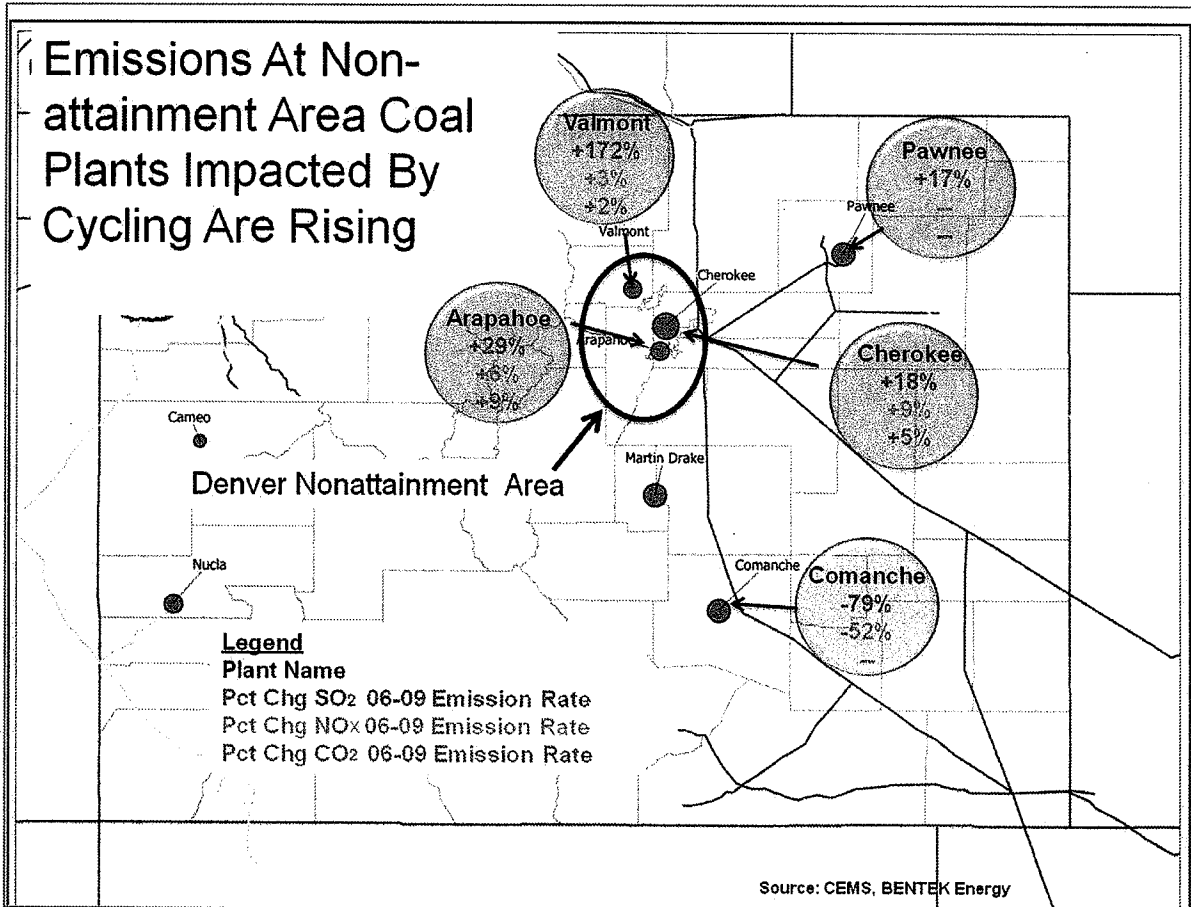
² Environment Colorado website, <http://environmentcolorado.org/envcoenergy.asp?id2=22373>

³ As used in this report, the term cycling refers to sudden increases or decreases in power generation output. Cycling occurs for a variety of reasons including making way for alternative generation, maintenance and/or equipment failure or sudden changes in load size.

An analysis of the Electric Reliability Council of Texas (ERCOT), which also operates under a mandate to use renewable energy, validates the emissions findings for PSCO. The underlying problem is the same for both PSCO and ERCOT: the generation capacity of wind resources has become too large relative to the capacity that is available from coal and natural gas facilities. Natural gas-fired combustion turbines and combined-cycle facilities are designed to accommodate cycling. Because gas resources are insufficient to offset all of the wind energy produced in PSCO and ERCOT, coal units must be cycled to counterbalance the amount of wind that cannot be offset by natural gas. As a result, when the wind energy is generated at a high enough rate, PSCO is forced to scale-back generation from its coal-fired resources. But, coal equipment is not built for cycling. Coal boilers are designed to be operated as a base load resource – in other words, to operate at a consistent output level all the time. Cycling causes coal units to operate less efficiently and reduces the effectiveness of the environmental control equipment, substantially increasing emissions.

The results of this study help explain why PSCO's coal-fired plants located in the Denver non-attainment area have experienced an increase in SO₂, NO_x and CO₂ over the past few years. Figure I-1 below shows the change in emissions generated at the plants in proximity to the Denver non-attainment area – Valmont, Arapahoe, Cherokee and Pawnee, and the Comanche plant located outside of Pueblo. Between 2006 and 2009 despite the introduction of over 700 MW of wind energy, all of the Denver area plants except Cherokee show higher levels of SO₂, all show higher levels of NO_x and all but Pawnee show higher levels of CO₂. The Cherokee plant switched to a lower sulfur coal in 2008, thus, even the lower SO₂ readings at that plant cannot be attributed to the benefits of wind energy. Furthermore, during the 2006-to-2009 period, generation from the non-attainment area plants fell by over 37%, which makes the increase in emissions even more significant particularly in light of the EPA's announced intent to mandate tighter restrictions on SO₂ and NO_x emission levels by 2011.

**Figure I-1
Denver Non-attainment Area Plants Have
Experienced Higher Emissions Since 2006**



The results also suggest that the problem will worsen over time unless mitigation measures are taken. The emission issues documented in this report are evident because PSCO has approximately 1,100 MW of wind capacity. Under the existing Renewable Portfolio Standard (RPS) and the current Integrated Resource Plan (IRP), wind capacity is anticipated to grow by a minimum of 100 MW annually through 2020. Moreover, the Colorado state legislature recently increased the RPS to 30% of sales by 2020, which will force PSCO to add even more wind capacity to its system. Unless the additional wind capacity is coupled with significantly more gas capacity, a reduction in coal capacity, or a combination of the two, the higher RPS will drive SO₂ and NO_x and possibly CO₂ emissions higher, further exacerbating the ozone non-attainment area problems for the Front Range of Colorado.

There are national implications as well. Congress and the Obama administration are considering a national RPS. Before such a national standard is implemented, there is a compelling need to better understand where intermittent sources of energy such as wind can be integrated with existing nuclear, coal and natural gas capacity without producing cycling-induced emissions problems. The study's findings relative to ERCOT in this respect are not

encouraging. ERCOT, which has one of the nation's largest natural gas-fired generation bases, acquires only about 23% of its energy from natural gas between the hours of 12:00 am and 8:00 am. Consequently, when wind comes online in ERCOT during the early morning hours, coal plants are forced to cycle. As cycling of coal plants is problematic in ERCOT, it is very likely that emissions will increase virtually everywhere else unless natural gas-fired generation is added simultaneously with wind.

Report Organization

This report is organized as follows:

- Chapter II provides an overview of PSCO's generation capacity and utilization, basic data and analysis describing the various utilities and fuel sources that generate power in the state.
- Chapter III describes why coal plants are cycled, and what happens as a result.
- Chapter IV examines two specific "wind events," quantifying the emissions and the implications of each, as well as how PSCO handled these events.
- Chapter V estimates the total incremental emissions that occurred as a result of using wind energy in the PSCO territory for 2008 and 2009.
- Chapter VI describes the interaction between wind, coal and natural gas in ERCOT, showing how the same dynamics evident in PSCO's territory have emerged as the magnitude of wind generation has grown.
- Chapter VII examines the emissions implications of one possible mitigation measure: retiring Cherokee and Valmont coal fired plants and replace their generation with power produced from either the existing or new gas-fired facilities.
- Chapter VIII draws conclusions and suggests several recommendations regarding mitigation measures that might be implemented to improve the impact of wind on the PSCO system.

Data Sources

This report is built on a variety of publicly available primary and secondary data sources. The general descriptive information generally comes from basic Energy Information Administration databases including Forms 860, 861 and 423; the Federal Energy Regulatory Commission Form 1; PSCO documents, including their annual 10K financial report, and other reports available on the PSCO public website.

The core of the analysis is based on detailed primary information reported to the Federal Energy Regulatory Commission (FERC) and the U.S. Environmental Protection Agency (EPA)

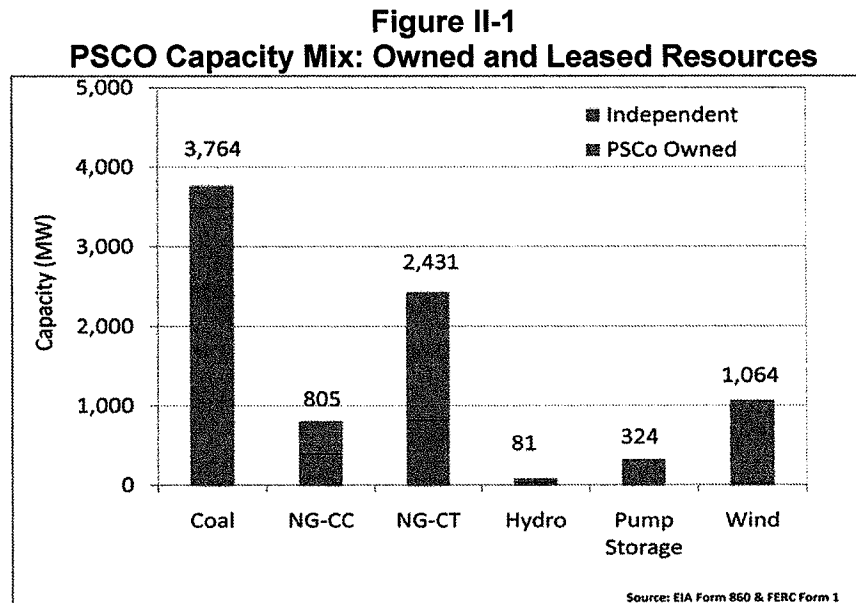
by PSCO. FERC Form 714 data provides hourly load generation for operational control areas such as that of PSCO. Additionally, the Continuous Emissions Monitoring System (CEMS) of the EPA is the source of boiler-specific hourly generation and emissions data. This information is relied on heavily for the analysis of the July 2, 2008, and Sept. 28-29, 2008, wind events discussed in Chapter IV. Finally, ERCOT requires generators to publish on a 15-minute basis their generation by fuel and type of facility, enabling analysis of the interaction between wind, coal and natural gas combustion turbines and combined-cycle facilities in the ERCOT region. These data provide the analytical basis for the analysis of ERCOT operations in Chapter VI.

II. Wind Energy and PSCO

PSCO is the dominant electric utility in Colorado. Owned by Xcel, the fourth largest electric utility holding company in the U.S., PSCO provides electricity service to approximately 1.4 million customers solely in the state of Colorado. Based on total sales, PSCO ranks 33rd in the U.S., and 25th in customer count.⁴ While PSCO is less than 30% the size of some of the nation's largest utilities, it is one of the largest sellers of wind power. Its parent company, Xcel, is the largest provider of wind energy in the nation according to the American Wind Energy Association, and PSCO accounts for nearly one-third of Xcel's wind energy resource. This chapter describes PSCO's generation mix, load and key aspects of the regulatory context in which it operates in order to introduce many of the terms and factors that will become important to the discussion of the interaction between wind, coal and natural gas generation in subsequent chapters.

PSCO's Generation Mix

Today, PSCO is primarily a coal-fired utility. Figure II-1 depicts PSCO's current generation mix. Approximately 60% of PSCO's generation resources are PSCO-owned with the balance owned by a variety of third parties. Coal accounts for 44% of the total resource base, and PSCO owns virtually all of the coal-fired capacity. By contrast, PSCO owns 37% of its natural gas resources and only 2% of its wind resource.

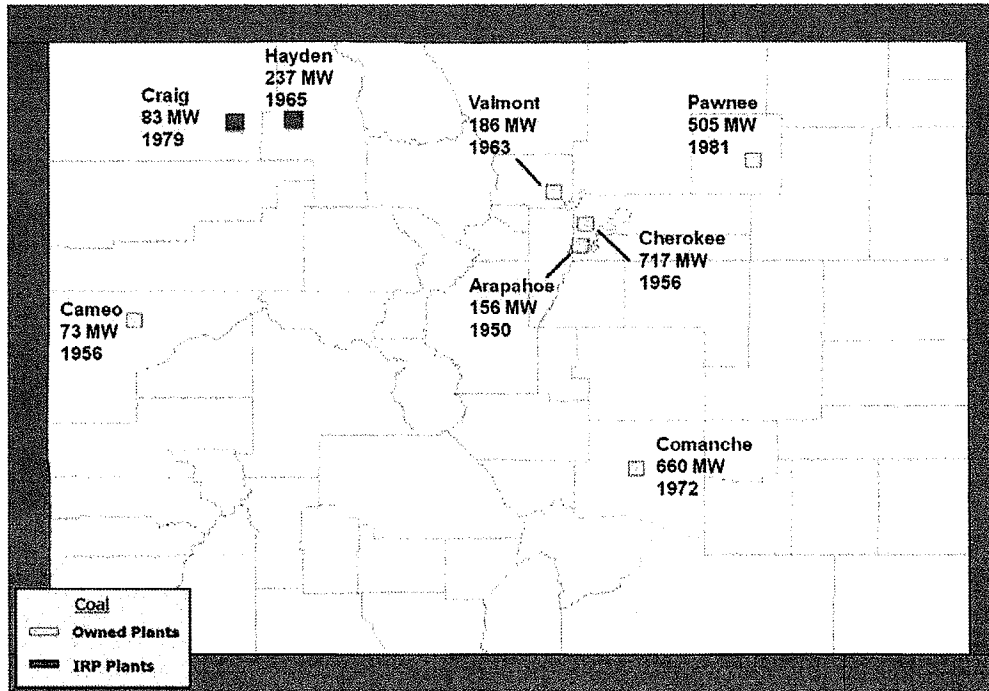


PSCO's coal resources are located on the western slope and along the Front Range. Figure II-2 shows the location size and age of PSCO's coal resources. The Comanche Unit Number

⁴ EIA Form 861, 2007.

3 is coming into service in 2010, but all of the remaining coal-fired facilities were built prior to 1981. Arapahoe, Cameo and units of the Cherokee plant were built prior to 1960.

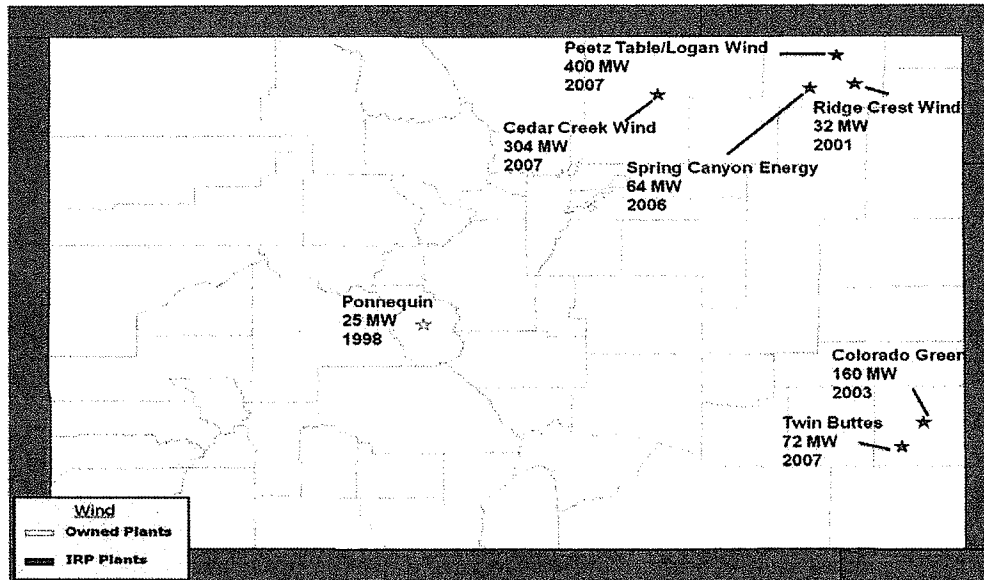
Figure II-2
PSCO's Coal-Fired Generation Resources: Location, Size and Age



The Ponnequin facility in Weld County was PSCO's first wind facility and remains its only company-owned wind farm. The Ponnequin facility consists of 29 units, totals 32 MW and came into service between 1999 and 2001. The remaining 1,032 MW of wind resource is comprised of five wind facilities, having capacities between 60 and 400 MW. Of the 1,032 MW total, 950 MW has come online since 2007. Figure II-3 shows the location, size and ownership of the wind facilities from which PSCO obtains power. ⁵

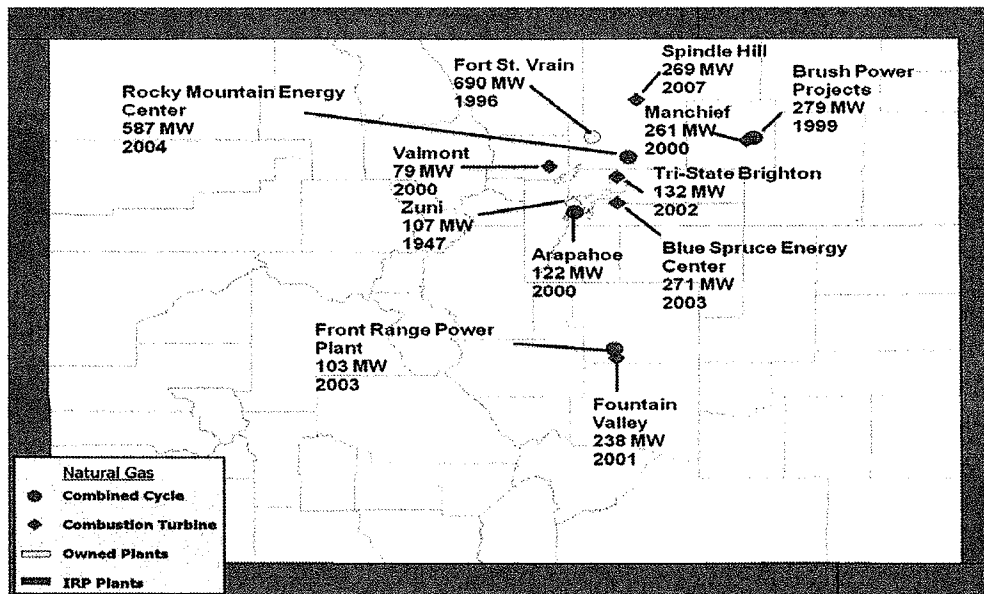
⁵ American Wind Energy Association web-site, February 2010.

**Figure II-3
PSCO's Wind Facilities: Location, Size and Age**



Natural gas is a relatively new energy source for PSCO. The Zuni plant in Denver is the oldest plant on the system, burns natural gas and oil and is seldom used. The Fort St. Vrain plant, which is located near Platteville, CO, has six combustion-turbine units. Two of the six units, which have an aggregate capacity of 260 MW, came online in 2009.

**Figure II-4
Natural Gas Generated Resources**



PSCO obtains natural gas generated resources from several non-affiliated companies, which are also identified in Figure II-4. Combined-cycle plants account for 35% of the total gas-fired additions with the balance being combustion turbines. Combustion turbines operate with a heat rate of about 10,000 MMBtu/MW, and emit approximately 0.159 lbs of NO_x per MW. In contrast, combined-cycle plants operate at a heat rate of approximately 7,000 MMBtu/MW and have NO_x emissions of approximately 0.105 lbs per MW.⁶ Because of the heat rate advantage associated with combined-cycle units, they are approximately 30% less costly to use than are combustion turbines. On the other hand, combustion turbines are designed to follow load and can be used to quickly offset unexpected outages.

While Colorado's Renewable Portfolio Standard (RPS) will be described more fully in a subsequent section, its impact on the PSCO generation stack (portfolio of energy producing resources) is clear. Between 2005, the year after the first RPS standard was approved with Amendment 37, and 2010, PSCO has added about 2,000 MW of electric generation capacity. Of that total, 40% has been in the form of wind, 23% (500 MW) coal and 36% natural gas combustion turbines.

PSCO's current Integrated Resource Plan (IRP), which the Public Utility Commission (PUC) approved in 2007, calls for further changes in the resource stack composition. By 2020 under the approved plan, 29% of the resource mix will be coal-fired, 44% natural-gas-fired, 21% wind, and the balance other renewables such as solar and biomass. These percentages include approximately 150 MW of integrated-gas, combined-cycle generation (IGCC) in 2016, a 480-MW combined-cycle plant at the Arapahoe location in 2013, and 2,148 MW in the form of one combined-cycle and 13 combustion turbines beginning in 2013. All together, the IRP calls for PSCO to add 5,764 MW of new capacity between 2011 and 2020. Between 2007 and 2015, the plan calls for the addition of approximately 2,500 MW of new capacity, of which 1,000 MW will be wind.

PSCO Demand

PSCO demand peaks during the summer. Total sales numbers for 2009 are not yet available. In 2008, average day hourly sales were approximately 4,113 MW, peak day demand was 6,757 MW. Figure II-5 shows average and peak day trends since 2006 as published in PSCO Annual Reports.⁷ Average hourly demand has fallen by a rate of 3% since peaking in 2005. Peak day demand has fluctuated between 2005 and 2008. While 2008 was lower than 2007, it was still well above 2006. This fluctuation is due to the variability of summer temperatures.

⁶ Page 2-259, 2-262 2007 CRP PSCO

⁷ Public Service Company of Colorado, Form 10K for the fiscal year ended Dec. 31, 2008, pages 7 and 12.

**Figure II-5
Average Daily Demand Is Falling At A 3% Average Annual Rate**

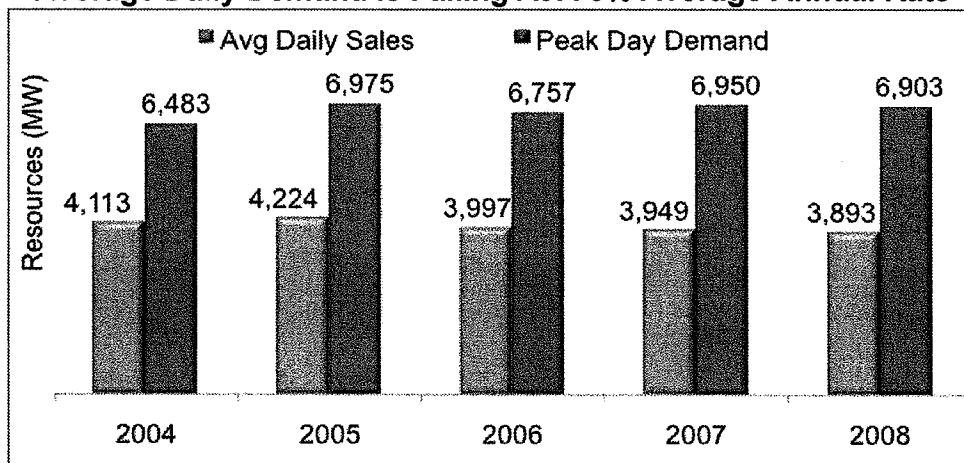
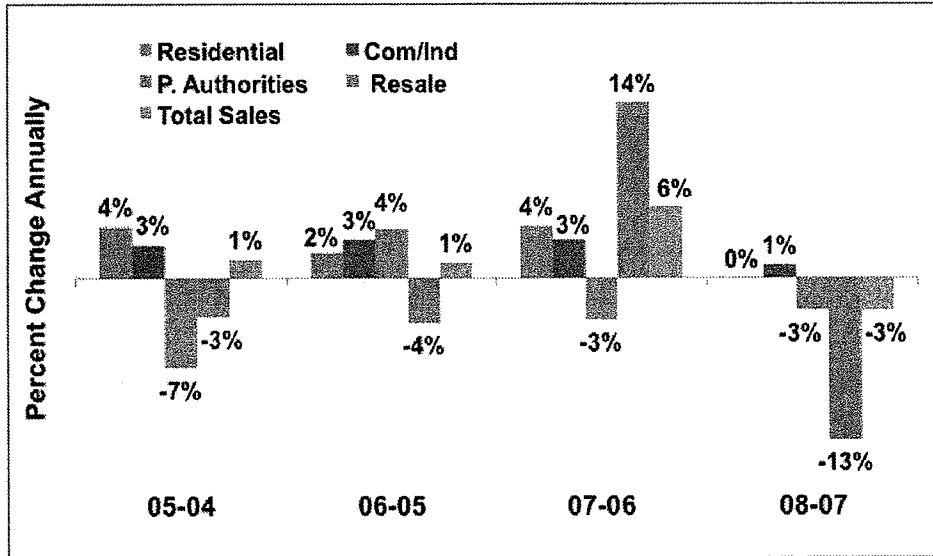


Figure II-6 details PSCO's sales. While total sales were off about 3% in 2008, the figure shows that most of the variation stems from the fluctuating sales for resale component. Sales for resale rose by 14% in 2007, and then fell by 13% in 2008 accounting for most of the 2008 total decline. PSCO's base – residential and commercial/industrial sales – both declined slightly in 2008 after growing annually between 2004 and 2007. Given the slowness of the 2009 economy and the efforts made to increase conservation, it is likely that total demand and demand from the residential, commercial and industrial customers continued to drop in 2009.

The 2007 PSCO IRP anticipates a 1.4% total annual load increase between 2009 and 2015, even accounting for declines in 2010 and 2012 due to expiring resale contracts. The average day energy requirement is projected to grow by 570 MW or 71 MW per year between 2007 and 2015, while peak day demand is projected to grow by 327 MW or 41 MW per year under the base case. Under the high case outlined in the IRP, peak day demand would increase by 610 MW between 2007 and 2015.

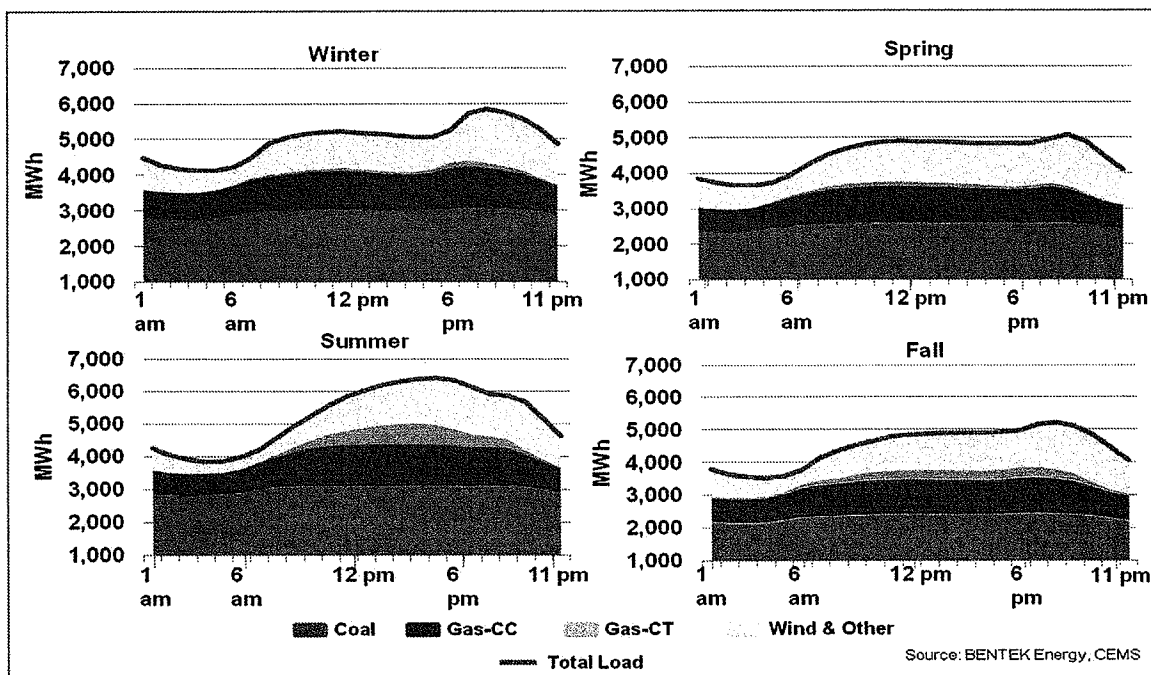
**Figure II-6
Percent Annual Change in Sales (2004-08)**



The graphs in Figure II-7 below describe PSCO's load profile across seasons based on hourly data reported to FERC. While there are differences, particularly in the timing and magnitude of the peak demand, the profiles are relatively consistent across the four seasons. Lowest hourly loads tend to occur between 10:00 pm and 6:00 am. Highest load levels are evident between about 2:00 and 9:00 pm. During the summer, the peaks are more pronounced and last for a longer period, reflecting air-conditioning demand. The added load, which is quite variable, requires significantly greater operation of PSCO's combustion turbines.

Figure II-7 also shows an average day's 24-hour generation stack for each season in 2008. The grey area depicts generation from coal-fired facilities, dark blue from combined-cycle, natural gas units and the light blue area depicts generation from natural-gas-fired combustion turbines. The light green area signifies generation from wind, hydro, pumped storage, other non-fossil fuel sources or off-system purchases. Regardless of season between 12:00 am and 8:00 am, coal fuels between 58% and 67% of total resource needs. Combined-cycle, gas-fired plants account for between 18% and 21%, while wind, hydro, pumped storage and off-system purchases account for the balance.

**Figure II-7
Average Day Load Curve and Generation Mix**



Accordingly, generation sources have different utilization rates. Table II-1 captures the utilization of each plant for each type of facility. As Figure II-7 suggests, coal facilities typically have utilization rates around 80% because they are run for base load generation. Utilization rates at gas-fired combined cycle facilities average about 60% due to their role as intermediate, load following generation. Combustion turbine units are only used during the day to meet the variable nature of net load. These units have utilization rates in the 20% range.

**Table II-1
Utilization Rates by Plant**

	Capacity	2007	2008	2009
Coal: Steam Turbine				
Arapahoe	156	79%	70%	63%
Cameo	73	43%	45%	43%
Cherokee	717	83%	79%	56%
Comanche	660	85%	83%	90%
Craig	83	49%	49%	47%
Hayden	237	98%	97%	87%
Pawnee	505	91%	85%	51%
Valmont	186	86%	77%	72%
Gas: Combined Cycle				
Fort St. Vrain	690	69%	75%	63%
Arapahoe	122	27%	26%	31%
Rocky Mtn. Energy Center	587	56%	51%	55%
Front Range Power	103	82%	58%	52%
Gas: Combustion Turbine				
Spindle Hill	269	22%	9%	41%
Manchief	261	N/A	9%	19%
Tri-State Brighton	132	21%	5%	10%
Blue Spruce Energy Center	271	21%	17%	19%
Valmont	79	3%	1%	1%
Zuni	107	1%	0%	0%
Fountain Valley	238	23%	19%	21%
Brush Power Projects	279	N/A	1%	3%

Regulatory mandates play a major role in determining what resources PSCO can draw on to meet demand requirements. The state RPS has the most direct influence on the stack structure, but the EPA's State Implementation Plan (SIP), which sets goals for SO₂ and NO_x emissions among other things, is also significant.

The state RPS originated as a result of the passage of Amendment 37 in the general election. This amendment mandated that the state's largest utilities, including PSCO, obtain 3% of their electricity from renewable resources by 2007 and 10% by 2015. Solar energy was required to meet 4% of the renewable set aside. As will be discussed in subsequent chapters, the requirements of the SIP and RPS are not aligned.

The requirements of Amendment 37 were changed in 2007. HB07-1281, which passed the Colorado legislature in 2007, increased the RPS mandate. Under HB07-1281, Colorado utilities must employ renewable technology to meet various portions of their energy sales as outlined below:

2007	3% of total retail electric sales
2008-10	5% of total retail electric sales
2011-14	10% of total retail electric sales
2015-19	15% of total retail electric sales
Beyond 2020	20% of total retail electric sales

While PSCO is charged with meeting this requirement, the bill also mandates that the "maximum retail rate impact" be 2% of the total electric bill annually for each customer."

In March 2010, the legislation passed and the Governor signed into law a new RPS. Under the new RPS, the Colorado legislature increased the above mandate to 30% of sales. At the time of this report, passage of the new compliance schedule will be:

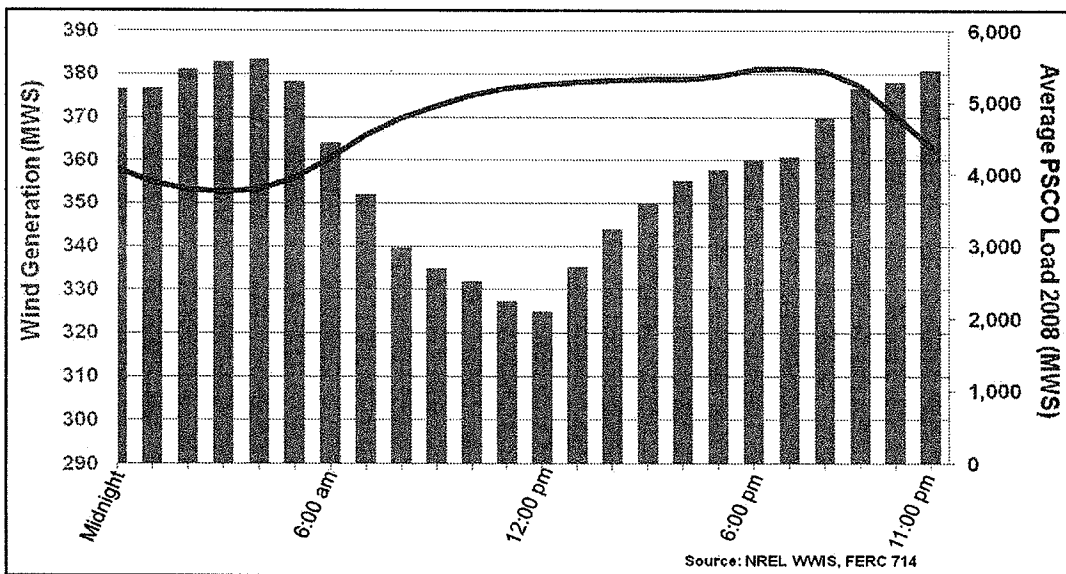
2007	3% of total retail electric sales
2008-10	5% of total retail electric sales
2011-14	12% of total retail electric sales
2015-19	20% of total retail electric sales
Beyond 2020	30% of total retail electric sales

III. Wind, Gas and Coal Integration

Integrating wind generation with generation from other sources presents a number of challenges. The difficulty stems, fundamentally, from the unpredictability and intermittency of wind: predictive models are constantly improving, but one rarely can be absolutely certain precisely when wind will commence to blow or for how long it will continue to blow.

Historical analyses suggest that wind in the PSCO territory blows most frequently at night. Figure III-1 compares a wind profile of PSCO's territory published by NREL to PSCO's average daily load.⁸ Wind generation tends to peak around 4:00 am, then declines until about noon before slowly increasing until about 8:00 pm. The wind peak usually occurs in the early morning hours when system demand (load) is relatively low. PSCO's load, on the other hand, peaks between late afternoon and early evening (2:00 pm to 9:00 pm).

**Figure III-1
Wind Blows Strongest Between 9:00 pm & 5:00 am, When Demand Is Weakest**



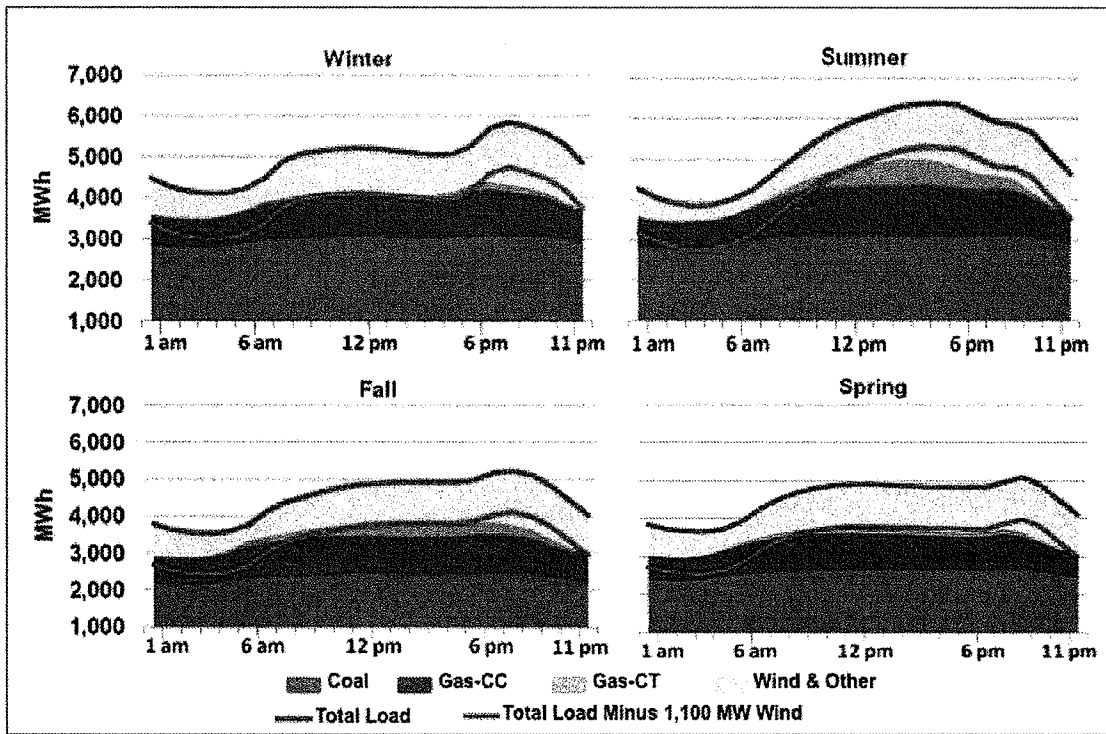
PSCO, like most other utilities, operates its wind generation as a “must-take” resource because of the RPS mandates. In other words, Xcel will operate its dispatchable resources (coal and gas-fired plants) in a manner that allows it to take as much generation from wind as possible without allowing generation from their fossil fuel facilities to fall below their design minimum generation levels.

⁸ The wind profile source is taken from work produced in 2008 as part of the Western Wind Integration Study, an ongoing research effort by the National Renewable Energy Laboratory. The NREL URL is http://wind.nrel.gov/Web_nrel/. The PSCO load profile is the average daily load profile for 2007 and 2008 based on data provided in FERC Form 714.

When the wind kicks up, PSCO curtails generation from its dispatchable sources sufficient to accommodate the wind power. Then, when the wind dies down, generation from the dispatchable sources is brought back online as needed. The process by which generation is ramped up and down at a plant due to wind or any other factor is called *cycling*.

The must-take aspect of wind generation impacts the generation stack differently, depending on the season. Figure III-2 adds a purple line to the seasonal load and generation graphic shown in Chapter 1 (Figure II-7). The purple line indicates the portion of total load that can be met with the 1,100 MW of current wind capacity if used at 100% capacity.

**Figure III-2
Impact of Wind on Generation Stack**



As can be seen in Figure III-2, between 8:00 am and 10:00 pm, coal generation comprises between 49% (summer) and 60% (winter) of the generation mix. Accordingly, coal facilities are less likely to be cycled to compensate for wind generation because gas-fired generation (from combined-cycle and combustion turbines) is at sufficient levels to absorb the variability of wind generation. During periods of high load, it is also somewhat easier to sell excess power above what PSCO needs for its own load to neighboring utilities to help meet their peak requirements.

After 10:00 pm, the generation options are different. Wind resources tend to be strongest and most predictable at night. During that time period, generation from coal comprises approximately 62% of the generation mix and gas-fired generation falls to 20%. If there is not

enough gas-fired generation to safely cycle gas plants, coal plants must be cycled instead. Later in the night, coal-fired generation is the only resource available to absorb wind power and thus PSCO cycles its coal facilities. As wind energy begins to taper off around 6:00 am, the cycled power plants must be ramped up because load starts building for the day.

PSCO has another, somewhat restricted, option for offsetting wind generation. The company uses its 350 MW of pumped storage hydroelectric power to accommodate wind as much as possible. But when that facility is running at maximum capacity, it can only operate for four consecutive hours.

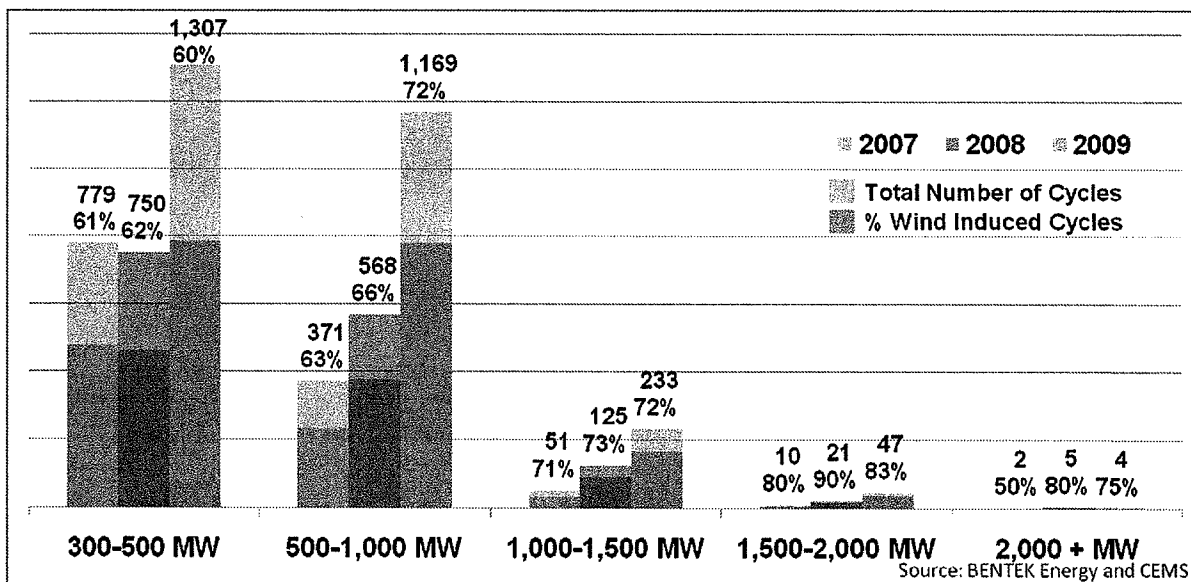
How frequently wind affects coal or natural gas-fired generation is difficult to determine because PSCO does not publish hourly wind generation data. Nevertheless, PSCO acknowledges that wind impacts coal as well as gas in its 2008 Addendum to the 2006 study "Wind Integration Study for Public Service of Colorado." In Appendix B of the 2008 Addendum Report, Xcel notes that:

"There is a discrepancy between the Cougar modeling and the current experience when comparing the impacts on coal units. The modeling predicts almost no impact, but the company [PSCO] is already seeing some cycling that seems related to wind output."⁹

In other areas of the country, information on wind power is required as part of overall power generation reporting. For example, utilities in the ERCOT area of Texas are required to report their power generation every 15 minutes by fuel type. This data for 2007, 2008 and 2009 was used to compare coal-plant cycling with wind generation. The analysis identified the number of instances where coal-fired power plants cycled down by 300-500 MW, 500-1,000 MW and more than 1,000 MW during the same time periods where wind generation increased by at least a like amount. Figure III-3 shows the results.

⁹ Page 47, "Wind Integration Study for Public Service Co. of Colorado" Addendum Detailed Analysis for 20% Wind Penetration. The Cougar model is used by Xcel to measure the cost impacts of integration.

**Figure III-3
Distribution of ERCOT Coal Cycling Instances by Magnitude of Hour-over-Hour Change**



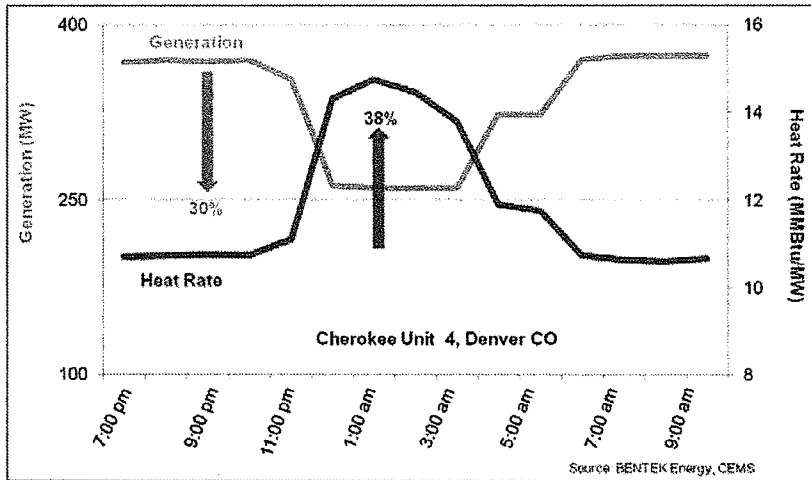
In 2009, there were 1,307 instances where coal plants were cycled at least 300 MW and 284 examples where plants were cycled more than 1,000 MW from one 15-minute period to the next. The table also indicates that the number of instances in all categories has increased annually since 2007. While Texas has more coal plants and wind farms than Colorado and the wind undoubtedly exhibits somewhat different behavior in Texas, this analysis concludes that the two systems are similar enough for a valid comparison. Even in Texas, which has one of the nation's largest gas-fired generation bases, coal plants are frequently cycled. It clearly stands to reason that the same happens in Colorado.

Impact of Cycling

Power plant cycling results in more fuel being used for every MWh generated. In fact in the first case study in the following chapter, coal consumption at the plant was actually 22 tons greater than if the plant had not been cycled and generation had remained stable.

Figure III-4 depicts operations at PSCO's Cherokee Unit 4, located in Denver, between 7:00 pm and 9:00 am on March 17 and 18, 2008. Total generation from the plant is shown in blue; the heat rate – defined as the MMBtu of fuel per unit of generation – is shown in red. Between 9:00 pm and 1:00 am, generation from the Cherokee 4 fell from 370 to 260 MW. It then increased to 373 MW by 4:00 am. During the period in which generation fell by 30%, heat rate rose by 38%. Heat rates are directly linked to cycling: as the generation from coal plants falls, the heat rate begins to climb. Initially, the heat rate climbs because generation of the plant is choked back and fewer MW are produced by the same amount of coal. Later in the cycle, the heat rate climbs further because more coal is burned in order to bring the combustion temperature back up to the designed, steady-state rate. Additionally, for many hours after cycling, the heat rate is slightly higher than it was at the same generation level before cycling the plant.

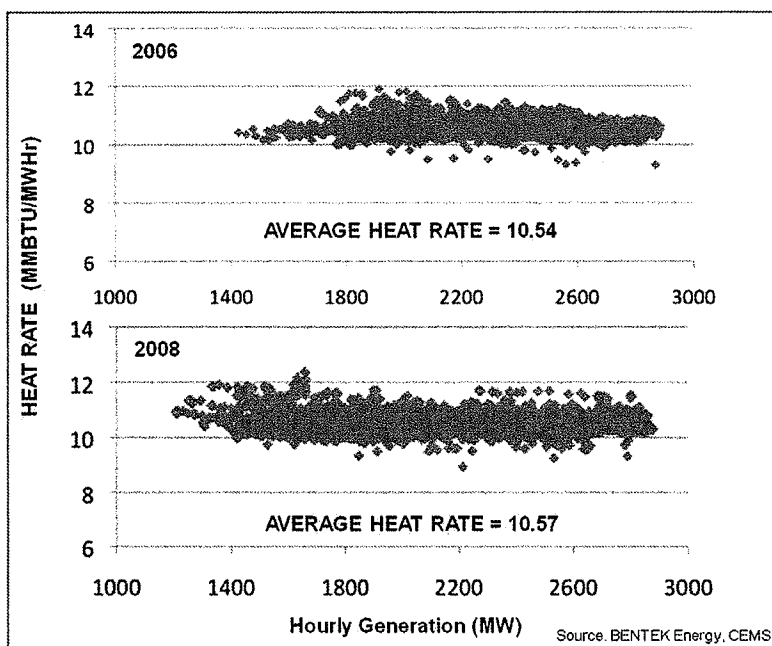
**Figure III-4
Impact of Generation Decline on Heat Rate**



While Xcel does not publish hourly wind generation data, it does publish hourly generation data for coal plants as part of their Continuing Emissions Monitor (CEMS) report. Using that data, it is possible to examine the behavior of PSCO's coal plants as reflected by their heat rates.

Figure III-5 below compares the hourly heat rate versus generation for all coal-fired plants in 2006 to their heat rate in 2008. The data show that the average heat rate rose slightly, from 10.45 to 10.57, but overall, the total system changed only slightly.

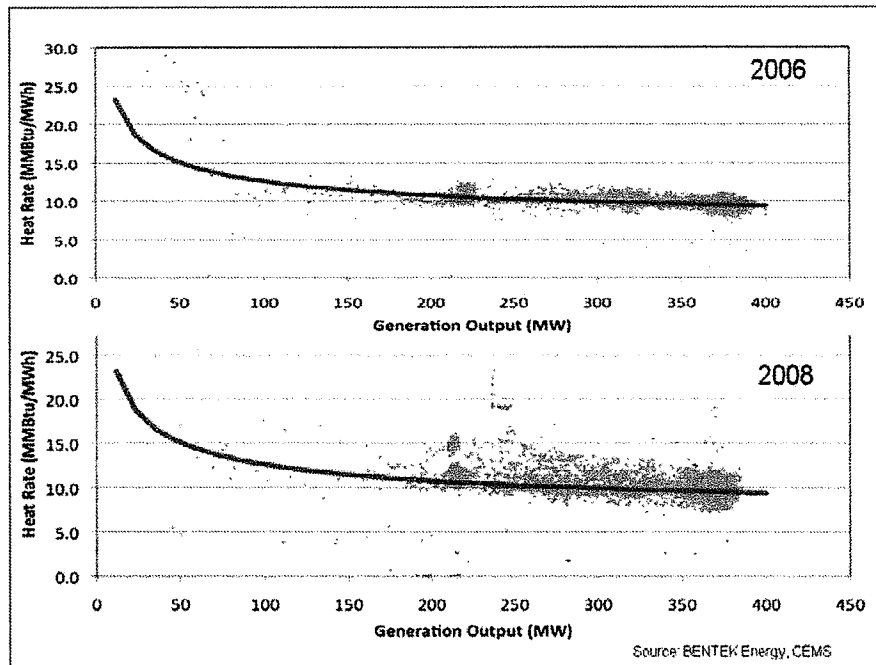
**Figure III-5
Comparison of Heat Rate Vs Generation across All PSCO Coal Plants (2006 vs 2008)**



These data, however, mask the impacts on specific facilities. For example, Figure III-6 below compares the hourly heat rates for the Cherokee 4 boiler in 2006 and 2008.¹⁰ Each blue dot on the graphs represents the generation and associated heat rate for each hour of operation in 2006 and 2008. The red lines indicate the average heat rate for the boiler during the year. A comparison of the two graphs shows that in 2008 the Cherokee plant was operated in a manner that caused far greater variability in heat rate at different output levels compared to 2006. Why is there a difference? The only significant change in the operating environment between 2006 and 2008 is the addition and use of 775 MW of wind energy. A detailed analysis in Chapter III of two “wind events” will show concretely how the wind changes the operations at this and other plants. However, these data indicate that cycling coal has caused heat rates to become more variable at PSCO’s coal plants.

¹⁰ Cherokee 4 boiler is a 352-MW unit that is part of the 717-MW, coal-fired Cherokee plant located in Denver County, CO.

Figure III-6
Change in Heat Rate 2006-08 at the Cherokee Plant, Unit 4



Cycling of coal facilities impacts efficiency and, thus, emissions. To illustrate how cycling a power plant makes its operation less efficient, think about an automobile. When driven at its designed, high speed in a high gear, the automobile gets maximum mileage and minimizes emissions. If the driver allows the car to slow without lowering the gear, the car operates less efficiently, decreasing mileage and increasing emissions, until it eventually stalls. Conversely, driving at too high a speed for a given gear also makes the car operate less efficiently, resulting in excessive emissions and lower mileage.

A power plant operates in much the same way, but with only a single gear. Theoretically, coal-fired plants are designed as base load generators, meaning they are designed to operate at a high utilization rate (typically greater than 80%), which results in a flat generation profile. The boilers are “tuned” to combust the coal at a specified rate and temperature, and the emissions-control apparatus is synchronized to operate with maximum efficiency at the design rate of the boiler. If the plant has to cut back on its output, the input rate of the feed coal is cut, thereby allowing the boiler to cool, produce less steam, and thus, less power. As long as the boiler is throttled back, it may emit fewer emissions simply because it is consuming less coal, but the emission rate (emission per MW output) actually increases because the plant is operating less efficiently.

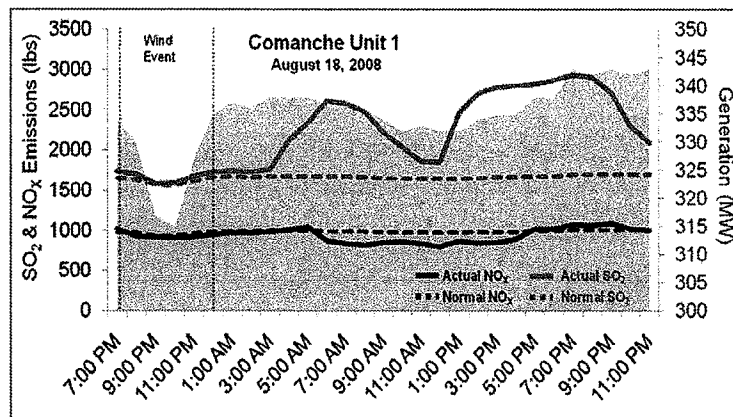
The emission rate increases further when the temperature of the boiler is increased in order to once again increase generation, as the wind energy loses strength. More coal has to be fed into the boiler in order to raise the temperature to the design threshold that it was operating at before being cutback. In addition, once the boiler has been brought back to the desired

temperature, the emissions scrubber equipment must be recalibrated and adjusted to achieve optimal control.

Below, the examples of SO₂ and NO_x impacts from wind events show how emissions rates are impacted by coal plant cycling. Each graphic shows generation during a specific period in the day in purple. Actual SO₂ and NO_x are depicted with the solid red and blue lines respectively. The red and blue dotted line show the average SO₂ and NO_x rates for the month multiplied by hourly generation to derive a “normal” emission rate. Days are chosen arbitrarily with the intent of showing some of the various excess emission patterns that occur after plants are cycled.

In Example III-A below, taken from the CEMS data for the Comanche Unit 1 on Aug. 18, 2008, cycling occurred between 7:00 pm on Aug. 17 and 1:00 am on August 18. Generation began to fall at about 8:00 pm; dropped by 4% between 8:00 and 9:00 pm; and dropped an additional 1% between 9:00 and 10:00 pm. After 10:00 pm, generation began to build: 4% between 10:00 and 11:00 pm, and another 3% between 12:00 am and 1:00 am. About three hours later, problems arose with the SO₂ emissions controls that were not re-stabilized until after midnight. During the night of Aug. 18, total SO₂ output was 16,464 lbs higher than if the average SO₂ emission rate had been achieved. NO_x controls appear to have worked well and actually, compared to the average emission rate for the month, the unit generated slightly lower NO_x.

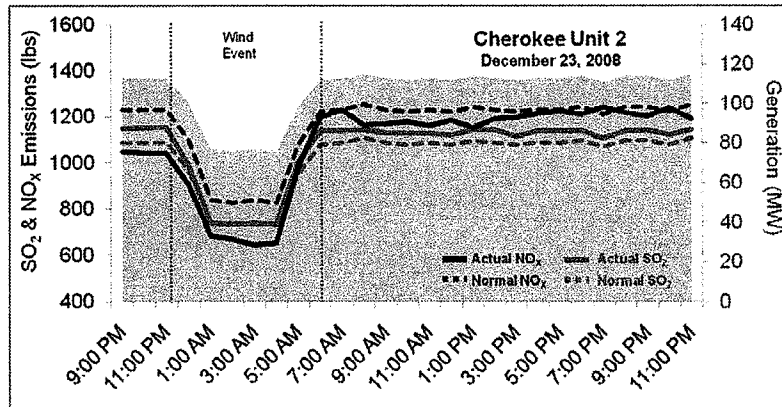
Example III-A



Example III-B below depicts Cherokee Unit 2 on Dec. 23, 2008, and is more extreme. Between 11:00 pm and midnight, generation was reduced by 11%; by 1:00 am, generation fell another 30%. It is important to note that this event may well have been triggered by wind due to the sudden steep generation reduction. Also, these examples show hourly data. In reality, these changes occur minute-to-minute, sometimes even more suddenly. As stressful on the equipment as the 24% reduction appears on an hourly basis, the reduction is potentially far more problematic if it occurred over a period of a few minutes. After the large decline, production was flat for about four hours, rose by 30% between 5:00 and 6:00 am, and another 13% before 7:00 am. Again, whether this sharp increase occurred smoothly over an hour or happened within a few minutes time cannot be determined from the data. In this example, the

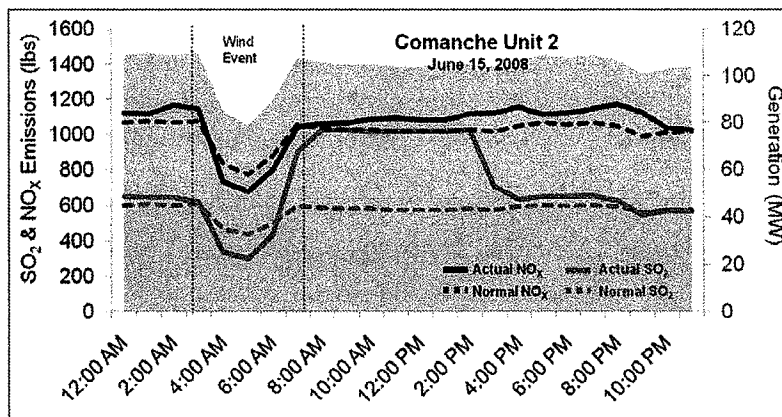
control equipment worked well: cycling induced extra SO₂ emissions amounted to 885 lbs. and NO_x emissions were below the average. This is an example in which the impacts of cycling were relatively minimal.

Example III-B



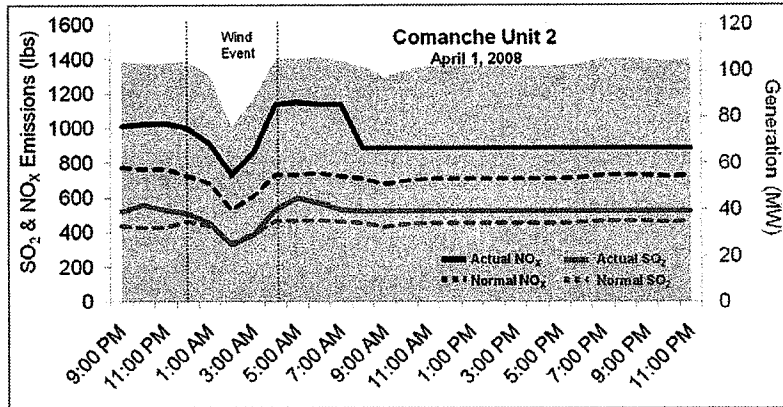
Comanche 2 provides Example III-C below. On June 15, 2008, generation fell by 23% between 3:00 and 4:00 am, and an additional 7% between 4:00 and 5:00 am. Between 5:00 and 6:00 am, generation rose sharply (14%), followed by another 20% before 7:00 am. The event produced 3,739 lbs. of SO₂ and 1,094 lbs. of NO_x – more than would have occurred had the plant's average emission rate for June 2008 been achieved.

Example III-C



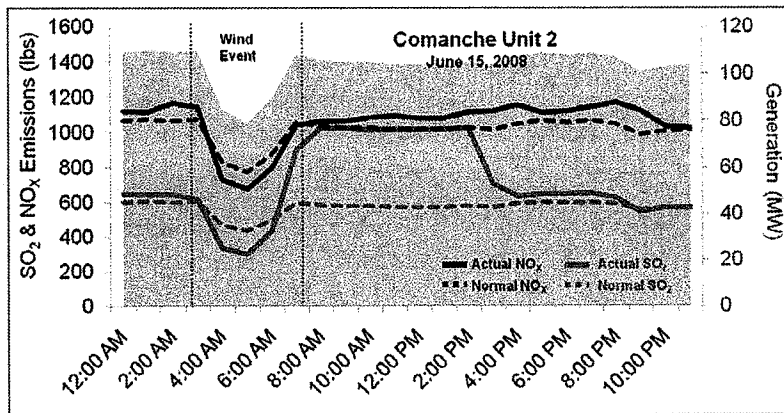
Example III-D below also shows a different day for Comanche 2. On April 1, 2008, generation fell by 6% between midnight and 1:00 am, and another 22% between 1:00 and 2:00 am. Between 2:00 and 3:00 am, generation rose by 14%, and another 20% before 4:00 am. This cycling incident generated 1,412 lbs. of SO₂ and 4,644 lbs. of NO_x – more than would have occurred had the plant's average emission rate for April 2008 been achieved.

Example III-D



Finally, Example III-E below depicts generation and emissions for May 2, 2008. On that day generation fell between 5:00 and 6:00 am by 17%, then fell another 7% before 7:00 am. Between 7:00 and 8:00 am, generation rose by 4%, and then shot up 21% by 9:00 am. This event produced 5,877 lbs. of SO₂ and 1,896 lbs. of NO_x – more than would have occurred had the plant's average emission rate for May 2008 been achieved.

Example III-E



From these examples it is clear that cycling causes difficulties for emission control equipment, and that higher than normal emission rates last several hours after the cycling event. It also appears that occasionally, the emission controls will immediately perform such that emissions are relatively normally, yet an hour or two after the event has ceased, problems occur. Cause and effect cannot be determined from this data, but the frequency of these occurrences in the data suggests more than a random relationship. Finally, it is also important to recognize that it is not possible to determine whether it is the magnitude of the increase or decrease, or the suddenness of the event that causes the problems. A 30% decrease over two or more hours may not have the impact of a 10% decrease that happens instantaneously.

The emissions instability associated with cycling is a function of the age and design of individual plants and reflects the inherent operational difficulties associated with coal-fired

plants. If a coal-fired plant has to cut back on its generation output, the input rate of the feed coal must be cut to produce a lower rate of steam generation, while keeping the right temperature to maintain low NO_x generation. This is not as simple as it sounds. The boiler was designed to run at certain heat output. At lower heat output, the boiler design may be too large to maintain the lower output at the desired temperature.

Think of the automobile example again: imagine a car engine is specifically designed to run on flat highways (just like a utility boiler). The engine and its cooling system were designed to operate at an optimal temperature to achieve the lowest energy consumption and lowest emissions level for the amount of power being produced. If you were to drive the same car downhill, the engine would generate too much power for the driving conditions. Therefore, it must be throttled back. With lower power output, the engine would tend to run at a lower temperature because the cooling system was designed to take away much higher amounts of heat than are being generated. Likewise, when the automobile must run uphill and much more power is required, the cooling system may not be capable of evenly cooling the engine. There will be uneven temperatures within the engine, again resulting in suboptimal operating conditions. Hot spots in the engine may cause premature ignition, resulting in lower mileage and higher emissions. The engine will now require more fuel to generate the same amount of power. and emissions levels will increase.

With any complex combustion system in which a precise and steady flame temperature coupled with just the right amount of fuel and air is required to maintain efficient and clean combustion, varying the operating conditions poses a great challenge, because boilers are designed to run most efficiently within a narrow, steady-state range of operating rates.

The process of controlling efficiency and proper emissions is a complex mix of computer-based technology and manual intervention. There are often over 50 required adjustments, involving everything from fuel-to-air mixes to the lime-slurry mixtures for proper SO₂ absorption that must be made in response to changing generation output¹¹. Even though computerized controls are employed, finding the exact adjustments is not always a straightforward process¹². With changing conditions, the combustion processes are frequently suboptimal and the calculated adjustments do not have the expected impact on the boiler operation. These irregularities cause unstable operation of the plant and require further manual adjustments. It is when manual adjustments must be made that the plant is subjected to the greatest risk of instability. Significant emission excess could result from suboptimal flame, leading to lower efficiencies, sometimes to partial loss of flame and, in an extreme case, to a total plant shut down.

The other consequence of cycling coal plants is the damage to the plant itself. The financial cost of this damage would be seen in an immediate increase in plant maintenance and

¹¹ "Model Predictive Control and Optimization Improves Plant Efficiency and Lowers Emissions," M. Antoine, T. Matsko, P. Immonen, ABB Power Systems, "Retrofitting Lime Spray Dryers at Public Service Company of Colorado," R. Telesz, The Babcock & Wilcox Company, POWER-GEN International 2000, Nov. 14-16, 2000.

¹² "Balancing Low NO₂ Burner Air Flows Through the use of Individual Burner Airflow Monitors," S. Vierstra, AEP, D. Early, AMC Power, POWER-GEN International 1998, Dec. 9-11, 1998.

reduction of useful plant life – a cost that can be very high¹³. This is especially true for base load power plants that were not designed to cycle. While it is hard to quantify exactly the costs of cycling damage, it should be pointed out that the cost should be explicitly included in calculating wind integration costs. To date, however, most of the wind integration studies (including those of PSCO), have ignored this cost¹⁴.

For power plants that were designed to operate at steady base load, cycling due to the wind is like driving the car calibrated for the plains of Nebraska in the mountains of Colorado. Not only will these plants burn more fuel, and cause higher emissions, their operation will also cost more money in the long run when maintenance and shorter life are fully accounted for.

¹³ While most of the plant is designed to be able to cycle, the change in generation has direct impact on the plant water systems, pulverizers, boilers, scrubbers, heat exchangers, and generators. Catastrophic failures as a result of many unit cycles are most commonly in the form of fatigue, corrosion, and cycling-related creep. These failures may eventually cause plant shutdowns, and high capital cost due to necessary replacement of the damaged equipment.

¹⁴ "Wind Integration Study for Public Service Company of Colorado." R. Zavadil, EnerNex Corporation, 2006.

IV. Estimating the Emissions Impact of Wind Energy in PSCO's Territory

Increasing CO₂, SO₂ and NO_x emissions as a result of aggressively developing a wind energy program is a classic example of the Law of Unintended Consequences. The RPS was implemented without fully understanding the degree to which the intermittent nature of wind would stress existing generation facilities. Accommodating wind energy forces coal plants to operate less efficiently, unintentionally resulting in increased emissions. The previous chapter explained in theory how cycling coal-fired generation plants causes them to operate inefficiently, raising the heat rate and creating a host of other deleterious impacts. This chapter takes the analysis a step farther, examining two wind events that are described in detail by PSCO in training materials.

Data and Methodology

The data employed in these analyses is critical to their validity. The emission data for CO₂, SO₂ and NO_x derives from the CEMS database, which is maintained by the EPA. Electric utilities are required to report on an hourly basis their total generation, CO₂, SO₂ and NO_x emissions by boiler by plant for all boilers over 25-MW nameplate capacity. Total load is based on data reported by PSCO to the Federal Energy Regulatory Commission (FERC) on Form 714. This data is required of all control area utilities and is also reported on an hourly basis.

For any given utility territory, total load data, as reported in the FERC Form 714, equals the sum of generation from all plants reported in the CEMS data, plus generation from nuclear, wind, hydro and other renewable energy such as solar, plus other non-coal, gas or oil-generated purchases from other utilities (spot and contract).

Separating wind and hydro generation on an hourly basis is not possible for PSCO's territory because PSCO does not report wind generation on anything other than a monthly and annual level¹⁵. Nevertheless, PSCO has published as part of other studies and training manuals hourly wind data for select days: July 2, 2008, and Sept. 29, 2008.¹⁶ Using the hourly data provided for those two days, it is possible to examine in detail how coal, gas and wind interact and the resulting emissions implications.

¹⁵ BENTEK and IPAMS have repeatedly tried to obtain hourly wind generation for 2008 from PSCO. All requests have been denied since PSCO feels the data portrays confidential trading information.

¹⁶ Reference source of the two days data:

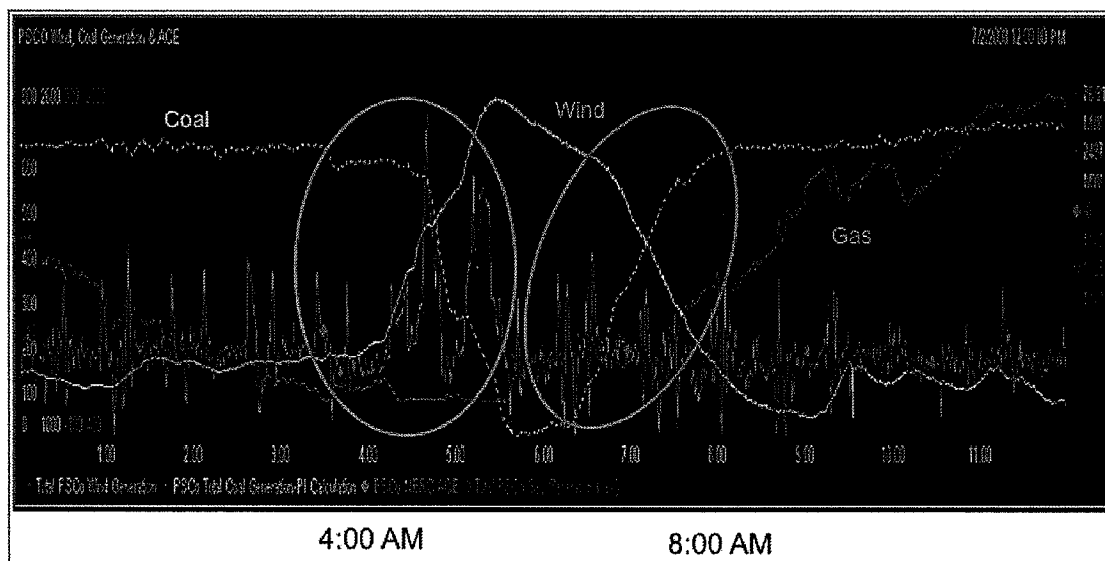
<http://www.xcelenergy.com/SiteCollectionDocuments/docs/CRPEXhibit2PSCOIntegratedReliabilityTraining.pdf>.

The July 2, 2008, Wind Event

The first wind event began at 4:15 am on July 2, 2008, and continued through 7:45 am on the same day. During that period, total wind generation jumped 400% from approximately 200 MW to approximately 800 MW over a 90-minute timeframe. Within the following 90 minutes, wind generation fell back down to approximately 200 MW. This event is depicted in Figure IV-1 taken from the PSCO training manual. Coal generation is shown in yellow, wind generation in blue and gas in green. The red line illustrates the Area Control Error (ACE) used by the National Electric Reliability Council (NERC) to measure system reliability. ACE measures too much or too little power on the system to safely serve total load. In short, it is a measure of reliability. As wind comes online rapidly, ACE spikes upward. Coal generation must be dropped in order to bring the ACE measure down to the appropriate level.

At the beginning of the event, gas-fired generation accounted for approximately 400 MW, 10% of total load. Coal-fired generation accounted for 2,500 MW, 60% of total load. When the wind commenced, PSCO had to curtail generation at either coal or gas plants to accommodate the incremental wind generation. As is shown in Figure IV-1, they chose to curtail generation from coal units rather than gas units. The motivation for this approach is not clear, but the most likely explanation is that the gas units were operating at near minimum levels and could not be curtailed further without significant risk to the facilities. In order to maintain system margin standards required by NERC, the sudden availability of wind forced PSCO to decrease total coal generation from 2,500 MW to 1,800 MW, then, back to 2,500 MW in a matter of 180 minutes.

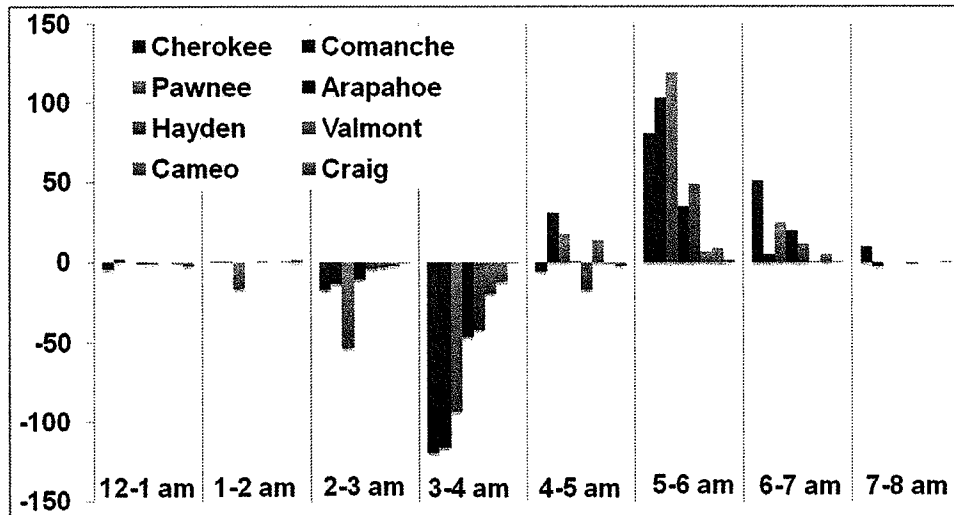
Figure IV-1
Wind Event on PSCO System (July2, 2008)



To draw coal-fired generation down, PSCO cycled three plants – Cherokee, Pawnee and Comanche. Figure IV-2 shows the hour-to-hour change in generation between 4:00 am and

5:00 am on July 2. All of PSCO's power plants can increase or decrease generation hour-to-hour. This hour-to-hour change is referred to as ramp rate.

**Figure IV-2
Hour-to-Hour Change in Generation (MW)**



As discussed in Chapter 2, exceeding the designed ramp rate places significant stress on the equipment, makes operation unstable and potentially shortens its life expectancy. The hour-to-hour changes shown in Figure IV-2 are compared to the published design ramp rates for PSCO's coal-fired plants as shown in Table IV-1. Cherokee's performance in this incident is within its designed ramp rate but Pawnee operated outside its design rate.

**Table IV-1
Ramp Rate for Selected PSCO Plants**

Plant	Fuel	Owned or IRP Resource	Capacity (MW)	10-Minute Ramp Rate	
				(MW)	% Cap.
Arapahoe-3	Coal	Owned	45	6	13%
Arapahoe-4	Coal	Owned	111	5	5%
Cabin Creek-A	Hydro	Owned	162	95	59%
Cabin Creek-B	Hydro	Owned	162	150	93%
Cherokee-1	Coal	Owned	107	6	6%
Cherokee-2	Coal	Owned	106	6	6%
Cherokee-3	Coal	Owned	152	22	14%
Cherokee-4	Coal	Owned	352	20	6%
Commanche-1	Coal	Owned	325	22	7%
Commanche-2	Coal	Owned	335	22	7%
Fort St. Vrain	N. Gas	Owned	690	75	11%
Pawnee	Coal	Owned	505	16	3%
Valmont 5	Coal	Owned	186	14	8%
Valmont 6	Coal	Owned	43	43	100%
Arapahoe 5, 6, & 7	N. Gas	IRP	122	20	16%
Blue Spruce	N. Gas	IRP	271	81	30%
Brush1/3	N. Gas	IRP	76	18	24%
Brush 2	N. Gas	IRP	68	19	28%
Brush 4d	N. Gas	IRP	135	44	33%
Fountain Valley	N. Gas	IRP	238	34	14%
Manchief	N. Gas	IRP	261	97	37%
Rocky Mtn Energy	N. Gas	IRP	587	103	18%
Spindle Hill	N. Gas	IRP	269	119	44%
Thermo Fort Lupton	N. Gas	IRP	279	147	53%
Tristate Brighton	N. Gas	IRP	132	55	42%
Tristate Limon	N. Gas	IRP	63	27	43%
Valmont 7 & 8	N. Gas	IRP	79	38	48%

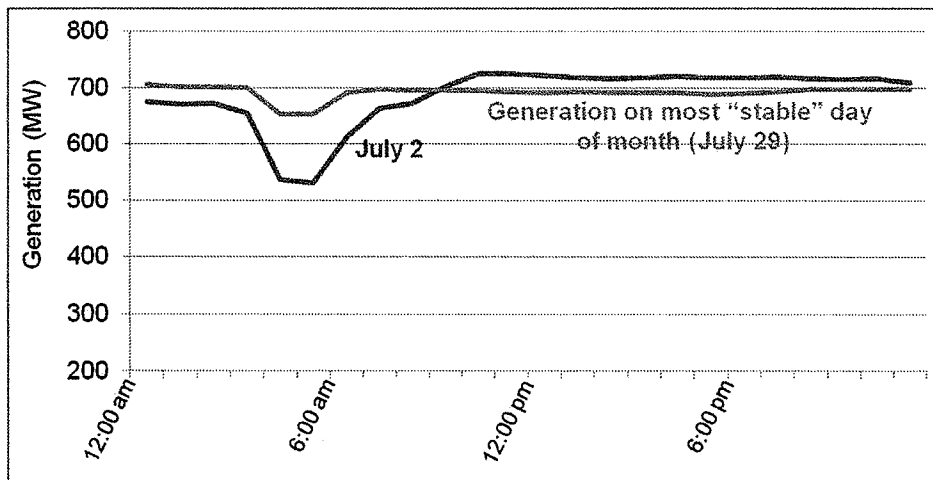
Operation of the Cherokee coal plant during this wind event is used to illustrate the emission impacts of cycling coal units. The Cherokee Plant was chosen due to its proximity to Denver and because it appears to be frequently cycled. The plant is comprised of four coal-fired boilers with summer nameplate capacity of 107 MW, 107 MW, 152 MW, and 352 MW, respectively. In 2008, the boilers were operated at 75%, 72%, 75% and 83% utilization rate, respectively.

Cherokee's hourly generation during this wind event is depicted in Figure IV-3. Between 2:00 am and 5:00 am generation at the plant fell by 141 MW, then, between 5:00 am and 7:00 am generation increased until it reached the high for the day of 725 MW at 10:00 am. From approximately 9:00 am through the balance of the day, generation was essentially flat.

The performance of the coal-fired plant on July 2, contrasts sharply with its performance on July 29, when there was less wind on the system and the plant operation was stable. The red line in Figure IV-3 depicts hourly generation on July 29. Although generation declined slightly

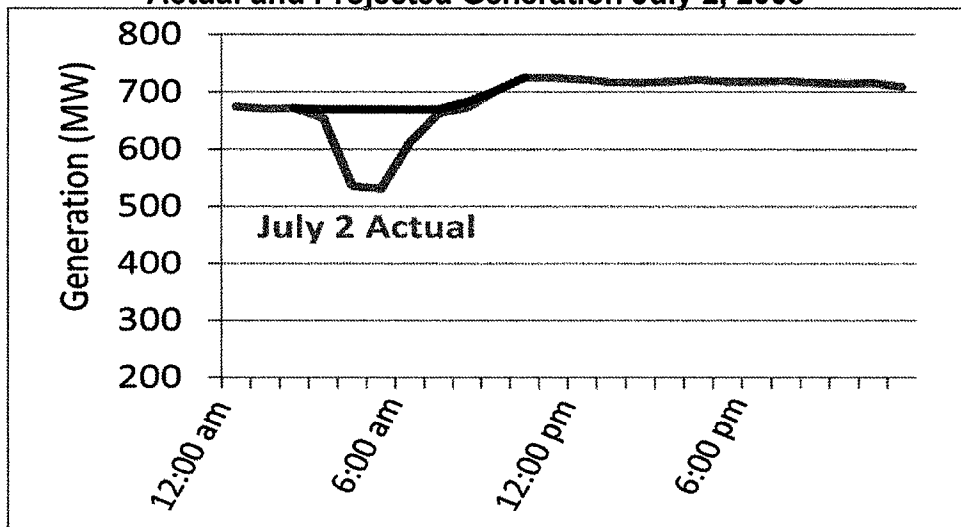
in the early morning hours on July 29, the rapid decline in generation evident on July 2 is clearly not evident. The July 29 curve is very similar in shape to the curve for the rest of July after the wind event. Total generation on July 29 was 16,603 MWh compared to 16,445 MWh for July 2.

**Figure IV-3
Actual and Projected Generation at Cherokee Plant**



The first step in estimating the emission impact of the July 2 wind event is to calculate the generation as if the event had not happened. A straight line estimates the generation avoided between 3:00 am and 7:00 am, the time period in which the plant was cycled (see Figure IV-4). Generation for the remainder of the day is approximately the same as for July 29 with little wind. Wind generation on the morning of July 2, 2008, caused Cherokee to cycle, reducing generation by 363 MWh.

**Figure IV-4
Actual and Projected Generation July 2, 2008**



Three methods are used to estimate the emission impact of the July 2 wind event. The simplest and most frequently used method is to multiply the design emission rates to the generation curve without a wind event (July 29) and to the generation curve with the wind event (July 2), then compare the results over the time period of the event. Table IV-2 summarizes the calculation. The measured emission rates for July 29 are presented in row one. The second row indicates total emissions for the no-wind scenario; row three shows total emissions associated with July 2 generation. Analyzing the emission impacts in this manner results in the estimate that the wind event reduced SO₂ by 730 lbs, NO_x by 1,386 lbs and CO₂ by 392 tons.

**Table IV-2
Estimated Emission Savings Due to Wind on July 2, 2008 (Method A)**

	SO ₂ (lbs)	NO _x (lbs)	CO ₂ (tons)
Est. Stable Day Emission Rates (July 29) (per MWh)	2.01	3.82	1.08
Stable Emission Rates, Est. No Wind Gen. (3:00 am – 7:00 am, Total Gen. = 3,360 MWh)	6,754	12,829	3,628
Stable Rates, Actual Gen. (3:00 am – 7:00 am, Total Gen 2,997 MWh)	6,025	11,443	3,236
Saved (Additional) Emissions	730	1,386	392

The limitation of Method A is that it replaces the actual emissions that occurred on July 2 with estimated emissions from a stable day, which are lower because of the inefficiency injected into the boiler by cycling as described above. Method B corrects the calculation by substituting the actual emissions on July 2 for the estimated emissions on July 2. The emission rates for these hours were actually much higher than the “stable day” rates used in Method A reflecting the impact of cycling on the facility. Table IV-3 compares the same timeframes but using the emission rates as reported in the CEMS data for the July 2 wind event. Using the actual emissions yields the result that cycling Cherokee resulted in 6,348 pounds more SO₂, 10,826 pounds more NO_x and 246 less tons of CO₂.

**Table IV-3
Estimated Emission Savings Due to Wind on July 2, 2008 (Method B)**

	SO ₂ (lbs)	NO _x (lbs)	CO ₂ (tons)
Est. Stable Emission Rates based on July 29 (per MWh)	2.01	3.82	1.08
Actual July 2 Emission Rates (per MWh)	4.37	7.89	1.13
Stable Emissions, Est. No Wind Gen (3:00 am – 7:00 am, Total Gen 3,360 MWh)	6,754	12,829	3,628
Actual Emissions, Actual Gen on July 2 (3:00 am – 7:00 am, Total Gen 2,997 MWh)	13,103	23,655	3,383
Saved (Additional) Emissions	(6,348)	(10,826)	246

The limitation of Method B is the fact that it only focuses on emissions associated with the Specific-Event, in this case between 3:00 am and 7:00 am. As was shown above, however, the sudden decrease, then increase, of generation at the Cherokee plant caused emissions variability that extended well beyond 7:00 am when the plant returned to its pre-cycle generation level. Table IV-4 captures these additional emission impacts as it extends the analysis to include generation and emissions for the entire day of July 2. Estimation Method C provides the most accurate analysis because it captures the total impact of cycling the plant.

**Table IV-4
Estimated Emission Savings Due to Wind on July 2, 2008 (Method C)**

	SO ₂ (lbs)	NO _x (lbs)	CO ₂ (tons)
Est. Stable Emission Rates based on July 29 (per MWh)	2.01	3.82	1.08
Actual July 2 Emission Rates (per MWh)	4.37	7.89	1.13
Stable Emissions, Est. No Wind Gen (3:00 am – 7:00 am, Total Gen 3,360 MWh)	33,787	64,175	18,151
Actual Emissions, Actual Gen on July 2 (3:00 am – 7:00 am, Total Gen 2,997 MWh)	71,897	129,799	18,561
Saved (Additional) Emissions	(38,109)	(65,624)	(410)

The net result is that cycling Cherokee on July 2 resulted in greater emissions even netting the emission avoided by using wind.

Figure IV-5 summarizes the results from the three calculation methods. If wind generation had not caused PSCO to cycle Cherokee on this day, 38,110 lbs of SO₂ or 53% of the day's total SO₂ emissions, 65,624 lbs of NO_x or 51% and 410 tons of CO₂ or 2.2% would have been avoided. The use of wind generation in a manner that forced PSCO to cycle Cherokee added a significant amount of emissions from the Cherokee plant on July 2, 2008. Additionally, assuming that the same quality of coal is used throughout the event, cycling the plant also required PSCO to burn approximately 22 tons more coal than would have been used if the plant had not been cycled.

**Figure IV-5
Incremental Emissions Resulting From Cycling Cherokee on July 2, 2008**

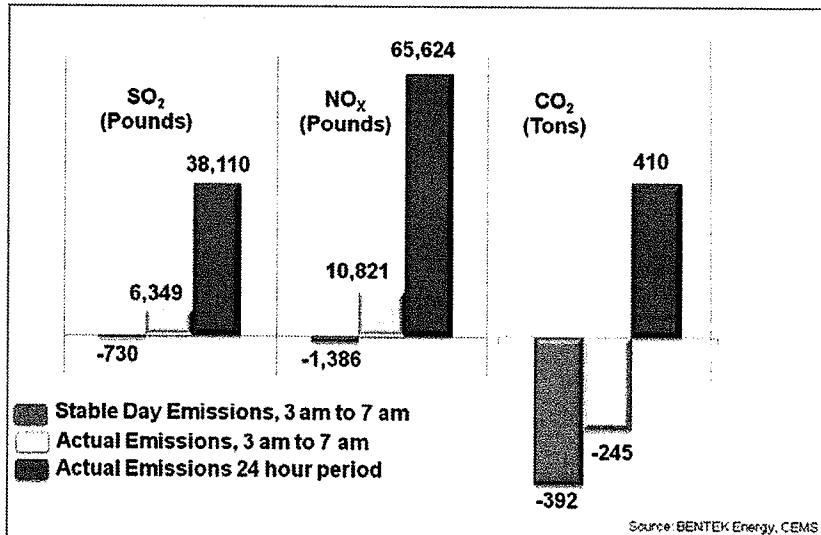
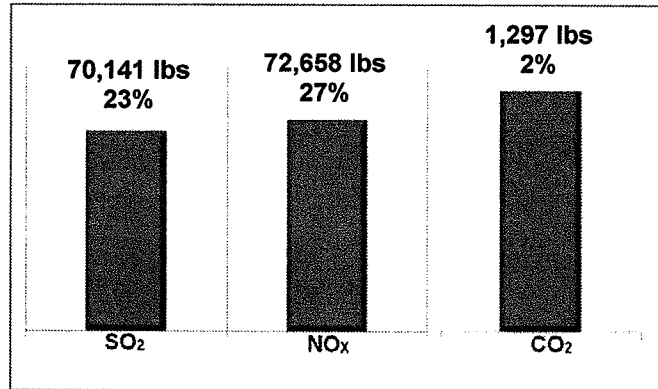


Figure IV-5 also shows how important the definition of event duration is to the estimated impact. If the narrow 3:00 am to 7:00 am definition is used, the impact of cycling is considerably less. However, this definition does not take into consideration the longer term difficulties of recalibrating the emission controls after a significant cycling event, which, as we have seen, can result in increased emissions over several hours. Clearly the longer term perspective is the most appropriate means to measure these impacts.

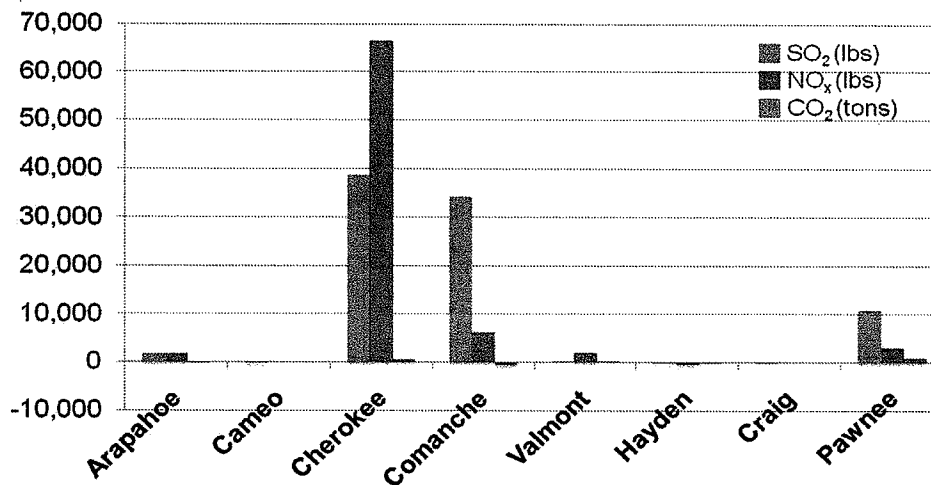
The same analysis was used to estimate the emissions implications of the July 2 wind event on all of the coal-fired plants in PSCO's resource base. The results are summarized in Figure IV-6. Using the 24-hour event definition (Method C) across the system, the July 2 wind event caused 70,141 pounds of SO₂ (23% of the total PSCO coal emissions), 72,658 pounds of NO_x (27%) and 1,297 more tons of CO₂ (2%) to be emitted than if the event had not caused the plants to be cycled.

**Figure IV-6
Incremental Emissions Impact of Coal Plant Cycling
All Plants - July 2, 2008**



As shown in Figure IV-7 most of the additional emissions came from three plants, Cherokee, Comanche and Pawnee. All of these plants are located near Denver, thus, directly impact emissions levels along the Front Range.

**Figure IV-7
Incremental Emissions July 2, 2008 by Plant**



Conclusions

System-wide, wind generation on July 2 caused 70,141 lbs of SO₂ (23% of total SO₂), 72,658 lbs of NO_x (27% of total NO_x). Wind generation saved 1,297 tons of CO₂, 2% of total CO₂ emissions.

Compensating for wind generation on July 2 appears to have resulted in inefficient and abnormal operation at PSCO's coal plants which resulted in increased total SO₂ and NO_x

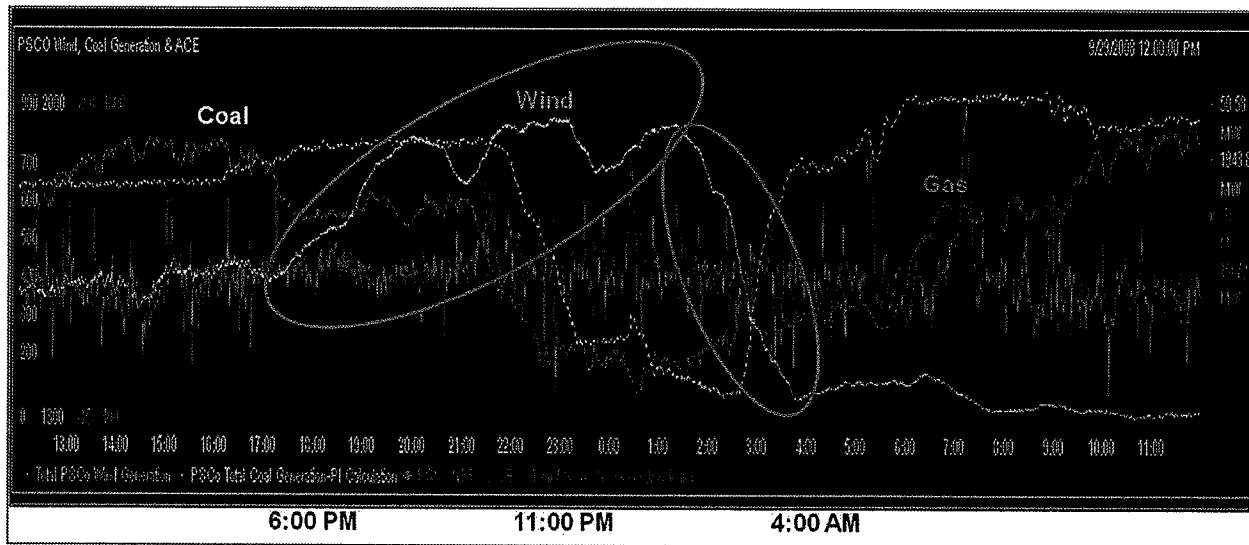
emissions. By netting out the emissions associated with the coal-fired generation that were avoided by using wind, the result is that due to wind generation, SO₂ and NO_x emissions were significantly higher (23% and 27%, respectively) than they would have been if the coal plants had not been cycled to compensate for wind generation.

Sept. 28-29, 2008

The second wind event begins during the night of Sept. 28-29, 2008. This event is depicted in Figure IV-8 taken from the PSCO training manual. Generation from coal is shown in yellow and gas load in green. The red line is the ACE.

As total load came down during the night, PSCO reduced generation at coal and gas units to allow wind to continue to generate. When the event commenced, PSCO was generating approximately 2,000 MW from coal and 1,500 MW from natural gas. Beginning at 10:00 pm and continuing until 2:00 am the following morning, coal generation was ramped down by approximately 25% to 1,487 MW until wind generation dropped to approximately 50 MW between 2:00 am and 4:00 am. In response, coal was ramped up from approximately 1,500 to 1,900 MW in 60 minutes beginning at 3:00 am.

**Figure IV-8
Sept. 28–29, 2008, Wind Event**



Generation from all PSCO coal plants on Sept. 28 and 29, 2008, contrasts to that of just a few days earlier on Sept. 22 and 23. Figure IV-9 details the hourly generation for these two sets of days. Wind generation availability on Sept. 28-29 resulted in a significant reduction in coal-fired generation. As was done for the July 2 case study, the emission rates associated with generation from the 22nd and 23rd will be applied to the 28th and 29th event.

Figure IV-9
Generation from Coal Plants Sept. 28–29, 2008, Compared to Sept. 22-23, 2008

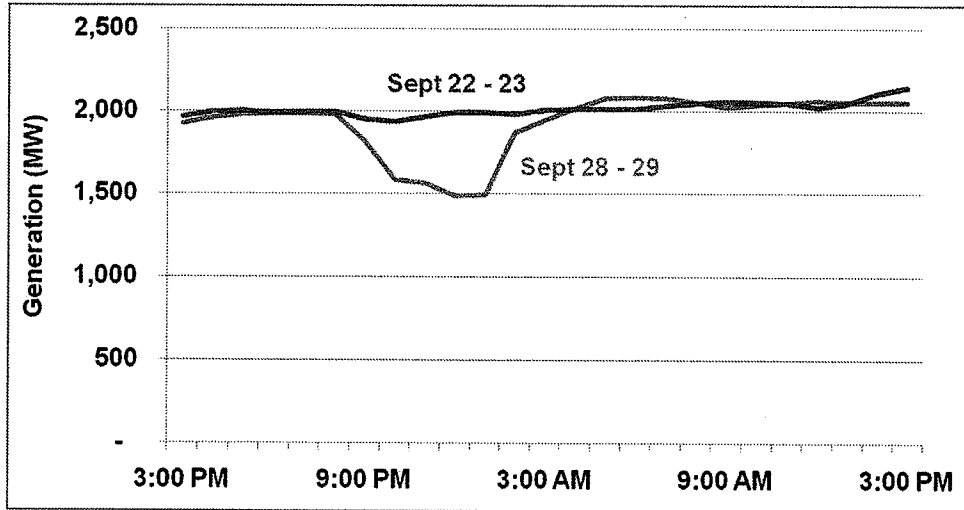


Figure IV-10 shows the plants that were cycled to accommodate wind on Sept. 28–29. Of those, the Pawnee, Comanche and Cherokee coal units were cycled to balance the load.

Figure IV-10
Hour-to-Hour Change in Generation Sept. 28–29, 2008

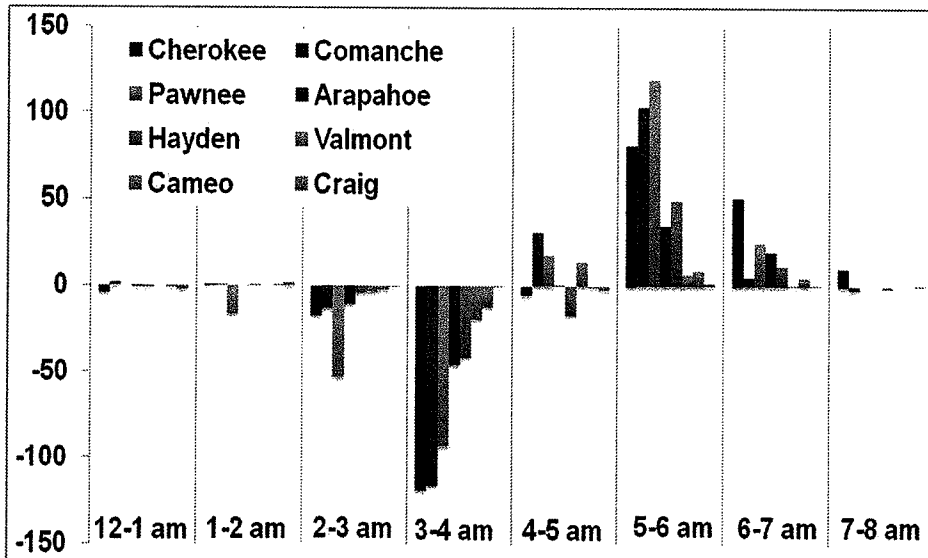
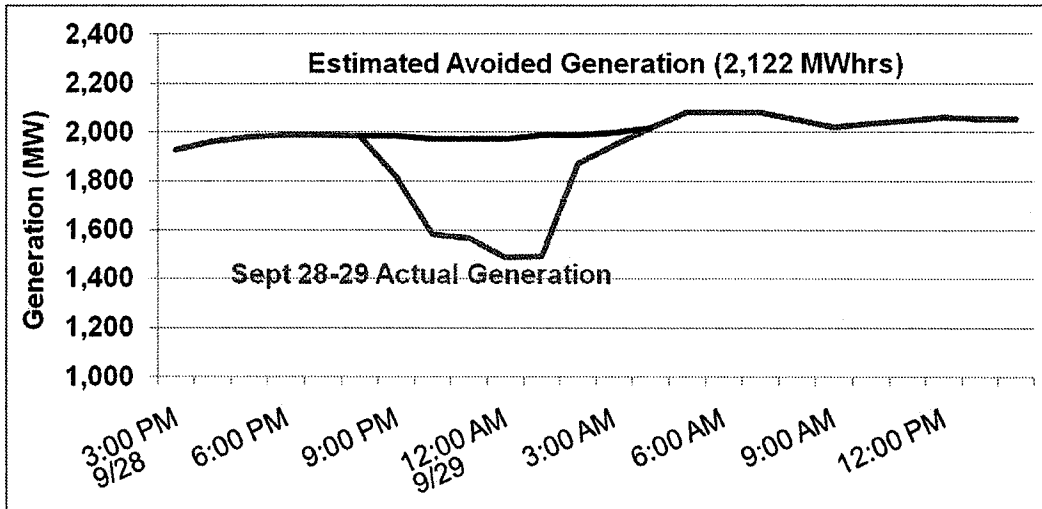


Figure IV-11 shows the coal generation that was avoided during the wind event aggregated to include all coal-fired plants. The event is estimated to have avoided approximately 2,122 MWh of coal-fired generation during the period between 8:00 pm and 4:00 am.

Figure IV-11
Estimated Avoided Generation Due to Wind Event Sept. 28–29, 2008



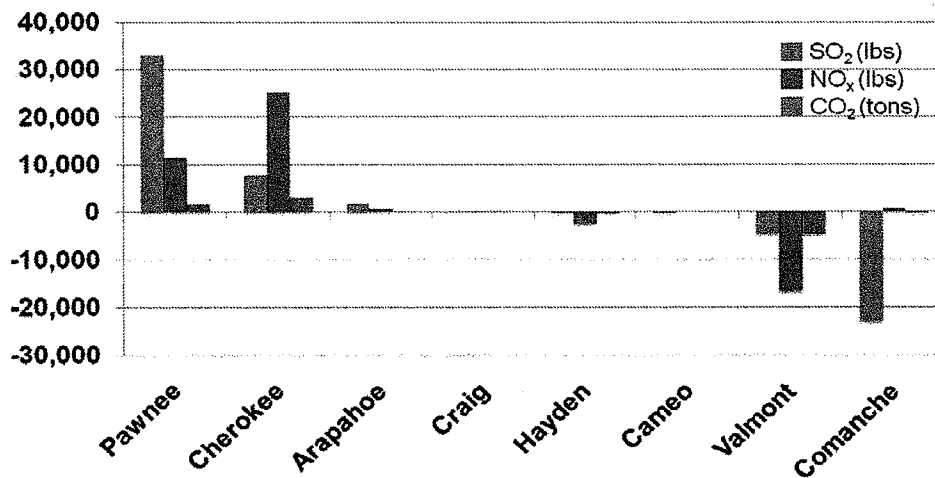
The estimated extra emissions generated by this event are shown in Table IV-5 using the same three calculation methods described earlier. As was the case with the July 2 event, the calculation method drives the results. If the additional emissions that occurred during Sept. 29 (after the wind fell off and coal generation resumed) are included, this wind event resulted in 28,823 lbs of SO₂ and 17,017 lbs of NO_x (18% of total SO₂ and 10% of total NO_x generated that day) more than would have been emitted had coal not been cycled. On the other hand, using wind to the degree it was used on Sept. 29 allowed PSCO to avoid generating 1,686 tons of CO₂ (3.2% of total CO₂).

**Table IV-5
Excess Emissions Resulting from Sept. 28-29 Wind Event**

	SO ₂ (lbs)	NO _x (lbs)	CO ₂ (Tons)
Method A			
Sept 22 Emission Rates (per MWhr Generated)	0.0305	0.0320	0.0110
Stable Emissions-Actual Gen 8 pm-3 am	48,370	50,778	17,457
Stable Emissions-Est Gen 8 pm -3 am	41,900	43,986	15,122
Saved (Additional) Emissions	6,470	6,792	2,335
Method B			
Sept 22 Emission Rates (per MWhr Generated)	0.0350	0.0320	0.0110
Sept 28 Emission Rates (per MWhr Generated)	0.0345	0.0361	0.0112
Actual Emissions-Actual Gen 8 pm-3 am	48,370	50,778	17,457
Stable Day Emissions-No Wind Gen 8 pm-3 am	47,430	49,580	15,356
Saved (Additional) Emissions	940	1,198	2,101
Method C			
Sept 22 Emission Rates (per MWhr Generated)	0.0350	0.0320	0.0110
Sept 28 Emission Rates (per MWhr Generated)	0.0345	0.0361	0.0112
Stable Day Emissions-No Wind Gen 8 pm-6 pm	131,823	150,909	53,696
Actual Emissions-Actual Gen 8 pm-6 pm	160,646	167,926	52,010
Saved (Additional) Emissions	(28,823)	(17,017)	1,686

Figure IV-12 shows the distribution of the emissions associated with the Methodology C calculation. Virtually all of the extra SO₂ and NO_x emissions were created at the Pawnee and Cherokee plants. The Arapahoe, Hayden and Comanche plants showed small NO_x savings.

**Figure IV-12
Distribution of Extra Emissions by Plant Sept. 28-29, 2008**



Conclusions

The two case studies reviewed in this chapter lead to two conclusions:

- When PSCO utilized more wind energy than it could absorb without cycling coal, net emission may occur. In these two examples, the additional emission levels amounted to significant percentages, greater than 10% of total SO₂ and between 2% and 10% of total NO_x on the days reviewed.
- The amount of extra emissions due to cycling depends on how narrowly a “wind event” is defined. When the definition is limited to the very narrow definition, i.e., the time between when the wind build-up begins and when it falls off, then using wind energy appears to create a net emissions savings. However, when the definition is broadened to include the balance of the day after the wind dies down, the emission impacts become much more significant. The difference between the two approaches is the fact that cycling coal often results in destabilizing the emission equipment effectiveness and produces extra emissions for a longer period of time than just the actual wind event. The entire day must be analyzed to fully understand the impact of coal plant cycling on emissions.

V. Coal Cycling Impacts on PSCO Territory Emissions

The preceding chapter documented the SO₂, NO_x and CO₂ implications of two “wind events” defined as such by PSCO in their training manual. The important policy concern hinges on whether these types of events are common or whether the July 2 and Sept. 29, 2008, events are exceptional and rarely happen. To the degree that the events are exceptional, then the RPS standard appears to have little impact on levels of SO₂ and NO_x emissions. On the other hand, a troubling public policy question is raised if wind-induced coal cycling is common and generates higher levels of SO₂ and NO_x emissions. In that case, the mandates of the RPS standard are in direct conflict with the need to reduce SO₂ and NO_x in order to meet EPA ozone attainment requirements.

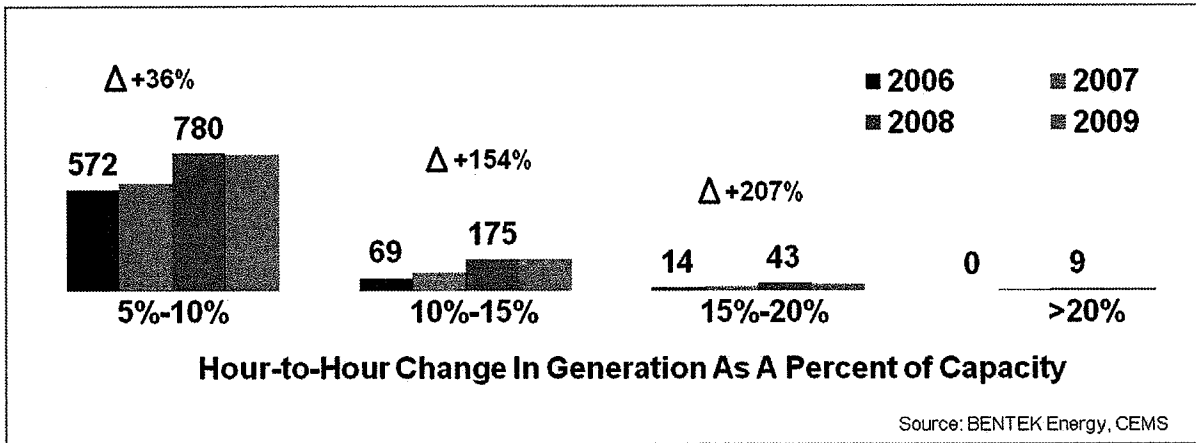
This chapter concludes that, although circumstantial, the evidence strongly suggests that the latter is in fact true: incidence of coal cycling is common and has risen sharply since introduction of wind generation, and in 2008 and 2009 the result has been significantly greater emissions of SO₂, NO_x and CO₂ than would have occurred if the coal units had not been cycled.

It has been stated before but is important to say it again here; it is not possible to understand precisely the interaction between wind generation and coal plant cycling in PSCO’s territory because PSCO will not release its hourly wind generation data. In contrast to the methodology that is employed when wind-coal interaction is analyzed in Chapter VI for ERCOT where wind data is available, we can only identify coal-cycling events. We cannot conclusively associate the events with wind activity (as we can in ERCOT), thus, we cannot differentiate between the impacts of wind events and other non-wind-induced cycling events such as regular maintenance and other “unplanned” generation downturns. As a consequence, the results described in this chapter will be discussed as caused by coal cycling rather than wind. As will be shown, however, it is a fair inference to conclude that much of the cycling is wind-induced as the occurrence of cycling has risen sharply since the growth of wind energy availability in 2007.

Coal-fired Generation Cycling

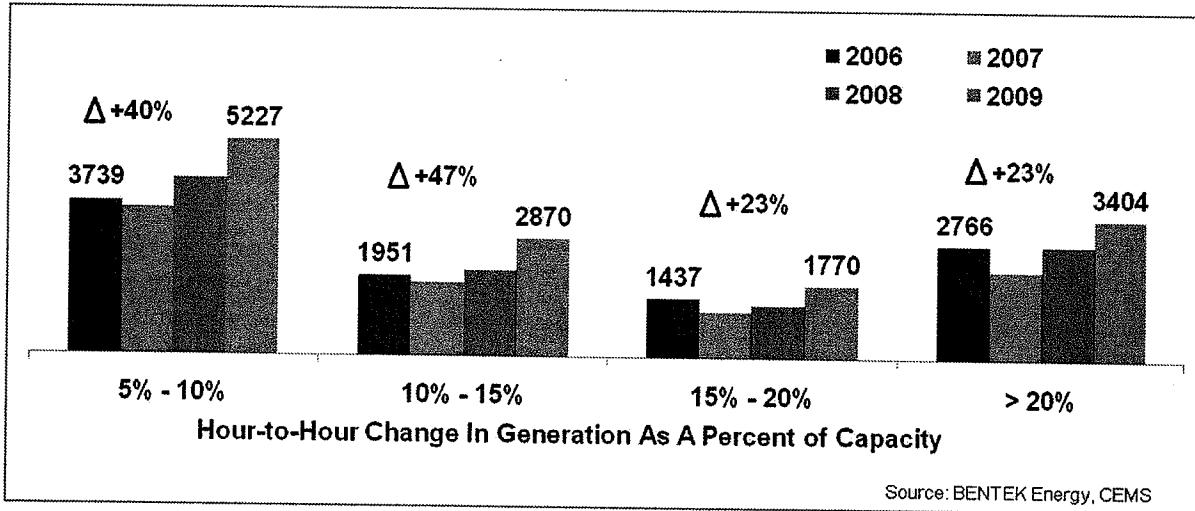
The incidence of coal-fired-generation cycling has risen sharply since 2007 when approximately 1,000 MW of wind energy was introduced into the PSCO generation mix. Figure V-1 shows the number of cycling events distributed by the magnitude of the cycle, which is defined as percent change in hour-to-hour generation for all PSCO plants taken in aggregate. Purple depicts 2006 information, green 2007, red 2008 and blue 2009. Looked at from this “system perspective,” all magnitude categories increased substantially in 2008 after wind generation expanded. Cycling events that were between 5% and 10% of nameplate capacity increased by 36%, events between 10% and 15% more than doubled, and events between 15% and 20% tripled. There were nine events in 2008 over 20% where there were none in 2006.

**Figure V-1
Distribution of Coal-Fired Plant Cycling Events: All Plants Combined**



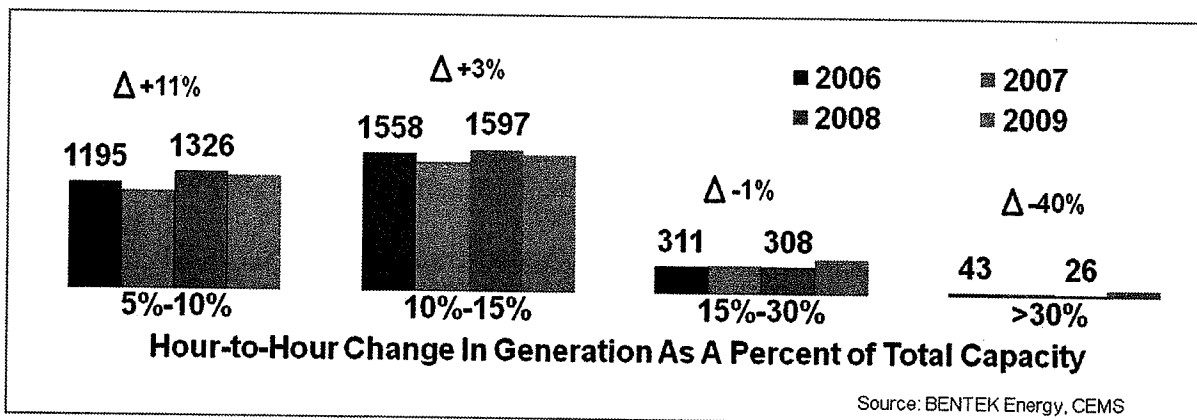
The increase in cycling is even more evident when the behavior of individual plants is analyzed. Figure V-2 uses the same approach as was used above, but counts cycling events at individual plants, again, based on the hour-to-hour change in generation level relative to each plant's nameplate capacity. The number of events at the individual plant level is significantly larger than when system-wide generation is considered, yet the number of events in each category has risen appreciably. The magnitude of change between 2006 and 2008-09 is even more impressive when the total generation from the plants is considered. According to the CEMS data series, the plants represented in these graphics generated 19,604 GWh in 2006 compared to 18,392 GWh in 2008 and 15,440 GWh in 2009. Between 2006 and 2009 generation from these plants fell by over 20%, yet the incidence of cycling events greater than 10% increased by between 47% and 23%. Even between 2008 and 2009 there were 24% more cycling events despite the fact that power production was down 16%.

Figure V-2
Distribution of Coal-Fired Plant Cycling Events: All Plants Calculated Individually



PSCO's use of its natural-gas-fired plants, which are designed to be cycled, contrasts sharply. Figure V-3 depicts the incidence of cycling among PSCO-owned gas-fired facilities (Zuni, Alamosa, Fruita, Ft. Lupton, Fort St. Vrain, Valmont, Fountain Valley, Front Range Power, Rocky Mountain Energy, Spindle Hill, Arapahoe, Blue Spruce, Limon, Rocky Mountain Reserve, Brush and Manchief). Between 2006 and 2008, the number of cycling events with a magnitude equal to between 5% and 10% of capacity increased 11%, events between 10% and 15% increased 3%, events between 15% and 30% actually declined slightly and large-scale events (greater than 30% of capacity) declined substantially. These changes occurred despite total generation from the facilities increasing from 7,498 GWh in 2006 to 7,977 GWh in 2008, a 6% gain.

Figure V-3
Distribution of Gas Plant Cycling Events: All Plants Combined



Cycling Caused Emissions

Multiple approaches were used to estimate the extra emissions that resulted from the increased cycling of coal. There are a number of important variables to consider and most tie back to the need to differentiate “wind induced” events from all sudden declines in coal-fired generation. As has been said several times in this report, it is impossible to do this precisely without good wind generation data. Nevertheless, by using several analytical approaches, it is possible to frame a range of emission outcomes that probably contain the actual number. In reality, however, the actual number is not as important as recognition that cycling coal plants does appear to increase emissions, particularly SO₂ and NO_x by a significant magnitude.

Specific-Event Approach

The first approach only included instances where generation from individual coal-fired plants decreased by more than 10% hour-to-hour between 12:00 am and 8:00 am. To be included as an event, plants must also operate all 24-hours, thus, eliminating events that would result from maintenance or unplanned outages. For each instance, the power not produced during the incident was estimated. “Stable day” emission rates were multiplied by the avoided power from the coal-fired plants to estimate avoided emissions. Then the actual emissions are compared to the avoided emissions as described in the case study using Methodology C (i.e., the stable day rates were applied to avoided generation and post-event generation for the balance of the day [See Chapter IV]).

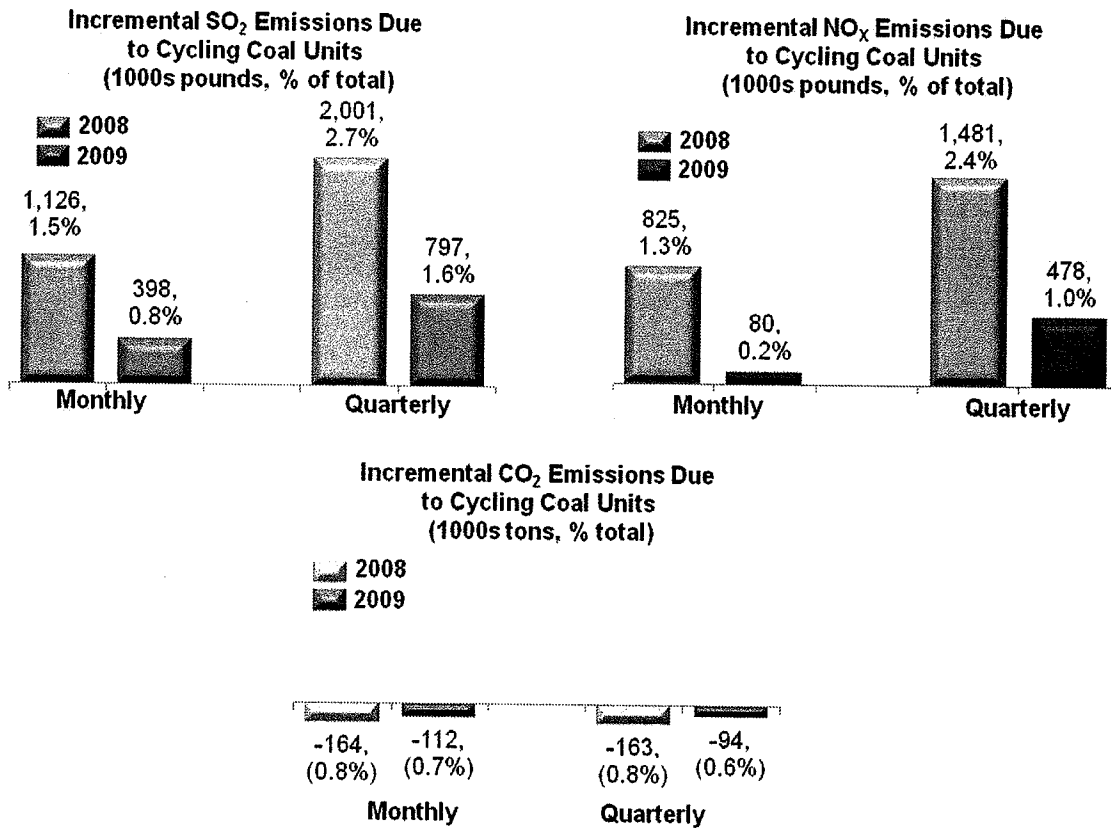
The “stable day” emission rate is a key aspect of this analysis and multiple options may be used in the calculation. One approach defines the stable day rate based on selecting the most stable emission rates evidenced at the plant during the month of the event. The advantage of using a monthly approach is that it incorporates any variation that results from monthly weather conditions. The disadvantage to using monthly data is that, if there are many small cycling events, or the large events perturb emissions over long periods of time, the “stable day” rate is inflated. Alternatively, stable day rates can be based on rates during the most stable period evidenced during a quarter or annually. Using a quarterly average rate is slightly less sensitive to monthly weather, but reduces the inflation effect associated with the monthly approach. Further, it is also possible to run the analysis using an annual stable day estimate. This further averages out emission variability, but also ignores seasonal variability that may be important. Table V-1 summarizes the stable day emission rates associated with each approach. The table shows the average rate across all coal plants and is intended only to provide a sense of how much impact the monthly/quarterly assumption makes on the stable rate estimate.

Table V-1
Comparison of Average Emission Rates Monthly vs. Quarterly

	SO ₂ (lbs/MW/hr)		NO _x (lbs/MW/hr)		CO ₂ (tons/MW/hr)	
	Month	Quarter	Month	Quarter	Month	Quarter
	2008	3.93	3.71	3.83	3.73	1.11
2009	3.90	3.73	3.82	3.70	1.11	1.11

Figure V-4 compares the results using “stable day” rates estimated on a monthly and quarterly basis. In all, there were 1,261 and 1,327 specific cycling events in 2008 and 2009, respectively, which met the 10% hour-to-hour criteria. Using the monthly stable day average for 2008, these events generated 1.1 million pounds of SO₂ and 825,455 pounds of NO_x and saved 164,304 tons of CO₂. In 2009, the lower number of events resulted in 397,782 pounds of SO₂, 79,654 pounds of NO_x and 111,506 tons of CO₂ more than would have been produced had the cycling not occurred.

Figure V-4
Incremental Emissions Resulting Coal Cycling (Specific-Event Approach)



Using the quarterly method for estimating the most stable day increases incremental emissions for all three types. In 2008, using the quarterly stable day average SO₂, emissions

were 2.0 million pounds higher than would have been produced without coal cycling. NO_x emissions were similarly elevated by 1.5 million pounds, but 163,146 tons of CO₂ were not emitted. In 2009, coal cycling resulted in 797,423 pounds SO₂, 477,762 pounds of NO_x and 94,428 tons of CO₂ being produced more than would have been produced without coal cycling.

Using the Specific-Event method to calculate emission suggests that coal cycling is causing PSCO to emit more SO₂ and NO_x than it would have if the coal plants are not cycled to this degree. This approach, however, underestimates the magnitude of the problem because it ignores all of the little short-term cycling events and does not account for situations where cycling causes the emissions control to enter into a prolonged period of erratic behavior. Due to these limitations, the Specific-Event Approach can be viewed as defining a minimal level of probable impact.

Full-Year Approach

The Full-Year Approach compensates for the limitations of the Specific-Event Approach. Instead of focusing simply on the days where there were 10% hour-to-hour declines as was done in the Specific-Event Approach, the Full-Year Approach applies the monthly and quarterly "stable day" emission rates to generation from every day of the year. Again, days when the plant is not running or days with planned outages are eliminated as a means of accounting for maintenance. Stable Day emission rates are the same as were calculated for the Specific-Event Approach.

The implicit assumption in this approach is that cycling is the root cause of all emission rates that exceed those of the "stable day." Another way of describing the underlying assumption for the Full-Year Approach is that it assumes the plants are run at their most stable emission rate consistently throughout the year. Due to these underlying assumptions, this estimation method may be viewed as calculating the upper end of incremental emissions associated with coal cycling.

Figure V-5 shows the results from the Full-Year Approach. Using the monthly stable day rates in 2008, coal cycling caused PSCO to emit between 6.7 and 10.5 million pounds of SO₂, between 4.5 and 6.3 million tons of NO_x and 152,000 tons of CO₂ more than would have been emitted had the plants been run stably throughout the year, depending on whether the monthly or quarterly stable day rate calculation is used. In 2009, cycling resulted in smaller levels of excess emissions for SO₂, NO_x and CO₂. The difference is most likely a result of the lower generation levels achieved by PSCO from these facilities in 2009, which were documented earlier.

**Figure V-5
Incremental Emissions Resulting Coal Cycling (Full-Year Approach)**

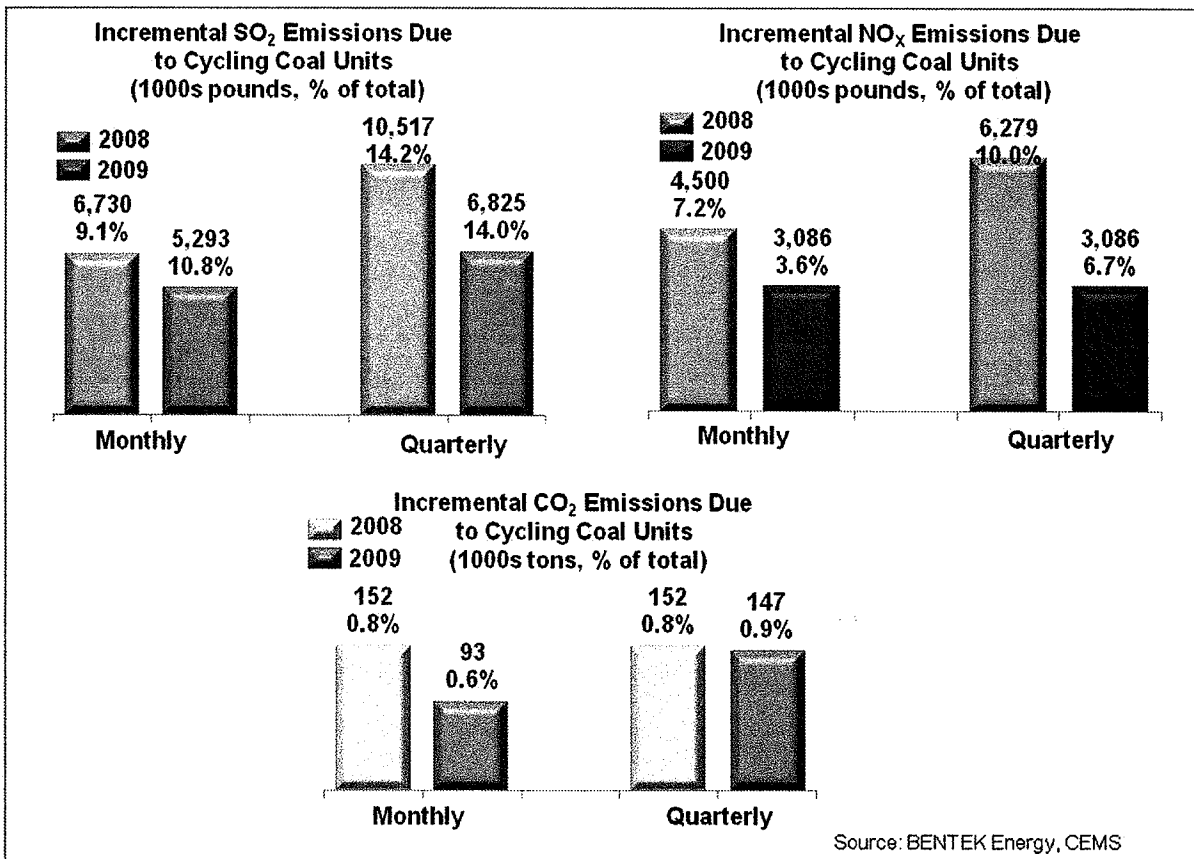
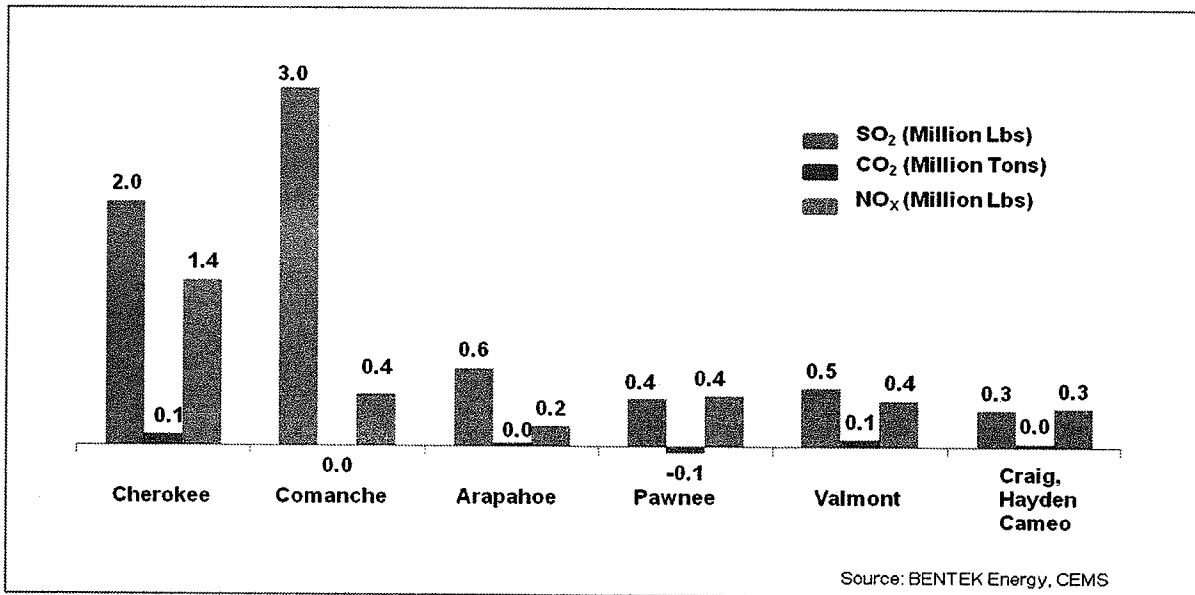


Figure V-6 shows the distribution of 2009 incremental emissions by coal-fired plants using the stable day method calculated on a quarterly basis. Cherokee and Comanche account for the largest share of the excess SO₂ with Arapahoe and Pawnee contributing smaller amounts. NO_x also comes primarily from Cherokee. The distribution for 2008 is similar to 2009, but Pawnee contributed relatively more of both SO₂ and NO_x and Comanche less. The distribution is significant because Cherokee, Arapahoe and Valmont are within the Denver non-attainment area, and Pawnee is located just northeast of the area.

**Figure V-6
Incremental Emissions by Plant in 2009 (Quarterly Analysis)**



Conclusions

The analysis presented in this chapter suggests that cycling of coal-fired facilities has increased significantly since 2007 as wind energy generation increased to its current levels. The number of cycling events where system-wide coal generation dropped between 5% and 10% increased by 40% in 2008, events where generation dropped between 10% and 15% increased by 47% and larger sized events increased by over 20% as well. Since the introduction of 775 MW of wind generation is the only real operational difference between 2007 and 2008, it is reasonable to presume that the operational needs associated with accommodating wind are what drove the increases.

In addition, the increased incidence of cycling has led to emission of greater volumes of SO₂, NO_x and CO₂. In 2008, depending on the method of calculation, cycling coal plants caused between 1.1 and 10.5 million pounds of SO₂ to be produced that would not have been produced had the plants not been cycled. Similarly, cycling resulted in between 825,455 and 6.3 million pounds of incremental NO_x being generated. Cycling's impact on CO₂ is more ambiguous as the range is between creating a savings of 164,000 tons and a penalty of 151,000 tons.

In 2009, generation from PSCO's coal-fired plants fell off by about 20%, but their emissions did not diminish proportionately. Again, cycling appears to be a central factor. In 2009, there were 1,327 cycling incidents and they resulted in creating between 398,000 and 6.8 million pounds of SO₂, 80,000 and 3.1 million pounds of NO_x and between 94,000 and 147,000 pounds of CO₂ more than would have been generated had the plants been run stably.

VI. Wind, Coal and Natural Gas Interaction in ERCOT

To gain a better understanding of the impact of wind events on coal-fired generation and to validate the findings relative to the PSCO territory, this chapter examines coal cycling within the Electric Reliability Council of Texas (ERCOT) system. The ERCOT and PSCO systems have aggressively pursued wind generation in the last decade due to legislative goals and incentives. Wind power is a must-take resource on both systems, but is curtailed more often in ERCOT because resources are much larger and when fully generating can create reliability problems. Finally, both systems are dispatched by central operators who attempt to utilize as much wind generation as possible without disrupting reliability standards. More important than these similarities, however, are the distinctions: ERCOT has far larger gas-fired generation capacity and ERCOT requires publishing of detailed wind generation data. This data combined with the CEMS data, enables precise definition of wind events, thus, facilitates a more precise understanding of the emission implications of wind use.

Accordingly, this chapter examines the interaction between wind, coal and natural gas in the ERCOT region of Texas as a means of further validating the results found in the PSCO territory. The chapter will demonstrate that while the scale of wind, gas and coal operations in ERCOT is larger than in PSCO's territory, the result is the same. Since the wind blows at night when gas generation is relatively low as a percent of total generation, coal plants are cycled, which results in higher SO₂, NO_x and CO₂ than would have been the case had those coal plants not been cycled.

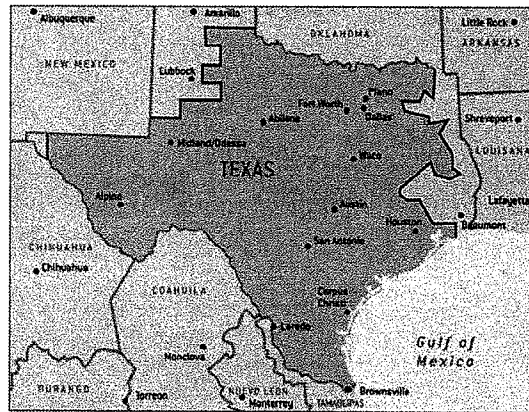
Electric Reliability Council of Texas

ERCOT is an independent system operator (ISO), servicing most of Texas. ERCOT manages over 85% of power generation in Texas (as depicted in Figure VI-1), ensuring that power reaches over 22 million residents. The ISO schedules power offered by over 550 generation units¹⁷ and manages demand levels. In 2009, the ERCOT system was responsible for handling nearly 300,000 GWh of generation, which amounts to 8% of the U.S. total.¹⁸ The system reached its peak of 63,400 MWh in July 2009.

¹⁷ <http://www.ercot.com/>

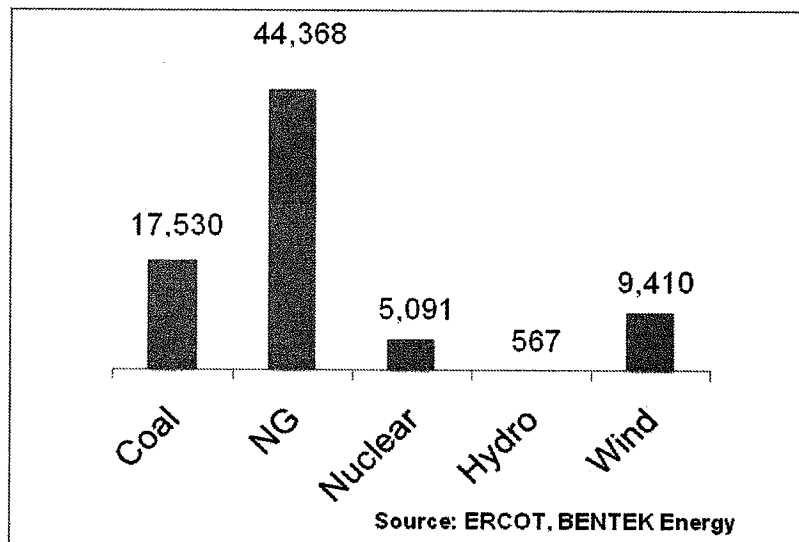
¹⁸ EIA and ERCOT

**Figure VI-1
ERCOT Encompasses 91% of Texas Consumers**



Natural gas-fired capacity comprises the majority (58%) of total ERCOT capacity. Coal is the next largest component at 23%, followed by wind (12%) and nuclear (7%). The difference in structure between PSCO's territory and ERCOT lies in ERCOT's need to meet dramatic demand swings during the summer related to air-conditioning load. The generation capacity mix was designed around this understanding, allowing for more than twice as much installed gas capacity as coal capacity. Figure VI-2 captures the capacity mix in Texas during 2009.

**Figure VI-2
2009 ERCOT Capacity Mix¹⁹ (MW)**

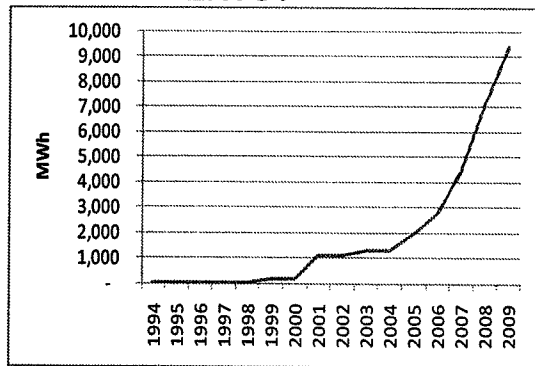


Nearly 8,000 MW of wind capacity have been installed in Texas since 2005. Figure VI-3 shows how wind generation has changed in Texas since 1994. In 2005, the PUCT enacted

¹⁹<http://www.ercot.com/>

S.B. 20, requiring that the state of Texas mandate certain levels of renewable capacity, which are summarized in Table VI-1.

**Figure VI-3
Total Wind Generation Capacity in
ERCOT**

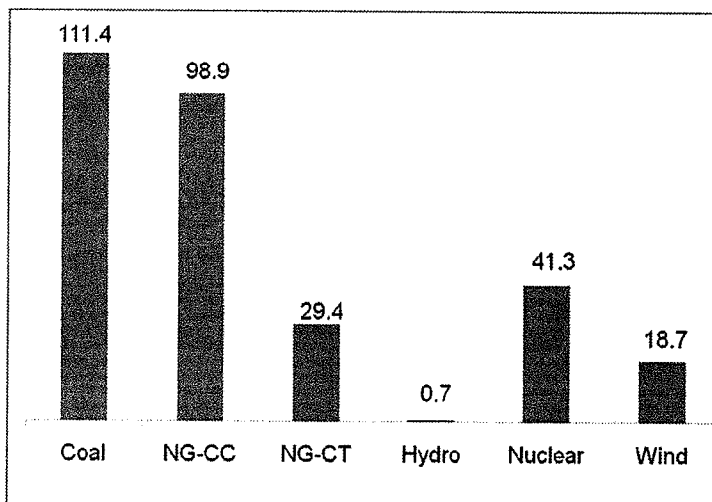


**Table VI-1
RPS Capacity Standards for TX**

Date	Installed Capacity
1/1/2007	2,280 MW
1/1/2009	3,272 MW
1/1/2011	4,264 MW
1/1/2013	5,256 MW
1/1/2015	5,880 MW
1/1/2025	10,000 MW

Figure VI-4 depicts the relative generation and utilization rates of the various fuel options in ERCOT for 2009. From the standpoint of total annual generation, natural gas and coal dominate the generation mix. Between combined-cycle and combustion turbines, natural gas provides about 43% of total generation, compared to 37% for coal, 14% for nuclear and 6% for wind. However, the relatively low utilization rate for gas-fired combustion turbines and combined-cycle units means that they are used less frequently than the coal and nuclear plants, which comprise the base load component of the supply stack.

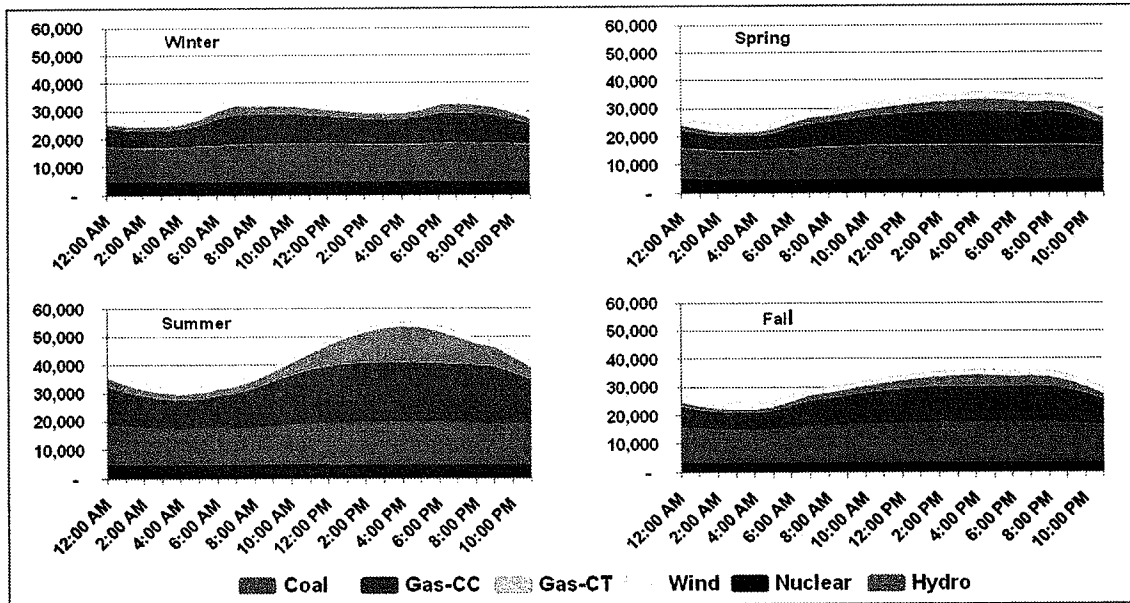
**Figure VI-4 2009
ERCOT Generation by Fuel Type (Ths of GWh)**



The distinction between base load and non-base load generation is more evident in the seasonal depictions of the average daily generation profile for the ERCOT region in 2009. Figure VI-5 shows the differences between the average daily profiles of each season. Nuclear generation is shown in purple, coal in grey, natural gas combined-cycle in dark blue, gas-fired combustion turbines in light blue, wind in light green and hydro in orange. There are several differences between the seasonal generation patterns.

- During the summer season, peak demand, which reaches 55,000 MW, is nearly twice what it is during the other three seasons.
- All of the seasons have a late-afternoon peak. During the summer, the peak is slightly earlier and more pronounced. During the fall and spring, it has a slightly longer duration. During the winter, it is matched by an early morning peak, which reflects the large number of homes that use electric heating.
- Coal, nuclear and combined-cycle gas comprise the bulk of the base load generation stack. During the hours between 9:00 pm and 6:00 am, nuclear generation averages between 14% and 18% of total generation regardless of season. Coal averages between 36% and 39% of total night-time generation during the spring and summer seasons and between 42% and 44% during the winter and fall.
- Natural gas plays a larger role in the night-time base load stack during the summer season as combined-cycle and combustion turbines provide 43% of total night-time generation compared to between 32% and 34% during the other three seasons.
- Wind provides between 5% and 8% of the average generation overall, depending on the season, but at night its contribution rises slightly from 6% (summer) to 10% (spring).

**Figure VI-5
ERCOT 2009 Average Hourly Generation by Fuel Type & Season (MW)**



Data and Methodological Considerations

As was mentioned earlier, ERCOT publishes wind, coal, nuclear, natural gas and hydro generation data on a 15-minute basis. In addition, hourly generation and emissions data is also available through the CEMS system. Both the ERCOT 15-minute data and the CEMS 60-minute data were utilized to understand the emission implications of cycling units due to wind generation in ERCOT.

The same methodology was used for calculating emission implications of wind in ERCOT as was used in the PSCO analysis with one exception. Due to the availability of the 15-minute generation data, “wind events” can be calculated more precisely. For the ERCOT analysis, a “wind event” was defined as an instance where a 10% or greater dip in coal generation coincided with an increase in wind energy generation. Otherwise, the analysis is identical: identify the wind events; calculate the avoided generation from coal plants; calculate the monthly and quarterly “stable day” emission rate; calculate the difference between the actual emissions and the emissions that would have been generated if the avoided generation had been produced with the “stable day” emission rates.

Frequency of Coal and Gas Cycling

Coal plants are being cycled due to wind generation on the ERCOT system. The eight-day example shown in Figure VI-6 illustrates the mechanism. Coal generation is represented by the grey area, wind by the light green; the black ovals highlight cycling events. On each day as wind increases between 9:00 pm and 5:00 am, coal generation dips. On some days, such as Nov. 9 and 10, coal generation drops significantly. But even on days such as Nov. 8 when limited wind comes on the system, it appears to push a small amount of coal generation offline.

Figure VI-6
Coal Plants Are Cycled as Wind Generation Increases (Nov. 5-12, 2008)

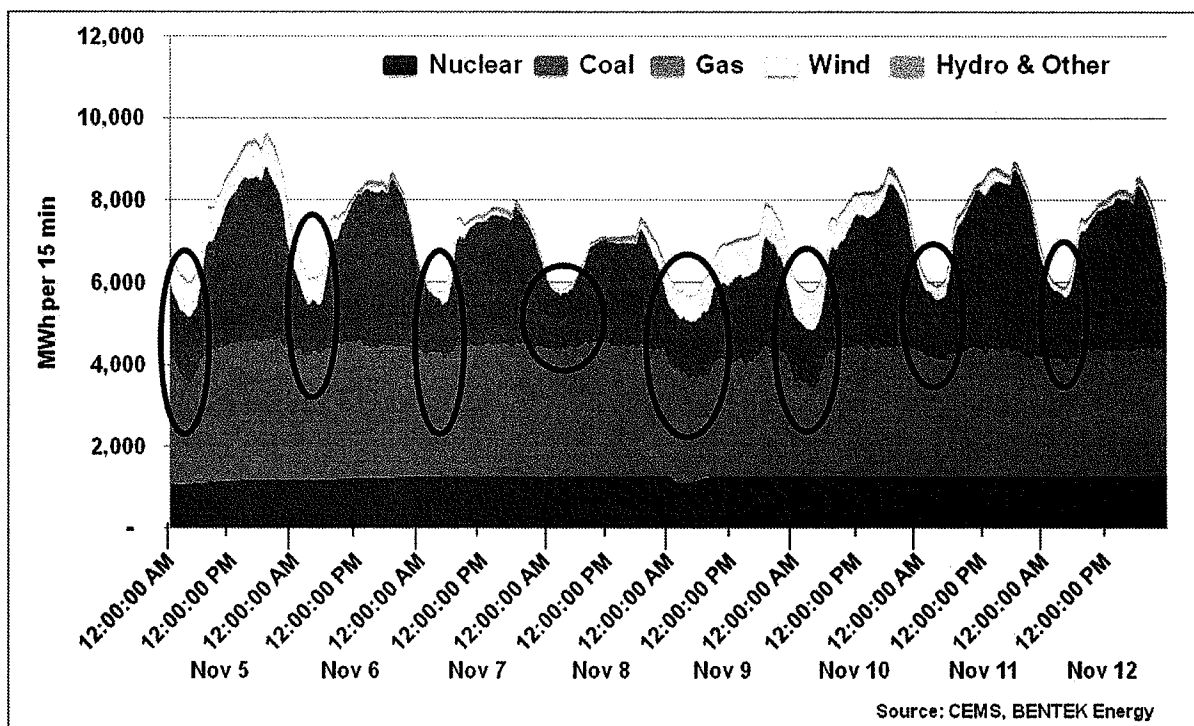
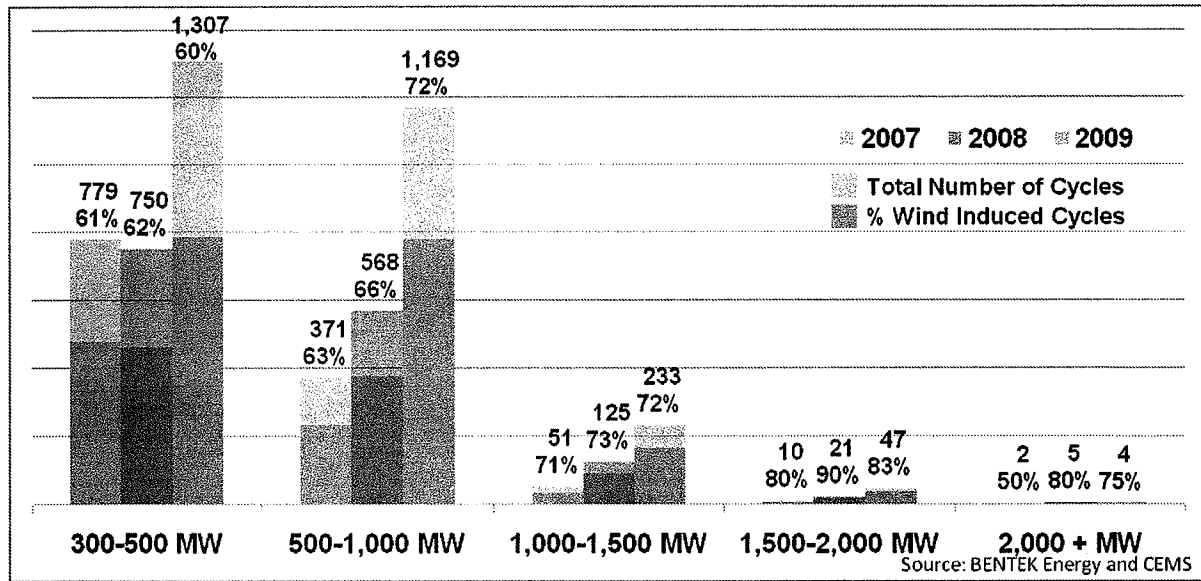


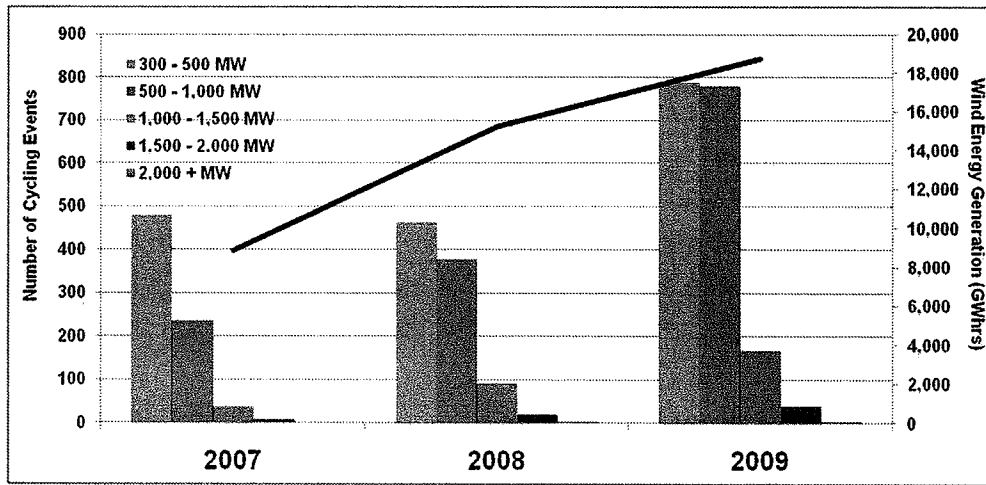
Figure VI-7 shows the impact of wind on coal cycling in ERCOT. The solid bars indicate the amount of wind induced cycle events. The shaded portion indicates the cycling events not related to wind. The categories capture the size of the cycling event. For example, the first category labeled 300-500 MW indicates that the number of instances in which the total coal-fired generation changed from 300 to 500 MW hour-to-hour.

**Figure VI-7
ERCOT Coal Cycling Events**



This data indicates that most coal cycling in Texas is due to wind generation. Additionally, the data indicates that the number of wind-induced cycling instances is increasing rapidly. Figure VI-8 compares wind-induced coal-cycling events from Figure VI-7 to the total wind generation for each year. In 2008, wind generation grew by 73% over 2007 and another 23% in 2009 over 2008. The incremental growth in 2009 appears to have had a more profound impact on the incidence of cycling than did the larger growth in 2008. This suggests that the impact of wind is cumulative: the more wind that comes on the system, without corresponding additions of other generation forms, the more wind-induced coal cycling happens.

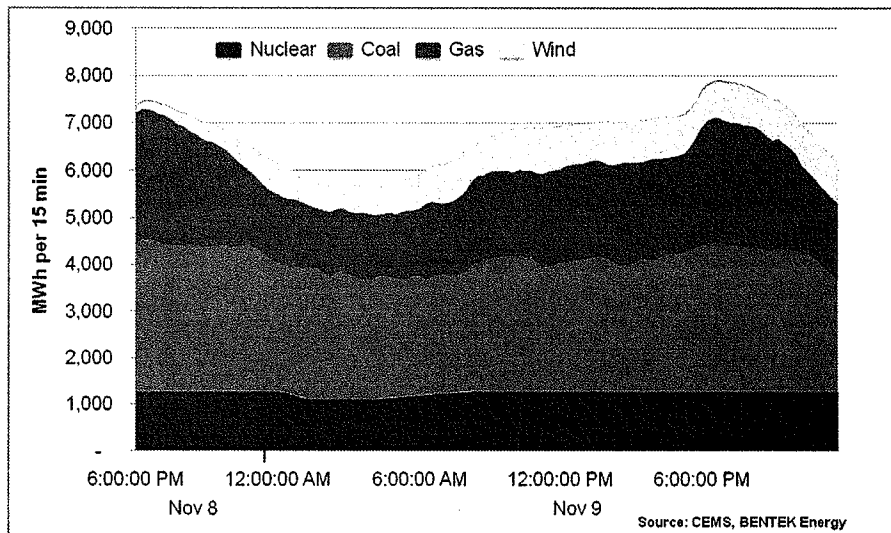
**Figure VI-8
ERCOT, Wind Induced Coal Cycling & Wind Generation**



Emission Impacts - The Deely Plant Case Study

The days of Nov. 8 and 9, 2008, are contrasting days on the ERCOT generation system. Figure VI-9 illustrates the generation mix for each of these days. The purple area indicates nuclear generation, the grey area shows coal generation, the blue area is gas-fired generation, and the light green area represents wind generation.

**Figure VI-9
ERCOT Generation Mix: 11/8/2008 – 11/9/2008**

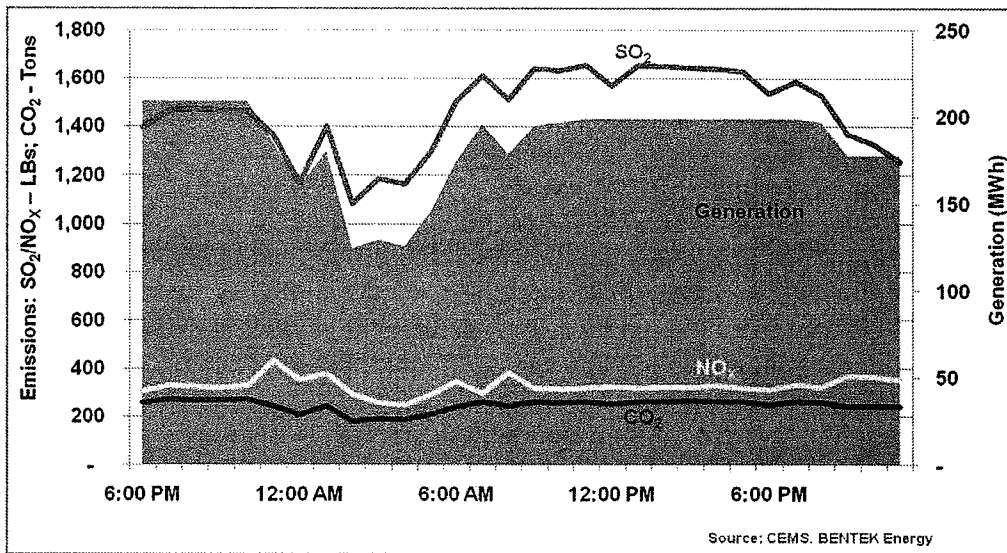


Nov. 8 had nearly no wind generation in the morning. Wind accounted for 2% of total generation on that day. As a result, coal-fired generation produced power on a consistent basis throughout the morning until late in the evening. About 8:00 pm on the 8th, wind

generation began coming online and grew until it peaked about 7:00 am on Nov. 9. However, through Nov. 9, wind generation was strong, accounting for 12% of total generation. Coal units were cycled throughout the day on Nov. 9 to accommodate wind generation.

One coal-fired plant was chosen to illustrate the impact of coal cycling. The J.T. Deely plant was one of the plants used to accommodate wind on that day. Figure VI-10 details hourly generation and emissions over Nov. 8 and 9. The blue area depicts generation, the red line shows pounds of SO₂, the green line indicates pounds of NO_x and the purple line is tons of CO₂. The graphic shows the sharp drop in generation, beginning about 9:00 pm. SO₂ initially followed suit and fell until generation began to rise about 4:00 am on the 9th. From that point, SO₂ rose with increased generation, but did not flatten out when generation reached its peak at about 7:00 am. For the remainder of the day, generation held at between 199 and 178 MWh, 10 MWh below the pre-event generation level, yet SO₂ emissions exceeded pre-event levels by an average of 161 pounds until 9:00 pm when it finally fell back as generation once again declined. NO_x and CO₂ both rose slightly as coal generation fell, but, as the generation came back online, emissions quickly came back and held at their pre-event levels.

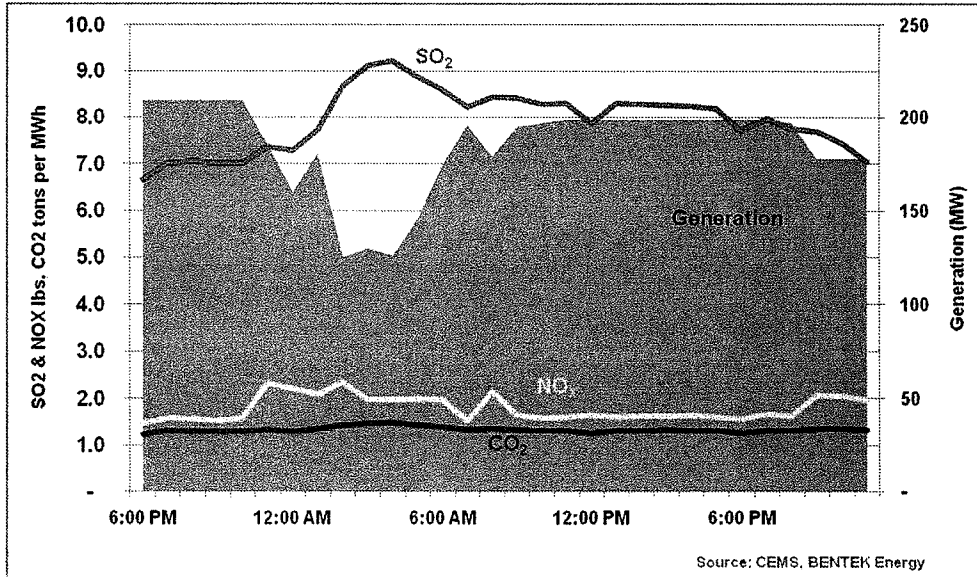
Figure VI-10
J.T. Deeley Generation & Emissions: Nov. 8-9, 2008



The behavior depicted in Figure VI-10 suggests that the emission rates did not fall proportionate to generation.

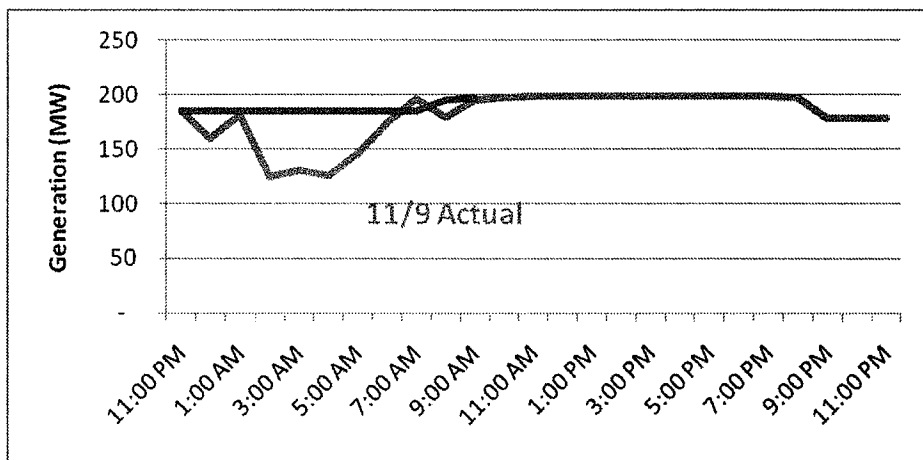
Figure VI-11 shows the impact of the Nov. 8-9 event on emission rates. Emission rates for SO₂, CO₂ and NO_x rose significantly immediately after Deeley generation was cycled and came back down as generation was brought back online. SO₂ rates did not return to their pre-event levels until late in the day. Interestingly, when generation dropped at about 10:00 pm on the 9th, NO_x rates, once again, went up.

Figure VI-11
J.T. Deeley Generation & Emission Rates: Nov. 8-9, 2008



Compared to the 8th, emission rates on the 9th are significantly higher. If generation at Deeley had remained constant on the 9th instead of variable, the emission rates would have been similar to the 8th. The blue line in Figure VI-12 depicts the 247 MW of avoided generation due to cycling for wind on Nov. 9.

Figure VI-12
J.T. Deeley Generation: Nov. 9, 2008



To calculate emissions associated with the event, Method C, which is discussed in Chapter IV was employed. The stable day rates evidenced on Nov. 8 prior to the wind event are used to

calculate avoided emissions and then compared to the actual emissions from Nov. 9. The event resulted in 2,506 pounds of incremental SO₂, 717 pounds of incremental NO_x and saved 120 tons of CO₂.

Cycling J.T. Deeley to compensate for wind generation caused more SO₂ and NO_x emissions than if J.T. Deeley had generated the same amount at a flat level. Due to cycling, J.T. Deeley emitted 8% more SO₂ and 10% NO_x, while saving 2% of CO₂ emissions.

This case study of the Deeley plant indicates that much like the PSCO examples, coal plants in Texas operate at the highest efficiency during steady-state operation at the levels for which they are designed. Operating these facilities irregularly or at non-design levels leads to inefficient operation and higher emission levels.

ERCOT General Analysis

The same methodology from the PSCO analysis is employed to understand the emission impact that wind generation had on the ERCOT system for an entire year. Stable days of generation are identified for each facility on monthly and quarterly bases. Wind events are defined as instances where coal generation dropped by at least 10% hour-to-hour with a corresponding increase in wind generation.

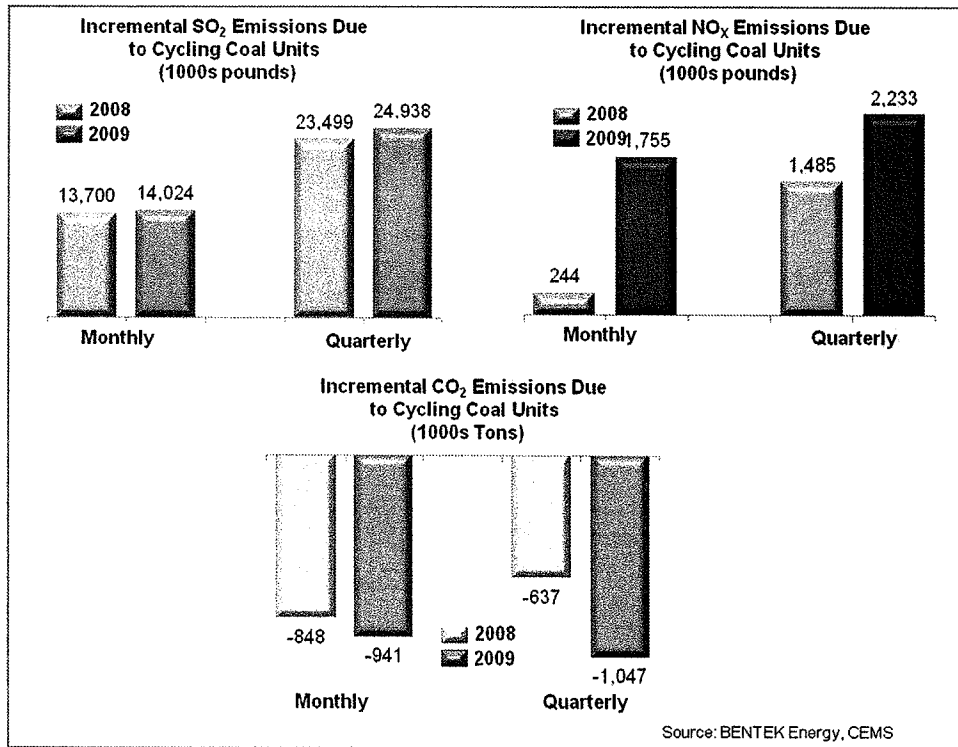
As was the case with the Colorado analysis, two techniques are used to estimate the emission impacts. The first is the Specific-Event Approach, the second, the Full-Year Approach. Both are described more fully in Chapter IV.

Specific-Event Approach

This approach identified all days where coal generation decreased or increased more than 10% hour-to-hour when total wind generation moved in an opposite direction over the same timeframe. The offset generation from coal plants during these instances is added into the stable day calculation. Stable days are identified on monthly and quarterly bases for a broad understanding of how emission rates can change. The key to this approach is that only emissions associated with the Specific-Events is included in the analysis.

Figure VI-13 summarizes the results for the Specific-Event Approach. Wind-induced cycling resulted in incremental production of SO₂ and NO_x, but resulted in less CO₂ being produced. Depending on whether quarterly or monthly averages are used for the stable day cycling, SO₂ emissions ranged between 13.7 and 14.0 million pounds (2%-3% of total SO₂), which is more than would have happened without the wind. Incremental NO_x emissions were between 0.2 and 2.2 million pounds (1% of total NO_x). CO₂ emissions were between 600 and 1,000 tons lower (less than 1% of total CO₂).

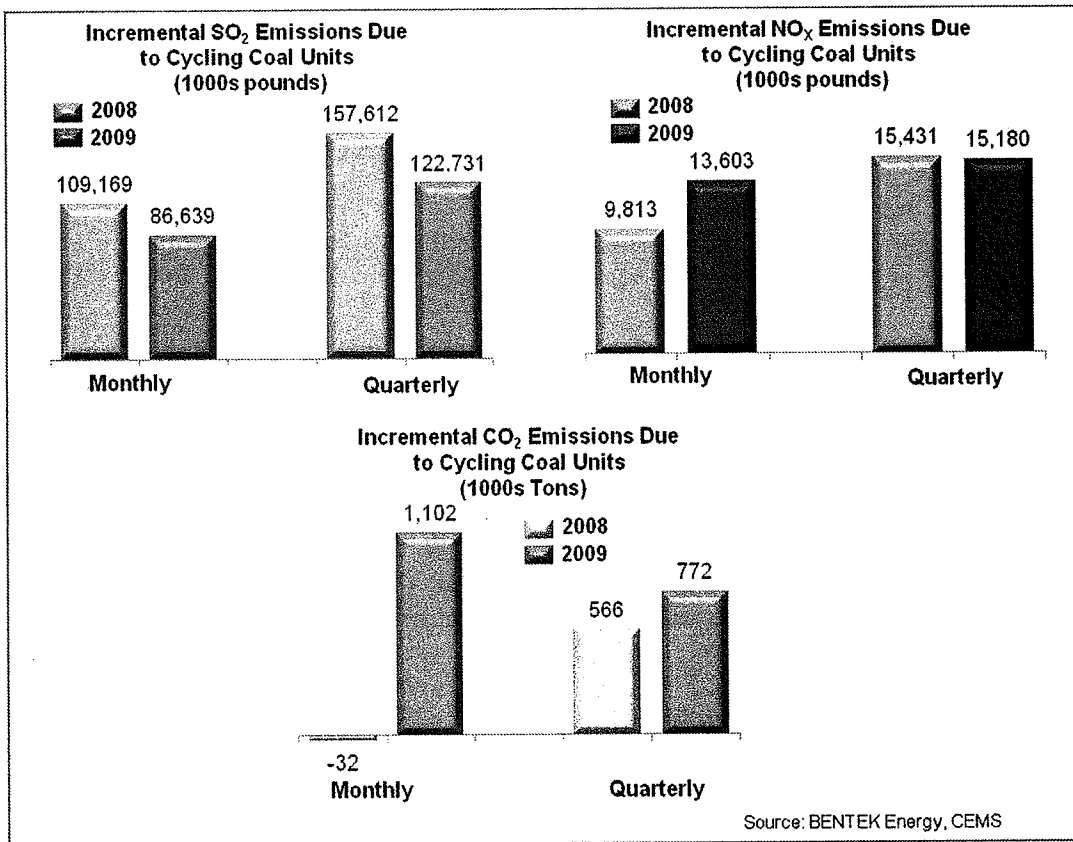
**Figure VI-13
Incremental Emissions Resulting from Coal Cycling (Specific-Event Approach)**



Full-Year Approach

As with the PSCO model, the Specific-Event Approach probably underestimates the emissions that result from cycling. It ignores the fact that the disruption to emissions controls and resulting abnormal emission rates can last beyond a day and that numerous other smaller events take place that are also brought about by wind forcing cycling at coal plants. To correct for this limitation the Full-Year Approach is also used. This approach compensates for the limitations of the Specific-Event Approach by taking all cycling events for all days into account for each unit. The same stable-day rates are used in this approach. While this approach probably overstates the impact, it provides solid upper bounds for the impact range. The results for the Full-Year Approach are captured in Figure VI-14.

**Figure VI-14
Incremental Emissions Resulting from Coal Cycling (Full-Year Approach)**



As shown in Figure VI-14, CO₂, SO₂ and NO_x emissions are all higher than they would have been had coal units not been cycled. SO₂ emissions were between 86.6 and 157.6 million pounds higher, which amounts to approximately 15% of total SO₂ emissions in 2008 and about 13% of SO₂ emissions in 2009. NO_x emissions were between 9.8 and 15.4 million pounds higher or about 7% and 8% of total 2008 and 2009 NO_x emissions, respectively. CO₂ emissions were higher in 2009 by between 0.8 and 1.1 thousand tons in 2009 and ranged from a very small savings to 0.6 thousand tons incremental emissions in 2008. The range amounts to less than 1% of total CO₂ emissions in either year.

Conclusions

The ERCOT system was studied due to the availability of wind data to correlate with coal cycling events and because of the larger gas-fired generation capacity resident on the system. Identifying days where wind generation resulted in the cycling of coal units allowed for a precise understanding of the emission impacts. The gravity and frequency of these events increased as more wind generation was introduced to the system. This mirrors the results found on the PSCO system, supporting the theory that the increased rate of cycling is due to the incremental integration of wind generation. Furthermore, these wind-driven, coal-cycling events resulted in significantly more SO₂ and NO_x emissions than if wind generation had not been utilized. The same results were found on the PSCO system. Not only does wind generation not allow ERCOT utilities to save SO₂, NO_x and CO₂ emissions, it is directly responsible for creating more SO₂ and NO_x emissions and CO₂ emission savings are minimal at best.

VII.

Toward a Solution: Substituting Gas-fired Generation for Coal

One major conclusion from the preceding chapters is that cycling coal-fired facilities – whether caused by accommodating wind or other factors – makes the units less efficient and increases emissions, particularly SO₂ and NO_x. Given the documented increase in coal cycling events over the past few years on the PSCO system, this dynamic is problematic because several of the plants that are cycled most – Cherokee, Arapahoe, Pawnee and Valmont are located within or in close proximity to the Denver Non-attainment Zone for Ozone. The Denver Non-attainment Zone for Ozone is the area around Denver in which the US Environmental Protection Administration (EPA) monitors ozone levels as part of their obligations under the Federal Clean Air Act (42 U.S.C Sec. 7401). As detailed in Chapters IV and V, all of these plants have experienced an increase in SO₂, while the Cherokee, Arapahoe and Valmont plants experienced increased NO_x and CO₂ emission rates between 2006 and 2009. Since the EPA has announced that it will tighten allowable ozone emission levels beginning in February 2011, continued cycling of these plants will make it more difficult to meet the new emission restrictions.

This chapter explores one approach to reducing the NO_x and SO₂ emissions within the Denver Non-attainment Zone, namely retire or cease to use the Cherokee and Valmont plants and replace the lost generation with natural gas-fired generation. These two plants are among the oldest of the Front Range coal units. Arapahoe is also relatively old, but it is already scheduled for retirement in 2012 according to the 2007 PSCO IRP. The Pawnee facility is also located in proximity to the Denver Non-attainment Zone, but because it is relatively new (1981) and equipped with more flexible generation capabilities, it is not as dramatically impacted by cycling as the other units and replacement would be more costly for the consumer.

Methodology

The capacity lost by retiring the Cherokee (710 MW) and the Valmont (166 MW) plants can theoretically be offset by increased utilization of existing gas-fired resources, whether PSCO or third-party owned. Alternatively, if those resources are insufficient, PSCO might replace the plants with gas-fired capacity, increased third-party purchases or a combination of the two options. Accordingly, a model was developed that calculated the total hourly generation from the Cherokee and Valmont plants over the three year period from 2007 through 2009. Next, the hourly coal generation from the retired plants is compared to the hourly available generation capacity from the combined cycle plants that are part of the 2007 IRP resource plan. If the combined cycle generation is insufficient, the available combustion turbine capacity is utilized. When the available combined cycle and combustion turbine capacity are inadequate to meet the demand, then a shortfall is identified. Both combined cycle and combustion turbines were assumed to run up to 90% of their nameplate capacity, thus, accounting for NERC reliability standards. The objective of the analysis is to determine whether or not the existing gas-fired facilities of PSCO are adequate to provide the power

generation that would be lost by the early retirement of Cherokee and Valmont or whether additional capacity is required.

Results

The existing combined cycle and combustion turbine resources appear adequate to absorb the generation lost by retiring Cherokee and Valmont. Table VII-1 summarizes the calculation on an annual basis. In all three years there was ample gas-fired capacity to make up for the lost generation from Cherokee and Valmont.

**Table VII-1
Estimated Available Gas-fired Capacity after Replacing Cherokee and Valmont (Annual Calculation)**

	2007	2008	2009
Total Available Combined Cycle Capacity	8,085,990	8,152,453	8,595,652
Total Generation From Cherokee and Valmont	6,611,206	6,203,178	4,720,685
Net Remaining CC Capacity	1,474,784	1,949,275	3,874,967
Total Available Capacity from Combustion Turbine	13,368,519	13,934,405	12,793,050
Net Remaining CC and CT Capacity	14,843,304	15,883,680	16,668,017

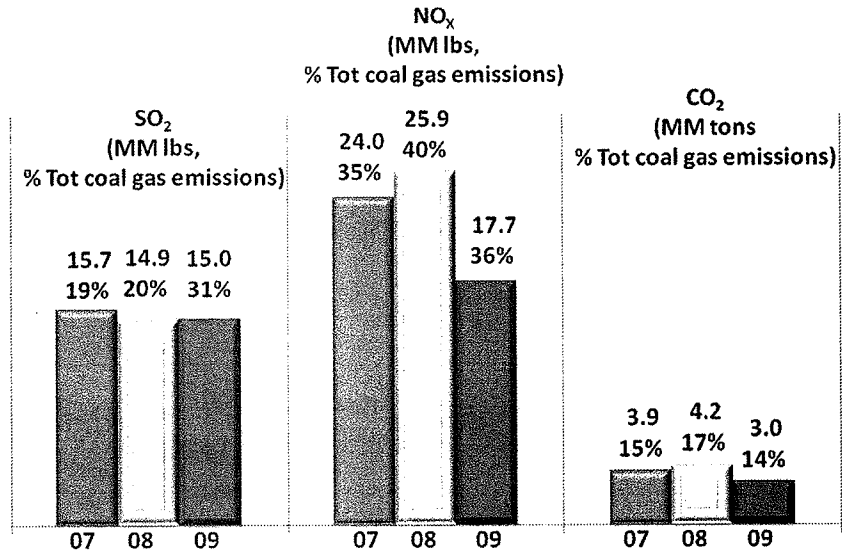
The annual calculation, however, masks the reality that capacity issues are immediate – the power is needed immediately when called upon. Annual averages mask hourly variability, thus, are of minimal value. The hourly granularity of the CEMS data allows analysis on an hourly basis. Table VII-2 shows the number of hours during 2007, 2008 and 2009 that the aggregated combined cycle and combustion turbine generation was not adequate to offset the lost coal generation. In 2007 the combined gas-fired capacity could offset 100% of the lost coal generation and in 2008 and 2009 there were 35 and 11 hours respectively when the gas-fired capacity was insufficient to handle the lost generation from Cherokee and Valmont.

**Table VII-2
Number of Hours Installed Gas Capacity Cannot Meet Incremental Demand**

	2007	2008	2009
Combined Cycle	3,158	2,353	1,067
Combined Cycle Plus Combustion Turbine	0	35	11

To calculate the emissions reduction inherent in using the existing gas plant more fully and retiring Cherokee and Valmont, the incremental emissions at gas-fired plants was multiplied by the average actual emission rates for combined cycle and combustion turbines in each. The total is then subtracted from the total emissions from Cherokee and Valmont to estimate the net savings or increase in emissions. Figure VII-1 summarizes the results below. Replacing Cherokee and Valmont will improve total SO₂ emissions by approximately 15.2 million pounds, NO_x by about 22.5 million pounds and CO₂ by 3.7 million tons.

**Figure VII-1
Estimated Emissions Savings from Replacement of Cherokee and Valmont with
Gas-fired Generation**



Source: BENTEK Energy, CEMS

Conclusions

Assuming that total demand is less than or equal to 2007 demand, the available capacity from the existing gas-fired plants appears adequate to absorb the generation lost by retiring Cherokee and Valmont. Once Arapahoe is retired in 2012, gas-fired generation will no longer be adequate, particularly as PSCO also plans to add some 300 MW of additional wind capacity by that year.

VIII. Conclusions and Mitigation Suggestions

The overarching conclusion of this analysis is that, like many other public policies, there are unintended consequences to implementation of Colorado's RPS. Wind and renewable energy programs have been implemented in Colorado and around the country for the best of intentions: reducing air pollution (primarily CO₂ and other greenhouse gases). The research in this report, however, suggests that wind energy, as it has so far been developed by PSCO in Colorado and by numerous utilities in ERCOT, has had minimal, if any, impact on CO₂, yet has led to a significant increase in SO₂ and NO_x. This chapter presents the study conclusions and makes a number of recommendations to improve the effectiveness of wind resources.

Conclusions

The study details the surprising conclusion that the use of wind energy in the PSCO and ERCOT context results in increased SO₂ and NO_x and, in the case of PSCO, CO₂. The mechanism driving increased emissions is the need to cycle coal facilities in order to accommodate wind, which is considered a "must-take" resource due to the respective states' RPS mandates. When wind generation comes online, generation from coal (and natural gas-fired) plants is curtailed until the wind subsides, then their generation is once again ramped up to meet demand. Cycling coal units in this manner drives their heat rate up and their operating efficiency down, resulting in higher emissions of SO₂, NO_x and CO₂ than would have been the case if the units had not been cycled.

For the PSCO territory, two methods are used to calculate the incremental emissions that result from coal cycling. The first method includes only specific instances where coal generation fell by 10% hour-to-hour between 12:00 am and 8:00 am. Results generated from this method represent the lower end of the estimate of incremental emissions due to wind because this methodology masks small, but sharp, generation changes that happen within an hour. The data suggests that these minimal events also result in significantly abnormal emission rates. The second method assumes that all variation in emission rates above stable day norms result from coal cycling events, and ignores maintenance. Maintenance events typically are controlled events where emission rates do not increase. Therefore, maintenance events are assumed not to contribute to significantly to the emission increases captured in this method. Nevertheless, the second method captures emission increases due to a much broader array of causes, only one of which is wind. Accordingly, this method over-estimates the potential impact of wind because many of the events are not wind induced.

In the ERCOT territory, wind events are defined precisely: a 10% or more decrease in coal generation simultaneous to a similarly sized increase in wind generation. For all scenarios, actual emissions associated with the events are compared to estimated emissions defined as avoided generation from coal multiplied by an estimated "stable day" emission rate based on stable coal-fired generation periods observed over the month and quarter.

Table VIII-1 shows the results of these analyses. The study estimates that coal cycling due to wind in PSCO's territory resulted in between 2.0 and 10.5 million pounds of SO₂ (2.7% to 14.2% of total PSCO SO₂ emissions) in 2008 and from 797,000 to 6.8 million pounds of SO₂ (1.6% to 14%) in 2009. NO_x emissions were also higher due to cycling. In 2008, they ranged from 1.5 to 6.3 million pounds (2.4% to 10.0%). In 2009, the range was from 478,000 to 3.1 million pounds (1.0% to 6.7%). CO₂ emissions results were more mixed. In 2008, they ranged from between a savings of 163,000 tons to an incremental 152,000 tons (-0.8% to 0.8%). In 2009, the range was from 94,000 to 147,000 tons (-0.6% to 0.9%). In all cases, the savings or gain amounted to less than 1% of total CO₂ emissions.

Table VIII-1

	2008			2009		
	SO ₂ (Ths LBS)	NO _x (Ths LBS)	CO ₂ (Ths Tons)	SO ₂ (Ths LBS)	NO _x (Ths LBS)	CO ₂ (Ths Tons)
PSCo Specific Event (Quarterly)	2,001	1,481	(163)	797	478	94
PSCo Full Year (Quarterly)	10,517	6,279	152	6,825	3,086	147
ERCOT Specific Event (Quarterly)	23,499	1,485	(637)	24,938	2,233	(1,047)
ERCOT Full Year (Quarterly)	157,612	15,431	566	122,731	15,180	772
	Pct of Total Annual Emissions					
PSCo Specific Event (Quarterly)	3%	2%	< 1%	2%	1%	< 1%
PSCo Full Year (Quarterly)	14%	10%	1%	14%	7%	1%
ERCOT Specific Event (Quarterly)	2%	1%	< 1%	3%	1%	< 1%
ERCOT Full Year (Quarterly)	15%	7%	< 1%	13%	8%	< 1%

In ERCOT, the results are somewhat different. The ERCOT study found that cycling coal due to accommodating wind resulted in increases between 23 and 157 million tons of SO₂ in 2008, and 25 and 123 million pounds of SO₂ in 2009. As a percent of total SO₂ emissions, these estimates range from 2% to 15% for 2008 and between 3% and 13% for 2009. Excess NO_x emissions due to coal cycling in 2008 ranged from 1.5 to 15.4 million pounds and between 2.2 and 15.2 million pounds in 2009. The 2008 numbers amount to between 1% and 7% of total NO_x emissions and between 1% and 8% in 2009. As was the case with PSCO's territory, CO₂ emissions due to cycling were mixed. In 2008, the range was between a savings of 637,000 tons and generation of an incremental 566,000 tons. In 2009, the range was a savings of 1.0 million tons to a gain of 772,000 tons. In all cases, these estimates were less than 1% of total CO₂ emissions.

In both the PSCO and ERCOT analyses, the overall conclusion is that coal cycling has significantly increased since wind generation was added to both systems. The above table clearly indicates that, regardless of how they are measured, SO₂ and NO_x emissions have increased due to the increased coal cycling. While it is not possible to precisely indicate how much of the increase is due to wind-induced cycling, as much as 70% of cycling events appear to be wind related in ERCOT. Thus, it is logical to assume that a significant portion of the incremental emissions due to cycling are, in fact, caused by the need to accommodate

wind. While meeting RPS-mandated wind generation requirements appears to have a minimal impact on CO₂, it appears to appreciably increase SO₂ and NO_x.

There are two caveats that must be understood when interpreting the results of this study. First, the study found no instances where PSCO violated any of its air permits as a result of cycling coal. Neither PSCO case study revealed instances where PSCO's emissions exceeded its permits. Furthermore, the study authors are not suggesting that PSCO violated permits in extrapolating the case study results to estimate annual emissions. The second caveat pertains to the data. For the ERCOT analysis, hourly generation data is available by plant and fuel type including wind. Thus, it is possible to precisely identify wind events based on a sudden decline in coal generation coupled with a simultaneous increase in wind generation. In the case of PSCO's territory, it is not possible to define wind events with the same precision since PSCO does not release its hourly generation data for its wind resources.

There are several other subsidiary conclusions from the analysis:

1. **Duration.** Cycling coal-fired power plants has short term and long term impacts. Studies that describe interaction between coal and wind often mention the cycling issue, but they generally discuss the impacts in a very narrow context: the period of time in which the coal plant reduces generation. This study concludes that the impacts frequently have much longer duration. Many instances were found where cycling causes bag-houses or other pollution controls to lose their calibration and take as long as 12 to 15 hours, sometimes as long as 24 hours, to settle back to the pre-event emission rates. During these periods, emission rates normally exceed what would be experienced if the plant were run at a "stable" generation level.
2. **Timing.** Wind-induced coal-plant cycling appears to be a nighttime phenomenon. Nearly 70% of the cycling instances identified for PSCO in 2008 occurred between 12:00 am and 8:00 am. Similarly, 82% of coal cycling events in ERCOT occurred during the same time of day.
3. **Non-wind renewable implications.** Coal-cycling issues do not appear to impact solar and other non-wind renewable energy forms. Solar energy is generated during daylight hours, thus, coincides with natural gas-fired generation. When solar energy peaks, there is a much greater likelihood that natural gas-fired generation can be cycled to accommodate the energy.
4. **Generation mix.** Composition of the generation stack is a critical factor. Since most wind driven cycling events appear to occur between 12:00 am and 8:00 am, they also occur during periods of lowest load. As a result, PSCO and the utilities in ERCOT are only operating their "base load" facilities. In the PSCO context, this means the coal plants supplemented with some combined-cycle natural gas and hydro are in operation. In the ERCOT context, base load includes nuclear, coal and combined-cycle plants. The extra emissions result because the RPS-mandated "must-take" wind resource exceeds the quantity of power being generated from combined-cycle gas.

PSCO's generation mix between 12:00 am and 8:00 am averages 62% Coal, 20% Combined Cycle, and 18% Hydro, Wind and Purchases. In ERCOT, the corresponding mix is 17% Nuclear, 40% Coal, 28% Combined Cycle, 6% Combustion Turbine, 9% Wind and 0% Hydro. Increasing the proportion of base load that is generated by more flexible generation equipment – such as natural-gas-fired combined-cycle plants – will enable systems to absorb wind without having to cycle their coal plants.

5. **Regulatory conflict.** The study results suggest that the RPS mandate is in conflict with the Colorado State Implementation Plan for air emissions. The RPS standard requires that more wind resources be utilized than can be offset with lower-emission, natural-gas generation equipment. That is the case today when wind resources account for about 9% of PSCO's total sales. Wind generation will increase in the coming years due to mandates to move toward the new 30% of total sales standard. Without substantially more natural gas generation being added to the PSCO system, the emission increases documented in this study will rise, further enlarging the degree to which Denver and the Front Range violates its SIP limitations.
6. **National implications.** Congress considering legislation that would mandate a federal RPS. While this study only paid cursory attention to areas other than the ERCOT and PSCO territories, it is doubtful that a national RPS can be imposed without creating the same emissions outcome found in ERCOT, the PSCO territory and in many other states. Unless other states have a sufficient natural gas cushion – remember Texas has the largest share of its generating capacity fueled by natural gas – imposition of an RPS standard greater than 5% will probably increase emissions of CO₂, NO_x and SO₂.

Mitigation Recommendations

This study suggests several mitigation measures that should be considered:

1. **Result validation.** It is recommended that IPAMS request a joint research effort with PSCO to validate the results of the study. Significant additional emphasis should be placed on analysis of hourly wind data similar to that provided in ERCOT to enable more precise identification of "wind events." In addition, PSCO's insight should enhance understanding of why significant impacts occur hours after what appears to be a wind event.
2. **Data publication.** It is in the state's best interest to understand the air emission implications of PSCO's generation behavior, particularly if state mandates are counter-productive to emission reduction goals. Without timely publication of the hourly generation from wind, it is not possible for third parties or the state to understand the regulatory interactions without making significant assumptions. The PUC should consider requiring the publication of hourly generation data by fuel source including wind as part of PSCO's ongoing reporting mandates. The posting does not need to be immediate; a time lag of 90 days would be reasonable and enable PSCO to maintain limited confidentiality to enhance its trading positions. True transparency around these issues is not possible without publication of this data.

5

3. **Short term.** In the short term (one to two years) there appear to be two options:

- a. Immediately reduce generation at Cherokee and Valmont to levels that eliminate the need to cycle by replacing the generation with power produced by the numerous under-utilized gas-fired combine cycle and combustion turbines that are part of the current IRP resource mix.
- b. Limit the utilization of wind generation to levels that may be offset by cycling non-coal facilities. This means that until new generation equipment can be brought online, PSCO may not be able to meet the RPS mandate to provide 12% of "sales" by 2014, but it could meet a mandate to have 12% of capacity in the form of renewable energy technologies by 2014. After 2014 provisions of the current RPS mandate can be met, provided that adequate gas-fired generation is added.

4. **Long term.** Beyond 2012, PSCO should consider adding significantly to its combined-cycle natural gas plant capacity and utilization. Combined-cycle plants are designed to operate as base load generation and emit significantly lower NO_x and CO₂ than combustion turbines. Adding more combined-cycle plants to the generation stack will provide a cushion that will obviate PSCO's need to cycle its coal facilities in all but the most extreme situations.

5. **Improved modeling.** PSCO, like most utilities, dispatches its plants based on forecast generation needs, anticipated emissions, and fuel and emission costs. The models used to accomplish this are driven by assumptions about emissions outputs that do not appear to take account of the actual variability evidenced by coal cycling. PSCO and the PUC should consider improving these models so that they incorporate the variability that is evident in the historic data. This would provide more accurate accounting of emissions and the associated costs of cycling coal-fired power plants.

In addition, future wind integration studies should more dynamically account for the emission impacts of coal cycling. Modeling efforts should be calibrated to actual historical data, not hypothetical averages and recognize that emissions rates are adversely impacted over longer periods than the specific cycling timeframe. The impacts of cycling coal plants are not limited to boiler efficiency; the interactions of emission control technologies should also be considered.

6. **Reconcile RPS and SIP mandates.** This study documents the degree to which RPS and SIP mandates are counter-productive. The RPS promotes reduced CO₂, but if implemented inappropriately can result in greater SO₂, NO_x, and CO₂ emissions. It is this potential to increase SO₂ and NO_x which conflict with the mandates of the SIP. RPS mandates need to be structured so that they do not create this conflict.

RE: Joint Committee for Review of Administrative Rules

Author: Herbert S. Coussons, MD drc@wscare.com 920-639-8434

Video testimony at: <http://www.youtube.com/watch?v=nUQdeUXapD0>

Introduction

Thank you for reading and considering my comments. I am writing to express my disappointment with the process and outcome of the PSC and Wind Siting Council guidelines. It appears that the council ignored more and more evidence that shows health, safety and financial stress in communities that are burdened against their will with large industrial wind turbines. In fact in their recommendations on pages 19 thru 22, the constantly acknowledge sources that support strict guidelines to protect against disturbing noise, yet they chose to included more loose or weaker guidelines in their final conclusion. These weaker guidelines will result in annoyance, complaints, disturbed sleep and ultimately adverse health in a certain percentage of Wisconsin residents that can be mitigated from the outset by increasing the setback.

It is clear from extensive testimony, that more studies are needed to guarantee the safety of those living close to industrial wind turbines. What is the harm in adopting the most conservative guidelines until these studies can be completed? It is always easier to add more turbines than to remove turbines once they are there. Dr McFadden concluded, "*The evidence does not support a conclusion that wind turbines cause adverse health outcomes.*" Yet other expert testimony has exactly the opposite conclusion that when sited close to people, there will be an adverse health effects in a certain percentage of the population. Studies continue to determine the proper siting distance that will mitigate these health consequences. In a public presentation in Brown County Dr McFadden agreed that there is likewise "*no evidence to claim that industrial wind systems are safe*" and to claim that they are safe is not only misleading, but false." At best the jury is out and the evidence can be used to make claims by both sides of the argument. Because of this I believe it is premature to endorse the support the Rulemaking document as published on August 9, 2010 until more conclusive evidence is available.

I have reviewed the scientific literature. I have seen the testimony of residents that live in wind turbine communities in Wisconsin and elsewhere. I have reviewed the medical records of residents that have suffered from adverse health consequences. I have visited wind developments. And I have come to the same conclusions as many of studies from the US, Canada, New Zealand and the whole of Europe. *Large industrial wind turbine developments do not belong in close proximity to locations where people live and work.* I hope to show valid, accepted and reproducible data that put guidelines on siting distances.

At 30-40dB measurable objective sleep disturbances are seen.

At 40-55dB adverse health effects are seen.

Above 55dB is dangerous to public health.

Experience has shown industrial wind turbines cause noise that exceeds 40 dB when in close proximity. Noise deteriorates over distance. Allowing for proper distance will mitigate the

noise levels both experienced and predicted by independent research and the wind industry. *The safest minimum distance to protect the health and safety is to allow for less than 40dB, which correlates to 0.5 miles or 2640 feet. The optimal distance in a rural setting would allow for no more than a 10dB increase in ambient noise which would correlate to just over one mile.*

Yet the Wind Siting council came to a different conclusion, "The Council does not believe that the rules should include a noise-related setback requirement. Setback distance is only an indirect measure of exposure to noise... Evidence from studies of other sources of environmental noise, suggests that a daytime noise threshold of 50 dBA is well below the threshold at which measurable adverse health effects (e.g. hearing impairment, high blood pressure) from noise are seen." This completely ignores the World Health Organization exhaustive work on environmental noise and sleep disturbance. This is not surprising as the Wind Siting Council in majority is made up of individuals who are supported by the wind industry, or they belong to organizations whose "modus operandi is to identify barriers to renewable energy development, and come up with strategies for overcoming those problems, whether they be low buyback rates, permitting challenges, or regulatory roadblocks." In fact when Dr McFadden was asked to be an expert witness, he declined stating he was not an expert in wind energy health effects. After completing my own research I believe that a biased and uninformed group such as this is incapable of rendering a recommendation that looks out for the interests of the citizens in Wisconsin as they face decades of permanent development by the wind industry. The guidelines ignore local communities' public opinion and the rulemaking process has left local residents facing the threat of large wind developments feeling powerless and unable to have a voice in the politics of a permanent alteration to their way of life.

Background

As Wind Energy projects continue to expand across Wisconsin and as the need for energy independence becomes more urgent, controversy over siting regulations has become a dividing point in communities across the state. The recent applications for projects in northeast Wisconsin make safe siting guidelines the center of the argument. In local townships such as ours in Wrightstown, Holland, Morrison, and Glenmore, hours of emotionally charged meetings and conflicted town supervisors have led to only more controversy. A vote of town's members as slanted as 245-18 overwhelmingly does not support the Ledge Wind project. These same conflicts are seen world wide as wind energy projects develop. It is clear that studies are presented both supporting and refuting to notion that wind turbines harm people's health. It is my opinion as a physician that the best evidence support that *building large wind energy turbines in close proximity to humans has a negative impact on the health.*

Medical Facts

Normal sleep is essential for health and well-being. The science of sleep study has established the population averages for the amount of time it takes to fall asleep. The number of awakenings during the night and the number of sleep arousals that are standard. (American Academy of Sleep Medicine 2005.)

Disturbed sleep is defined as problems falling asleep, excessive awakening, excessive sleep arousals, difficulty resuming sleep after awakening, and an overall lack of restorative sleep.

Environmental sleep disorder is when outside factors such as noise cause sleep disturbance, insomnia, or results in daytime fatigue. These problems result in deficits of concentration, attention and cognitive performance, reduced vigilance, malaise, depressed mood, and irritability. The effects are seen in all ages and both genders.

Long-term sleep disturbance has great influence on metabolic and hormonal function. C-reactive protein is an inflammatory marker associated with the development of atherosclerotic plaques in the coronary vessels and is associated with increased risks of strokes and heart attacks. CRP as a risk predictor of strokes and heart attacks increases as sleep disturbance increases. (Meier-Ewert et al., 2004)

Leptin is secreted at night and helps to regulate appetite and glucose metabolism. When humans are sleep deprived, weight gain and impaired glucose tolerance is seen.

Cortisol has also been studied as a separate marker of disease related to environmental sleep disturbance. Higher cortisol levels are seen in individuals that are sleep deprived. Higher cortisol levels lead to increased blood pressure and impaired glucose tolerance. In fact the risk of heart attacks is two fold higher in those with insomnia. (Hyyppä and Kronholm, 1989) Many other health hazards can be directly related to sleep disturbance, including decreased immunity and susceptibility to viral illness, and many other consequences related to daytime fatigue such as work injuries, poor school performance and auto accidents. It has been shown that fatigue may impair driving more than alcohol. Work injuries may be increased, and children suffer from behavioral problems and decreased school performance. Children have problems with learning, attention and memory. These are all substantiated medical facts that stand alone as they relate to sleep disturbances. Many causes of sleep disturbance such as shift work, sleep apnea and environmental have been shown to cause the same group of adverse health effects. In summary, the overall health impact is that *death rates increase as sleep decreases* (Patel et al., 2004; Tamakoshi and Ohno, 2004) And according to Kripke et al. 1979, reduced sleep may be a greater independent risk factor for death than smoking or hypertension.

Environmental factors

Noise disturbs sleep. Many studies over the last 30 years show there are physical responses to noise as it disturbs sleep. EEG changes, blood pressure and heart rate, body movement and restlessness, and awakening can all be measured in the common sleep study. Environmental factors such as airport noise, road traffic, railway noise, and neighbor noise have all been reported as sources of sleep disturbance. They all follow a similar curve in that as noise levels increase so do complaints of sleep disturbance. At 40 dB less than 5% of individuals show night time sleep disturbance. At 50dB about 6% have sleep disturbance. At 55dB up to 10% have sleep disturbance. At 60dB as high as 15% have sleep disturbance. (European Commission, 2004) The neighbor induced noise is worth a closer look as up to 20% of neighbors are disturbed by voices, water running, toilets, TV, radio and music as well as neighbors pets. This is important in consideration of siting wind turbines because most locations targeted for development are rural (though not sparsely populated in southern Brown County). These areas tend to be quieter at night than urban areas. The people that chose to live there do not have background ambient noise, making any additional noises more noticeable.

Experience is the Best Teacher

Wind Turbine noise is disturbing to those who live close to them. Planners of wind turbine developments need to take into account the noise complaints from existing sites and the real world examples of the noise disturbance caused by wind developments. Many of these sites have been in place for years and those that are in close proximity to people are rife with complaints, law suits and unhappy landowners. Proper siting away from people will prevent such complaints. (Hanning, 2009) Surveys of residents living in close proximity to industrial wind turbines show high levels of sleep disturbance and annoyance. In Kewaunee County 52% of individuals living within 2400 feet found noise to be problematic. 32% within 4800 feet and 4% greater than 1 mile were disturbed. 67% reported disturbed sleep if they lived within 1200 feet. (Kabas 2001) In Sweden 2 studies yield similar results with complaints of disturbance rise as the noise levels increased from 32.5 dBA to 40 dBA. (Pederson and Persson 2007) Multiple other surveys from France, New Zealand, Canada, The United Kingdom, the Netherlands, Sweden and others show similar results. The conclusion that industrial wind turbine noise is disturbing to people that live close to the developments is a fact. We should learn from others mistakes and not subject the people of Wisconsin to repeat the problems seen across the United States and the world. It is clear that proper siting by increasing the distance of the wind turbines from people will prevent the noise complaints. The deterioration of noise over distance is very predictable and several models exist for industrial wind turbines. (UK Department of Transport and Industry 2006; Kamperman and James 2008)

What is the Best Distance?

At least 14 published recommendations follow the same logic. Wind turbines cause noise. Noise disturbs sleep. Sleep disturbance has a bad effect on health. The conclusions of many sound studies show that the noise decreases as the distance from the turbine increases. (Theriatult Acoustics, 2009 for Invenergy) Figure 9 "Predicted Noise Level Contours - Area" Shows that the entire Area shaded red will exceed 40dB. To reach an ambient level of less than 35 dB a home must be at least one mile away from the nearest turbine. To the northeast of the Ledge Wind Project that distance exceeds 2 miles. This agrees with the 14 studies tabulated in Dr Hanning's article "Sleep Disturbance and Wind Turbine Noise" (2009) Table 1 on page 33 summarizes these recommendations published between 1994 and 2009 by engineers, scientists, lawyers and physicians. The recommended setbacks vary from >0.62 miles to 1.55 miles with an average of 1.2 miles. At these distances the noise levels will be less than 45 dB. According to the WHO in their 2009 authoritative document on noise and sleep disturbance, *levels between 32 dB and 42 dB will disturb sleep and noise levels of 50dB or higher have been proven to cause health consequences.* The same study uses 21dB as a threshold for rural nighttime sleep.

According to Invenergy, the sample data from the Theriatult study, the ambient noise in 8 locations in rural Brown county were measured. The highest noise recorded was an isolated 56 dBA and the predominant level of daytime noise was 32dB. The ambient nighttime noise averaged 25 dBA. According to the WHO standards, between 32 and 42dB or a 10dB level above ambient sound will be disruptive. *If we use Invenergy's sound contour map, then a setback of one mile will be required to safely fall within these standards.*

Best Choice

The council has a decision to make. With the known data on sound and sleep disturbance, with other wind farm failures by close siting, and with the wind industries predictions of sound in the wind farm – *will the council make the best recommendation for the people living in Wisconsin and take steps to be conservative by placing a setback of one mile from where people live, work, and attend school? This is the best choice based on the current data to ensure the safety of those living within a development by keeping the noise levels less than 40dBA*

Or will the council compromise the standards knowing that up to 50% people will experience disrupted sleep and 5% may suffer health effects if ½ mile is used? Or worse yet if 1250 feet is used, then up to 67% will complain of disturbed sleep and up to 15% will see adverse health effects.

TABLES

Table 1 From Hanning 2009; Recommendations for setback of residential properties from industrial wind turbines.

<u>Authority</u>	<u>Year</u>	<u>Notes</u>	<u>Rec'd miles</u>	<u>Rec'd Kilometers</u>
Frey and Hadden	2007	Scientists. Turbines >2MW	>1.24	>2
Frey and Hadden	2007	Scientists. Turbines <2MW	1.24	2
Harry	2007	UK Physician	1.5	2.4
Pierpont	2008	US Physician	1.5	2.4
Welsh Affairs Select Committee	1994	Recommendation for smaller turbines	0.93	1.5
Scottish Executive	2001	Visual recommendation included	1.24	2
Adams	2008	US Lawyer	1.55	2.5
Bowdler	2007	UK Noise engineer	1.24	2
French National Academy of Medicine	2006	French physicians	0.93	1.5
The Noise Association	2006	UK scientists	1	1.6
Kamperman and James	2008	US Noise engineers	>0.62	>1
Kamperman	2008	US Noise engineers	>1.24	>2
Bennet	2008	NZ scientist	>0.93	>1.5
Acoustic Ecology Institute	2009	US Noise engineers	0.93	1.5

Table 3 from World Health Organization 2009; Effects of different levels of night noise on the population's health.

Average night noise level over one year	Health effect observed in the population
Up to 30dB	Although individual sensitivities and circumstances may differ, it appears that up to this level no substantial biologic effects are observed.
30 to 40 dB	A number of effects on sleep are observed; body movements, awakening, self-reported sleep disturbance, arousals. The intensity of the effect depends on the nature of the source and the number of events. Vulnerable groups (elderly, children and chronically ill) are more susceptible.
40-55 dB	Adverse health effects are observed among an exposed population. Many people have to adapt their lives to cope with the noise at night.
Above 55 dB	The situation is considered increasingly dangerous for public health. Adverse health effects occur frequently, a sizeable portion of the population is highly annoyed and the sleep disturbed. There is evidence that the risk of cardiovascular disease increases.

Table 2 from Theriault 2009 for Invenergy; Summary of ambient noise levels in the Ledge Wind project assessment

Location	Description	0600-0800	1200-1400	1800-2000	2200-2400
1	Blake Rd	26	26	24	19
2	Cooperstown	31	33	34	29
3	Mill Road	34	36	34	27
4	Dickenson Road	29	37	34	31
5	Morrison Road	29	34	29	28
6	Park Road	31	31	28	20
7	Refuge Road	35	36	56	27
8	Mill/Blake Road	31	32	28	23

According to subsequent predictions, the rise in ambient noise will be 15-24 dBA based on 1000 ft setbacks. This exceeds the WHO guidelines for absolute noise levels and relative rise in noise in noise levels. The solution to keep the noise levels within acceptable range is to increase the setback.

Also consider the schools and businesses located in this area. Clearly the solution to this problem is in PROPER, SAFE siting. That siting guideline should include a minimum distance of ½ to 1 mile based on independent research and data from the wind industry.

“There is no medical doubt that audible noise such as emitted by modern upwind industrial wind turbines sited close to human residences causes significant adverse health effects. These effects are mediated through sleep disturbance, physiological stress and psychological distress. This is settled medical science.”

An Analysis of the American/Canadian Wind Energy Association sponsored “Wind Turbine Sound and Health Effects An Expert Panel Review, December 2009.” Peer reviewed and published January 2010.

Summary and Conclusion

Sleep is basic and important to human health. When sleep is disturbed, health suffers.

Noise disturbs sleep.

Above 30dB sensitive individuals complain.

At 30-40dB measurable objective sleep disturbances are seen.

At 40-55dB adverse health effects are seen.

Above 55dB is dangerous to public health.

Experience has shown industrial wind turbines cause noise that exceeds 40 dB when in close proximity.

Noise deteriorates over distance.

Allowing for proper distance will mitigate the noise levels both experienced and predicted by independent research and the wind industry.

The safest minimum distance to protect the health and safety is to allow for less than 40dB, which correlates to 0.5 miles or 2640 feet.

The optimal distance in a rural setting would allow for no more than a 10dB increase in ambient noise which would correlate to just over one mile.

As a physician and resident of Wisconsin in an area targeted for large industrial wind turbines, I ask the committee to *make the best recommendation for the people living in Wisconsin and take steps to be conservative by placing a setback of one mile from where people live, work, and attend school. This is the best choice based on the current data to ensure the safety of those living within a development.*

Or will the council compromise the standards knowing that at 2640 feet sleep complaints will develop? What percentage of residents is an acceptable compromise when action now by proper siting will prevent these problems?

Respectfully, Herbert S. Coussons, MD

State of Wisconsin
County of Dane

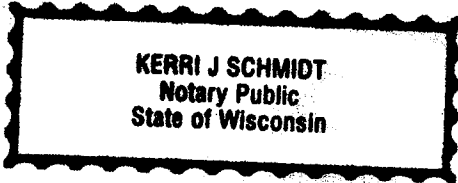
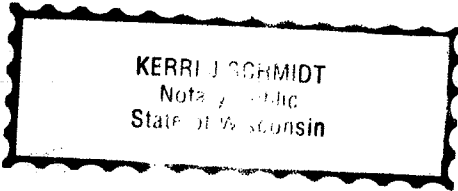
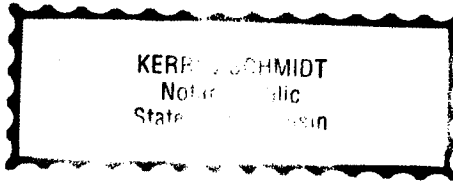
On this day February 9th 2011, personally appeared before me,
Dr. Herb Coussens,

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

Kerri J Schmidt
Notary's Signature

10/20/13
Notary's Expiration Date

Notary's Seal



Joe Yunk

Senate Energy Committee Testimony

February 9, 2011 -- Madison

My name is Joe Yunk; I at, N2630 Townhall Rd in Kewaunee County. My prior address was North 7905 County Trunk P, Algoma, Wisconsin which was in the Wisconsin Public Service (WPS) wind farm by Rio Creek, Wisconsin. I moved from the Algoma address to my current address on or about October 2009 to get away from the effects of the WPS wind farm.

My testimony will outline my personal experience while living in a wind farm. There have been many statements made that there were no problems with the Lincoln Township wind farm in Kewaunee County. I lived there and there are problems and I am part of the collateral damage of the wind turbine industry.

I am now living in the proposed Element Power LLC wind farm development. Yes, I moved to get away from a wind farm and now I find myself faced with yet another wind farm development right where I live.

I hope you listen to my testimony and that this information will help you make the right decisions with regard to the PSC rules for any other wind farms in Wisconsin. I would hate to see other people's life as negatively affected as mine has been as a result of living in a wind farm. I have no doubt in my mind that I will relive the awful experience once again if Element Power is allowed to build the Tisch Mills project they are planning.

In 1998 the WPS wind farm construction began about 310 yards from my home. This wind farm, the first in Wisconsin had 13 turbines of which, one was about 1,300 ft from my house and 600 ft from my property line.

I had built my home in 1980 on 6.5 acres of land which was our home farm that I lived on all my life; by the way, this farm belonged to our family since 1867 and meant a lot to me. I lived on this land since I was born.

In the summer of 2000, the turbines of the WPS wind farm began operation. I had lived on this farm all my life, I knew the neighbors well, and it wasn't long after the turbines began operating our lives began to change. In

conversations with my neighbors, I learned they too were experiencing constant disturbing noise, shadow flicker and had problems sleeping. The constant presence of these 220 ft. turbines made me feel uneasy and I was constantly irritated by them.

All the people living in this wind farm became guinea pigs / lab rats; no one knew what we were in for. It was in the fall of 2000 when neighbors and families began to divide over the effects of the wind farm. And that continued the entire time I lived there.

When the turbines began to operate, a hotline was established directly to WPS to report any problems. I had beef cattle for about two years prior to the turbines operating and never lost any animals. However, shortly after the turbines began to operate, I had beef cattle that become ill and started dying off. I reported this on the WPS hotline and nothing was done. I lost ten animals valued at \$5,000 over a two year period and couldn't afford to continue.

Because of noise complaints to WPS, within a year, two families' homes were purchased by WPS and demolished with bulldozers. At the same time WPS was settling nuisance suits with other neighbors. They were offering to buy out my neighbors but offered prices way below market value to stop the complaints. However, they never offered me any buyout opportunity and I wanted out! It was hard for me to leave my home place of 54 years. But over time, living with the constant sleep deprivation and irritation of the noise and flickering I decided to sue WPS to have them pay me fair market value for my home so I could afford to move.

I knew that I was might be risking everything I had worked for all my life, but I didn't care at this point. I didn't even try to sell my place outright because I didn't want anyone else to have to live as I did in this wind farm. I really wanted WPS to buy me out and to bulldoze the home.

I retained an attorney and filed suit with WPS. Shortly after, WPS offered me \$110,000 on my property that appraised for \$168,000. I decided not to take their offer, but proceed with the suit. I gave deposition in the summer of 2008, we were scheduled to go trail in September 2009 and WPS offered me a settlement in August of 2009 for \$163,000. With this settlement I was responsible for my attorney fees. My attorney advised me to accept this offer. After paying my attorney fees, I ended up with \$158,000.

Later, my home and property were listed with a real estate agency for sale by WPS and after a period of time, it sold for \$112,000, 33% below the appraised value. **Don't tell me that wind turbines do not affect the price of real estate.** In November of 2009, a home that was within one-half mile of my house on County Trunk P sold for \$21,000 after it was listed for \$89,500.

From my experience in living in this wind farm, it is apparent that setback away from property lines is absolutely necessary. I could hear the turbines a mile away from my house. The PSCW's standard setback from a property line should be 1.5 miles.

Now, my new home and property on Townhall road is within the confines of the Element Power proposed wind farm. I'd like to know what you recommend I do now. Where can I move to and be safe from the effects of wind turbines?

February 9, 2011

Members of the Senate, My name is Mark Deslauriers and my family resides in the Town of Holland. I commend this committee for calling hearings. I am alarmed and extremely angry over the disregard the PSC and Wind Siting Council has shown the people of Wisconsin and this committee by not conducting peer reviewed, scientific based health studies prior to submission to the Senate. I am also disgusted at the lack of DNR Commitment to protect both the health of our families from groundwater contamination and the Natural Resources of WI. Today, we must all remember the Industrial Wind Turbines are private projects and not subject to eminent domain.

Members of the Senate, I would encourage you to review the DNR's Office of Energy's Website. The document identified as "DNR Guidelines" is intended to act as a resource for Wind Developers in WI. The document has not been updated since July 2004 and uses references dated no more recent than 2001 with a majority of references dating from the mid 1990's. The information is outdated in light of the many new studies on the effects on Human Health, Karst features related to drinking water, the size of current projects, and new environmental issues such as "White Nose Syndrome" affecting bats.

I find it ironic that there is only 1 sentence regarding public health and ground water but a paragraph entitled "Major Tourist / Scenic Areas stating ".....Because of the potential for aesthetic and noise conflicts, constructing Wind Farms close to intensively used tourist areas is discouraged....." So much for being concerned about my family!

On November 12, 2010, former DNR Secretary Matt Frank submitted to the Senate the document titled "Report Pursuant to 2009 Act 40 Regarding DNR Authorities Relative to Wind Energy Development". One of the main issues involves wind projects under 100 megawatts. According to Dave Siebert, Director of the Office of Energy, the DNR does not have the authority to conduct pre-construction environmental reviews. This issue still has not been addressed by the Senate! How can the wind siting rules go forward when the mechanism to protect the environment is not in place? How can Michael Vickerman of Renew Wisconsin and other environmental groups not even mention the lack of environmental review? According to the DNR and The Audubon Society, Industrial Wind Turbines are major contributors to the unprecedented decline of Whooping Cranes and bats. Destroying the environment is not green energy!

Relating to the safety of our families.....How can a 50 story structure with blades spinning close to 200 MPH be constructed 1250 feet from my front door? Why are there no inspections done by state or local authorities during the construction process? How can my land be forcibly taken for a safety zone without my permission?

The State of WI and the DNR have an incredible responsibility to protect the health of our families and the environment since the State of WI took away local control through Act 40. We are not collateral damage as stated by Jennifer Heinzen during the Wind Siting Council Meetings.

Remember, Clean Wisconsin and the Citizens Utility Board officially protested the expansion of Point Beach Nuclear Power Plant in January 2011 because WI has a 35% excess electricity capacity already. Why would we further deepen our budget deficit, drive business south as electrical rates increase, continue paying huge subsidies to a few companies, many foreign owned, and harm our communities by further developing Industrial Wind Turbines in a state with a poor wind rating? I respectfully request the Wind Siting Rules be sent back to the PSC to properly address all the issues / expectations in Act 40. Our communities deserve a minimum setback of 2640 feet. Only then can we begin to ensure that our families and the environment are protected.

**Mark Deslauriers
8042 Holly-Mor Road
Greenleaf WI 54126**

wifirefightermark@yahoo.com

IN FAVOR OF SUSPENDING THE WIND SITING RULES

Commentator Information:

February 9, 2011

Name: Jerome Hlinak
Address: 3709 E. Co. HWY. BB
City: Two Rivers WI 54241
County: Manitowoc
Email: jhlinak@tm.net

Attachments:

1. Presentation at the Fond Du Lac PSC hearing June 28, 2010
2. Engineering facts from Dave Stetzer and David Colling

Attach 1

Wind Siting Rules June 28, 2010

1-AC-231

Commentator Information:

Name: Jerome Hlinak
Address: 3709 E Co Hwy BB
City: Two Rivers WI 54241

E-mail: jhlinak@tm.net

Comment:

The term stray voltage is misused by the majority of people. Stray voltage is when the ground is broken causing neutral current to find an alternate path to ground. This current migrates causing voltage to be measured between ground and an object. The Draft Proposal and the Straw Proposal both misuse the term in its meaning. One would think that the PSC being the government body regulating power generation and transmission would know the correct term to use. I have heard countless wind developers claim that stray voltage is not caused by wind turbines. This is true, but wind turbines do have the potential to cause electrical issues. If a wind turbine had a stray voltage problem and it migrated to a farm or a house the current would change into another form of electrical pollution.

Electric engineers and voltage consultants use the term electrical pollution to cover all electrical issues that are possible. Stray voltage is one form of electrical pollution. The term electrical pollution needs to be in the final wind ordinance to cover all electrical issues. The problem is that the PSC does not recognize these electrical pollutants as a cause to health and safety. Had the Assembly Bill 529, known as the Electrical Bill of Rights, passed all these issues would be addressed.

Wind turbines are more likely to cause objectionable current more commonly called earth currents. Other forms of electrical pollution wind turbines create are EMF's (electromagnetic frequencies), static discharge, and microwave currents along with possible others. The state of Wisconsin has a grid system electrically challenged at this time due to the lack of responsibility from the PSC and legislators on the energy committees.

The PSC does not recognize electrical issues other than stray voltage as a potential health and safety problems. We call ourselves the dairy state but allow our cows and the people in the surrounding communities to be poisoned by electrical pollutants. With wind turbines planing to go on line in the next few years, severe electrical pollution problems will escalate leaving those who don't understand these electrical issues helpless.

The comments filed by Lynne Knuth, PhD on 6/17/10 address various noise and electrical issues with wind turbines. As a dairy farmer who has struggled in the past with the PSC on electrical issues I now realize that a growing population is understanding the negative effects of electrical pollution as well as noise pollution and the shadowing issues caused by wind turbines, all which

are at this point dismissed as health related problems by the PSC and wind industry. I agree with the factual comments submitted by Lynne Knuth, PhD.

With a 1.1 foot wind turbine setback to a house we can safely say there will be a negative affect on those living there. Studies done by Dave Stetzer and Dave Colling, electrical engineers, show an increase in negative health for animals and humans alike near turbines. People living within a mile have experienced various ailments associated with electrical pollution. Far to often individuals dismiss these issues due to other factors. In Lincoln Township Kewaunee County people continue to deal with issues ignored by the PSC as non-creditable because their issues do not follow the political agenda set forth by our legislators.

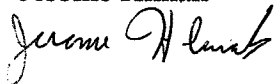
In 2004 Dave Stetzer did a study near the turbines near Lincoln Kewaunee and found a noticeable increase in heart related issues and a noticeably higher rate of death due to heart failure. Due to the time period this study was conducted the PSC deemed it inconclusive. In Fond Du Lac County these similar issues continue to surface with the PSC again washing their hands of the problems disclaiming their testimony as fact. A growing number of doctors and engineers both realize that cancer rates also increase as well as other related health issues from electrical pollution.

In the Town of Carlton Kewaunee County we addressed the electrical pollution issues. Our ordinance requires all neutral wires to be shielded. Local utilities require shielded neutrals on farm rewiring programs. Does it make sense to allow wind developers to be able to use bare neutrals to connect turbines? Should it also be recommended that wind developers be mandated to follow the American Transmission Company standards before the substations. Unfiltered transmission lines between turbines are the cause of dirty electricity as explained in the attachment from David Colling. Dirty electricity causes an increased risk of cancer as well as other health problems.

If the PSC Wind Siting Committee had an electrical engineer to help draft the wind ordinance the standards would limit the amount of turbines allowed thus creating the inability for Wisconsin to reach its renewable goal set by legislators. Local wind ordinances addressed various issues that if challenged in court would have been upheld under 66.0401 of the states statutes which allow for the standards to be based on health and safety. One nuclear generator could replace all the turbines, thus limiting the electrical pollution created by hundreds of turbines scattered throughout Wisconsin's dairy land.

I affirm that these comments are true and correct to the best of my knowledge and belief.

Jerome Hlinak



Modern Wind Turbines Generate Dangerously "Dirty" Electricity

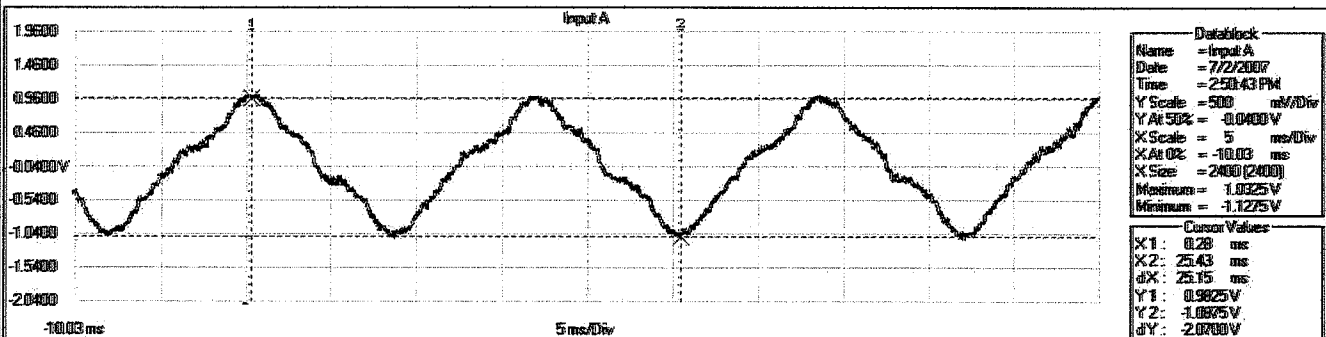
By Catherine Kleiber

Waveforms and picture courtesy of David Colling

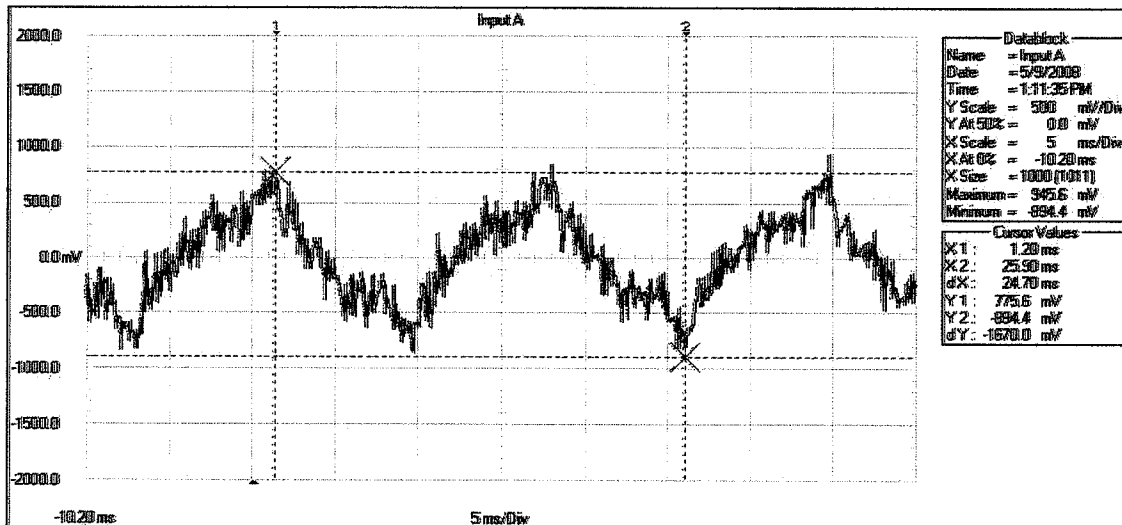
Wind turbines are causing serious health problems. These health problems are often associated, by the people having them, with the flicker and the noise from the wind turbines. This often leads to reports being discounted.

Residents of the area around the Ripley Wind Farm in Ontario where Enercon E82 wind turbines are installed feel that the turbines are making them ill. Residents suffer from ringing in the ears, headaches, sleeplessness, dangerously elevated blood pressure (requiring medication), heart palpitations, itching in the ears, eye watering, earaches, and pressure on the chest causing them to fight to breathe. The symptoms disappear when the residents leave the area. Four residents were forced to move out of their homes, the symptoms were so bad. Residents also complain of poor radio, TV and satellite dish reception. There is no radio reception under or near the power lines from the wind turbines because there is too much interference. Local farmers have found that they get headaches driving along near those power lines.

The waveforms below were taken at one of the residences in the area. The first waveform was taken before the wind farm started operation. (As you can see, a ground current problem existed even before the wind farm started.) The frequency profile of the neutral to earth voltage changed dramatically after the wind farm became operational (second waveform). There are far more high and very high frequencies present, indicated by the increased spikiness of the waveform.



Residence #3, Primary Neutral to remote ground rod, before windmills were installed and running.



Residence #3, Primary Neutral to remote rod, windmills running before the collection line was buried.

As demonstrated by these waveforms, wind turbines are extremely electrically polluting. Studies and anecdotal reports associate electrical pollution with a similar set of symptoms to those experienced by the residents of the area (1, 2, 3). The symptoms associated with electrical pollution are caused by overexposure to high frequencies and are known as radio wave sickness (4). Technical papers discuss the fact that it requires only very small amounts of high frequency signals (either from transients or communications) on wiring to induce significant electrical currents in the human body. They support findings of human health problems caused by exposure to even small amounts of high frequencies (5, 6). The specific symptoms experienced depend on both the frequencies present and the body type and height of the person being exposed. Increased risk of cancer is associated with exposure to both "dirty" power on wires and electrical ground currents (7, 8).

Jim Mueller

From: Larry & Carol [cllamont1220@dotnet.com]

Sent: Tuesday, February 08, 2011 2:48 PM

To: Jim Mueller

Subject: Wind tower commiteee Feb 9, 2011

Wind Tower Committee -- February 9, 2011

I have three minutes to describe some of the situations I will live with the rest of my life.

I was a supporter of wind generation until after they were put up in my back yard. I learned so much.

The impact has been a lot bigger and more intrusive than they had been portrayed.

Where do I begin?

Constant noise – even when not turning we hear the energy wasting transformer hum, continuous distracting motion, shadow flicker, environmental impacts, loss of “flight for life”, real and potential health problems, obnoxious red FAA warning lights, interference of radio reception, and according to the Wisconsin Realtors Association, up to a 40% reduction in property value.

Living inside the perimeter of a wind farm I can address all these problems. I bought 78 serene acres 40 years ago thinking I would be safe from intrusion by others. Not so. We have many omnipresent intruders. Three near the 1250-foot limit recommended by the PSC one only 1101 feet from my house. Way too close.

I will first address the most persistent problem – noise, specifically the post-construction noise study. It seems that once the test is passed they will never be checked again and they are free to roar. I would like to make comment to three statements in this study. First – The lead engineer is hard of hearing.

After spending the better part of a week on site he said he did not witness the often described “whoosh-whoosh” of the turbines. Say what? Second – The report is very hard to understand. They even had trouble because they reported the cut in speed at 3m/sec when it should be 3.6m/sec. The significance of

this is that the turbines where not producing electricity 71% of the time that day, just spinning slowly in the breeze. Thirdly – what is really meant by the engineer hired by the utility requiring all parties to meet before the test “to ensure a successful test”?

I borrowed a noise meter; on this meter I have had turbine noise readings as high as 63dbA. This is 20 TIMES the recommended 50dbA level. Remember these are on a logarithmic scale. Nobody is monitoring these abuses. Does anybody care – other than the people that have to live with under these conditions?

Monitoring should be continuous, unannounced and with no per-agreements. Noise is noise.

I passed my drivers test because I stayed under the posted speed. Does this exempt me from further monitoring – Hell no. Nobody is monitoring turbine noise. Why have guidelines if nobody gives a rip if they are ignored.

Our township has a nuisance ordinance. There are five definitions of causing or being a nuisance. The turbines are blatant violators of four of these categories. Here again the wind farms are beyond the law. They are not being monitored or held accountable. And they think they are good neighbors.

Another issue that bothers me is Vickermans band of 15 that was selected to advise the PSC on wind tower placement. What a folly. Who would ever have predicted this select group would support wind energy almost without reservation. What a waste of time and money. This is like asking a select group of tavern owners if they favor prohibition or not.

And I'm not totally buying into the green energy thing. Proponents say that the energy is carbon free. Nobody has talked about the large trail of energy and carbon that it takes to build, deliver and maintain these behemoths. It is the most expensive and least dependable way to generate electricity. 10 cents per kwh as opposed to 3-4 for coal and 2-3 for nuclear. And we still have to maintain all our other forms of generation because of there undependability.

If this information doesn't slow down the green theme a little check out some towers. Many are covered with dark splotches from a lubricant or something. Many blades are streaked with the same stuff. How much of this stuff are they splattering around the countryside?

These are a financial boon to those few that 'host' these things. \$175,000 over the life span is nothing to sneeze at. The rest of us put up with all these conditions for nothing. Many of the "hosts" are unhappy also but they cannot be too vocal.

And finally, I get so frustrated when the press buys into how great these things are as told to them by the well funded industry that build them or distributes there product. Especially when they tell us who live within the wind farm "some people just do not like these things". I challenge them to come live with us for a while and then try to think of anything you do like about them.

I would welcome any response to my comments. Did you hear them, do you understand? Any questions?

Larry Lamont

W 2362 Ash Rd

Malone, WI 53049

February 7, 2011

Joint Committee for Review of Administrative Rules
Room 412 East
State Capital, Madison WI

Our names are Jim and Darlene Mueller. We built our house in 1978 and have lived in the Town of Marshfield for 32 years, long before the Blue Sky Green Field Wind Project came to our neighborhood.

Today you will hear the same speeches that we heard years ago from energy companies, wind development companies and anyone else that can profit with the construction of wind turbine projects. You will be promised financial gains for the hosting land owners, townships and the county where turbines will be constructed. You will hear about extra jobs that will be created during construction and post construction for maintenance and operation of the turbines. You will be told of studies have been done by universities that there are minimum effects caused by the wind turbines. We-energies promised us that they will help resolve any problems that may occur with the wind turbines.

Here is what we now have with the Blue Sky Green Field wind turbine project in our township. Noise levels that can best be described as that of a jet engine roaring above your house especially during night hours when the air is heavy. You will be awakening at night for hours at a time with no chance of being able to get back to sleep. When wind turbines are not roaring like a jet, you will hear banging of brakes and mechanical grinding of turbines when changes in wind direction and wind speeds occur. You can no longer open your windows in your home during the summer. You will experience loss of television and radio reception. There will be flickering in your homes from the spinning of the blades. You now are closing your curtains during the day to avoid motion sickness. You will suffer losses of property values when you have spent your lifetime paying for your home and now want to sell to fund your retirement.

With the complaints received from citizens in our township it was decided that a committee would be formed in our township to try and resolve these problems. This committee includes several town board members, Larry Lamont and myself and two people representing We-energies. Here is what we have accomplished. After arguing for over a year about television and radio reception losses, We-energies now offers a base Dish family plan to get us television reception and cirrus radio for radio reception.

We-energies asked this committee to have citizens contact their hotline first with problems. The hotline number is (887)380-0522 and is only responds during daytime hours. You can leave a message during nighttime hours. Citizens call evenings when the turbines roar like jet engines to complain but will not get an answer until the next day. By then the jet noise is gone and We-energies respond by stating that everything is running normally. We-energies was able to pick the times and dates of the required sound study so they were able to control the testing to make sure they would be in compliance of the 50 dBA during their sound study. We have been told since they were in compliance during testing that they do not need to do anything about the noise. We would have to do a noise study to prove them wrong.

Our township does not have the money to finance a noise study. Fond du Lac County receives \$625,000 last year from wind turbine revenue, but also refuses to finance a sound study. Larry Lamont has taken decibel reading as loud as 63 decibels at his home which is 20 times higher that the maximum of 50 decibels, but no one will come out to confirm noise levels.

Today I would like to ask the members of this committee for your home phone numbers. I would like the opportunity to be able to contact you each time we are awoken by the noise of the wind turbines so you personally will understand what we are going thru. We cannot understand how any committee or even the Public Service Commission would approve noise guidelines that are not enforceable. There needs to be guidelines set that are enforceable and monitored by an agency that will enforce these guidelines.

This is only one of our problems. Since we already have the wind turbines, who is going to step forward and help us? Who is going to reimburse us for the loss of our property values because people not wanting to live with problems associated with wind turbines. I work as an insurance agent. We insure homes. This gives me the opportunity to work with realtors in our area. In speaking with realtors the market is slow in most areas. The one area that still is in demand are homes out in the country with one acre or more land. People enjoy the beauty and quietness of country living, except if you live in a wind turbine area. Realtors tell us that properties in the turbine project are hard to sell. One of the first questions asked is: is this property near any turbines? One realtor said if anyone tells turbines do not make any difference, tell them straight to their face they are liars.

Things can be done to make our lives more bearable. Why are wind turbine blades allowed to turn when not producing electricity? Wind turbines do not produce electricity until wind speeds reach eight miles per hour. If turbines would not turn until wind speeds of six miles an hour we would not have to listen to the noise, flickering and would be able to get reception on our televisions and radio stations. The technology is out there to do this, but again no one is monitoring this.

Because the Public Service Commission and our lawmakers have not stepped forward

to do what needs to be done our wind turbine committee is at the mercy of We-
energies. This committee hasn't had meetings anymore because of lack of
responsibility of our lawmakers. The best way to describe what has been done to the
citizens in the Blue Sky Green Field Wind Project is legalized rape of our rights.

Last year Darlene was home sick with the flue. I expected to find her resting in bed.
When I came home she was on the floor in an interior hallway with blankets and a pillow
over her head trying to get away from the noise created from the wind turbines. This is
when I realized our house was no longer our home.

Sincerely,

James Mueller
Darlene Mueller

James Mueller
Darlene Mueller
N8710 Pine Road
St. Cloud, WI 53079

GenMet Corp.

SUPERIOR METAL FABRICATION

I am Eric Isbister. My wife and I own GenMet, a 70 employee metal fabrication company located in Mequon Wisconsin. We are working hard to grow our company and diversify our customer base. GenMet's employees and owners have an interest in alternate energy. The wind industry in particular utilizes a lot of fabricated metal. We have joined a number of wind industry associations and we have started to grow our business in this space. Many of the manufactured parts of these large machines are produced local to the final installation. If we don't install wind turbines in our state we won't likely manufacture them here.

Therefore our job should be to minimize restrictions on wind turbine installation to technical issues such as those necessary to protect personal and property safety. The protection provided by setbacks should be based on science (for example ice damage) and derived from hub height and blade length not an arbitrary distance.

We have yet another job and it is to grow jobs in Wisconsin. Our manufacturing base, if reinvigorated, can provide good paying careers. If manufacturing is to grow it will need today's young people. The jobs will need to ignite their passion. Alternate energy does that and you can help make it happen in Wisconsin.

The country that manufactures innovates and becomes the leader. For example we in Wisconsin are a leader of agricultural equipment design and manufacture because the farms are here. The problems that need solutions are here. The problem solvers have made us an industry leader in agricultural equipment. We have the engineers and manufacturers. The wind industry can be our future leadership industry.

Don't make laws that move the wind industry out of our state.

Thank you.

Eric Isbister

CEO

GenMet Corp.

10245 N Enterprise Drive

Mequon WI 53092

Phone (262) 238-7000 ext.125

Fax (262) 238-7007

www.genmet.com

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My name is Gerry Meyer. I live at W6249 County Road Y, Brownsville Wisconsin. I live in the Forward wind factory erected by Invenergy.

I agree that there are some energy issues in the state although there are reports that we have 35% more electricity than we currently need. Probably at some point we will need that extra capacity. I hope that we also can agree that if this is an issue we need to solve the problem using a science based approach as this is a very technical field not one that can be solved by throwing out the word "green" or "renewable" and expecting to solve the problem.

The Forward project was the first big project in the state with the Blue Sky Green Field right after it. The wind companies pretty much wrote the rules telling the PSC this was safe. Science and common sense were not used. I have heard many times that a 1000 foot set back from a home is a safe set back. Then 1250 feet is safe. That sound levels of 50 Dba or even 65Dba is safe. We hear that there is no affect on property values and that shadow flicker is minimal and can be eliminated. Non of this is true.

I live in a wind factory. The rules that the PSC approved last fall does nothing to stop the suffering of those living near irresponsibly placed industrial wind turbines. How can you not know that **world wide** where ever there are large industrial wind turbines there are health problems, sound problems and property value loss?

Since Governor Walker proposed the 1800 foot set back from property lines all we hear from the pro-wind people is Wisconsin will lose \$1.8 billion in wind energy. This shows me that this industry is not designed with science, but of the lust for money.

The PSC did not use science for the rules they approved last fall. They used recommendations from the wind siting council that was legislatively designed to be strongly biased to make wind energy development in Wisconsin easy. I was at those meetings and saw the one council member that lived within a wind farm boundary ignored when he spoke about responsible siting and was denied his request several times to play a recording of sound he captured one morning at 4:00 AM when he could not sleep.

I have been labeled "anti" wind by a member of Renew Wisconsin. That was not true. I went to informational meetings for the Forward project and was neutral. This seemed like good thing just as we were told. I listened to what I know to be misrepresentations from Invenergy and the PSC. I was not a part of the group fighting the project. I actually thought is it possible that I could host one of these on my six acres of land. I sure was naïve and ignorant.

The turbines around my house began turning on March 3rd, 2008. Our quality of life immediately changed. First of all it sounded like a jet flying over. I actually looked into the sky for that jet. That turbine is 1560 feet directly north of my house. My first thought

was "We've been had". I began a daily noise diary. My wife and then 13 year old son immediately began having head aches and sleep problems. At least I was sleeping. Or so I thought. As time went on I realized I no longer dreamed. Now I only dream when I am away from home. I would have a pulsing feeling at the base of my neck and feel nauseated when I sat on the edge of the bed. We had other symptoms, but did not connect any of these to the turbines or anything else.

About two months after the turbines start up some out of state visitors came and gave me a copy of a radio interview done by Doctor Nina Pierpont from Malone, New York. She had been studying people that live close to large industrial wind turbines and the affects these people were experiencing. As she talked about symptoms these people had I found that we were experiencing those same symptoms.

As time went on our quality of life got worse. I felt unmotivated. I felt exhausted and needed one or two naps during the day to try and alleviate the sleep deprivation I was experiencing at night. I had trouble remembering customer's names on my mail route and could no longer do simple calculations that in the past I did in my head. I felt stressed and angry, especially when working outside in the garden which in the past was a relaxing activity.

I hear people say "I know about noise because I live near an airport", or I live next to the highway or train tracks. None of these compare to the sound of large industrial wind turbines. I am not a sound engineer, but I do know that there is a low frequency sound or infra sound that often we do not physically hear, but our body feels. Does this get better or do we get used to it. NO. My symptoms are getting worse. I usually sleep until about 1:30 or 2:30 AM then am woke up about every hour or get only restless sleep. Often by 4:30 or 5:00 AM I can not longer sleep.

I have had my cortisol level checked. Cortisol is a stress hormone. I had it checked in July of 2009. My level, which is analyzed by the Mayo Clinic, was 254. It should be less than 100. In late September early October of 2009 all 86 turbines were shut down for 21 days. During that time I found I had lost 17 of the 37 pounds I had gained since the turbines went on line. I also was feeling better. The day after the shut down I again tested my cortisol. It was 35. From 254 to 35. Don't that tell you something or at least raise a red flag that appropriations need to be made to do an epidemiological study in the current wind factories before more wind energy victims are produced in more wind factories?

Sleep deprivation causes a number of diseases. A partial list includes high blood pressure, diabetes, depression, memory loss, impotence and heart disease. This list comes from Bellin Heath in Green Bay.

I have 5 wind turbines within 3300' of my house. From this experience I know that a 2640' set back is not enough so an 1800' set back from a property line would be a

giant compromise. I know that 50 decibels is too loud. I know that 45 decibels is too loud. I have a sound meter to experience this. I feel 5 decibels above the ambient sound is a safe sound level especially at night. We need property value protection clauses just like those of neighbors to land fills and quarries. We also need to end the shadow flicker that is trespassing on to neighboring properties.

My time is up. I have much more to say as one can not put 2 years, 11 months and 6 days of hell into a few minutes.

Please suspend the current rules so nonparticipating property owners get proper protection from large industrial wind turbines.

Thank you

Gerry Meyer
W6249 County Road Y
Brownsville WI 53006-1103
920 948 7469
gcmeyer@fastbytes.com

Health Effects We Feel From Living Near Industrial Wind Turbines

Written in the fall of 2008 with several updates

13 year old son -: Can't sleep or interrupted sleep, headaches, tells us and teachers "It feels like my head is spinning 100 miles an hour. In general more anger than in the past. Most nights sleeps with one radio and some night two radios running to cover the turbine sound.

wife:- Headaches, lack or loss of sleep – often up in the middle of the night to read and try and get tired again due to either direct sound from the turbines or low frequency noise not heard but felt by the body. Ringing and buzzing in the ears. In early April, 2010 we went on a vacation to Montreal, Canada. It took 4 to 5 days for the ringing to go away. We came home after dark. When we turned on to our road she said, "The ringing is back". Updated July 19th, 2009. After being to the Dr. in January and advised to watch blood pressure went back today as it has been continuing to climb. Also gaining weight. Dr told my wife, lack of sleep will cause both of these issues. Now she has been prescribed a sleep aide to see if this will help first. If not then I will need to go on blood pressure meds. Also she (doctor) said that lack of sleep can cause heart disease, dibetes and fibromyalgia. We know some people who have that and I certainly do not want this.

Gerry: -Tenseness, anxiety, occasional headaches (in the past rarely got headaches), light headed, unusual feeling in the base of the neck, nausea, anger (that elected officials have allowed this to happen) (anger from the constant sound), lack of motivation, tired most of the time, having trouble remembering names and facts, lack of feeling happy, not dreaming at home. Only dream when away from the wind farm which would show not getting into deep sleep or REM sleep. Added April 9th, 2009 Recently I have been experiencing chest pains. When I go away for a few days the chest pains go away. Crackling or hissing in my ears is now constant. I also have been gaining weight, especially the last month. In all 26 pounds since the turbines began turning even with eating less and not in the late evening. At question is my cortisol which I hope to have checked soon. Updated August 17, 2009: On Friday 8-14-9 I received the results from my Dr. from my cortisol check. I was told it is moderately high and recommended that I see an endocrinologist for further testing. I have now gained 27-37 pounds. During the worst sleep deprivation (July 29, 2009) my cortisol level was 254. It should be less than 100. On October 19th after all 86 turbines were shut down for almost 21 days and noticing that I had lost 17 pounds, I again tested my cortisol level and found it to be 35. More recently I get about 2 hours sleep a night. After that I am either consciously awake or toss and turn. When YOU get a normal nights sleep you don't even think about the chemical changes and nourishment your body and brain during sleep. Now that my sleep is deprived I am learning. Those affects you can read about in other documents I will submit. One is from my federal health insurance while looking for an approved endocrinologist due to my high cortisol level. Updated 6-20-2010. I have blood tests about every six months to most specifically check thyroid levels but other tests as well. This is the first time that my glucose level was above standards and a concern to my Dr. Diabetes is one of the diseases connected to sleep deprivation. Yes, I am concerned. Updated January 13, 2011. Today's glucose level is 114. Not terribly high, but above standards. It is increasing while I eat fewer foods with sugar in them.

Our dog – He will walk down the sidewalk and look at the turbine because of the noise. I have commented to my wife and oldest son that "Trigger is acting like an old dog (he is 7) he walks around slow, sleeps a lot and does not have much motivation". When I finally admitted and wrote down my motivation issues I realized our dog was experiencing the same.

This is due to five industrial wind turbines being erected within 5/8 of a mile (1005 meters) from our home. One is 1560 feet (475 meters), one 2480 feet (756 meters), and three are 5/8 of a mile (1005

meters) away from our house. Occasionally I hear one to the east 7/8 mile (1408 meters) away and one directly south 1 mile (1610 meters) away. Sometimes the first three mentioned are equal in sound and can be heard inside the house sometimes in all rooms. Some say, "You can hear the train or you can hear traffic and that is not a problem". That is correct. That is not a problem, but the large, loud, industrial wind turbines emit a different sound, a constant sound that does not go away and a low frequency sound that penetrates the house and body that sometimes the body does not consciously hear, but feels.

Written and submitted by
Gerry Meyer
W6249 County Road Y
Brownsville WI 53006-1103
920 948 7469

The document below is from a woman I will name Sue. Sue is a very private person that at this time wants to remain anonymous. I know her boyfriend and in our conversations I would learn that she was suffering from many health issues. I would suggest that she explore the possibility that her health was being affected by the wind turbines. It took many months for Sue to take her boy friend's advice and call me. Now that I have interviewed Sue I would say she had the worst health symptoms of anyone I know living in a wind factory. When I talked with her she did not want our conversation to be recorded nor for me to take a photo of her. I wrote every comment she made on paper, went home and typed my hand written notes and took them back for her approval. Below is what I wrote and near the end comments I wrote after they moved in early June or about a month ago.

May 14, 2010

I wrote this after receiving a call from Sue. I went to her home and as I listened to her I wrote down the symptoms she recited to me. Because up until now she did not believe the turbines were the causes of her symptoms she did not think about which wind direction might be causing the worst nights of sleep deprivation or making certain symptoms more severe. I later took note of the distances of turbines from their home. The closest is about 1560 feet as measured with a range finder. Interesting is that is the same distance as the closest turbine to my house. Two other turbines are ½ mile away. One is 7 tenths of a mile away. There are two more that could be in the ½ mile range, but I did not estimate the distance of those turbines.

On about April 29 I received a phone call from a woman in great distress about the serious health affects she is experiencing due to living near large industrial wind turbines. I had been talking to her boyfriend for at least six months about what he had been telling me about her health. I had suggested the large industrial wind turbines near their home. She was in denial that the turbines were causing her serious health issues.

Sue moved out to live with her boyfriend on Road X about September 7th of 2007. She has two sons in the 6th and 9th grades from a previous marriage. Some of the large industrial wind turbines were erected however the turbines closest to their home were not yet up or turning. The area where she lives is somewhat near where the first turbines were erected. The turbines closest to their home and causing the most noise and discomfort are turbines 107, 40a (?), 44, 45 and 48 and probably turbine 22a to the NE of their home.

The concerns began about 2 months after Sue moved to rural Oakfield just ½ mile north of the Fond du Lac County line. As soon as the turbines began turning she had a tightening in her chest, pain in her chest and gasping for air as well as headaches. Sue has a history of headaches which were not greatly enhanced by living in her new residence. She had migraine headaches in the past, but she mentioned these headaches are not migraine headaches, yet they are more severe. She would take large amounts of over the counter pain killers going from one brand to another looking for relief. Later she learned that these headaches were migraines, but were different from what she experienced before moving to this home surrounded by wind turbines.

Then came eye pain. It feels like the left side of her head is inflamed although it is not. As time went on the headaches became excruciating and the left eye hurt more.

She mentions she is becoming forgetful. Talking on the phone is painful and tries to avoid it.

She also realizes she is more crabby than in the past over simple, stupid "stuff".

At issue is lack of sleep, often getting an hour of sleep, looking at the clock and over and over at the night goes on. She tried Benadryl for sleep, but it did not work.

This spring the health affects got greater. She had severe abdominal pain. She had an upper GI series with negative results. She had an abdominal CAT scan with "all is OK results". One doctor told her stress was the cause. The only different catalyst in her life is the industrial wind turbines.

From March 6th to May 6th 2010 she lost 20 pounds. Sue states that otherwise her daily life is no different than the past other than the sleep deprivation caused by the wind turbines. She feels like her body is changing. She has been tested for allergies. Nothing shows up.

Sue's body reacts to foods that never were a problem for her in the past. She enjoys drinking milk, but her stomach no longer can handle milk.

She has been on a hormone medication for about 10 months which she now has quit taking because it began causing her to feel "weird" and delusional.

She feels very frustrated and angry over this invasion of her life. Often she has difficulty breathing. She does not smoke. She often has a fluttering in her chest. In one episode of concern for her life she went to the emergency room.

She has had a CAT scan of her sinuses with normal results. She is tired, exhausted, has anxiety, and stressed. One doctor told her that her immune system is low.

Again when Sue moved to this home in September of 2007 she was in good health and felt really good.

Her eyes and ears have hurt the last few months. Most recently she has spots in her eyes and does not dream anymore.

After our discussion Sue called me with concern that she does not have good circulation. Her feet and fingers are always cold with winter being especially uncomfortable.

In talking to Sue and her boyfriend I found this was to be their dream home. There was 35 acres of land with the house and barn. They found they no longer could live here under these conditions (the loud, sleep depriving, severe health causing life in a wind factory). Because of the farm land and offer in their price range was accepted.

Sue and her boyfriend moved in early June. Most of Sue's symptoms are gone and the remainder has greatly improved. She did exactly what Jevon McFadden's presentation to the wind siting council suggested. She visited health care professionals many times. She had many tests and numerous blood test with normal results. No serious underlying health issues, yet her body was greatly affected. I don't think any findings filtered to the state health department? She feels much better now that she is not living near the large industrial wind turbines that affected her life for about 20 months.

Update October 2, 2010. Sue's boyfriend told me she is a new person since moving away. She feels better and has motivation and ambition she has not had since the turbines began turning.

This information should raise red flags to the Public Service Commission of Wisconsin that there **IS** serious health issues related to large industrial wind turbines being placed too close to residences. Leading doctors and science related professionals are suggesting a 1 mile or more setback from homes. Where is the science that shows that living 1000' from an industrial wind turbine is safe? The state health department states (Wind siting council presentation by expert Dr. Jevon McFadden) "**Evidence does not support the conclusion that wind turbines *cause* or are *associated with adverse health outcomes***". If you look at this letter, the cortisol testing that I have done and information about many others with serious health issues from living in wind factories you should determine that a moratorium on wind factory construction needs to be enacted until epidemiological studies can be done.

We hear testimony that Wisconsin is lagging in wind farm construction and jobs are being lost. Why should Wisconsin be a leader in wind energy production? Why aren't Wisconsin legislators, doctors and other leaders speaking out for the health and safety of its residents?

As Written by Gerry Meyer

Wildlife-How Industrial Wind Turbines Affect Them

January 31, 2009

This of course is not a scientific study. It is just from daily living inside an industrial wind farm and the affect it has had on wildlife on our property and others in the Town Of Byron area here in Fond du Lac County, WI. We used to see 16 to 20 turkeys if not every day every few days before construction of the industrial wind turbines began. Now that construction has been completed and since March 3rd of 2008 we have seen ONLY one turkey.

The same goes for deer. We used to see on a regular basis a deer or two down our lane behind the house or in one of our two gardens. We have 6+ acres of land with over 3 acres in heavy pine trees and an acre of wild flowers. That is pretty good habitat for deer. We have not seen a deer or deer tracks on our property since construction began.

Our neighbor, Dave C, across the road bought 40 acres when our neighbor discontinued farming. Part of that land has woods on it. Dave's father many years ago built a hunting stand on a corner of the woods in a tree and shot many deer from it. I later used that same stand and now Dave hunts from that very same tree. This year he saw no deer from that hunting stand. The only thing he saw was shadow flicker from industrial wind turbines and the annoying sound from those same turbines.

Another neighbor, Greg B, whom I have known since a child has a 19 acre woods between turbines 6 and 7. He used to feed the deer from his back yard deck. Since construction of the wind turbines began he has not seen any deer accept on opening day of deer hunting in November of 2008. Three deer were being chased and they ran through his yard.

At a town hall meeting today (1-31-9) with state senator Joe Liebham with about 80 people in attendance I mentioned this (not seeing wildlife) and I heard many yeses and agreeing head nods.

We don't see and hear the song birds like we used to at our feeders. If the turbines are turning we no longer hear song birds. A friend, who also lives in the project, recently told me he no longer sees the hawk that used to hang out by his home. We don't see kestrels or hawks and I no longer hear the owl that would frequent the woods adjacent to my property. Yes, there definitely is an affect on wildlife when industrial wind turbines take over the neighborhood.

We know residents two miles north of this wind factory and they are seeing more deer than before the industrial wind turbines were erected.

Update June 15, 2010. We continue to see no deer and no turkeys. We used to see hawks and hear owls at night. It was so neat to hear them. They have not been present since the turbines began turning. We do have some Cardinals and a few other song birds that come to our feeders. There are very few compared to what we had prior to the turbine construction.

October 10, 2010 – We heard an owl tonight. It is the second time I have heard an owl since construction began. We used to have owls in the woods behind our house on a regular basis.

One of the first siting council meetings in the PSC center in Madison I asked a PSC staff member about no mention of wildlife in the items to be discussed. I was told that would be up to the DNR to respond to. I have read the DNR letter concerning wind and wildlife. It is so weak it is pathetic. It is all generalizations and no requirements. These happenings are going on world wide wherever large industrial wind turbines are places. Why is the PSC blind on this? Instead of promoting wind energy why isn't the Sierra Club and other environmental groups striving to protect the wildlife rather than kill it and stress it? Why won't the wind energy victims be heard? \$\$\$\$\$\$

Written and submitted by
Gerry Meyer
W6249 County Road Y
Brownsville WI 53006-1103
920 948 7469

As a retired Postal Service employee I am covered by federal health insurance. The very first time I went to the company's web site this is what greeted me on the home page. Very fitting to wind energy.

Gerry Meyer
W6249 County Road Y
Brownsville WI 53006-1103

From <http://fepblue.org> federal employees Blue Cross insurance
Sleep Needs and Insomnia

We've been doing a giant experiment on ourselves by turning night into day. In the millennia before electricity lit up our nights, we slept about 10 hours a night. Today Americans average just under 7 hours' sleep on weeknights, and a half hour more on weekends. That's a whopping 20 hours less sleep each week. And 20% of us sleep less than 6 hours a night.

What are the effects of this radical change? For the most part, we don't know. The scientific study of sleep is still young. We're just beginning to chart the territory, from the basics of normal sleep patterns through the woes of insomnia and further to the exotic lands of sleep disorders called parasomnias, where mild-mannered men howl like wolves and women ravage their kitchens for food while fast asleep. It's a fascinating journey for scientists as they discover the role of sleep in learning, memory, disease, immunity and aging. There is already lots of evidence of a feedback cycle between not sleeping well or enough and poor health.

For many of us sleep is a frustrating issue. We have so many tasks and distractions that we can't get our kids or ourselves to bed on time. When we do get to bed we lie awake with racing minds or restless legs. Our partners snore so loudly it makes us crazy. We wake up in the wee hours and can't fall back asleep. By day we're so drowsy we can't think straight. We nod off in meetings and at stoplights--or worse, while actually driving.

Our basic problem is too little sleep. But about 64 million Americans a year also have insomnia, often for long periods. Insomnia is trouble falling asleep, waking up often, waking up early and being unable to fall back asleep, or waking up not feeling rested. Another 18 million or so have sleep apnea, where part of the throat relaxes and repeatedly closes the airway until they snort or gasp and breathe again. As many as 12 million have restless leg syndrome. And another quarter million has narcolepsy, causing "sleep attacks" where they may suddenly lose all muscle tone and collapse.

There's help for nearly all of these problems. This week we'll start with the basics of sleep needs and insomnia. Next week we'll discuss some of the other sleep disorders that trouble our days and nights, like restless legs syndrome and narcolepsy. To learn about the serious health condition sleep apnea, search the Cover Story Archives for our article *More Than Snoring: Obstructive Sleep Apnea (OSA)*.

How much sleep do we really need?

- **Infants:** 11-18 hours per night
- **Toddlers:** 12-15 hours
- **Preschool kids ages 3-5:** 11-13 hours
- **Kids 5-12:** 9-11 hours
- **Teens:** at least 8.5-9.5 hours
- **Adults:** 7-9 hours (women in the first 3 months of pregnancy often need several more)

Good morning, Co-Chairs Vukmir and Ott and members of the Committee. I appreciate the opportunity to testify today on PSC 128.

My name is Julie Voeck. I am the Director of Regulatory Affairs for NextEra Energy Resources and am responsible for representation of the company in regulatory and legislative matters in Wisconsin.

NextEra Energy Resources, a wholly owned subsidiary of NextEra Energy, is the largest owner of wind projects in the United States. We operate 115 electric-generating facilities in 26 states and Canada, including 80 wind facilities that produce more than 8,000 MW of wind power and represent investments of over \$11 billion.

NextEra operates three facilities in Wisconsin... the Point Beach Nuclear Plant in Two Rivers... the Butler Ridge Wind Energy Center in Dodge County... and the Montfort Wind Energy Center in Iowa County.

NextEra's presence in Wisconsin has created and over 650 permanent jobs. Our facilities also help boost the state's economy through other direct benefits, including nearly \$400,000 in landowner payments, an expanded tax base and the purchase of local goods and services.

When Special Session Bills AB 9 and SB 9 – relating to wind siting – were introduced at the request of Governor Walker, it sent shockwaves through the wind energy industry. If passed, not only would the legislation severely limit future investment in Wisconsin by NextEra... it would likely shut down the state's wind energy industry.

NextEra is equally concerned about potential action by this Committee to suspend PSC 128. This would create unpredictability in the market, driving investors and developers who depend on market stability out of Wisconsin.

NextEra is currently pursuing a potential 100MW project in Wisconsin that would contribute roughly \$180 million to economy as well as create 100-200 construction jobs and

eight to ten high-quality permanent jobs. Suspension of PSC 128 would put this project in jeopardy.

With that in mind, I would ask the Committee to withhold action to suspend or modify PSC 128. We believe the rule should be implemented and given adequate opportunity to work before any modifications are considered.

PSC 128 was crafted through a fair, open rulemaking process and represents several years of study by state regulators to consider the position of all stakeholders. The end result is a statewide wind siting standard that addresses the concerns of landowners, while also supporting continued economic development in Wisconsin.

I would also like to stress that NextEra takes any concerns regarding our projects seriously, and we are not aware of any scientific, peer-reviewed information linking wind turbines with negative health effects or diminished property values.

However, as the county's leading generator of wind energy, we are keenly aware of the negative impact arbitrary and onerous regulations have on wind energy development... and the jobs and economic benefits it brings to communities across the nation.

In closing, I would once again ask the Committee to support economic development and job creation in Wisconsin, and withhold action to suspend or modify PSC 128.

NextEra Energy Resources looks forward to further discussing the points brought up in my testimony. At this time, I would be happy to answer any questions.

SECONDWIND

Second Wind Financial Services
 1719 Route 10 East, Ste. 207
 Parsippany, NJ 07054
 Phone (973) 292-0025 Fax (973) 292-0019

CUSTOMER CREDIT INFORMATION

Legal Company Name: WES Engineering INC Years in Business: _____ Term: _____ Lease Option: _____
 Address: 706 S Orchard St State of Incorp.: WI COUNTY: Dane Fed Tax ID#: 27-2026743
 Phone: 608/259-9304 Equip LOCATION: (If different) _____
 Location Type: _____
 Branch, Parent, If Other, Please explain: _____
 Fax: 608/299-0426 Location Contact: _____
 Contact: Wes Slaymaker
 E-mail Address: Wes@WESengineering.com

BUSINESS OWNERSHIP

Name: Wes Slaymaker Home Address: 706 S Orchard St
 Social Security #: 309-66-2341 Madison, WI 53715
 Ownership %: _____ Home Phone: _____
 Name: Tim Laughlin Home Address: _____
 Social Security #: _____ Home Phone: _____
 Ownership %: 50
 List Others Separately: _____

BANK REFERENCE

Name: Park Bank Contact: Tom Pope
 Address: 815 Greenway Cross
PO Box 8969 Checking Acct # 235707
 Phone: 608/278-2843 Savings Acct # _____
 Fax: 608/278.2853 Loan Acct # _____

TRADE REFERENCES

Company Name: Pioneer Windworks LLC Contact: Jason Vidas
 Address: 222 North Elm St Phone: 608/333-7041
LaFarge, WI 54639 Fax: 608/237-2106
 Account Number: _____
 Company Name: Wave Wind Contact: Tim Laughlin
 Address: 4589 Cty Rd TT Suite A Phone: _____
Sun Prairie, WI 53590 Fax: _____
 Account Number: _____
 Company Name: _____ Contact: _____
 Address: _____ Phone: _____
 Account Number: _____ Fax: _____

I/We herby authorize the release of any and all credit information from the above listed references, and certify that all is true and correct to the best of my/our knowledge. The undersigned individual(s), recognizing that his/her/their individual credit histories may be a factor in the evaluation of the credit applicant, hereby consent(s) to and authorizes(s) the credit provider to obtain and use a consumer credit report on the undersigned, now and from time to time, as may be needed in the credit evaluation and review process and waives any right or claim they would otherwise have under the Fair Credit Reporting Act in the absence of this continuing consent.

Signature _____ Title _____ Date _____ Signature _____ Title _____ Date _____

February 8, 2011

Representatives of Wisconsin
Joint Committee for Review of Administrative Rules

Re: PSC 128 Wind Siting Rules

Wisconsin legislative members reviewing wind turbine siting rules PSC 128:

I own and operate a Wisconsin based business with 4 employees that is involved in wind and renewable energy technology. I moved here 5 years ago in part due to progressive policy on renewables and the prospects for work, as well as the quality of life for myself and my family. WES Engineering assists schools and businesses who are interested to install wind turbines to offset some or all of their energy use or sell energy to a utility. These clients are very committed to improving the air quality in Wisconsin and demonstrating leadership in reducing the carbon footprint of their entities.

I am expressing my support for the adoption of the PSC 128 wind siting rules as written. These reasonable regulations and setbacks for wind turbines in Wisconsin will allow Wisconsin businesses like mine to design and construct wind energy projects around the State where there are good wind resources. These projects employ many Wisconsin businesses in design, construction and operations. The projects also include benefits for the local communities, including revenues, employment and energy generated from a Wisconsin resource without any carbon emissions, water usage, or other harmful emissions. There are operating wind projects in Wisconsin with satisfied neighbors and communities, the Montfort project west of Dodgeville has operated nearly ten years with few complaints, and 20 large wind turbines.

I realize wind turbines can have negative impacts on neighboring properties, but believe the PSC rules are some of the most stringent in the Midwest and offer a compromise that allows wind turbine projects to continue while also affording more protection for neighbors. Many tall structures in Wisconsin have similarly been seen at times as a blight that should not be allowed (cell towers and transmission towers), but each persists in WI and the rest of the world as necessary components of a modern world.

This country was made great and important in the world through technological advancement and industry, not always the best for peace and quiet living, but certainly the best to maintain our world leadership position. Let's keep some reasonable regulations allowing wind turbines to be sited in the State.

Thank you for your time.

Sincerely,

Wes Slaymaker, P.E.



President
WES Engineering Inc.
www.WESengineering.com
wes@WESengineering.com
608-259-9304

IBEW LOCAL UNION 2150
INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS
N56W13777 SILVER SPRING DRIVE MENOMONEE FALLS, WI 53051-6127
262-252-2552 * 800-551-1151 * FAX 262-703-3520
FORREST CEEL, BUSINESS MANAGER

Feb. 9, 2011

Senator Vukmir, Representative Ott and Committee members,

Thank you for the opportunity to speak with you today. My name is Mike Bellcock and I am a Business Agent and Legislative Director for the International Brotherhood of Electrical Workers (IBEW) Local 2150. Local 2150 is the largest labor organization representing energy workers in the state with over 4500 members employed by investor-owned and municipal utilities, electric co-ops, and electrical, gas, and telecommunications contractors. In addition, our members manufacture medium and large size transformers at Waukesha Electric Systems that serve the electric grid throughout North America.

Our organization supports a common-sense, balanced energy approach for the state which would include a mix of coal, nuclear, gas, hydroelectric, solar and wind energy as well as other emerging technologies. We believe such an approach is good for the state of Wisconsin as it will help hold costs down for ratepayers, spur economic development and ultimately result in more good jobs for Wisconsin residents.

Local 2150 supports the current version of wind siting rule (PSC 128) including the setback standards contained in the rule. We have concerns that amending the rule to be more restrictive to wind energy development could have a very negative impact for Wisconsin based manufacturing and construction companies and workers. Wisconsin based employers such as Michels Corporation and Waukesha Electric Systems, as well as concrete companies, tower manufacturers and constructors, road builders and others employ hundreds of Wisconsin workers who are directly involved in the wind energy industry here and throughout the country.

The current wind siting rule was developed to balance the interests of many stakeholders, and as written, will preserve as well as expand job opportunities for Wisconsin workers, which would help fulfill a high priority of the administration.

Thank you,

Mike Bellcock
Business Agent
IBEW Local 2150

IBEW LOCAL UNION 2150
INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS
N56W13777 SILVER SPRING DRIVE MENOMONEE FALLS, WI 53051-6127
262-252-2552 * 800-551-1151 * FAX 262-703-3520
FORREST CEEL, BUSINESS MANAGER

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The current wind siting rule was developed to balance the interests of many stakeholders, and as written, will preserve as well as expand job opportunities for Wisconsin workers, which would help fulfill a high priority of the administration.

Thank you,

Mike Bellcock
Business Agent
IBEW Local 2150

Submitted by

Dr. Larry J. Lark
Chm. Town of Holland Wind Study/Ordinance Committee
2427 Park Rd
Greenleaf, WI 54126
920-864-7411
larrylark@rocketmail.com




State of Wisconsin

County of Dane

On this day February 9th 2011 personally appeared before me,

Dr. Larry J Lark

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

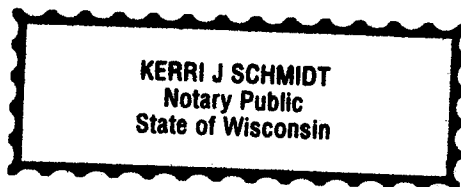


Notary's Signature

10/20/13

Notary's Expiration Date

Notary's Seal



To: Joint Legislative Committee on Administrative Rules

From: Theresa Lark, retired Math Instructor for FVTC (Appleton) --

I have lived in Brown Co for over 35 yrs. I'm in the township of Holland, 1000 ft from the proposed Turbine # 60 of the Invenenergy Ledgeview Wind Project.

A large Wind Turbine Company from Chicago has come into my neighborhood and proposed secretive business contracts with my neighbors that will lower my property value, take away my property rights, and put my safety and health, and that of my family and guests in jeopardy. This has been done without any previous disclosures to me.

If this wind farm is built on my neighbors' properties according to the current PSC RULES, the infringement of the setback which overlaps part of my property will prevent me from building, developing, or utilizing the effected land. Therefore I am asking that you suspend the current PSC RULES and consider the setback and noise levels established by the Ordinance of my local township of Holland ... a 2,640 ft setback from property lines and a noise level of not more than 5 over ambient.

The proposed Wind Farm is in an area where the turbines will at best be 25% efficient, and average only 17%. I'm a math teacher and those numbers just don't make good business sense. Wisconsin cannot continue to support this tax-subsidized industry. It is infuriating to think that my tax money is financially supporting an industry that in turn is infringing on my property rights, lowering my property values, and in the long run, increasing the tax on electric rate payers, and using my taxes to support the subsidy in the first place ... it's a ridiculous, vicious circle!

I know we need to increase building, business and industry, and economic development in Wisconsin, but Wind Farms are not doing that. They create short-term temporary jobs, and only a few jobs thereafter. It takes just a few days to build and put up a turbine... I watched that in my neighboring township of Glenmore last September.

There are no long term jobs after the turbines are built. And now on the acres where those windmills stand, there will be no other development for years and years... no new homes or farm buildings, no industry, nothing.... It has all been halted! This is not progress... it's stunting the growth and development that our economy needs.

The jobs that would be created by future property and economic development are gone

with job-killing wind energy policies, higher taxes on energy and business, and lost property rights.

Submitted by

Theresa Lark
2427 Park Rd
Greenleaf, WI 54126
920-864-7411
terry lark@ymail.com

Theresa A. Lark

State of Wisconsin

County of Dane

On this day February 9th 2011, personally appeared before me,

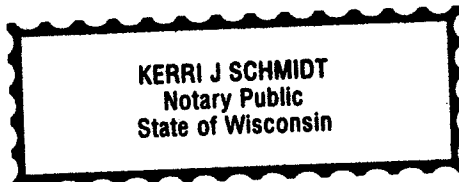
Theresa Lark

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

Kerri J. Schmidt
Notary's Signature

10/20/13
Notary's Expiration Date

Notary's Seal



February 8, 2011

Joint Committee for Review of Administrative Rules

RE: PSC 128 (CR 10-057) Relating to the siting of wind energy systems.

Dear Legislator,

We support proper siting of anything...a manure pit, silo, barn, new home, etc. We have ordinances in our town to protect ALL residents regarding siting.

Our State now tells us we must allow industrial wind factories to occupy our farm and residential land... squeezing in between our homes. These factories are given the title of wind FARMS with carte blanche...even though Wisconsin is on the very low end scale for wind generation.

Our homes are about one to two RESIDENTIAL blocks from each other...which is about 600'-1200' from each other. Many are even closer than that...just right across the road. We're not the wide open plains.

Industrial wind factories are tall as a 50 story building. (Only two buildings in Wisconsin are taller.) Imagine looking at 50 story turbines...with spinning blade movement ...two blocks from your home...EVERY DAY.

Our fields of crops sit quiet most of the year. We don't hear tractors often...or cars consistently...but we're told we must listen to turbines day and night with noise limits exceeding the RURAL norm.

The proposed 1250' setback to the corner of an innocent neighbor's home includes a portion of their land. Land they own and pay taxes on will now be taken from them without regard.

As a former realtor and president of our board of realtors in the 80's when the economy tanked... house values went down. BUT houses near a water tower, factory, or other undesirable...fell even lower...or didn't sell at all. When the economy bloomed, house values went up. BUT those houses near the undesirables...still sold for less or not at all...because now the economy was good...why buy the undesirable houses?

Turbine companies won't support property value guarantee because they KNOW the property values drop up to 40% from the turbines.

Whether you have turbines coming to your area or not, you and your constituents as taxpayers are subsidizing these...helping to foot the bill.

Jobs will be created initially, BUT remember...many turbine parts are foreign sourced. Once turbines are up, jobs are unsustainable and fall drastically.

Energy costs WILL rise...existing companies WILL be electrically cost-devastated...and prospective companies WILL SNUB Wisconsin.

In turbine areas, new development will NOT happen. Home and business construction jobs will be lost. Turbine areas also border cities...whose expansion is then restricted.

Globally, countries are including a minimum of one to two mile setbacks, lower noise limits, improved control over communication interruption, etc. YET WE ARE TOLD CONSISTENTLY... we are not those other



February 9, 2011

RE: Please allow the wind siting rules to take effect.

Dear Members of the Joint Committee for Review of Administrative Rules:

The Citizens Utility Board urges you to allow the "wind siting rules," codified as PSC 128 (CR 10-057), to take effect without modification.

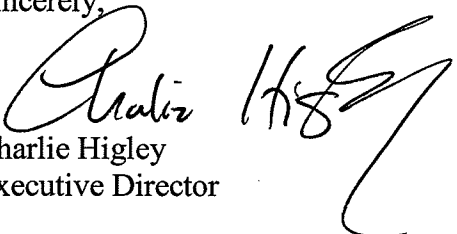
CUB is a member-supported nonprofit organization that advocates for reliable and affordable utility service. Since 1979, CUB has represented the interests of residential, farm, and small business customers of electric, natural gas, and telecommunication utilities before regulatory agencies, the Legislature, and the courts.

The wind siting rules will allow for the rational development of wind farms in Wisconsin with positive impacts for electricity consumers while protecting the interests of local landowners. Wind farms produce electricity using free fuel. Wind projects help protect electric ratepayers from rising rates caused by ever-increasing prices for the fossil fuels from which Wisconsin utilities derive most of their electricity.

Modifying the wind siting rules could jeopardize further development of wind projects in Wisconsin, and make Wisconsin ratepayers more dependent on fossil fuels and associated rate hikes.

Please allow the wind siting rules to take effect without further modification.

Sincerely,


Charlie Higley
Executive Director

February 7, 2011

Dear Sir or Madam,

I am writing you to suspend the PSC Wind Sitting Rules that are to go into effect March 1. There needs to be more time for all parties, especially the Legislatures, to gather more information. These rules affect the whole state, every single citizen. Not just the people that live near wind farm or people that will be living with them soon.

I totally support and like Governor Walker's proposal to place wind turbines 1800' from those who are not hosting the turbines. But that is already a compromise. If you truly and honestly want to do the right thing is to have a minimum of **2640ft setback from property lines**. This is truly the only way to protect my family's property rights. I am in all favor of this safe distance. So many other states and countries are setting a ½ mile setback to protect people, animals, and property. This is the morally and economically right thing to do and I feel that is a compromise for what we have to live with. I am also asking for 5dba over ambient for a noise limit.

I am a Morrison resident with a family of 5 that will have to live with the wind turbines in my neighborhood for the rest of my life if the Inverengy project for the Morrison area goes through. This is a serious issue with serious people. My family and I are terrified of what are life is going to be like if these monsters come to our community. Our community is an over populated that has no room for these huge wind turbines. Something needs to be done now, not tomorrow and not next week about the setback, health & safety issues, shadow flickering, and other terrifying aspects that come from those type of dinosaurs.

We need to protect Wisconsin taxpayers from the injustices of the proposed PSC wind sitting rules. Rules currently proposed by the Wind Sitting Council, a group appointed by the PSC and heavily weighted with members who have a direct financial stake in wind development, would plunder rural families of their property values and property rights, as well as expose them to health risks induced by or exacerbated by chronic sleep deprivation caused by the noise generated from turbines located so very close to homes.

I believe so many people do not understand what life it is like living under or close to a wind turbine. Even you and others in the room probably never experienced the trauma that comes from wind turbines. I would like to share with you one experience that a very good friend of mine just experienced less than a week ago when he visited the newest WI wind farm in Shirley.

I was graciously invited to go to a neighbor's home that is within approximately 3400 feet of 3 of the 500 foot tall Shirley Wind turbines (the closest being approximately 2700 feet from their home). They can see 6 of the turbines from their home - the farthest being miles away. The couple built this home and has lived there for 30 plus years and is now in their mid/upper 60's. They wanted me to experience the effect the turbines are having on them.

I drove up their driveway and got out of my car. I looked around and the presences of the 3 closest turbines are very imposing. I listened and could hear the thrumming of the blades and the whir of the gearboxes, but the noise I could hear has was not particularly loud - the wind speed this morning was 10mph so a pretty calm day.

I walked up to the door and was invited in the house to see the wife wearing industrial earmuffs in her kitchen which she removed right away when I walked in. She went to the doctor this week due to ear pain (a new condition) and the earmuffs help - Doctor found nothing physically wrong.

The husband asked me to sit in his rocker and just left me alone for a while. I heard the whir and whoosh, but it was pretty muffled. **But here is what is scary to me** - as I sat there over the course of 10 minutes or so, I could start feeling pressure in my right ear (facing the window that faced the turbines). This was not expected. At first, it was just "weird", but the longer I stayed, the more unsettling it was.

After a while the husband and I walked outside around their home. As we walked on the side of the home, he stopped and I immediately said to him **"I know why you stopped here!"** It was a strange phenomenon - that place at that moment, I felt the same 'pressure' he did - must be from how the house is situated, wind direction, etc. I thought this was very weird so I walked back to the front of the house and came back to that spot a number of times and the same sensation was present each time. It is hard to describe but there is a difference in pressure that you feel in your head. The pressure feeling was present in most places, but particularly bad in some.

The longer I stayed at their home the more unsettled I became. I honestly don't know how else to describe it. Unsettled is the best way - the physical feeling of pressure in my ears did not go away, and the longer we visited, it felt like pressure was being felt in my temples. This is a feeling that my body was telling me was not good, and quite frankly, I did NOT want to stay. Not because of any lack of hospitality, but the feeling that was in my head was not pleasant at all. It triggered a flight response in me - I wanted to leave. This on a day of 10mph winds....

This couple has offered to invite anyone to their house to experience this first hand. Plan to spending some time there - my body's reaction worsened over time (that is this couples experience as well when they return after being gone a while). Bring a magazine or newspaper and sit in the husband's chair. While I can't say your reaction will be the same, it is worth your time. Even this couple's reaction to the sound/pressure is different, so sure it will affect each of you in different ways.

This is my first visit of any length inside an affected home and it was eye opening. The setback and wind speeds were certainly not even close to the worst it could be, and despite that, **I wanted OUT!** ... I could not live there.

Now after reading that, how can that not give you chills down your spine or scare you. This is only one family that is affected. There are thousands more just like them. If they can be affected so much by one turbine being more than a ½ mile from their home, what would life be like for them if they were far closer like 1250 ft that the PSC wants or even 50 more around their home. Can you live in a home like that? Could you see yourself living a typical normal life in that type of situation? Every legislature needs to experience this before they truly make a decision. I told you this experience because the setbacks are so important to saving our lives. You have big discussion to make. Please suspend all the PSC Wind Sitting Rules ASAP.

Thank you,

Sarah A Vercauteren

Sarah A. Vercauteren
Town of Morrison
Brown County
7566 County Road W
Greenleaf, WI 54126
(920) 864-2896

P.S. Please include my written letter to you to be included in the records.

State of Wisconsin
County of Brown

On this day February 8th 2011, personally appeared before me,
Sarah Vercauteren,

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

Kerri J Schmidt
Notary's Signature

10/26/13
Notary's Expiration Date

Notary's Seal



2/8/2011

Joanne and David L. Vercauteren

3410 Park Rd

Greenleaf, WI 54126

920-864-7315

joever2@yahoo.com

To whom it may concern;

We are writing you this testimony in regards to this hearing on 2/9/2011 for the Wind Siting Rules. Please do not disregard our testimonies, put a halt to the PSC 128. Without high taxpayers subsidies these wind turbines would never have been placed in Wisconsin making all of Wisconsin citizens Lab Rats. There is all kinds of proof out there that shows harmful effects to our health, our property values lowered, possible harm to our water and harm to nature's animals and birds that can not protect themselves. They do not belong in such a populated area so close to God's living creatures.

There is around 300 up or in construction in Wisconsin already and there are problems in all the areas. To meet the 2025 RPS they will have to put up 12,000 Wind Turbines. What we all would like to know is where do you plan on putting them? They are already destroying our beautiful state of Wisconsin. They're also turning families and friends against each other. Our small townships will never be the same, that's what the green of money and greed does to people. It's all about the money and nothing else.

Anyone that thinks these things belong anywhere near homes, schools, churches or business is wrong, and are not looking out for the good of the people. My husband and I are hoping you take our testimony to heart and put a halt on the PSC 128. Please do not allow them to continue this destruction in this great state of Wisconsin.

My husband and I would like to thank for this hearing and your time.

Respectfully submitted

Joanne and David I. Vercauteren

Joanne Vercauteren David I. Vercauteren
State of Wisconsin

County of Brown

On this day February 8, 2011 personally appeared before me,

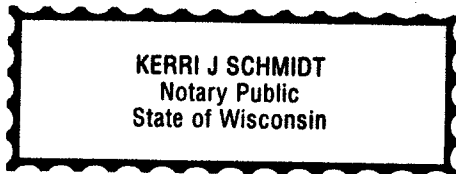
Joanne + Dave Vercauteren,

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

Kerri J Schmidt
Notary's Signature

10/20/13
Notary's Expiration Date

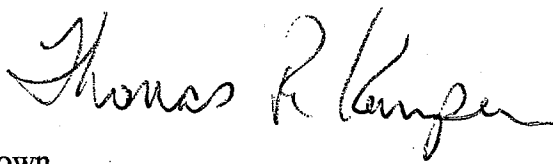
Notary's Seal



Written Testimony
To be submitted at the public hearing scheduled for
February 9, 2011
Joint Committee for Review of Administrative Rules
PSC 128 (CR 10-057)
Relating to the siting of wind energy systems.

- Any rules establishing setbacks must be from property lines and nothing less than property lines. Anything less than setbacks from property lines results in a taking from a non-participating property owners.
- Sound limits should be set such that the noise level is never greater than 5DB over ambient level.
- NO non-participating property owner should be subject to ANY level of shadow flicker.
- Taxpayer dollars MUST NOT be used to fund this industry. If the wind energy industry is such a good idea, then let it stand on its own funding.
- Before another industrial wind turbine (any wind turbine over 100 feet) is constructed, a SCIENTIFIC study MUST be done to ensure that any one living closer than 2640 feet from a wind turbine will not sustain health and/or safety effects.
- Rules must incorporate a requirement that states the owner of the wind turbine must guarantee that they will compensate anyone within one mile of the wind turbine that ends up selling their property for less than the appraised value, will compensate that owner for the difference between the sale price of the property and its appraised value.
- If an owner chooses to site a wind turbine on their property, one turbine must be sited such that it is closer to the owner's house than any turbine is to a non-participating house.
- Wisconsin has a surplus of electricity now. Wind turbines would add no value to the electrical supply and in fact will raise rates causing businesses to locate in states where electrical rates are more favorable.
- Finally, please take whatever action is necessary to suspend the current rules that are set to take effect on March 1, 2011.

Tom Kempen
6968 Pleasant View Road
Greenleaf, Wi 54126
920-864-2090



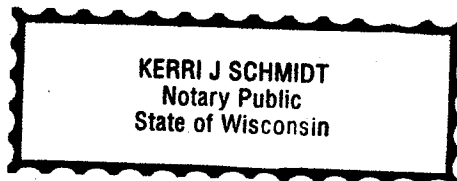
State of Wisconsin County of Brown

On this day 02/08/2011, personally appeared before me, Thomas P. Kempen, to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.


Notary's Signature

10/20/13
Notary's Expiration Date

Notary's Seal



1874 Wayside Rd
Greenleaf, WI
February 8, 2011

Dear sir:

I am a property owner in southern brown county and I am opposed to windmill generators in this area for the following reasons:

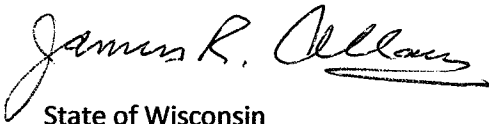
- Proven health effects on sleeping and physiological effects from continuous noise of the turbines
- Kills and injures birds and other wildlife
- Flicker affect on neighbors
- Danger to water supply when installing the base due to cracks in rock covering water supply

In addition, it decreases land values for the neighbors of the land where the generator is located and stops neighbors from putting up fences or trees on their own property that would affect the generator. This is a taking away of your own property.

These generators need to be placed away from where people are living. They need to be at a minimum setback from the property line of 2640 feet (1/2 mile).

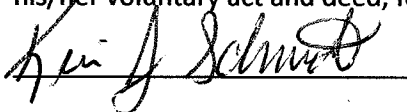
Please consider our opinions in this matter as we need to live with this for the remainder of our ownership.

Sincerely,
James R. Allan



State of Wisconsin
County of Brown

On this day February 6th 2011 personally appeared before me,
JAMES R. Allan, to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

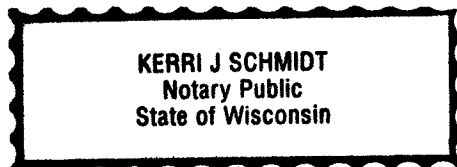


Notary's Signature

10/20/13

Notary's Expiration Date

Notary's Seal



Larger setbacks will **NOT** prevent *responsible* wind development

Many claims have recently been made about how increasing wind turbine setbacks would be a job killer and put current/future wind energy projects at risk. But safer setbacks do not have to prevent development of wind energy at all. They would, however, require wind developers to *responsibly* develop projects by using more modern and efficient wind turbines, and gaining the consent of those living nearby.

Recently, the Glacier Hills Wind Park (GHWP) went through Wisconsin Public Service Commission (PSC) approval. Using information uncovered during that process as an example, we can see how wind energy can still be accomplished with larger, safer setbacks.

On page 25 of the PSC's Final Decision document (Docket 6630-CE-302, ref #126124), a table describes the number of 'preferred' turbine sites affected by varying setback increases from the then standard 1000 ft. setback. Affected sites could be moved to match the setback, moved to an alternate site, or eliminated. Out of the proposed 90 turbines, 15 were said to be affected by a 1250 ft. setback, 39 at 1500 ft., 60 at 2000 ft., and 81 at 2500 ft.

The Glacier Hills project was approved by the PSC, but with a setback of 1250 ft. And we can now see that even though 15 turbine sites were indicated to be affected by such a setback, the turbine locations were adjusted so that the full 90 turbines were placed. Despite all the arguments against the 1250 ft. setback, the project was not affected in the end.

Apply this experience to a similar planned wind project lamented as being impractical with increased setbacks, Invenenergy's Ledge Wind farm. This project is planned as 100 - 1.5MW turbines generating 150MW of electricity, designed with 1000 ft. setbacks. As seen in Glacier Hills, increasing setbacks to 1250 ft. would likely have little or no impact on the number of turbine locations. Taking into account that many of the 'affected' sites could be easily relocated (as the 15 locations in Glacier Hills were), increasing setbacks all the way to 2000 feet would likely affect only 50 out of the 100 turbines.

Now consider that GE offers the 2.5MW GE 2.5 XL turbine, and Vestas offers the V112 3MW turbine. If the Ledge Wind project used more modern, more efficient turbines, such as the V112, the project could produce *the same* 150MW output with *only half* the proposed turbines.

So we see that with a more responsible 2000 ft. setback and modern turbine technology, the Ledge Wind project could still be built, and generate the same output.

If ideas such as expanding the wind project footprint and gaining property owner participation are taken into consideration, then it is even feasible to have an acceptable setback of 2640 ft from non-participants in place and still go forward with wind energy.

If this is really about renewable energy, and not about wind company profits, then the extra effort to enforce safe setbacks would not be a deterrent to wind project development in Wisconsin.

Eric Malvey

2-08-2011

State of Wisconsin
County of Brown

On this day February 8th 2011, personally appeared before me,
Eric Malvey,

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

Kerri J. Schmidt
Notary's Signature

10/20/13
Notary's Expiration Date

Notary's Seal



920-864-7640

Glen Peotter
5706 Big Apple Rd.
De Pere, WI 54115

Please include this testimony in the official records.

Public Hearing Testimony February 9, 2011

Health Issues

I am personally at risk for health issues being close to or within 3 miles of industrial wind turbines per experiences, testimonies, world health collected information. There are already six 50 story industrial wind turbines within about 2 miles of my home. I have always had motion issues, am not able to fly in an airplane without 2 weeks of after effects, I wear hearing aides, and this year I will celebrate my 67th birthday. I am not able to attend this hearing as I am home from the hospital for just a week after having open spinal surgery with instrumentation. This is a very serious surgery.

I would like the health issues findings, the international symposium in Canada from October 2010, plus all the world health studies and findings to be considered. It seems that every week or month more information is available about the actual findings of the ill effects of turbines. There seems to be an ill wind blowing. Please consider that people have health issues to deal with. Many of us with those issues are living in rural areas to keep away from the lights, noise, pressures, of more industrialized areas. We paid a higher price to live out here with longer traveling time, higher rural electric rates, more consumption of vehicle fuel, planning and curtailing unnecessary traveling. We paid those prices our entire lives to secure a safer, quieter, and healthier place to live.

Property Rights

I am asking for 2640 feet or more setback from property lines to protect my property rights.

I am asking the committee to suspend the PSC rules and introduce legislation to change the rules. I am asking that the fair rulings include a property value agreement as they do for landowners residing next to landfills.

I am asking you to consider my property rights even if I did not already have health reasons that put me at risk from the effects of a wind turbine ghetto. After this back surgery, what if I am not able to continue to do the physical part necessary to keep living in a rural area and situation? Honored Representatives, the whole population is aging. I do have risk factors that would contribute to my not being able to live close to turbines, but all that aside, what about the property rights of all rural citizens who may be not able to keep living in their beloved country homes for other very real reasons? Are they to have their property devalued or unable to sell at all? Why is this right in the USA? How is it legal and fair to make a law or rules that say because someone else wants WIND, our rights are to be demolished? Where are these people to get the means to even move elsewhere? Why would rural Wisconsin homesteads and farms be sacrificed and become collateral damage just to allow others to override for their own financial gain?

Finally, why must those in my situation face financial ruin to "maybe" create some jobs that cannot even be counted or accounted for with real facts and figures?

Honored elected officials, please remember that we are not just numbers but real people with faces, lives, hopes, in all stages of living with others counting on us for their existence. We are counting on you for real and insightful evaluation, review of laws and rights of individuals, and to stand up for us. We have lived here all of our lives, contributed, voted, had faith in this system. Now we are counting on you. Thank you for listening and considering.

Glen Peotter *Glen Peotter*

State of Wisconsin
County of Brown

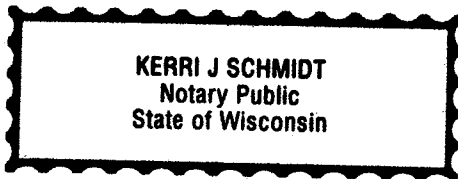
On this day February 8th 2011, personally appeared before me,
Glen Peotter

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Kerri J Schmidt
Notary's Signature

10/20/13
Notary's Expiration Date

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920-864-7640

Nancy Peotter
5706 Big Apple Rd.
De Pere, WI 54115

please include this testimony
in the records.

Public Hearing Testimony February 9, 2011

Health Issues

Personal testimony, my family is composed of three "at risk" adults at this address. I already have blood pressure issues which I monitor, motion sickness issues (a lifetime issue for me) and high sensitivity levels to sounds, lights, flickering (driving on a road canopied by trees such in door county) as well as many medications. Clinical monitoring after a night of wind turbine noise exposure reveals dangerously high blood pressures including in people with no prior history of hypertension—up to 2.5 mile distance. My daughter is extremely a high risk person with diagnosed conditions which make her unable to be exposed to loud sounds, pressures, smells, almost any and all prescription or over the counter medications. She is a human being in a very fragile state, is disabled, and has a questionable prognosis. My husband is also very sensitive to motion, has hearing aids, and an individual unable to tolerate or use prescription or over the counter drugs. Health issues are not a numbers game to us; they are a very personal reality. We care and are involved in this wind turbine issue on a level that most would not understand.

December 9, 2010 is the last day the 4 x 4 foot wooden sign with two steel fence posts and braces was visible on our property. It read, TAKING MY FAMILY'S HEALTH IS NOT A RIGHT, its A WRONG. The sign was removed, stolen, taken. Not a scrap left. Four other signs in this area were smashed with the remains left on the owner's lawn. In my opinion, this is not right either but is demonstrating the ugliness this issue is turning into. Our media campaigns about bullying in schools, while bullying is yet acted out in our communities by adults.

I am asking for a 2640 foot or more setback from property lines not only for health issues, but to protect my property rights. This homestead we have spent our lives building is what we have. We have carved out what we have with your own hands and resources. If a neighbor is enabled by a law or wind biased ruling to build 50 story industrial wind turbines on our property lines which publications, records, and testimonies, and human experience clearly show harm and damage both human and animal existence, we have nothing. We are in our mid 60's; we can't just start over at this time of our lives. We will not be able to physically exist with the effects or financially exist with the taken property rights. How can we sell our 40 acres to get money to even move away? Would you buy a lovely piece of land with woods and flowing

creek in a community that allows all the surrounding neighbors to construct huge turbines by simply agreeing? Would you put yourself in that position or risk? Consider the reality reports showing from a 40% decrease in value to not being able to sell at all. What would those reality companies have to gain by creating false figures? Only the wind companies would gain by denying those facts. Common sense would show the reality. I am asking that fair rulings include a property value agreement as they do for landowners residing next to landfills.

I AM ASKING THE COMMITTEE TO SUSPEND THE RULES CREATED BY state Public Service Commission and introduce legislation to change the rules. I do not believe the rules as they are now are a fair compromise or study. The people deserve better representation than this.

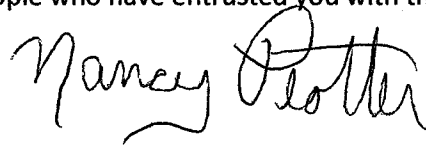
On a recent public radio broadcast I asked Keith Reopelle for real and actual numbers of business and people hired in Wisconsin wind turbine industry. I spoke of the recently closed Oshkosh wind turbine production company. I asked for actual figures and explained my concern about generalizations and the lack of true figures. When he took the mike, he said a few words from a 2009 report and again many generalizations and "I think" statements. I still had no answer or proof, and I had no opportunity to so state. It is now 2011 and there are no better figures or information from an expert than an old report from 2009? We know the construction work is temporary and gone once the turbines are erected. For those few and temporary jobs and a big maybe, residents are required to give up their health, their property value, their ability to exist and manage the end stages of their lives. We need protection by our elected representatives.

For years I have listened to America criticizing other nations about their human rights policies. What about my human rights for health and happiness? What about my property rights to not be taken over?

Please listen, hear, review carefully and represent the people who have entrusted you with this great honor.

Thank you!

Nancy Peotter



State of Wisconsin
County of Brown

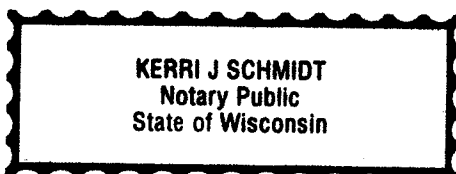
On this day February 8th 2011, personally appeared before me,
Nancy Peotter

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.


Notary's Signature

10/20/13
Notary's Expiration Date

Notary's Seal



February 9, 2011

To: **Joint Committee for Review of Administrative Rules**

Re: **PSC 128 (CR 10-057) Relating to Wind Siting Rules**


Dear Committee Members,

I am asking you to suspend the current wind siting rules that are currently set to take effect on March 1, 2011.

These rules do not adequately protect the health and safety, and property values of Wisconsin residents. If wind turbines are going to continue to be developed in Wisconsin, they must be at least 2640 feet from property lines. Ask yourself if you rather buy a property with industrial size turbines 1250 ft from your front door or the exact same property without any turbines. To me, it is common sense that wind turbines sited too closely to homes will decrease the property values. Currently, turbines that are placed too close to homes are causing a great deal of health effects. Ask the person who lives next to industrial wind turbine about health effects and then ask a person who financially benefits from wind turbine development the same question. Who are you going to believe? The person who has is gaining nothing, but has everything to lose, or the person who is gaining everything, and has nothing to lose. Listen to the people are already being negatively impacted by industrial wind turbines. What is going to happen to the people who are already collateral damage because they have wind turbines too close to their home?

Please do what you have the power to do and vote to SUSPEND the current wind siting rules.

Respectfully submitted,


Brian C. Schmidt
17733 Taus Road,
Reedsville, WI 54230
(920) 754-4158

State of Wisconsin

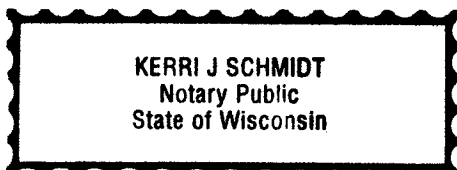
County of Manitowish
On this day February 9th 2011, personally appeared before me,
Brian C Schmidt

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.


Notary's Signature

10/20/13
Notary's Expiration Date

Notary's Seal



Testimony of Tom Meyer

1 of 2 Pages

1805 Parmenter St
Middleton, WI 53562

608-332-8331

Tom@tommeyer.com

JCRAR February 9, 2011

I am a Wisconsin Real Estate Broker, I live in Middleton, and have held a real estate license since 1989. One of two Realtors on the fifteen member State of Wisconsin Wind Siting Council, I joined three other Council members in writing what is known as the Council's *Minority Report* submitted to the Public Service Commission.

Professionally and personally, I favor efforts to develop alternative energy solutions. I was grateful to be asked by the Wisconsin Real Estate Association to be considered to serve on the Council. All my life I've been an avid waterfowl and upland bird hunter. I grew up in Antigo, Wisconsin, the son of a sporting goods store owner, I'm a typical Wisconsin outdoor enthusiast. From a Real Estate Perspective I came into the Council work curious to learn about this Wind Farm Development process. I attended all but one of the meetings over the six or seven months, and drove out Fond du Lac County to walk around a couple of wind farms. I was impressed by the enormity of the industrial turbines and how they dominate the rural community landscape.

From a perspective of an outdoor guy with a real estate and business background there are three areas where the legislature could help Wisconsin residents and energy interests create a workable solution.

First: If you agree location is a factor in establishing real estate value, you certainly agree that one or more 400 foot industrial turbines with 200 foot long rotating blades towering over the property would more likely than not diminish the property's value. The Wind Turbine Impact Study of 2009, by Appraisal Group One of Oshkosh, Wisconsin is the mathematical data to support what every first time home buyer knows to be true: **industrial giants in your backyard harm your property value**. The majority of the Council members chose to throw caution to the wind---they rejected common sense *and* the evidence of the Wisconsin licensed appraisers.

Second: The four of us in the minority tried to add some transparency to the process to help residents become better informed before wind developers come to their towns. We asked for advanced community notification rules. We were defeated. The objections were summed up clearly by a WE Energies employee on the Council who said, and I quote, "**...the people band together and basically leverage against you. ..Landowners hold out (thinking) we'll maximize our revenue.**" The energy interests tell you building turbines on farms is good for the farmer. And their actions tell us *they* decide how much "good" the farmer gets. When rules prevent Wisconsin residents from negotiating in a free market to profit from sharing their land, their community culture, we've taken a giant step back from progressive thinking.

Third: The wind developer's leases are designed to expand the rights of the energy interests. These are lengthy & complex documents, created with expert legal guidance. These leases may be for unlimited lengths of time, and include rights that extend beyond the right to build turbines. Developer's use a term of "signing up", to describe their work of negotiating leases with landowners. We suggested that the Wisconsin law which requires you to have a license if you are negotiating a lease and receiving compensation should extend to wind farm developers. Once signed, these contracts have a significant monetary value and are basically sold for compensation. The connection between action and compensation is clear, yet the majority of the Council voted us down. Free of real estate regulation, the terms and prices forced on landowners are not market driven. Real estate licensing will level the playing field for the landowners and farmers who have a right to an opportunity to make informed decisions before giving away more than access to their land.

In conclusion, there may not be a magic number to the setback question. A 2000 foot setback is supported by scientific evidence beyond my ability to explain. Establishing at least an 1800 foot setback requires the developers to involve Wisconsin property owners who are most impacted by the turbine component of wind energy. There is nothing to fear with a setback that protects property rights and health of Wisconsin residents. With an 1800 foot setback, a percentage of the profits will be redistributed from the investors to participating landowners and neighbors, and wind turbines will continue to be raised in Wisconsin counties where adequate wind exists.

Wisconsin residents monitored and video recorded nearly every Wind Siting Council meeting and have the videos available on www.betterplan.squarespace.com .

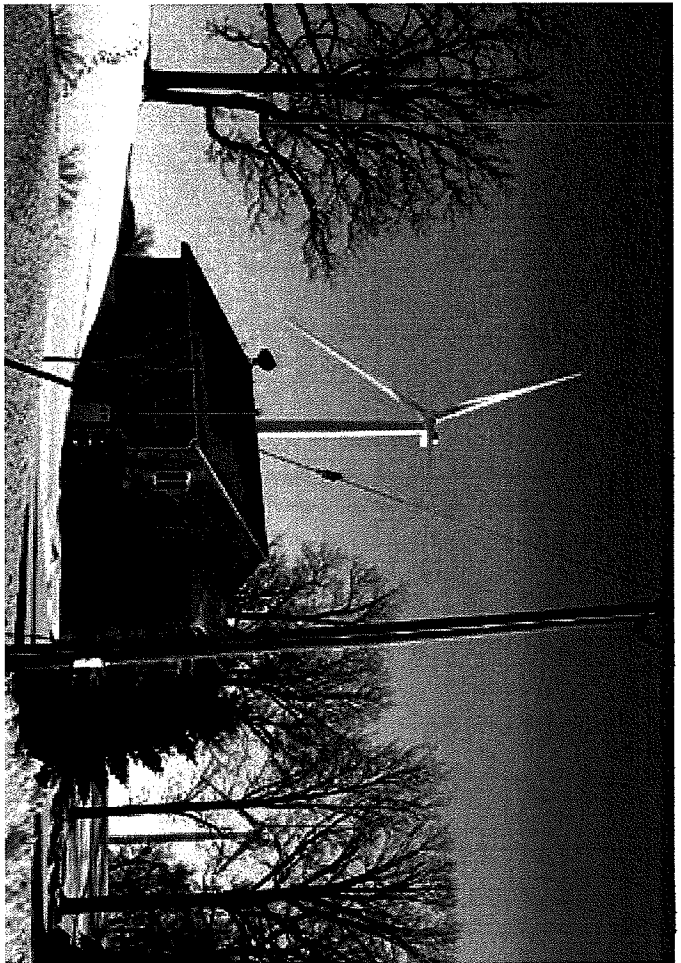
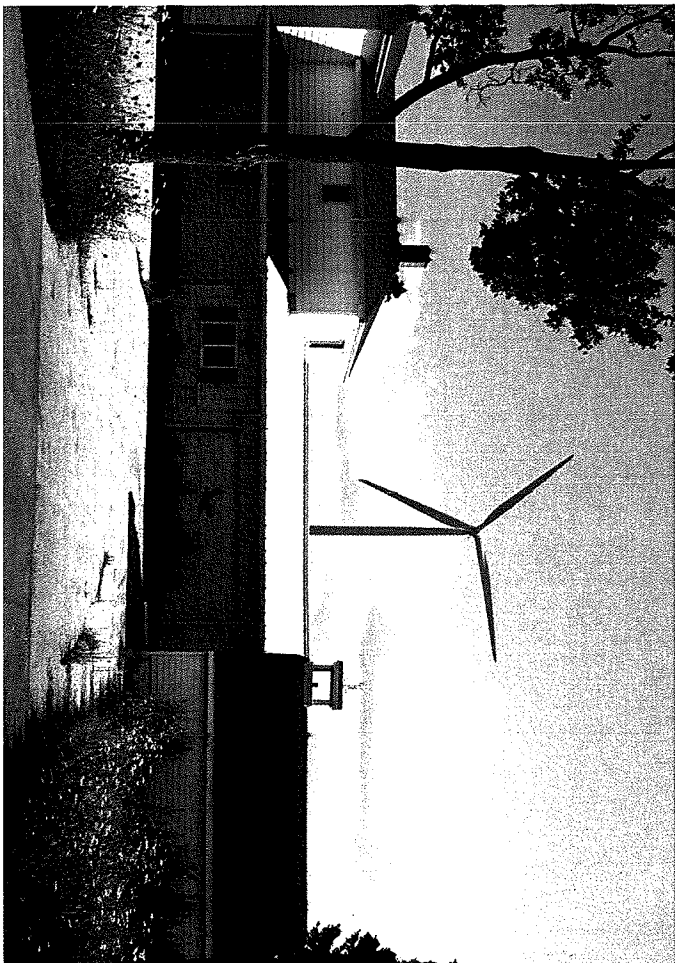
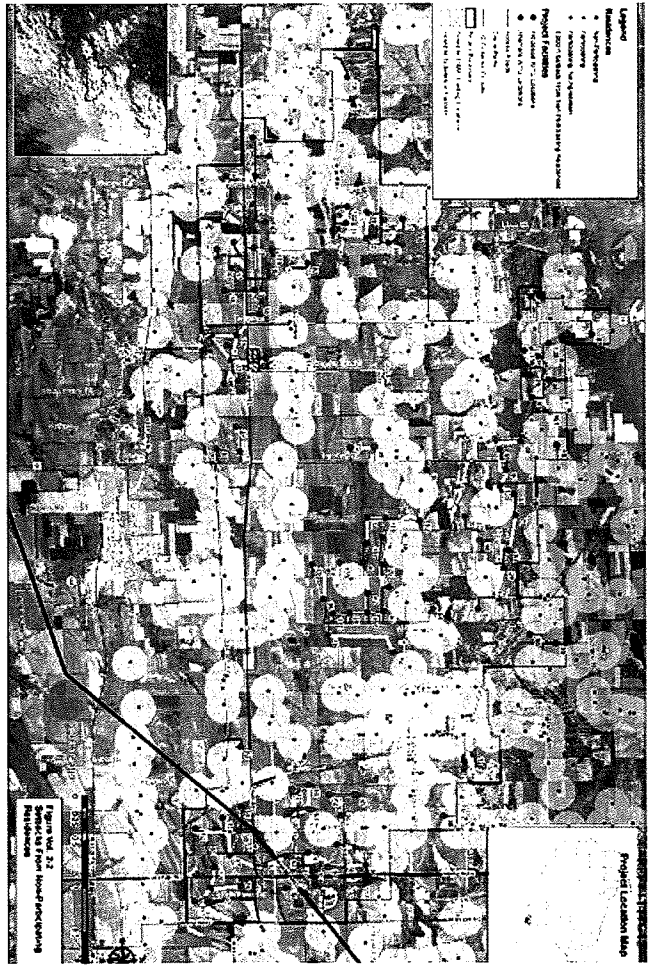
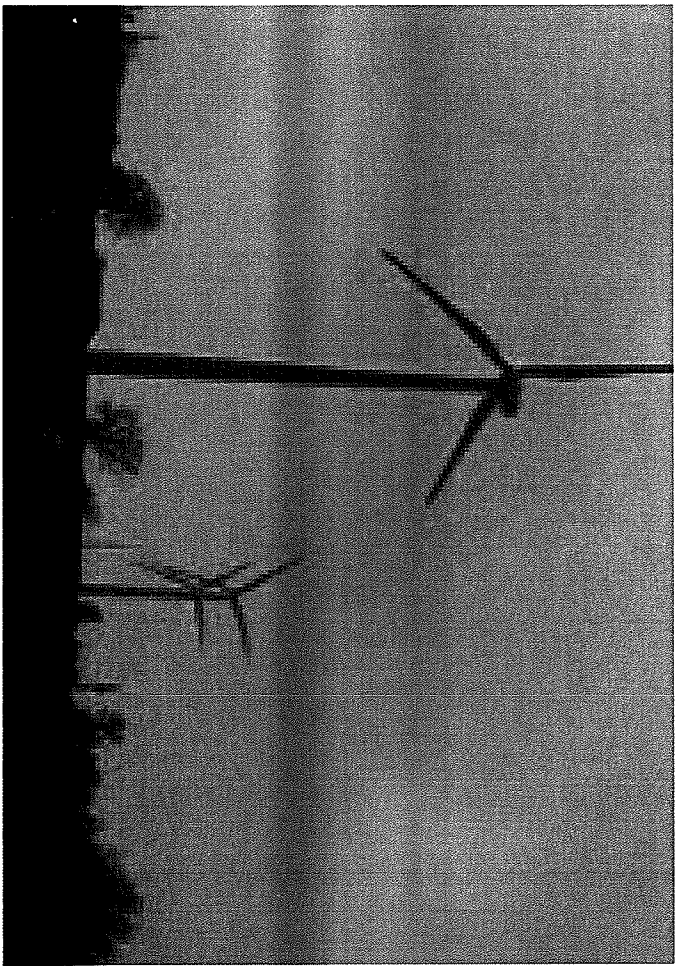
Testimony of Tom Meyer

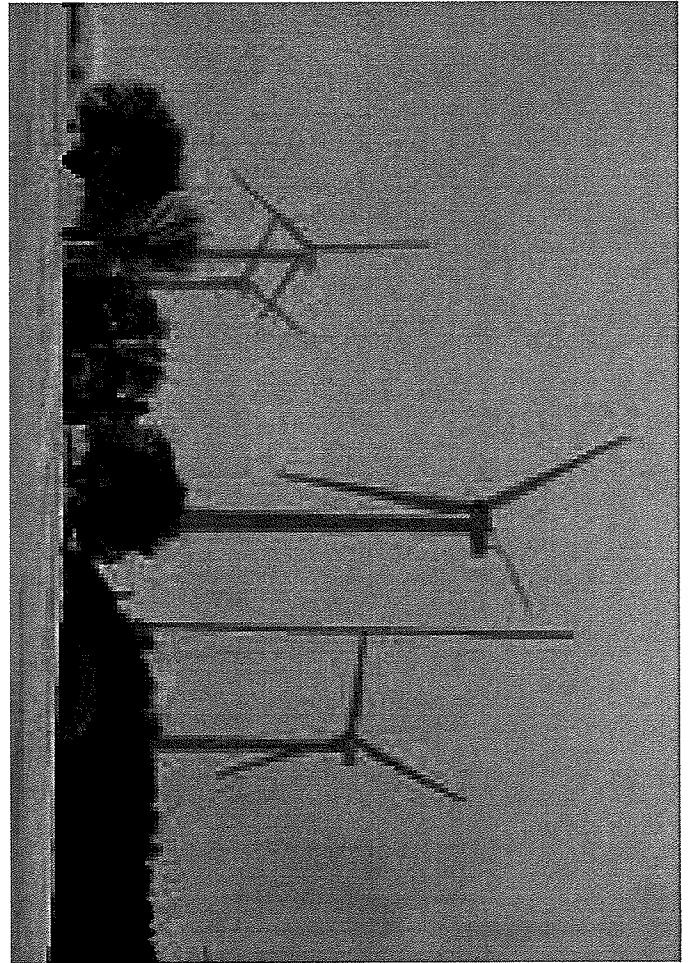
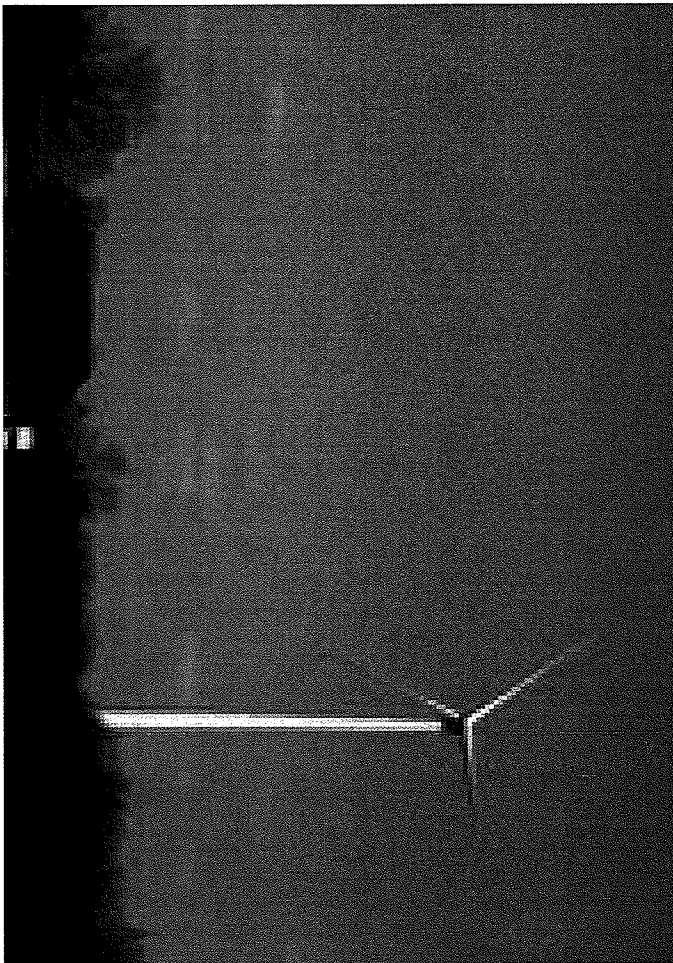
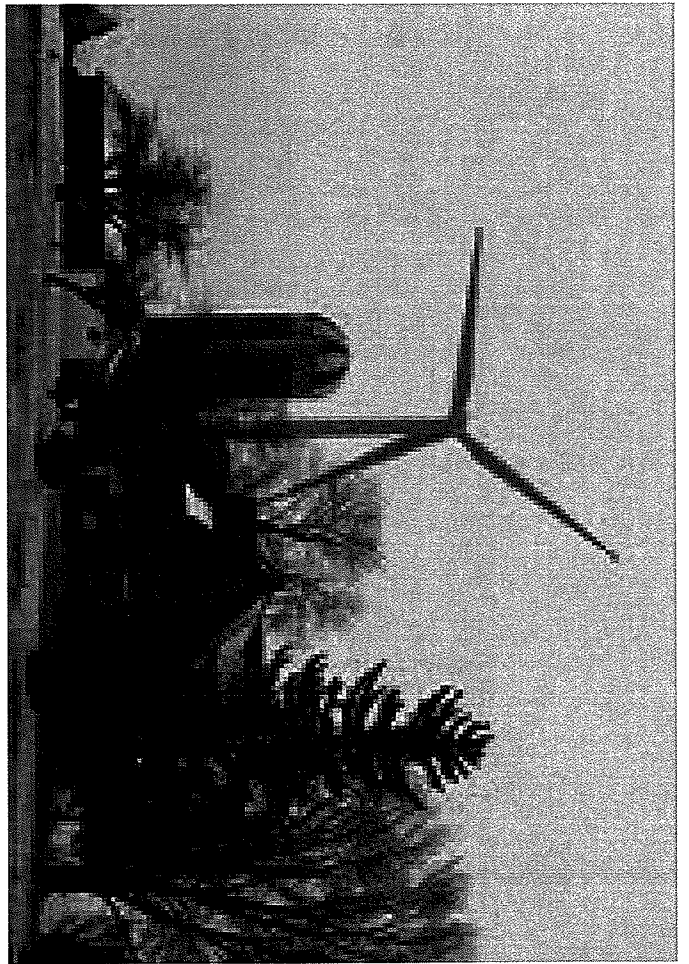
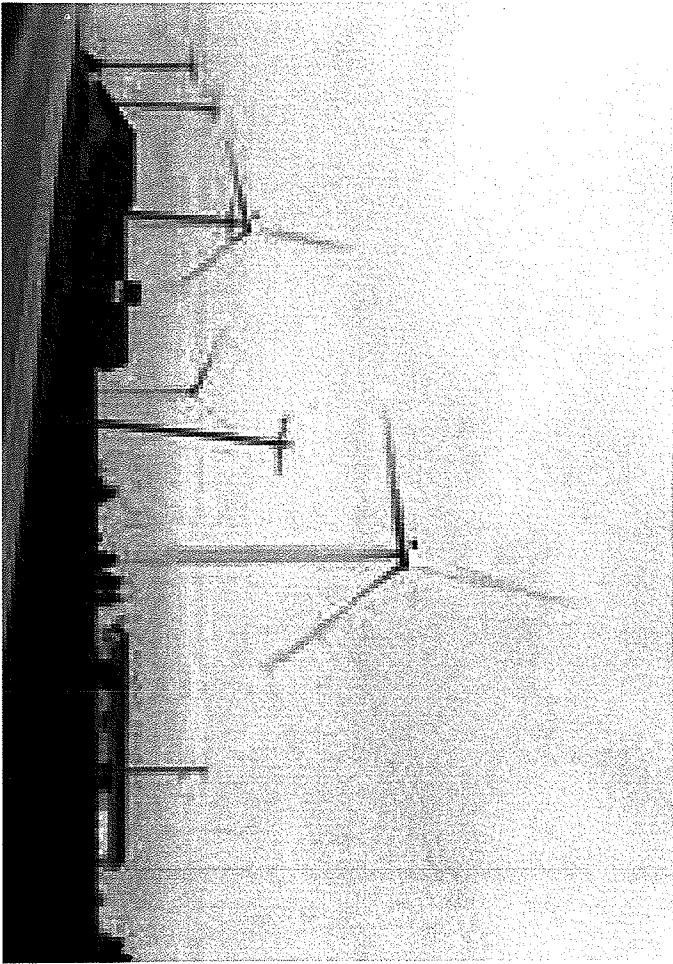
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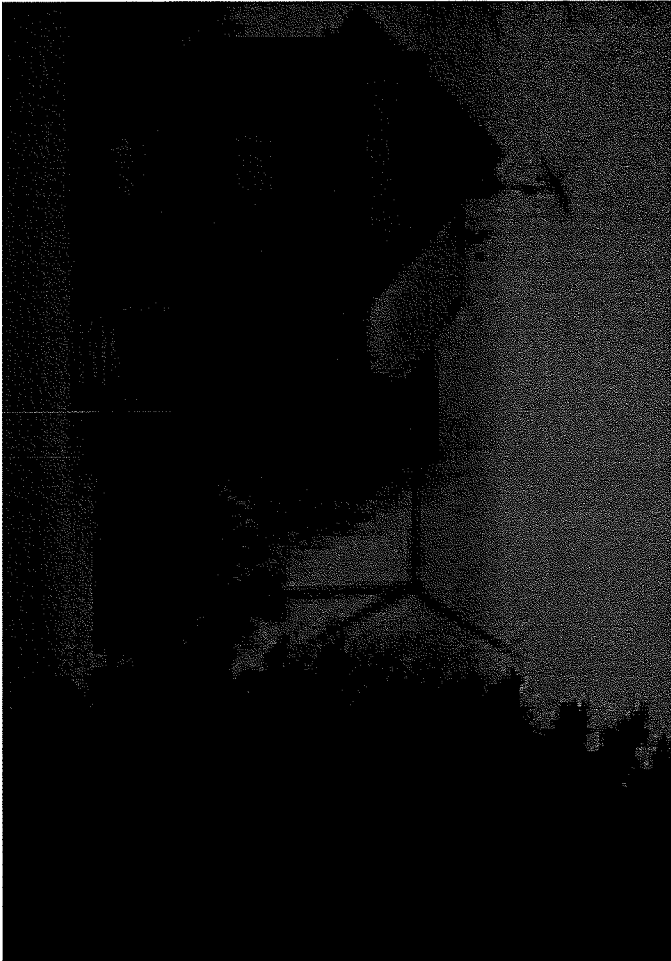
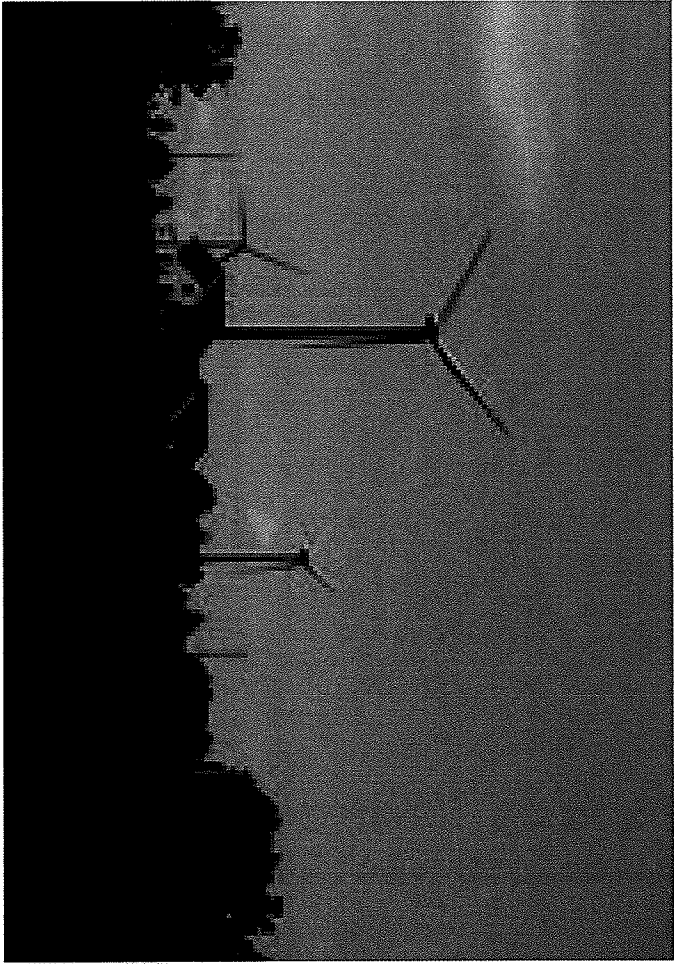
**Membership on the Wind Siting Council called for in 2009 Wisconsin Act 40
as appointed by the Public Service Commission,
a check with the legislative language and
identification of financial or organizational interests in the promotion of wind energy systems**

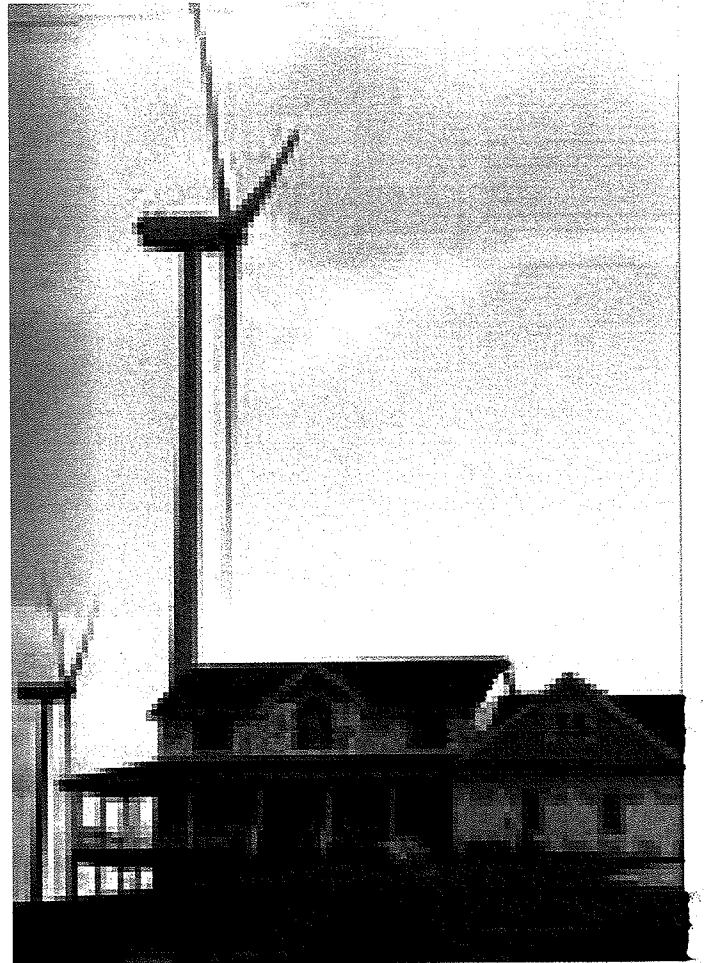
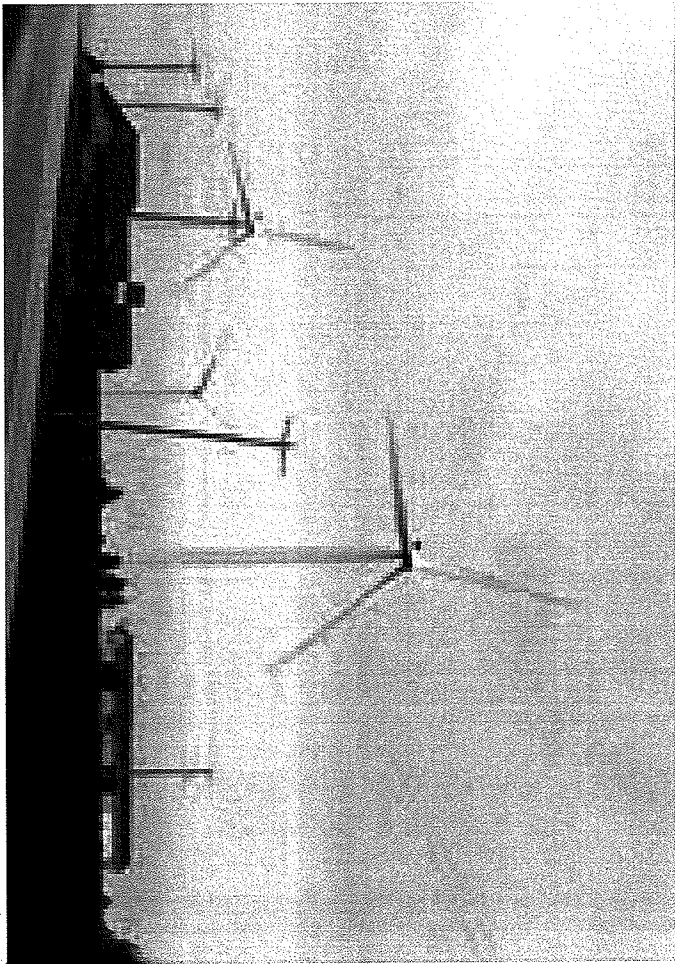
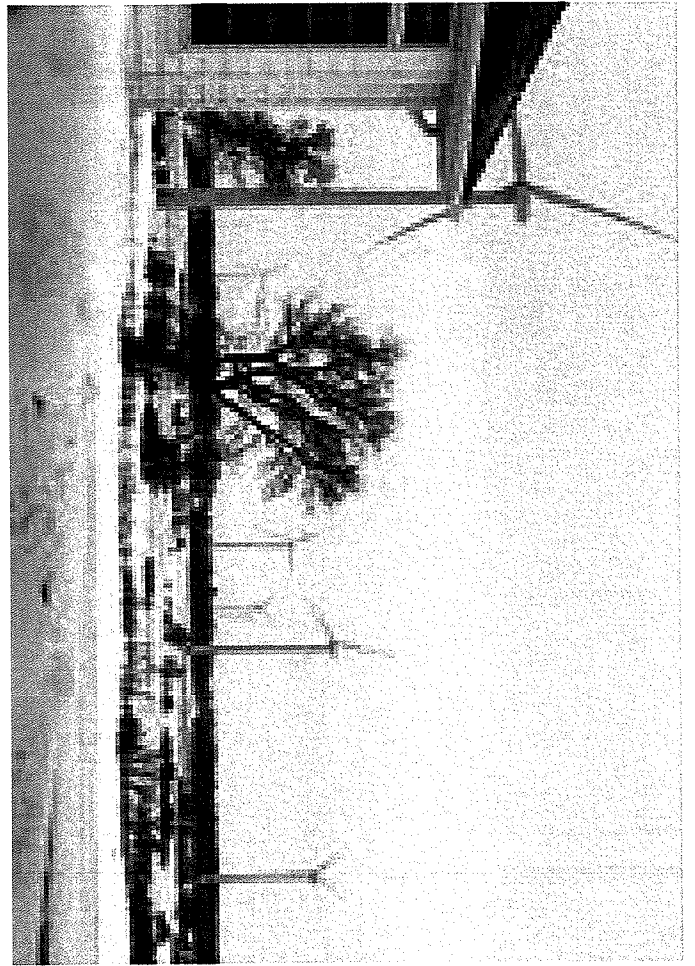
SECTION 1. (b) There is created in the public service commission a wind siting council that consists of the following members appointed by the public service commission for 3-year terms:

NAME	AFFILIATION	APPOINTMENT MATCHES LEGISLATIVE LANGUAGE?	INDEPENDENT OF FINANCIAL OR ORGANIZATIONAL INTEREST IN THE PROMOTION OF WIND ENERGY SYSTEMS?
1. Two members representing wind energy system developers.			
Tom Green	Wind Capital Group	Yes	No
Bill Rakocy	Emerging Energies of Wisconsin, LLC	Yes	No
2. One member representing towns and one member representing counties.			
Doug Zweizig	Town of Union (Rock Co.) (town wrote a wind ordinance)	Yes	Yes
Lloyd Lueschow	Green County (no industrial wind activity)	Yes	Yes
3. Two members representing the energy industry.			
Andy Hesselbach	We Energies	Yes	No
Dan Ebert, WSC Chair	WPPI Energy	Yes	No
4. Two members representing environmental groups.			
Michael Vickerman	RENEW Wisconsin	Yes	No
Ryan Schryver	Clean Wisconsin	Yes	No
5. Two members representing realtors.			
George Krause Jr.	Choice Residential LLC	Yes	Yes
Tom Meyer	Restaino & Associates	Yes	Yes
6. Two members who are landowners living adjacent to or in the vicinity of a wind energy system and who have not received compensation by or on behalf of owners, operators, or developers of wind energy systems.			
Dwight Sattler	Landowner, living .7 of a mile (3,700 feet) from a turbine	No	Yes
Larry Wunsch	Landowner, living 1,100 feet from a turbine	Yes	Yes
7. Two public members.			
David Gilles	Godfrey & Kahn, former WPSC General Counsel	No	?
Jennifer Heinzen	Lakeshore Technical College, President of RENEW Wisconsin	No	No
8. One member who is a University of Wisconsin System faculty member with expertise regarding the health impacts of wind energy systems.			
Jevon McFadden	Wisconsin Department of Health Services Not a member of the UW System Faculty and admitted non-expert on this topic.	No	?











John Muir Chapter

Sierra Club - John Muir Chapter
222 South Hamilton Street, Suite 1, Madison, Wisconsin 53703-3201
Telephone: (608) 256-0565 Fax: (608) 256-4562
john.muir.chapter@sierraclub.org http://wisconsin.sierraclub.org

Support PSC 128, Wind Energy Siting Rules, Before the Joint Committee for Review of Administrative Rules, PSC 128 (CR 10-057), February 9, 2011 at 10:00 AM in 412 East

Thank you for accepting our comments today. The Sierra Club – John Muir Chapter is made up of 15,000 members and supporters of the nation's oldest, grassroots environmental organization working to promote clean energy and protect water resources in Wisconsin. For the past several years, we have supported the thoughtful efforts of the Public Service Commission and the legislature to develop fair, statewide siting criteria for wind turbines under PSC 128. The process that went into developing PSC 128 relied on extensive stakeholder input and peer-reviewed research. Giving this rule the chance to go into effect will allow 572 MW of wind energy investments that are currently stalled to move forward. The Sierra Club is here today to urge the members of the Joint Committee for Review of Administrative Rules to support PSC 128.

Uniform wind siting rules are critical to Wisconsin's economy. As of 2010, the wind industry employed 85,000 people nationwide. Wisconsin is ranked 18th for its wind resource potential, with about 450 MW of installed projects as of 2010.¹ Yet, we have less than one fourth of the wind development of Illinois, which has over 1,800 MW in installed projects despite having similar wind resources. Just yesterday the media reported that Minnesota had jumped to 4th in the nation with 2,196 MW in installed wind developments, due to aggressive renewable standards and other key policies.² Iowa has long been second in the nation, with 3,670 MW. PSC 128 offers wind energy businesses with regulatory certainty that is sorely needed in order to compete with neighboring states for wind energy jobs.

Uniform wind siting rules are about improving public health. Wisconsin currently relies on coal to meet 70% of our energy needs. A 2010 Clean Air Task Force study found that fine particulate matter emitted by Wisconsin's power plants results in about 456 heart attacks and 268 premature deaths every year in our state.³ Mercury emissions from coal plants are linked to neurological problems that have required fish consumption advisories for every water body in Wisconsin. And the problem does not stop at the smoke stacks. Last year, the *Racine Journal Times* reported on coal ash pollutants from Oak Creek that have resulted in permanent drinking water contamination for local residents. And this year, an Earthjustice study identified coal ash sites in Kenosha and Cassville with dangerous levels of cancer-causing chromium.⁴ Health problems cost Wisconsin money and reduce our quality of life. PSC 128 will allow cleaner, safer wind energy alternatives to move forward.

For all these reasons and more, we urge the members of this Committee and the Legislature to support uniform wind siting rules under PSC 128. Thank you for considering our comments on this important matter.

Selected Sources:

¹ US Wind Energy Projects Database, AWEA, <http://archive.awea.org/projects/>

² Minnesota continues to be a leader in wind energy, *Echo Press*, Feb 8, 2011, <http://www.echopress.com/event/article/id/82032/>

³ The Toll from Coal: An Updated Assessment of Death and Disease from America's Dirtiest Energy Source, Clean Air Task Force, 2010, http://www.catf.us/coal/problems/power_plants/existing/map.php?state=Wisconsin

⁴ EPA'S Blind Spot: Hexavalent Chromium in Coal Ash, Feb 1, 2011, Lisa Evans, Earthjustice, <http://earthjustice.org/sites/default/files/CoalAshChromeReport.pdf>

TOWN OF CLAY BANKS

Door County, Wisconsin

Myron Johnson, Chairman
Mark Heimbecher, Supervisor
Patrick Olson, Supervisor

Jessica Bongle, Clerk
Trudy Kruger, Treasurer

February 8, 2011

Representative Garey Bies
Room 216 North
State Capitol
P.O. Box 8952
Madison WI 53708

Senator Frank Lasee
Room 104 South
State Capitol
P.O. Box 7882
Madison WI 53707-7882

Dear Representative Bies and Senator Lasee:

Please be advised, the Town of Clay Banks, Door County, is opposed to the Wind Siting Rules as proposed by the Public Service Commission of Wisconsin.

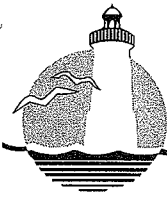
Our Town firmly believes that decisions for wind siting should be made by local government. There are vast differences in our communities, i.e. land topography, land use, populations, ages of populations, home densities, etc. These are all variables that must be considered when siting wind turbines. One common standard on wind energy construction and operation is not a doable one 'size fits all' solution. The impact of wind energy systems on one community can be vastly different than on another.

The Town of Clay Banks initiated and conducted our own study over the course of a year and resulted with the adoption of a comprehensive Town Wind Siting Ordinance. We concluded that studies on low frequency noise required a minimum setback of 2,650 feet from an existing building. Further, our study was conducted in greater detail than the PSC, expounding on the impact that wind turbines would have on our community, i.e. public health and safety, environmental, compatible land use, water quality, emergency communications, certification, decommissioning, etc, etc.

The PSC guidelines are seriously flawed in protecting the health and wellbeing of our communities. I urge the proposed rules be sent back to the Public Service Commission for further intensive study. We further request reestablishing greater local government control and responsibility in rules governing the siting of wind turbines.

Sincerely,

Myron Johnson, Chairman
Town of Clay Banks



Fond du Lac County

PLANNING/PARKS DEPARTMENT

(920) 929-3135

FAX (920) 929-7655

City/County Government Center

160 South Macy Street, Fond du Lac, WI 54935

February 8, 2011

Representative Jim Ott
Co-Chair
Joint Committee for Review of Admin. Rules
Room 317 North
State Capitol
P.O. Box 8953
Madison, WI 53707-8953

Senator Leah Vukmir
Co-Chair
Joint Committee for Review of Admin. Rules
Room 131 South
State Capitol
P.O. Box 7882
Madison, WI 53707-8953

Honorable Representative Ott and Senator Vukmir:

I am writing to express my support of PSC Rule 128. The rule will create a level playing field for Wisconsin's growing wind energy industry and provide reasonable regulation of wind turbine siting everywhere in Wisconsin where wind is a viable resource. I encourage your Committee, the Legislature and Governor Walker to allow the new PSC 128 rule on wind turbine siting to take effect to assure Wisconsin's place as a renewable energy leader. PSC 128 is in many ways similar to the siting rules developed by six town boards and plan commissions in Fond du Lac County. If encouraged, renewable wind energy will continue to produce family wage jobs for state residents and payments to our farmers that by their own choice participate in Wisconsin's renewable energy program.

Fond du Lac County is home to three major utility-scale wind farms comprised of 168 turbines and 268 MW of electricity generation capacity. Wind farms in Fond du Lac County involve six town boards and town plan commissions representing 8,831 town residents. All six towns administer their own, unique zoning ordinances. In all six towns, town boards that approved permitting for wind farms are still in office by their own choosing and with support of their constituents. Local regulation of wind turbines has not been without controversy, but town government has been stable over time, from pre to post wind farm operation.

Town government takes the lead on utility-scale wind farm regulation in Fond du Lac County. The typical wind turbine setback in all six of our towns is 3 times the maximum height of the wind turbine. A typical wind turbine is 430 feet in height in our county. This equates to a setback of about 1,290 feet. Typically, setbacks for wind turbines detailed in local developer agreements written by towns in Fond du Lac County are as follows:

1. Setback from municipal/civil structures is 3 times the maximum height of a turbine.
2. Setback from participating residences is 600 feet. 1.1 times the turbine height is allowable with written permission of participating resident. This equates to a 473-foot setback.
3. Setback for non-participating residences is 3 times the maximum height of a turbine. 1.1 times the turbine height is allowable with written permission of non-participating resident.
4. Setback from a property line is 1.1 times the maximum height of a turbine.
5. Setbacks from communications and utility lines are 1.1 times the maximum height of a turbine.

Our town plan commissions and town boards held all the public hearings, heard all the pros and cons, imposed conditions on siting turbines and executed developer agreements that nailed down the specifics

February 8, 2011

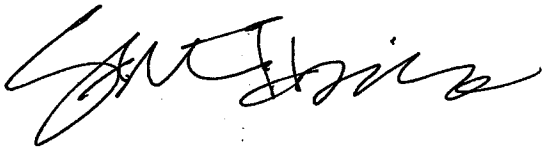
Representative Jim Ott & Senator Leah Vukmir

of locally grown regulations. One of the most respected private attorneys in our part of the state was legal counsel for all six towns in our county that host wind farms. Developer agreements are comprehensive. Town boards and their legal counsel anticipated the issues to arise out of a utility-scale wind farm throughout the life of such projects. Town boards and wind energy developers hammered out the developer agreement details including the five details listed above during many hours of open town planning commission and town board meetings.

Utility scale wind farms in Wisconsin have meant a lot to local businesses. Farmers that want to continue working their farmland have additional income to support their operations. Land rental payments for turbine sites bring farmers \$5,000 each year for each turbine site. Farmers invest these dollars, \$829,900 in 2010, into growing crops or their dairy herds. One of our local contractors, Michels Corporation of Brownsville, Wisconsin, has been the prime contractor in several utility scale wind farms. Michels was the prime contractor and paid living wages to just over 200 employees in the Fond du Lac/Dodge County area during the construction of the Forward Energy Center and the Blue Sky/Green Field wind farm. Michels was also part of the construction team for both Butler Ridge and Glacial Ridge projects elsewhere in Wisconsin. Michels has been in discussions with 4 other wind developers each with 100 MW projects around Wisconsin.

Before tightening up the regulation of wind turbines in Wisconsin, give the new PSC 128 rules a chance to work. The rules are similar to wind turbine rules developed and used successfully in Fond du Lac County. A committee with representation across the entire spectrum of the utility-scale wind farm issue developed PSC 128.

Best regards,



Sam Tobias
Director of Planning & Parks

cc: Allen J. Buechel, County Executive
Senator Randy Hopper, 18th Senate District
Senator Joseph Leibham, 9th Senate District
Senator Luther S. Olsen, 14th Senate District
Senator Glenn Grothman, 20th Senate District
Representative Steve Kestell, 27th Assembly District
Representative Joan Ballweg, 41st Assembly District
Representative Jeremy Thiesfeldt, 52nd Assembly District
Representative Richard Spanbauer, 53rd Assembly District
Representative Daniel R. LeMahieu, 59th Assembly District



Upper Midwest Regional Office
400 1st Avenue North, Suite 535
Minneapolis, MN 55401

612.767.6241 phone
888.767.6241 toll free
612.767.6248 fax

February 9, 2011

I apologize I am unable to be here today, but I appreciate the opportunity to submit written testimony regarding PSC 128. My name is Brian Lammers, and I am the Director of Development for the Upper Midwest for Horizon Wind Energy. As the third largest owner of wind energy in the US, Horizon is active in over 20 states in developing, constructing, owning and operating wind farms. We first entered Wisconsin in 2003, where we started to develop a project, Quilt Block Wind Farm, in Lafayette County. This is our most advanced development project in Wisconsin, and the one that has the most potential to be affected by the possibility of suspending PSC 128.

As a wind farm owner with a long-term timeline, Horizon aims to be a positive member in the communities that we are in—both before a project is built and for the 20 year expected lifetime of the project. With our landowners in Lafayette County, we have paid \$600,000 directly to them in development rent payments to date—money which has directly been supporting the local economy.

From a development perspective, Quilt Block Wind Farm is mature, and provided we are successful in signing a long-term power purchase agreement, is ready for construction in 2012. Overall, this project will cost around \$200 million, of which a significant amount will be spent locally. The construction jobs will likely total around 250, with long-term operations and maintenance jobs to be over a dozen people. Each year while in operations, the project will pay over a million dollars through property tax payments to the local communities in and royalty payments to our host landowners—funding that can help decrease the amount of property tax revenue needed from residents to maintain budget levels and funding that can help improve lives.

In the two-year process, involving six rounds of public hearings, PSC 128 went through the PSC rulemaking process in a balanced and fair way. The end result is a bill that has a solid balance of allowing developers like ourselves to take some of the risk out of siting projects while protecting Wisconsin residents.

As written, PSC 128 includes in its uniform statewide protective standards for projects under 100 MWs. As a company we have learned in other areas that without statewide standards, it is possible to spend years and millions of dollars in developing a wind farm, only to have permitting difficulties unexpectedly come up at the last minute; without this stable environment, it would be less appealing to develop projects in Wisconsin.

In addition, PSC 128 requires local municipalities to have good neighbor payments for non-host landowners, ensuring that the entire community benefits from having a wind farm. In addition, PSC 128 has safe setback distances, once again ensuring predictability for developers like us.

As passed, the wind siting rule supports rural economic development by providing development, construction, operations, maintenance, transportation, legal and even hospitality jobs. Horizon is hopeful that we will soon build our Quilt Block Wind Farm, and to help realize the project that we started with our community partners back in 2003.

We ask that you do not suspend the rules that have already been created in an open, fair, and balanced way.
Sincerely,

Brian Lammers
Director of Development

WISCONSIN STATE CONFERENCE

**International
Electrical**



**Brotherhood
Workers**

Affiliated with the AFL-CIO and All Central Bodies

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS SUPPORT WIND DEVELOPMENT AND JOBS

February 9, 2011

Contact: David Boetcher, 608-334-0462

The membership of IBEW WI State Conference supports the PSC windsiting rules as a long sought compromise to protect landowners of wind tower projects and neighbors to those projects along with the many jobs they create. By having a uniform set of statewide standards we not only help landowners but we also give confidence to the many businesses and workers in Wisconsin that are part of this growing piece of the economy.

We need to create regulatory certainty now to retain and capture the jobs created by this industry. From the many manufacturing jobs in Wisconsin now specializing in wind energy components to the many electricians we have and are training in wind tower construction, making more onerous regulations will send a cold chill on job creation.

The PSC rulemaking process last year was open, balanced and fair, and will allow developers to site projects efficiently while protecting Wisconsin's residents. In over 2 years of study, the PSC took into account input from all major stakeholder groups.

Without uniform statewide standards for projects under 100 MW, many current Wisconsin wind projects will not go forward. Projects currently in development will be jeopardized by a possible suspension and alteration of PSC 128. These projects represent as much as \$1.5 billion in investment and approximately 1.6 million job-hours.

In addition wind energy is a major source of local revenue. Projects in Fond du Lac and Dodge County will pay landowners slightly more than \$1.2 million annually to and almost \$1.6 million to local governments in 2010. PSC 128 protects the rights of landowners to host wind turbines, providing them with a new source of revenue. We will always be using and spending money for energy – lets keep as much of that reinvested in Wisconsin as possible.

The Wisconsin IBEW State Conference is made up of 20 locals around the State. Our 16,000 members are employed in all facets of electrical work – construction, utility and manufacturing. We are constantly working to increase job opportunities, improve the standard of living and working conditions for our members. Our political involvement is a major part of that effort.

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February 9, 2011

TO: The Joint Committee for the Review of Administrative Rules:
Senator Leah Vukmir, Co-Chair Senator Joseph Liebham
Representative Jim Ott Co-Chair Representative Dan Meyer
Senator Glenn Grothman Representative Daniel LeMahieu
Representative Gary Hebl Senator Lena Taylor
Representative Frederick Kessler Senator Fred Risser

FROM: Brenda Salseg
Town of Forest-St. Croix County, WI

RE: Public Hearing on PSC 128 Clearing House Rule 10-057

Just four months ago, my husband and I traveled here to Madison to attend and testify at the public hearing held in October before the Senate Committee on Commerce, Utilities, Energy, and Rail. Back then, it had been just a little over a month since most of my neighbors and I found out about the wind agreement with Emerging Energies to site 39 turbines 500-foot tall in our small township. We wondered how the project could have developed with so few people knowing about it and without a public hearing. Some had heard rumors but could not believe the size and scope of the project. How could what was done have been legal? Through open records we found the agreement was managed by attorneys for the town and the developer and backed by a select group of hosting landowners who wanted the deal done. Two town supervisors, both with conflicts of interest, approved the project.

During those first few days after learning about the agreement, my neighbors and I had many questions. We researched the pros and cons of wind energy systems. I read how windmills were good for people and good for the planet. I watched the videos of turbine sound and shadow flicker. I read about the effects of low-frequency vibration on hearing, muscles, and organs. Many of my neighbors are farmers, and they worried if livestock would suffer from stray voltage. What would happen to our rural lifestyle, the birds and wildlife, and investments in our homes and property? With ten to twelve proposed within a mile of my home, and one just 1200 feet, what could I do if I was opposed to living in a wind project? Still, I thought, government would not allow industrial wind if it could cause us harm.

We were told the wind is free, and our electricity needs will be cleaner, greener, and cheaper. Cleaner and greener does not equate with health and safety issues or the fact the power plants work much less efficiently when ramping up or down in response to wind. Wind energy is not cheaper when it is variable and inefficient and not viable unless taxpayer subsidized, and takes a double dip through electricity rate hikes.

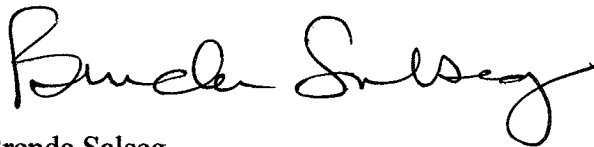
The more I searched for answers, the more apparent it became that there was no protection. Communities all across the world are banding together to fight the negative effects of industrial wind. Right here in our own home state hundreds of people live with unacceptable noise many times above natural ambient levels. Wind projects are negatively affecting the health of people, pets, and animals. Buffer zones cross property lines and take from adjoining landowners. I read the stories of so many people who health began to fail as soon as the turbines began operation.

I found out very quickly that few want to believe these people all with similar stories, all of which have spoken the truth and many of which are in this room today. Those who stand to make financial gain deny and manipulate the truth because safe setbacks cut into profit margins. They call us liars, whiners, NIMBYs, and anti-green for defending our quality of life and protecting our investments, for some of us, all that we own of value.

Hundreds of ordinary people like my neighbors and me, as well as physicians, acoustical engineers, and scientists have researched, studied, and lived with the evidence you have been given through testimony today. We are your source of proof that industrial wind is not safe and does not belong in densely populated rural areas, too close to nonparticipating homes. By state law, I cannot leave my driveway in my car without putting on a seatbelt. Yet people are put at risk every day by turbine blades spinning as fast as 170 miles per hour. Where is the safety net for the people of Wisconsin?

The Public Service Commission is not composed of elected officials and does not represent the voters of Wisconsin. Yet the Commission is attempting to make policy and pass laws that further erode the health and safety issues of wind energy systems and our private property rights. We, from the Town of Forest, St. Croix County, Wisconsin, ask that you as a committee stand up for the people of Wisconsin, and stop the PSC 128 Clearinghouse Rule effective for March 1, 2011 and lead to uphold our constitutional rights for us all.

Thank you.

A handwritten signature in cursive script that reads "Brenda Salseg". The signature is written in black ink and is positioned above the typed name and address.

Brenda Salseg
2969 – 210th Avenue
Emerald, WI 54013

Wednesday, February 9, 2011

10:00 AM
412 East
State Capitol
PSC 128 (CR 10-057)

Relating to the siting of wind energy systems

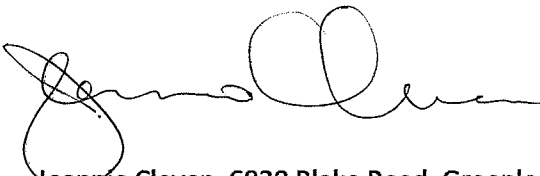
I can't help to wonder how many more peaceful nights I will be able to enjoy in my own home. I can't believe people like Jennifer Heinzen who referred to us as "collateral damage" has made decisions that will directly affect me and mine. She was also quoted as saying she didn't know why people are so against these wind projects but "it doesn't matter what they think." The Wind Siting Council is loaded with bias as most of the members have a financial gain in the wind industry. This fact must be considered. These are the people that are blatantly ignoring the safety and health issues that are pouring in daily from projects all over the world. I have seen photos and videos of turbines exploding, breaking, and catching on fire. There are issues with shadow flicker, ice throw, noise and each and every one of these issues could be curtailed with a more reasonable setback distance of no less than 2640 feet from PROPERTY LINES. The rules were unjustly run through during the "lame duck session" and must be suspended now until further research can be done. The Wind Industry Symposium held in Canada this past fall holds startling information that needs to be paid attention to. My property values and my health are not unimportant.

If I had a dog that was a nuisance to my neighbor, I would have to do something about that dog, like get rid of it. And yet, these turbines – which have been proven to my satisfaction to have tremendous health and safety risks will be allowed to be built too close to my home. The World Health Organization has deemed safe noise levels in RURAL communities to be 35 decibels during the day, 30 in the evening, and 25 overnight. To say 45 and assume it's just a "little louder" is not correct. 45 decibels is TWICE as loud as 35 decibels. I live in a rural community, not an urban one. I've heard mention of compensation for people with issues. I do not want money for these issues. You cannot "pay" for my health and safety. That is a price only I could pay and it's because of decisions you are making. You must consider the safety and health of the residents of Wisconsin and err on the side of caution. Please suspend these rules to give more time to the issue. Once the rules are in effect, there's no turning back and there is way too much unbiased information out there to ignore it.

The following list of information is only a portion of why these rules need to be suspended. These points need to be considered along with the knowledge that we are NOT collateral damage. We are people with rights and lives that should not be discarded in the name of some feel good legislation that does way more harm than good.

- Wind turbines actually decrease the number of jobs. A study in 2010 by the University of Rey Jaun Carlos about Spain's employment history concludes that 9 jobs were lost for every 4 "green" jobs created. In addition, these green jobs cost over \$1 million each to create. This is interesting given Spain's large wind turbine manufacturing base and large number of installed wind turbines.

- Renewable energy cost is too high and impede job growth in industry. Using data from the U.S. Energy Information Administration, the average family of four would have household electric bills in 2016 of \$188.66 if the power was supplied by coal. If wind were used to supply 100% of the electricity used by this family, the cost would be \$339.58, an increase of 55%. These numbers would devastate the industries in Wisconsin that rely on large amounts of electricity in their manufacturing process.
- Wind Turbine projects requires huge taxpayer subsidies to be profitable to the developer. These subsidies are millions of dollars of tax and rate payer's money into the hands of a few companies, many of them foreign owned. Remove these subsidies and let the free market drive the electricity providing system.
- Wind turbine projects decrease property values to neighboring landowners. A study by Appraisal One Group in 2009 showed a decrease of up to 40%. The Lawrence Berkeley Labs study of land values touted by the wind interest as showing no impact to pricing has been discredited in multiple peer reviews. Multiple homes in the Fond du Lac County wind complex have not sold because of their close proximity to wind turbines.
- Wind turbines do not decrease emissions from other electricity generating sources. In studies in California and Colorado, the wind turbine projects actually increased emissions because of the cycling of coal and natural gas power plants to ensure a steady flow of electricity during periods of little wind. World-wide, not a single coal plant has been shut down because of wind turbines.
- Eliminate the Renewable Portfolio Standard. Wisconsin business cannot afford the addition cost of subsidized renewable energy. Force the marketplace to innovate and engineer new solutions to the problem. We should not be throwing money at the wrong solution simply because it is here. Force the wind industry to prove scientifically that they are the long term solution.
- Wisconsin currently has about 300 wind turbines in operation or under construction. To meet the 2025 RPS mandate an additional 12,000 turbines will be required. Where will the state put them? The marginal wind available is in the Eastern quarter of the state, which is also the most densely populated area of Wisconsin. The experiences of residents in Fond du Lac County have proven that wind turbines do not mix well in populated areas.
- In January, Clean Wisconsin and the Citizens Utility Board officially protested the expansion of Point Beach nuclear plant in Two Rivers because they say the state has more than enough electricity to meet its demands. Why then are we encouraging wind energy?

 2-9-11

Jeannie Clevon, 6830 Blake Road, Greenleaf, WI 54126

ATTENTION=JOINT COMMITTEE for REVIEW of ADMINISTRATIVE RULES

Message from a tax paying and voting resident of the Town of Forest , St.Croix county, Wisconsin.

You are part of an important committee with the responsibility of setting and administrating guide lines involving wind energy in Wisconsin. I beg of you to take the time to listen to ALL sides of the arguments about the issues surrounding wind generation. The setback rules that are presently recommended are not adequate to protect non-participating land owners. Property owners that own large tracts of land may not see this as an issue, but if the construction is near to a non-participant and the wind generator causes noise or shadow flicker that is detrimental to their health it seems apparent that their only recourse is to abandon their property. If the property doesn't resell and the township can't collect taxes on the abandoned property, isn't this a negative impact on the area. From more than just a few fact finding missions by people in other areas including in other states, it is becoming more and more apparent, that wind energy generation is not as "green" as it is advertised to be. Without your assistance on the rulings committee to consider ALL input I fear that us "small" land owners have no way of protecting ourselves. We pay taxes into our townships and our school districts just like our neighbors with large tracts of land. Unfortunately we don't have the large acreage buffer to get away from the side affects that are becoming more apparent. Many of our small acreage land owners consider our property to also be a retirement investment. Most of us hope to either hand this property down to our next generation, who will be the next tax payers and voters in that community. Or the property will be listed and sold to some new family that wants to move into that area. But it is becoming obvious in other areas that the property values are not indicating the desire of people to move into or stay in the proximity of these towers. I believe it is necessary for our elected leaders to listen to ALL of the voters and tax payers. Respectfully, Laverne Hoitomt 3162 State Road 64 Glenwood City, Wisconsin

Invenergy

February 9, 2011

Joint Committee for Review of Administrative Rules
State Capitol
Madison, WI 53702

Re: Clearinghouse Rule 10-057, Wind Siting Rule

Dear Honorable Members of the Committee:

Invenergy is the nation's largest non-utility affiliated wind power generation company. We're based here in the Midwest, in Chicago, and we've developed and placed in service more than twenty wind farms across the country.

Our company is proud to have invested in Wisconsin. Our first wind farm here, the Forward Energy Center near Fond du Lac, became operational more than two years ago. We'd like to do even more business in the state and to make a deeper investment through continued wind development.

Unfortunately, after two years of work by many stakeholders on the establishment of a uniform siting standard, we remain in a holding pattern. The prolonged process has created, and now may cause to continue an atmosphere of regulatory uncertainty.

PSC 128 would provide stabilization of the regulatory environment. It is in that vein that I am writing in support of the adoption of PSC 128.

Wind Development significantly and positively impacts the economy of Wisconsin. Our Forward Energy Center, for example, provides \$1.5 million annually in landowner payments, local taxes and the use of over 40 Wisconsin business. Wind Development also creates jobs in the construction trade and provides opportunities for Wisconsin contractors; a Wisconsin contractor constructed the Forward Energy Center at over \$50 million.

Further, projects impact the Wisconsin economy at all stages of development; with 5 year developments providing \$500,000 in landowner payments to rural communities, and \$1.5 million spent on Wisconsin based engineers, environmental consultants and legal support.

Stabilization of the regulatory environment is crucial to encouraging such development. The suspension of PSC 128, in contrast, would mean pressing the 'pause button' on investment and watching much of that potential go to other states where the rules are fair, clear, and certain.

PSC 128 is a common-sense approach to establishing reasonable wind turbine siting rules. Crafted over a two-year period, it reflects input from a number of stakeholders - including the citizens of Wisconsin.

PSC 128 may not be perfect. Perhaps no standard would be. But it is a good and fair compromise that balances many different interests. The adoption of PSC 128 will make it

Invenergy

possible for numerous wind developments to finally go forward. It would be a green light for investment - and jobs.

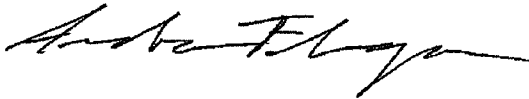
Invenergy very much wants to do business and create jobs and investment in Wisconsin. But to continue to invest here, we must have a partner in those who shape public policy. As state legislators, you can remove barriers to business development and help shape a stable regulatory climate.

It would be an environment that encourages investment. An environment in which wind is a plentiful crop - a crop harvested with great results for the citizens of this state.

Please feel free to contact us for more information as your committee considers this legislation.

Thank you for your time and consideration.

Sincerely,



Andrew Flanagan
Vice President - Development

TESTIMONY BEFORE THE
JOINT COMMITTEE FOR REVIEW OF ADMINISTRATIVE RULES
February 9, 2011

Julie Voeck
Director of Regulatory Affairs
NextEra Energy Resources, LLC

**STATEMENT OF POSITION CONCERNING THE SITING OF WIND ENERGY SYSTEMS
IN WISCONSIN – PSC 128 (CR 10-057)**

Julie Voeck
Director of Regulatory Affairs
NextEra Energy Resources, LLC

(262) 814-2639
Julie.Voeck@nexteraenergy.com



1000 megawatts requires 500-600 turbines and a total footprint of only 200-300 acres. That's 1/3 to 1/2 an acre needed per turbine. Folks like GE, Vestas, American Superconductor, and Wausaukee Composites stand to lose \$2 billion dollars.

So please think about this ? We need 200-300 acres (offered by landowners) in exchange for a \$3 billion industry opportunity? Good deal or not ??

Please do the right thing...No more compromises or splitting hairs. Setbacks over 1250 feet and turbine placement dictated by fence posts and not based on proximity to homes are game breakers...

Please **DO NOT SEND** this **BACK TO THE PSC AGAIN**. Adopt **PSC 128** as the blue print or the game plan. The results could be Super ! Do we Punt or Move the ball down the field **NOW!?**

GO PACK GO

Thank you....

Kim A. Egan
Wind Wisconsin
608-516-0233
kimegan@gmail.com

Feb. 9, 2011

Hearing on PSC 128 (Clearinghouse Rule #10-057)
PSCW Wind Siting Rules

Joint Committee for Review of Administrative Rules
February 9, 2011

Testimony by Glen R. Schwalbach, P.E.
for
Towns of Glenmore, Morrison, and Wrightstown of Brown County

Thank you, Co-chairs and Committee Members for providing us this opportunity to comment upon the wind siting rules which could go into effect next month.

Our towns support suspension of these rules for two reasons. The towns have existing wind siting ordinances in which they have invested hours and hours of effort to ensure the safety and health of their residents. A March 1st deadline to convert to the state rules is not possible since any local ordinance change requires an open process by the planning commissions and the town boards and, then, via town public hearings.

Secondly, the previous legislative committees sent the draft rules back to the Public Service Commission because of some key concerns about safety and health protections. Instead of providing for more stringent requirements, the PSCW relaxed the setback provisions and reduced payments to non-participating property owners. Then, as you know, the lame-duck committees did not provide for public hearings on those changes.

Our towns also support having an opportunity, after suspension of the rules, to explain the good, bad, and ugly in the proposed rules based upon our research and experience.

Progress has been made but an essential element is still lacking. Rules or standards intended to protect the health and safety of people must be based upon scientific fact rather than scientific opinion. We still lack statistically-controlled epidemiological studies to assess the wind turbine impacts on humans and animals. There are peer-reviewed scientific studies which say that significant evidence of negative impacts exists. On the other hand, there are peer-reviewed scientific reports which stress that there is no true scientific proof that turbines are harmful. Both groups of authors, including our own State Board of Health, are correct. There just are no controlled scientific studies except one which was recently published. That one was not considered in promulgating our state rules.

Wisconsin has an opportunity to do epidemiological studies in their existing wind farms. The University of Wisconsin and the State Board of Health is capable of doing such studies. The time is ripe because 1) there are complaints of health issues from Wisconsin residents in or near existing wind farms, 2) studies are necessary to determine setbacks which are adequate but not extreme and 3) all

indications are that the Wisconsin utilities already have enough renewable generation planned for meeting the state requirement for 10% by 2015.

We call upon the wind energy industry to help fund such studies because the use of better science would improve their designs, speed their project application process, and help reduce their liability. I, personally, call upon the licensed Professional Engineers in the wind industry to remind themselves that, as P.E.'s, they have an ethical responsibility to the public which goes beyond obligations to their employers or their clients. Their designs and operational procedures must be based on good science. They should voice support for controlled studies.

Such studies are also important to Wisconsin residents since it is more likely that, in the future, continuing federal subsidies will prompt wind development in Wisconsin but the power will be sold and used in other states.

That said, we offer comments on some key fixes needed in the proposed rules.

Historically and reasonably, setbacks have been defined as a distance from property lines for structures or other land use--until wind turbine projects came along. Ironically, the state decided to allow wind turbines, which greatly exceeded traditional height restrictions for structures, to also have direct impact beyond the property line as to the neighbors' use of their land. Adequate setbacks from property lines are necessary not only for safety and health reasons but also to minimize financial impact for non-participating landowners.

Another concern is that the proposed rules do not allow the towns to decide the acceptable means to provide financial collateral for future decommissioning. In the proposed rules, the wind turbine owners get to decide that.

A third concern is that when wind projects are sold, the towns should have some authority to approve the new owners. Most likely, if the statutes still require 10% renewable energy, it will be the utilities which will be forced to buy the projects from the developers. But, if not, the towns need to have better protection from irresponsible owners.

A fourth concern is that the rules do not provide explicitly for local authority to protect the environment such as groundwater. County experts often know the sensitive areas and the risks they represent better than the DNR. This is a huge concern for our towns because of the nature of the Niagara Escarpment and its many karst features. Karsts are rock fissures which often provide a direct pathway to groundwater. One University of Wisconsin expert estimates only 10% to 20% of karsts have been found and officially mapped in Brown County.

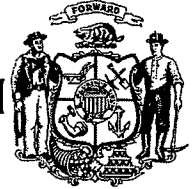
And, the last concern is that the rules only apply directly to wind energy systems less than 100 megawatts. Legislation should provide for explicit protections for residents near the largest wind developments as well.

Thank you for your consideration.



Frank Lasee

WISCONSIN STATE SENATOR
FIRST SENATE DISTRICT



Thank you Madam Chair Vukmir and Chairman Ott for holding this hearing and hopefully suspending these rules and asking the PSC to take another look at them. Wind energy systems are a big issue in my district as well as many others areas in our state. We need to take a very close look at what is happening in our state and to our citizens.

Windmills are large, industrial installations. That is why this committee and the Legislature need to make sure that our citizen's health and property are protected.

The list of concerns citing Windmills is long and I will briefly touch on some of them.

1. Health Issues caused by windmills too close to human and animal dwellings are as follows. Vision problems are caused by Shadow Flicker (light passing through the blades, like turning on and off your light switch.). Sleep problems because of noise or physical sensations of pulsation or pressure make it hard to go to sleep and cause frequent awakening. Headaches which are increased in frequency or severity. Dizziness, unsteadiness, and nausea. Exhaustion, anxiety, anger, irritability, and depression. Problems with concentration and learning. Tinnitus (ringing in the ears). Livestock (not producing and shorter life spans). And, wildlife, birds bats, and other animals in the surrounding habitat are leaving areas where windmills exist.
2. Real Estate Values: There is not one instance that I have been able to find where neighboring real estate has increased in value because of having a wind generator on or near ones property. In fact it is quite the opposite. Studies show that property values in Fond du Lac County near the Wind Generators have fallen by 19%. Are we as legislatures who are here to help and protect our constituents going to allow this to happen to our tax paying citizens?
3. Inefficient Energy: In Wisconsin, because of wind patterns, it is a very inefficient form of energy production. In Wisconsin, windmills have been rated at 7 to 27% efficient. That means that to replace a 500MW clean coal, natural gas or nuclear plant, we would need to put up 2,000 1MW windmills. How many people's lives, livestock and property will this effect?

Please take the concerns of the people who live in the areas that windmills are sited in to account. We need to be careful of our citizen's health and their right to enjoy their property. Property and a way of life they have worked hard for.

I thank you for your time committee members Madam Chair Vukmir and Chaiman Ott.

Senator Frank Lasee



STATE REPRESENTATIVE
Garey Bies
1ST ASSEMBLY DISTRICT

**Written Testimony of Representative Garey Bies
Joint Committee for the Review of Administrative Rules
Clearinghouse Rule 10-57 – Siting of Wind Energy Systems**

Good morning Chair Persons Ott, Vukmir and committee members, I appreciate the opportunity to submit my testimony on Clearinghouse Rule 10-57, relating to the siting of wind energy systems.

We have a full room today so I will keep my comments brief. What I would like to see is that these rules be thrown out, along with the change in oversight to the Public Service Commission (PSC) of where wind farms are constructed in local communities. My belief is that the regulation for the siting of wind farms should remain with local government who best understand the needs of their residents.

However, understanding that this is not the issue before the committee today, I would then request that these proposed administrative rules be set aside pending further research on what impact wind turbines have on residents in close proximity to them.

Today the committee is going to hear testimony from people who live close to giant wind turbines and the committee will learn about the impact of these turbines on their lives. These are not people here lobbying against the placement of a wind farm in their backyard, that deed has already been done. They are here to share their experiences of having a wind farm in their backyard so that the committee can understand the potential consequences to other Wisconsin residents.

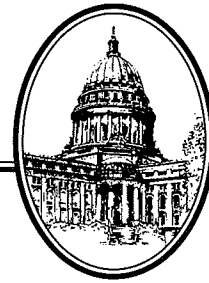
If a utility company receives approval for the placement of wind farm, and builds the giant turbines, those turbines are permanent and the impacts of those turbines are permanent. It is not a matter of simply taking down some scaffolding and moving them when it turns out the turbines are harming nearby residents. Too many questions remain in this regard and it only makes sense to me, that the state takes a step back and further investigates the potential harm to those living close to wind turbines.

Once again, thank you for the opportunity to submit my testimony on Clearinghouse Rule 10-57. Again, I would request that these rules be set aside pending further research.

First for Wisconsin!

Capitol: P.O. 8952, Madison, WI 53708-8952 • (608) 266-5350 • Fax: (608) 282-3601
Toll-Free: (888) 482-0001 • Rep.Bies@legis.wi.gov
www.legis.state.wi.us/assembly/asm01/news/

Home: 2520 Settlement Road, Sister Bay, WI 54234 • (920) 854-2811



February 9, 2011

Joint Committee for Review of Administrative Rules

CR 10-057

Representative Peter Barca

Chairman Ott, Chairwoman Vukmir and members of the Joint Committee for Review of Administrative Rules, thank you for the opportunity to address the committee on this important rule.

I would hope that the committee would allow CR 10-057 to stand as promulgated and that the committee would not act in future meetings to suspend this rule. Suspending or repealing this rule and replacing it with restrictions similar to those proposed by Governor Walker would wipe out 1,000 Wisconsin construction jobs, \$1.8 billion in investments in planned developments, and close the door on future projects. I would be concerned by any attempt to undo the major step forward our state took on a bipartisan basis last session. Suspending the rule alone jeopardizes \$1.5 billion in planned Wisconsin projects, 1.6 million construction job hours, and prevents wind energy growth in our state.

If this rule is suspended or repealed, we would return to the patchwork regulation that held us back as other surrounding states became leaders in wind energy. I encourage you not to suspend or repeal this rule and not to undermine our state's growing wind energy industry. Industry experts point out that if regulations like those proposed by Governor Walker were in place it would have prevented any of our state's wind energy systems from even being constructed.

We should join other states in our region in striving to be on the cutting edge of clean, wind energy. While we have made great strides in recent years, Wisconsin is currently unfortunately still lagging behind other Midwest states in terms of wind energy production, in part because of overregulation. The promulgated rule has an appropriate balance of protections for property owners and opportunities for economic development in the wind industry, which will contribute to growth in manufacturing, construction, operation, maintenance, development, transportation, and other jobs.

The state of Iowa produces eight times as much wind energy as Wisconsin. Minnesota and Illinois each currently produce four times as much energy through wind as our state and they are growing. Both states have projects underway that alone will produce more wind power than our state is currently producing. Other states in our region are benefitting from cheap and clean energy, huge private investments, and countless high-tech energy and construction jobs. Why would we want to make it more difficult to bring wind energy and the jobs it creates to our state?

After Governor Walker unveiled his proposal to cripple wind energy production in our state, the Illinois Wind Energy Association issued a statement encouraging Wisconsin energy companies to “escape to Illinois.” According to the Wisconsin Energy Business Association, setbacks at the level called for by Governor Walker in his special session bill would make our regulations the most burdensome in the country. While Illinois benefits from a \$3 billion wind energy industry, we appear prepared to take a step backward that would stop 11 proposed wind projects and erase hundreds, if not thousands, of jobs.

We could risk losing some of our state’s most innovative high-tech companies, which are directly related to the forward steps we have taken towards wind energy.

According to estimates by the American Wind Energy Association, our state’s wind industry currently contributes between 2,000 and 3,000 direct and indirect jobs. A group of prominent Wisconsin manufacturers noted in a letter to Governor Walker that more than 20 manufacturing facilities in Wisconsin currently provide essential components for the industry and represent tens of millions of investment in wind-specific manufacturing infrastructure and equipment.

What prevents Ingeteam, Inc, the Spanish wind turbine production and clean energy company, which recently created 275 jobs in Milwaukee, from moving to Chicago? Why wouldn’t Energy Composites Corporation in Wisconsin Rapids, a wind blade manufacturing company which is on pace to bring more than 600 jobs to central Wisconsin, move to Minnesota? What would stop Tower Tech Systems, a company that employs over 250 people in Manitowoc to manufacture utility-scale wind towers, from picking up and moving to Iowa?

As this committee considers this rule, I would ask that you also consider the long term negative implications on potential job creation associated with suspending or repealing this rule. This is a method of clean energy produced right here in Wisconsin, which does not suffer from the cost volatility of sources like gas or coal, at a time when we currently annually send \$16 billion out-of-state for energy. With the legislation authored and supported by members of both sides of the aisle last session, Wisconsin took a substantial step in the right direction, and I would hope that we would not take a step backward that could put this important industry in jeopardy.

My name is Gary Koster and I am the Suppler Quality and Development Engineer for Northern Power Systems of Barre Vermont. We are a Community and Utility Turbine Manufacturer.

My job is to find the top suppliers in the World to produce components for all of our Wind Turbines. I am happy to say that most components in our turbines are made here in America. I believe that not many turbine manufacturers can state this same fact.

I have been in Windpower for almost twenty years and worked with many of the top companies in the industry.

Wisconsin, to the surprise of many of you, was the Windpower component manufacturing center of America. Throughout the 90's there were more than 50 Wisconsin suppliers doing almost 100 million dollars worth of work in the Wind industry. From Wausau and Ashland, down to Kenosha and Racine, and many places in between, WISCONSIN workers were producing almost every component that went into Wind turbines.

Wisconsin again is in the position to become a major player in Wind Turbine component manufacturing. Northern Power Systems has already started doing work with more than a dozen Wisconsin companies. That list could expand and put more WISCONSIN workers back to work. Wisconsin's strong manufacturing and machining background puts them in a great position to be the leader in this industry.

Eliminating PSC 128 before giving it a chance would cripple this possibility. Changing the rule now would have a massive effect on small turbine growth in Wisconsin. Northern Power has installed 4 NW100's in the Wisconsin area from Wausau High School, to a waste water treatment plant in Cascade Wisconsin. The savings to the town will be almost 1 million dollars over the next 30 years. The students in Wausau are learning about turbines and that could also lead to more jobs. Wisconsin technical colleges are training people in Wind Technology.

Jobs is the name of the game. Do not let this opportunity blow away.

Leave PSC 128 where it is, it will put Wisconsin workers back to work.

Shane Rich (641) 233-7885

Confidential and Proprietary Information

**Element Power
Tisch Mills Project Worksheet**

The figures below represent payments made by the Tisch Mills Wind Project. This information is presented only as an example based on some reasonable assumptions. Please note that the annual payment shown in the Operations and Maintenance Term will increase each year at the rate two percent.

1) Development Term (Five years plus optional five-year extension; five-year extension payment is \$5/acre)

Number of acres in project 54 times \$10 per acre \$ 1,000
(\$1,000 minimum)

2) Construction Impact Fee (one time)

Payment will be \$2000/MW of installed capacity.

3) Operations and Maintenance Term (30 years, plus two 10 year extensions)

Number of acres in project:	<u>54</u> times \$20 per acre	<u>\$ 1,080</u>
Number of turbines:	<u>11</u> times \$10,000 per turbine*	<u>\$ 10,000</u>
House: Yes (1) No (0)	<u>1</u> times \$1,000	<u>\$ 1,000</u>
Linear feet of access roads:	<u>1200</u> times \$1.00 per linear foot**	<u>\$ 1,200</u>
Linear feet of underground wires:	<u>1200</u> times \$0.25 per linear foot	<u>\$ 300</u>
	Estimated Annual Payment	<u>\$ 13,580</u>

*Assumes \$4,000 per MW of nameplate capacity and use of a (2.5) MW wind turbine.

The information contained herein is purely an estimation, based on several assumptions, all of which are believed to be reasonable as of the date hereof. When reviewing this information, please be reminded that it is preliminary and is subject to change based on any number of variables that may change or be introduced over time. Such changes may be material and we cannot guarantee that the information contained herein will reflect the actual performance or financial terms of the project if and when it enters operation. This is NOT an offer to purchase or a solicitation of an offer to purchase and any transaction will only be consummated upon execution of negotiated agreements between the parties.

PROJECT: Tisch Mills
LANDOWNER:
COUNTY/STATE: _____, Wisconsin
DRAFT DATE: 5Oct09

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RENEWABLE ENERGY LEASE

This Renewable Energy Lease (this "Lease") is entered into as of _____, 20____ (the "Effective Date") by and between _____ ("Landlord") and ELEMENT POWER WIND DEVELOPMENT, LLC, a Delaware limited liability company ("Tenant").

NOW THEREFORE, for good and valuable consideration including the covenants, terms and conditions of this Lease, Landlord and Tenant agree as follows:

1. BASIC LEASE TERMS.

- 1.1 **Premises.** The real property owned by Landlord and located in Kewaunee County and/or Manitowoc County (each a "**County**"), State of Illinois, as more particularly described in Exhibit A hereto, including all rights, privileges, easements and appurtenances pertaining thereto. The Premises consist of _____ acres. This acreage is an estimate agreed to by Landlord and Tenant, and shall be conclusive for purposes of this Lease, regardless of whether the actual acreage of the Premises may be different.
- 1.2 **Project.** The larger, integrated renewable energy project that may be constructed by Tenant on the Premises and on other adjacent or nearby real property.
- 1.3 **Phase.** A portion of the Project that is distinguishable from the remainder of the Project because it is constructed and put into operation at approximately the same time. The Project may have one or more Phases. Phases shall be determined by Tenant in its reasonable discretion.
- 1.4 **Development Period.** The period commencing on the Effective Date of this Lease and expiring five (5) years thereafter, if not extended or sooner terminated as provided in this Lease. Tenant may, by written notice to Landlord given no earlier than one hundred eighty (180) days before expiration of the Development Period, extend the Development Period for an additional five (5) years.
- 1.5 **Operations Period.** The period commencing on the last day of the Development Period and expiring thirty (30) years thereafter, and which may be extended pursuant to Section 4.3.

- 1.6 **Commercial Operations Date.** With respect to any Phase, the date that WTGs representing at least ninety-five percent (95%) of the installed capacity of that Phase are authorized and able to continuously and reliably generate and deliver energy. Tenant shall notify Landlord in writing of the Commercial Operations Date for any Phase that includes the Premises no later than 60 days after it occurs.
- 1.7 **Development Rent.** For the first year of the Development Period, an annual payment of \$10 per acre. For all subsequent years of the Development Period, an annual payment of \$5 per acre. However, no annual Development Period payment shall be less than \$1,000.
- 1.8 **Construction Impact Fee.** A one-time payment of \$2,000 per megawatt ("MW") of rated nameplate capacity of any WTGs installed on the Premises by Tenant, prorated for any partial MW.
- 1.9 **Operating Rent.** An annual payment during the Operations Period consisting of the following components:
1. *WTG Payment.* Four Thousand Dollars (\$4,000) for each MW of installed nameplate capacity for each WTG installed on the Premises.
 2. *Road Payment.* One Dollar (\$1) per lineal foot of new roads constructed on the Premises by Tenant.
 3. *Underground Facilities Payment.* Twenty-Five Cents (\$0.25) per lineal foot of underground electrical or communication transmission lines installed on the Premises.
 4. *Aboveground Facilities Payment.* One Thousand Dollars (\$1,000) for each transmission structure supporting aboveground electrical or communication transmission lines installed on the Premises.
 5. *Acreage Payment.* Twenty Dollars (\$20) per acre of the Premises subject to this Lease.
 6. *Met Tower Payment.* One Thousand Dollars (\$1,000) per year for each temporary meteorological tower and Five Thousand Dollars (\$5,000) per year for each permanent meteorological tower installed on the Premises.
 7. *Occupied Residence Payment.* One Thousand Dollars (\$1,000) per year for each residence on the Premises occupied during the year for which Operating Rent is being paid. This Occupied Residence Payment shall only apply to

those residences continually occupied from the Effective Date through the date of payment of Operating Rent.

All components of Operating Rent shall be subject to adjustment pursuant to Section 6.8.

- 1.10 **Default Rate.** The Prime Rate as most recently published by the Wall Street Journal at the time the Default Rate is applied.
- 1.11 **Inflation Adjustment Factor.** Two percent (2.0%).

2. OTHER DEFINITIONS.

In addition to the terms defined in Section 1, the following capitalized terms have the meanings given in this Lease:

Aboveground Collection Facilities – see Section 5.1.2	Lease – see opening paragraph
Claims – see Section 8.8	Liens – see Section 7.1
Confidential Information – see Section 17.1	Mortgage – see Section 11.1
County – see Section 1.1	Mortgagee - see Section 11.1
Cropland Compaction Rate – see Section 7.7.3	MW – see Section 1.8
CRP – see Section 6.7	Net Removal Costs – see Section 16.3
Development Rights – see Section 17.17	Public Official – see Section 17.17
Effective Date – see opening paragraph	Removal Security – see Section 16.3
Event of Force Majeure – see Section 13.1	Tenant – see opening paragraph
Facilities – see Section 5.1.2	Term – see Section 4.3
Hazardous Materials – see Section 8.5.3	Transferee – see Section 10.1
Landlord – see opening paragraph	WTGs – see Section 5.1.2
Laws – see Section 5.5	Underground Collection Facilities – see Section 5.1.2

3. LEASING CLAUSE.

Landlord leases the Premises to Tenant, and Tenant leases the Premises from Landlord, on the terms and conditions of this Lease.

4. TERM.

4.1 **Development Period.** The initial term of this Lease shall be for the Development Period specified in Section 1.4.

4.2 **Operations Period.** If, at any time during the Development Period, the Commercial Operations Date for a Phase that includes the Premises occurs, then the Development Period of this Lease shall end and the term of this Lease automatically shall be extended for the Operations Period specified in Section 1.5.

Renewable Energy Lease
County/State: _____, Wisconsin
Project Name: Tisch Mills

Landowner:
Page 3 of 26

4.3 **Extension Rights.** If the term of this Lease has been extended for the Operations Period, and provided that Tenant is not then in default of this Lease, Tenant shall have the right to extend the Operations Period for up to two (2) additional ten (10) year periods by providing written notice thereof to Landlord no later than thirty (30) days before the then-existing expiration date of the Operations Period. As used hereafter, "**Term**" refers collectively to the Development Period and any Operations Period, including any and all extensions thereof.

4.4 **Tenant's Right to Terminate.** Tenant shall have the right throughout the Term to terminate this Lease as to all or any part of the Premises upon thirty (30) days prior written notice to Landlord, subject to Tenant's obligation to restore the Premises pursuant to Section 16.2.

5. USE OF PREMISES.

5.1 **Tenant's Use.** Throughout the Term, Tenant shall have the sole and exclusive rights to use the Premises for wind energy purposes and to convert all of the wind resources of the Premises including, without limitation, all rents, royalties, credits and profits derived from wind energy and the wind resources upon, over and across the Premises. "Wind energy purposes" means: wind resource evaluation (including use of SODAR or LIDAR technology) and determination of the feasibility of wind energy conversion on the Premises or on adjacent lands, including studies of wind speed, wind direction and other meteorological data; wind energy development; conversion of wind energy into electrical energy; collection and transmission of electrical energy converted from wind energy; and any and all other activities related to the foregoing. Without limiting the generality of the foregoing, Tenant's rights hereunder specifically include the right to:

5.1.1 Extract soil samples, perform geotechnical tests, and conduct such other tests, studies, inspections and analysis on the Premises as Tenant deems necessary, useful or appropriate in its sole discretion.

5.1.2 Construct, install, lay down, erect, improve, place, replace, remove, relocate and operate any and all improvements, machinery or equipment that Tenant deems necessary or desirable in connection with the uses described above, including, without limitation, the following (collectively, the "**Facilities**"): (a) one or more wind turbine energy generators, associated towers, related fixtures, equipment and improvements, including the appurtenant footings, support structures and towers ("**WTGs**"); (b) underground electrical and communications lines, collection and transmission equipment ("**Underground Collection Facilities**"); (c) aboveground electrical and communications lines between Tenant's substations and one or more points of interconnection with the existing electricity grid ("**Aboveground Collection Facilities**"); (d) power conditioning equipment, substations, interconnection facilities, switching facilities, operations and maintenance buildings, transformers, SCADA and telecommunications equipment; and (e) roads, gates, signs, fences, meteorological towers, renewable energy measurement equipment, maintenance yards and other related facilities, machinery, equipment and improvements. Aboveground Collection Facilities are not allowed between individual WTGs and Tenant's substations, except to the extent it would be

commercially unreasonable to install such facilities underground due to topographical or geological conditions of the Premises.

5.1.3 Allow rotor blades of WTGs installed on adjacent land to overhang on the Premises.

5.1.4 Capture, use and convert the unobstructed wind resources over and across the Premises.

5.1.5 Generate electromagnetic, audio, flicker, visual, view, light, noise, vibration, air turbulence, wake, electrical, radio interference, shadow or other effects attributable to the Facilities or any other operational or development activities.

5.1.6 Undertake any other activities, whether accomplished by Tenant or third parties authorized by Tenant, that Tenant reasonably deems necessary, useful or appropriate to accomplish the development and operation of the Facilities, provided that such activities are conducted in a manner consistent with customary industry practices.

5.2 **Solar Development.** During the Term, Tenant shall have the right to evaluate the solar energy development potential of the Premises. For so long as this Lease is in effect, Landlord may lease the Premises, or a portion thereof, for solar energy purposes to any third party, provided that: (a) the development and operation of a solar energy facility on the Premises does not affect Tenant's development, operation and maintenance of the Project, as reasonably determined by Tenant; and (b) prior to entering into any solar energy lease or similar contract or arrangement with any third party, Landlord shall first offer to lease the subject property to Tenant for solar energy purposes on the same terms and conditions offered by such third party. However, Landlord shall have no obligation to offer to lease the subject property to Tenant for solar energy purposes if at that time Tenant is in default hereunder beyond expiration of any applicable cure period. If Landlord believes it has no obligation to offer to lease due to a default by Tenant, Landlord shall so notify Tenant in writing, and allow Tenant an additional ten (10) business days thereafter to cure the subject default and preserve its right of first refusal to lease the subject property for solar energy purposes. If Tenant fails to accept Landlord's offer to lease the subject property within thirty (30) days after receipt by Tenant of notice thereof, then Landlord shall have the right for one year thereafter to enter into a lease on terms no more favorable to the tenant thereunder than as set forth in Landlord's offer to Tenant pursuant to this Section 5.2. If Landlord does not enter into such a lease within the one year period, any offer shall be submitted again to Tenant as provided above.

5.3 **Substations and O&M Buildings.** Prior to installation of any substations or operations and maintenance buildings on the Premises as part of the Facilities, Tenant shall, at its option, either: (a) enter into a separate agreement with Landlord to additionally compensate Landlord for the use of the site; or (b) purchase the site from Landlord, in which case the purchase price shall be the fair market per-acre agricultural land value of the site, multiplied by three (3). Any and all costs associated with partitioning the site from the remainder of the Premises shall be borne by Tenant; however, Landlord shall cooperate in such efforts at no out-

of-pocket cost to Landlord. If Landlord and Tenant cannot in good faith agree on any compensation required under this Section 5.3, the amount of compensation shall be resolved as provided in Section 14.9.

5.4 Ownership of Facilities. Tenant shall at all times retain title to the Facilities and shall have the right to remove them from the Premises at any time. Landlord shall have no ownership, lien, security or other interest in any Facilities installed on the Premises and Landlord expressly waives, relinquishes and quitclaims any lien or security interest in and to the Facilities or any other real or personal property of Tenant, whether arising at law or in equity. Landlord shall not have any ownership or other interest in any and all credits, tax credits, benefits, emissions reductions, offsets and allowances of any kind, howsoever entitled, attributable to the Facilities, nor to the electric energy, capacity or other products produced therefrom. The manner of operation of the Facilities is within the sole discretion of Tenant. Nothing in this Lease shall be construed as requiring Tenant to construct or operate Facilities or any other business or use on the Premises.

5.5 Compliance with Law. Tenant shall at all times and at its expense comply in all material respects with all valid laws, ordinances, statutes, orders and regulations of any governmental agency (collectively, "Laws") now or hereafter applicable to its use of the Premises, provided that Tenant shall have the right to contest the validity or applicability to the Premises or to the Facilities of any Law so long as Landlord is reasonably protected against any adverse impact to its interest in the Premises that could foreseeably result from such contest.

5.6 Right of Access. Tenant shall have the right of access over and across all portions of the Premises, and any adjacent property owned by Landlord, as reasonably necessary to use the Premises as permitted by this Lease and to develop and operate the Project. Before constructing any new roads on the Premises, Tenant shall consult with Landlord as to the proposed location of the roads and consider the Landlord's comments in good faith, but the final location of any new roads shall be determined by Tenant in its sole discretion.

5.7 No Warranty of WTGs. Tenant has not made and does not make any representations or warranties regarding the likelihood that Tenant will install Facilities on the Premises. Landlord acknowledges that the operation of any Facilities actually installed on the Premises is subject to adverse weather, lack of wind or sun, equipment failures and other events beyond the control of Tenant.

5.8 Quiet Enjoyment. As long as Tenant observes the terms and conditions of this Lease, it shall peaceably hold and enjoy the rights of Tenant hereunder and any and all other rights granted by this Lease for its entire term without hindrance or interruption by Landlord or any other person or persons.

6. RENT AND OTHER PAYMENTS.

6.1 Payment of Rent Generally. All rent payments shall be made to Landlord at Landlord's address set forth in Section 17.2 below. Tenant shall not be required to make any rent

payment to Landlord under this Lease until such time as Landlord has returned to Tenant a completed and executed Internal Revenue Service Form W-9. Further, all payments issued hereunder will be paid to the Landlord, as set forth in this Lease, or its permitted successors and assigns. If Landlord is comprised of more than one person or entity, then all payments will be issued by a single check payable to all such persons or entities, unless otherwise indicated below. Each person or entity holding record title to the Premises hereby acknowledges and agrees that all payments are legally permitted to be made as set forth below and that no other party shall have any right to such payments or to contest the payments and allocations as set forth below. Each person receiving payment hereunder agrees to fully indemnify and hold harmless Tenant against claims by any third party in connection with its payments hereunder to the person/entities set forth herein. Check one below:

A single check should be issued payable to all persons/entities comprising the Landlord.

Separate checks should be issued to each Landlord as set forth below:

Owner:	Name 1	Name 2	Name 3	Name 4
Payment Allocation:	[]%	[]%	[]%	[]%

6.2 Payments During the Development Period. During the Development Period, Tenant shall pay the Development Rent specified in Section 1.7. Payment shall be due within sixty (60) days after the Effective Date and within thirty (30) days after each anniversary of the Effective Date during the Development Period. If the Development Period ends on any day other than an anniversary of the Effective Date, Development Rent already paid for periods of time after termination of the Development Period shall be applied to payments due during the Operations Period.

6.3 Construction Impact Fees. Tenant shall pay Landlord a Construction Impact Fee in the amount specified in Section 1.8 for each WTG installed on the Premises by Tenant. Each Construction Impact Fee shall be paid fifty percent (50%) upon commencement of construction of the first WTG within the Phase that includes the Premises, with the balance due on the Commercial Operations Date for that Phase.

6.4 Operating Rent. Commencing on the first day of the Operations Period, Tenant shall annually pay Landlord "**Operating Rent**" as set forth in Section 1.9. Payment of Operating Rent shall be due within thirty (30) days after the first day of the Operations Period and each anniversary thereof.

6.5 Taxes and Assessments. Tenant shall pay any increase in the real property taxes levied against the Premises directly attributable to the installation of Facilities on the Premises. Tenant shall not be liable for taxes attributable to facilities installed by Landlord or others on the

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Premises or to the underlying value of the Premises itself. Landlord and Tenant shall cooperate in an effort to have Tenant separately billed for its share of taxes; however, if such arrangement cannot be made, then Landlord shall submit the real property tax bill to Tenant within ten (10) days after Landlord receives the bill, and Tenant shall pay its share of the taxes to Landlord no later than ten (10) days prior to the date the taxes are due. If Landlord does not pay its share of taxes on the Premises in a timely manner, Tenant shall be entitled (but not obligated) to make payments in fulfillment of Landlord's tax obligations and may offset those payments against future payments due Landlord under this Lease.

6.6 Tenant's Right to Contest Taxes. Tenant shall have the right to contest the legal validity or amount of any taxes payable by Tenant hereunder and may institute such proceedings as it considers necessary, at its own cost. If the contest poses a reasonable risk of loss, forfeiture, or imposition of a penalty on Landlord, then Tenant shall, at Tenant's option, post sufficient financial assurance or provide Landlord with a reasonably satisfactory indemnity against such risks. Landlord shall render to Tenant all reasonable assistance, at no cost or expense to Landlord, in pursuing any tax contest, including joining in the signing of any protest or pleadings which Tenant reasonably deems advisable; provided, however, that Tenant shall reimburse Landlord for its reasonable attorney fees and other expenses actually incurred in connection with providing such assistance.

6.7 Conservation Reserve Programs. Landlord has disclosed to Tenant all portions of the Premises, if any, that are currently enrolled in the USDA Conservation Reserve Program or any substantially similar local, state or federal program for the preservation of agricultural land (any such program, "CRP") as of the Effective Date. Landlord shall cooperate (at no out-of-pocket cost to Landlord) in any effort by Tenant to remove all or a portion of any such land from the CRP as needed for construction, operation and maintenance of the Project. Upon removal from CRP of any portion of the Premises that is enrolled in CRP as of the Effective Date, Tenant shall reimburse Landlord for any penalties or reinstated taxes resulting from such removal, but shall not be obligated to reimburse Landlord for any future CRP payments that would otherwise have been made to Landlord after the date of removal. After the Effective Date, Landlord shall not enroll any portion of the Premises in CRP without Tenant's consent, not to be unreasonably withheld.

6.8 Inflation Adjustments. Each component of Operating Rent shall increase by the Inflation Adjustment Factor set forth in Section 1.11, starting on the first January 1 during the Operations Period and each January 1 thereafter during the Term. For example, if (a) the Inflation Adjustment Factor is 2.0%, and (b) the WTG Payment is \$1,000 per MW of installed nameplate capacity, then on the next adjustment date hereunder, the WTG Payment shall increase to \$1,020 ($\1000×1.02) per MW of installed nameplate capacity.

7. IMPROVEMENTS TO THE PREMISES.

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7.1 Mechanics Liens. Tenant shall pay when due all claims for labor and material furnished to the Premises, and shall not permit any mechanic's, materialmen's, contractor's, or other claims of liens (collectively "Liens") arising from any construction, maintenance, repair, or alteration of improvements by Tenant to be enforced against the Premises or any part thereof. Tenant may, however, in good faith and at Tenant's own expense, contest the validity of any asserted Lien, provided that Tenant has, at Tenant's option, bonded against the Lien pursuant to applicable law or provided Landlord with an indemnity against enforcement of the Lien in a form reasonably satisfactory to Landlord. Tenant shall give Landlord at least twenty (20) days prior written notice of the commencement of any work on the Premises that could be the subject of a Lien, and Landlord shall have the right to record and post notices of non-responsibility for the work.

7.2 Landlord's Right to Discharge Lien. If Tenant fails to comply with Section 7.1 and a Lien is enforced against the Premises as a result, Landlord shall have the right, but not the obligation, upon ten (10) business days notice to Tenant, to pay or otherwise discharge, stay, or prevent the execution of any such Lien. Tenant shall reimburse Landlord for all sums paid by Landlord under this Section 7.2, together with interest thereon at the Default Rate and all of Landlord's reasonable attorney fees and costs incurred in connection with the Lien.

7.3 Maintenance of Premises. On completion of construction, Tenant shall restore all portions of the Premises temporarily disturbed by Tenant to a condition substantially similar to the condition that existed prior to construction, to the extent such restoration is commercially reasonable. Tenant shall reseed any areas that were vegetated prior to disturbance to commercially reasonable standards, in consultation with Landlord. Throughout the Term, Tenant shall, at Tenant's sole cost and expense, maintain the Facilities in good condition and repair, ordinary wear and tear excepted, and in accordance with all applicable Laws.

7.4 Transmission and Collection Lines. All underground transmission and collection lines on the Premises shall be buried at least three (3) feet below the surface or below any existing drainage tiles, to the extent practicable, and all overhead transmission lines shall satisfy the minimum height requirements of any applicable electrical or building code.

7.5 Erosion and Weed Control. Tenant shall, at its sole cost and expense, take commercially reasonable steps to mitigate erosion and control noxious weeds within one hundred (100) feet of the Facilities, along roads built by Tenant, and on any other portions of the Premises where the surface of the land has been disturbed by Tenant. If Tenant fails to control noxious weeds as required by this Section 7.5, then Landlord may upon ten (10) days prior written notice to Tenant assume responsibility for the implementation of all weed control measures, and Tenant shall reimburse Landlord for all reasonable weed control measures at the rates published by the County agency with responsibility for weed control.

7.6 Roads. Tenant shall post any roads it constructs on the Premises as private roads only for use by authorized personnel in connection with the Facilities. Landlord may use or cross (or permit the use or crossing of) such roads only to the extent such use or crossing does not interfere with Tenant's operations pursuant to this Lease or enjoyment of Tenant's rights

hereby granted. Landlord shall reimburse Tenant for the cost to repair any damage to Tenant's roads caused by Landlord or those using the roads with Landlord's permission.

7.7 Crop/Livestock Damage. Tenant shall reimburse Landlord (or, if requested by Landlord, Landlord's agricultural tenants) for each incident of damage to cropland, crops and livestock caused by Tenant's construction, operation and maintenance of Facilities on the Premises as follows:

7.7.1 At \$30 per acre for any land that does not have growing crops and yet has been cultivated for the purpose of growing crops within the prior three (3) growing seasons;

7.7.2 For land with growing crops, an amount equal to the fair market price multiplied by yield multiplied by percentage of damage multiplied by acreage damaged or destroyed. Prices for damaged or destroyed crops shall be based on the average price for that crop in the County during the prior crop year. Yield shall be the average of the previous three (3) seasons' yields according to Landlord's records for the land area that includes the damaged area, provided that the yield shall not exceed the County average yield for the same crop by more than twenty-five percent (25%).

7.7.3 For any land determined to have significant soil compaction directly caused by Tenant's activities on the Premises, an amount equal to quadruple the value calculated under Section 7.7.2 ("**Cropland Compaction Rate**"), except that Tenant shall have the right to decompact such areas before any payments are due, and to complete such decompaction within three (3) months of final construction of the Facilities on the Premises, in which event no amounts shall be payable under this Section 7.7.3.

7.7.4 For livestock, an amount equal to the average market price in the County for each head of livestock lost in the year in which the loss occurred.

7.7.5 The remedies provided in this Section 7.7 shall be the exclusive remedy for damages to cropland, crops or livestock caused by construction, operation and maintenance of Facilities on the Premises. Landlord and Tenant acknowledge that this liquidated remedy is appropriate because of the difficulty and expense of fixing actual, direct damages for such losses. Except as expressly set forth in this Section 7.7, Tenant shall not be responsible to compensate Landlord or its agricultural tenants for soil compaction, its inability to grow crops, raise livestock or otherwise use the Premises as a result of the construction, maintenance or operation of the Facilities on the Premises.

7.7.6 If Landlord and Tenant cannot agree in good faith on yields, prices or the extent of soil compaction for purposes of calculating the payments required under this Section 7.7, the matters shall upon mutual agreement of Landlord and Tenant be referred to an independent crop insurance adjuster for resolution, or if Landlord and Tenant cannot so agree then as provided in Section 14.9.

7.8 Gates and Fences. Tenant shall keep all gates on the Premises closed except when open to permit the passage of vehicular traffic, and shall not permit livestock to stray or

escape through the gates at any time. Tenant and Landlord may maintain separate locks on all gates such that either lock is capable of unlocking a given gate. When relocating an existing fence, Tenant shall pay for the cost of relocation, and also shall obtain Landlord's prior consent on the new location of the fence, not to be unreasonably withheld. When installing a gate within an existing fence, Tenant shall make fence cuts, braces, and repairs that will be permanent and remain functional for the remaining expected life of the fences of which they are part. Tenant shall have the right to install cattle guards in lieu of gates with the consent of Landlord, not to be unreasonably withheld. Within ten (10) days after written notice from Landlord of any problem with a gate, cattle guard or fence installed or maintained by Tenant, Tenant shall make adequate repairs, weather permitting; provided, however, that in the event Landlord reasonably deems it necessary to make repairs without notice to Tenant because of the imminent escape or loss of livestock, then Landlord may do so and shall be reimbursed by Tenant for the reasonable and actual out-of-pocket costs incurred by Landlord.

7.9 Drainage Tiles. Tenant shall repair or replace any drainage tiles on or under the Premises damaged by Tenant during construction or operation of the Project.

8. LANDLORD'S REPRESENTATIONS AND COVENANTS.

8.1 No Interference. Landlord shall not cause nor permit any restriction or interference with: (a) the siting, permitting, construction, installation, maintenance, operation, replacement, or removal of Project Facilities; (b) the flow of wind, wind speed or wind direction over the Premises; (c) the amount, intensity, or duration of sunlight reaching the Project Facilities; (d) access over the Premises to Project Facilities; or (e) any other activities of Tenant permitted under this Lease. Clause (b) above shall apply at all times in a three-hundred sixty degree (360°) radius from each WTG on the Premises to the boundaries of the Premises, and in a one-hundred eighty degree (180°) vertical arc above each WTG.

8.2 Trees, Structures and Improvements. Section 8.1 notwithstanding, all trees, structures and improvements on the Premises as of the Effective Date shall be allowed to remain and Tenant may not require their removal. After the Effective Date, Landlord may install new trees, structures and improvements on the Premises that are less than sixty (60) feet in height and at least five hundred (500) feet from the base of any WTG without Tenant's consent; provided, however, that if construction of Facilities on the Premises is not yet complete then Landlord shall first consult with Tenant to ensure that the new tree, structure or improvement is not within five hundred (500) feet of any planned WTG. Any new trees, structures and improvements on the Premises after the Effective Date that either exceed sixty (60) feet in height or are proposed to be within five hundred (500) feet of the base of an existing or planned WTG shall require Tenant's prior written consent, not to be unreasonably withheld.

8.3 Legal Requirements. Landlord shall, at no out-of-pocket cost to Landlord, assist and fully cooperate with Tenant in complying with or obtaining any and all Laws, land use permits and approvals, tax-incentive or tax-abatement program approvals, building permits, environmental impact reviews or any other approvals required or deemed desirable by Tenant in connection with the development, financing, sale, construction, installation, replacement,

relocation, maintenance, operation or removal of the Project and/or Facilities, including execution of applications for such approvals and delivery of requested information and documentation. Nothing herein shall prevent Landlord from expressing its opinion or appearing at any public proceeding and providing information to any government agency; provided, Landlord may only oppose Tenant's projects if and to the extent Tenant has breached this Lease beyond the expiration of any applicable cure periods.

8.4 Reclassification of Premises. Landlord shall not take or agree to any action that could potentially cause a rezoning or reclassification of the Premises resulting in Tenant's use of the Premises pursuant to this Lease being: (a) nonconforming, (b) prohibited, or (c) a conditional use if Tenant's use was not a conditional use as of the Effective Date, unless Landlord has Tenant's prior written consent which Tenant may withhold in its sole discretion.

8.5 Representations and Warranties. Landlord (and each person or entity comprising Landlord, if applicable) represents and warrants to Tenant as follows:

8.5.1 Landlord is the sole owner of the Premises and has the unrestricted right and authority to execute this Lease and to grant to Tenant the rights granted hereunder. Each person signing this Lease on behalf of Landlord is authorized to do so, and all persons having any ownership or possessory interest in the Premises have signed this Lease as Landlord. When signed by Landlord, this Lease constitutes a valid and binding agreement enforceable against Landlord in accordance with its terms and shall run with the land.

8.5.2 No rights to convert the renewable resources of the Premises or to otherwise use the Premises for renewable energy purposes have been granted to or are held by any party other than Tenant, nor shall Landlord grant such rights in the future without the written consent of Tenant, which Tenant may withhold in its sole discretion.

8.5.3 Landlord shall not violate, and shall indemnify and hold Tenant harmless for, from and against any violation or claimed violation (past, present or future) by Landlord or by persons on the Premises with Landlord's permission of any federal, state or local law, ordinance or regulation relating to the generation, manufacture, production, use, storage, release or threatened release, discharge, disposal, transportation or presence of any substance, material or waste which is now or hereafter classified as hazardous or toxic, or which is regulated under current or future federal, state or local laws or regulations (collectively, "**Hazardous Materials**") on or under the Premises.

8.6 Information About Premises. Within sixty (60) days after the Effective Date, Landlord shall provide Tenant with copies of any surveys, studies, reports, appraisals, investigations, information regarding ownership or control of mineral rights to the Premises (if not owned or controlled by Landlord), or other documents concerning the Premises in Landlord's possession.

8.7 Condition of Title. Except as expressly set forth in this Lease, Landlord makes no representation or warranty concerning the condition of title to the Premises. However,

Landlord shall use its best efforts to cause any person or entity (including without limitation Landlord or any person or entity comprising Landlord) with a lien, encumbrance, mortgage, lease or other exception to Landlord's fee title to the Premises, whether recorded or unrecorded, to enter into nondisturbance, subordination and other title curative agreements as requested by Tenant in its sole discretion. If Landlord and Tenant are unable to obtain such agreements from any person or entity holding an interest in the Premises, and Landlord defaults on its obligations to such holder, then Tenant shall be entitled (but not obligated) to fulfill Landlord's obligations to such holder and may offset the cost of doing so against future payments due Landlord under this Lease. Landlord also shall provide Tenant with any further assurances and shall execute any estoppel certificates, consents to assignments or additional documents that may be reasonably necessary for recording purposes or otherwise reasonably requested by Tenant. After the Effective Date, Landlord shall not create or suffer any lien or encumbrance against the Premises unless the holder thereof enters into a nondisturbance or similar agreement in a form reasonably acceptable to Tenant, which protects and preserves all of Tenant's rights hereunder in the event of a foreclosure.

8.8 Indemnity. Landlord shall defend, indemnify and hold Tenant harmless for, from and against any third-party claims, losses, liabilities, damages, costs or expenses, including reasonable attorney fees (collectively, "Claims"): (a) for physical damage to property and for physical injuries or death, to the extent caused by the operations, activities, negligence or willful misconduct of Landlord or persons on the Premises with Landlord's permission; and (b) arising out of or related to Landlord's breach of this Lease or the inaccuracy of any representation or warranty made by Landlord herein. The foregoing notwithstanding, Landlord's liability for persons on the Premises with Landlord's permission does not extend to hunting on the Premises pursuant to written permission to hunt as provided in Section 17.13.

9. TENANT'S REPRESENTATIONS AND COVENANTS.

9.1 Insurance. Throughout the Term, Tenant shall, at its expense, maintain: (a) a commercial general liability insurance policy in an amount not less than Five Million Dollars (\$5,000,000) of combined single limit liability coverage per occurrence, accident or incident, which has a commercially reasonable deductible; and (b) casualty loss insurance on the Facilities in amounts and as required by Tenant's lender(s), if any. Tenant shall have the right to use a qualified program of self-insurance to meet these requirements.

9.2 Indemnity. Tenant shall defend, indemnify and hold Landlord harmless for, from and against any third-party Claims: (a) for physical damage to property and for physical injuries or death, to the extent caused by the operations, activities, negligence or willful misconduct of Tenant or persons on the Premises with Tenant's permission; and (b) arising out of or related to Tenant's breach of this Lease or the inaccuracy of any representation or warranty made by Tenant herein. The indemnity provided by this Section 9.2 does not extend to Claims for damage to cropland, crops or livestock, which are governed solely by Section 7.7.

9.3 Hazardous Materials. Tenant shall not violate, and shall indemnify and hold Landlord harmless for, from and against any violation or claimed violation during the Term by

Tenant or persons on the Premises with Tenant's permission of any federal, state, or local law or ordinance or regulation relating to the generation, manufacture, production, use, storage, release, or threatened release, discharge, disposal, transportation, or presence of any Hazardous Materials on or under the Premises.

10. ASSIGNMENTS AND SUBLEASES.

10.1 **Tenant's Right to Transfer.** Tenant and any Transferee (as defined below) shall have the right throughout the Term to transfer, convey, sublease or assign this Lease or any interest in this Lease or the Facilities to any person or entity (a "Transferee") without the consent of Landlord. A Transferee also includes any person or entity acquiring an interest in the Lease or the Facilities by foreclosure or a conveyance in lieu of foreclosure, and a Mortgagee as defined in Section 11.1. Upon receipt of written notice of any transfer under this Section 10.1 that includes contact information for the Transferee, Landlord shall thereafter provide the Transferee with simultaneous copies of any notices of default issued to any person or entity under this Lease.

10.2 **Liability of Assignor.** If the transfer, conveyance or assignment is of all of Tenant's interest in this Lease and the Transferee expressly agrees to be bound by and assumes all the terms and conditions of this Lease, then Tenant shall be released of any further obligation or liability under this Lease as of the date of transfer. No sublease shall relieve Tenant of any of its obligations or liabilities hereunder.

10.3 **Rights and Obligations of Transferees.** No Transferee shall have any obligation or liability under this Lease prior to the time that the Transferee directly holds an interest in the Lease or the Facilities, or in the case of an interest granted for security purposes, the holder thereof succeeds to absolute title to the interest. Except as otherwise expressly provided in this Lease, a Transferee shall be liable to perform obligations under this Lease only for and during the period the Transferee directly holds such interest or absolute title. Subject to Section 10.4, and provided that any Mortgagee (as defined in Section 11.1) shall also have the supplemental cure periods described in Section 11.4, Transferees shall be entitled to the same cure period (if any) granted to the defaulting party under this Lease. For any Transferee that holds an interest in less than all of the Tenant's rights and interests under this Lease or the Facilities, any default under this Lease shall be deemed remedied as to the Transferee's partial interest if the Transferee has cured its pro rata portion of the default, and thereafter Landlord shall not disturb the Transferee's possession of the Premises or enjoyment of its rights hereunder. However, any Transferee shall have the right, but not the obligation, to cure any default of any other holder of a portion of Tenant's interest in this Lease or the Facilities.

10.4 **Cure Requiring Possession of an Interest.** Notwithstanding Section 10.3 or Section 11.4, if any default under this Lease cannot be cured without obtaining possession of all or part of the Facilities or an interest in this Lease, then the default shall be deemed remedied if, within sixty (60) days after receiving notice of the default, the Transferee: (a) shall have acquired possession of the necessary interest, or shall have commenced and is diligently pursuing appropriate proceedings to obtain the same; and (b) performs all other obligations that are

capable of performance without being in possession of the Premises as and when due under this Lease during the pendency of any proceedings to gain possession and after gaining possession of the necessary interest. Further, a Transferee's deadline for any action under this Lease shall be extended to the extent the Transferee is prohibited from acting by any process or injunction issued as a result of any bankruptcy, reorganization, insolvency or other debtor-relief proceeding, provided that Transferee continues to perform all obligations under this Lease that are capable of performance during such process or injunction as they come due during the tolling period.

10.5 New Lease to Transferee. In the event of termination of this Lease for any reason, including without limitation foreclosure, conveyance in lieu of foreclosure, and rejection in any bankruptcy proceeding, any Transferee shall have the right to enter into a new lease with Landlord for the interest the Transferee held in the Premises prior to termination, on all the terms and conditions of this Lease and for the remainder of the Term as of the date of termination, and subject to any subleases existing as of the date of termination, provided that the Transferee: (a) is not then in default of this Lease; and (b) cures any existing default to the extent applicable to the Transferee's interest in the Lease or the Facilities (except that any defaults not susceptible of cure by the Transferee shall be deemed waived as to the Transferee). Any receipt of sublease rent by Landlord shall be for the account of the Transferee requesting a new lease. Any new lease shall maintain the same priority as to the Premises as this Lease. The provisions of this Section 10.5 shall survive termination of this Lease and shall continue in effect thereafter until execution and delivery of the new lease.

10.6 Landlord's Right to Assign. Except as set forth in Section 10.7, Landlord shall have the continuous right to assign or otherwise transfer its interest in and to this Lease and the underlying real property without the consent of Tenant; provided, however, that as a condition precedent to any transfer by Landlord, Landlord shall notify Tenant in writing of the transfer and the transferee shall first agree in writing to be bound by all the terms and conditions of this Lease.

10.7 Severance of Renewable Energy Rights. Landlord acknowledges that, as of the date of this Lease, the parties are aware of no legal authority either allowing or prohibiting the severance of the renewable energy rights from fee title to the underlying real property. Consequently, Landlord shall not assign or otherwise transfer an interest in the renewable energy rights to the Premises, or a portion thereof, separate from fee title to such real property, without Tenant's consent which Tenant may withhold in its sole discretion unless Landlord demonstrates to Tenant's reasonable satisfaction that such severance is permitted by applicable law and shall not materially affect Tenant's rights under this Lease, in which case Tenant shall consent to the severance. Further, notwithstanding Tenant's consent to any severance, Landlord assumes all risk that the severance of the renewable energy rights from fee title is invalid, and shall jointly and severally indemnify and hold Tenant harmless from and against any and all claims, losses, liabilities, damages, costs or expenses arising out of or related to the purported severance of renewable energy rights and fee title. Such indemnity shall survive any further conveyance of the renewable energy rights and/or fee title to the Premises or a portion thereof.

11. LENDER PROTECTION.

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11.1 Right to Mortgage. Tenant or any Transferee may without the consent of Landlord transfer an interest in this Lease or the Facilities to any third party (a "**Mortgagee**") for security purposes, whether by mortgage, deed of trust, security agreement or otherwise (a "**Mortgage**"). As long as any Mortgage is in effect, the Mortgagee shall be entitled to the protections of this Section 11. Mortgagees shall include the successors and assigns, if any, of any original Mortgagees.

11.2 Consent to Modification or Termination. For the benefit of each Mortgagee, Landlord shall not, without the prior written consent of each Mortgagee amend, modify, or take any action consenting to or accepting the voluntary surrender or termination of this Lease by Tenant or any Transferee. This Lease shall not be terminated by Landlord as a result of any Tenant or Transferee default unless all Mortgagees have first been provided with notice and the opportunity to cure any such default in accordance with the provisions of this Lease.

11.3 Right to Perform. A Mortgagee shall have the right (but not the obligation) to perform any term, covenant, condition, or agreement and to remedy any default by Tenant or any Transferee hereunder, and Landlord shall accept such Mortgagee performance, payment and cure as if such performance had been made, done and performed by Tenant or any Transferee.

11.4 Extended Cure Periods. All cure periods provided to Tenant or a Transferee for a default under this Lease shall be extended for any Mortgagee: (a) by thirty (30) days if the default is a failure to pay money when due under this Lease; or (b) by ninety (90) days in the event of any other default. Nothing in this Section 11.4 modifies a Mortgagee's rights under Section 10.4, to the extent that Section applies.

11.5 Foreclosure and Conveyance after Foreclosure. A Mortgagee or its assigns may enforce its lien and acquire title to the Tenant's or Transferee's interest in the Lease in any lawful way and, pending foreclosure of such lien, the Mortgagee may take possession of Tenant's or Transferee's interest in this Lease and operate the Facilities, performing all obligations performable by Tenant or Transferee subject to all of the terms of this Lease. Any default not susceptible of being cured by the Mortgagee or party acquiring the Tenant's or Transferee's interest in the Lease shall be, and shall be deemed to have been, waived by Landlord upon completion of the foreclosure proceedings or acquisition of Tenant's or Transferee's interest in this Lease by any purchaser (who may, but need not be, Mortgagee) at the foreclosure sale, or who otherwise acquires the Tenant's or Transferee's interest in the Lease from the Mortgagee or by virtue of a Mortgagee's exercise of its remedies. Upon the sale or other transfer of an interest in this Lease or the Facilities acquired pursuant to foreclosure or conveyance in lieu of foreclosure, the Mortgagee shall have no further liabilities or obligations under this Lease.

11.6 Impact of Bankruptcy. Neither the bankruptcy nor the insolvency of Tenant or any Transferee shall be grounds for terminating this Lease or an interest therein, as long as the rent and all other monetary charges payable by Tenant or the Transferee are paid by a Mortgagee as required by this Lease.

11.7 **New Lease.** If more than one Mortgagee requests a new lease pursuant to Section 10.5, then Landlord shall enter into a new lease with the most senior Mortgagee.

11.8 **Minor Modifications of Lease Terms.** If requested by a Mortgagee, Landlord shall modify the Lease to include any supplemental Mortgagee protection provisions reasonably requested by the Mortgagee, provided such provisions do not impair Landlord's rights or increase the burdens or obligations of Landlord.

12. DEFAULT AND REMEDIES.

12.1 **Default.** Subject to any applicable notice and cure rights set forth in this Lease, the occurrence of any of the following events shall constitute a default and a breach of this Lease:

12.1.1 Either Tenant or Landlord fails to perform as required by any representation, warranty, covenant, term, or condition of this Lease;

12.1.2 Tenant files a petition in bankruptcy or insolvency or for reorganization or arrangement under the bankruptcy laws of the United States or insolvency act of any state, or is dissolved, or involuntary proceedings under any bankruptcy laws or insolvency act or for the dissolution of Tenant are instituted against Tenant; or

12.1.3 Tenant fails to make any payments required by this Lease when due.

12.2 **Notice of Default and Cure.** Notwithstanding Section 12.1, no party shall be in default under this Lease unless: (a) with respect to a failure to pay any rent, charges, or other amounts due and payable hereunder, Tenant fails to cure the default within sixty (60) days from receipt of notice from Landlord in writing that such amounts are due; (b) with respect to a default under Section 12.1.2, the petition is not dismissed within sixty (60) days of filing; or (c) with respect to any other default, the defaulting party fails either to cure the default within one hundred twenty (120) days after notice thereof or, if the failure to perform is such that it cannot reasonably be cured within one hundred twenty (120) days, to commence cure within the one hundred twenty (120) day period and to proceed diligently to cure the default in a manner reasonably acceptable to the other party.

12.3 **Remedies - Landlord.** In the event of any default by Tenant, and subject to any notice rights after the expiration of any applicable cure periods provided for in this Lease, Landlord shall have the following remedies, in addition to all other rights and remedies provided by law or equity:

12.3.1 Landlord may continue this Lease in effect as long as Landlord does not terminate Tenant's right to possession, and Landlord shall have the right to collect rent when due, plus interest on any unpaid sums at the Default Rate.

12.3.2 Landlord may cure any default by Tenant after Tenant's cure period has expired. If Landlord, at any time, by reason of Tenant's default, pays any sum or does any act

that requires the payment of any sum, the sum paid by Landlord shall be due and owing immediately from Tenant to Landlord as additional rent hereunder, together with any interest thereon at the Default Rate.

12.3.3 If Tenant does not cure a default in the payment of money within sixty (60) days after written notice thereof from Landlord, or in the case of any other default within one hundred twenty (120) days of such notice, then Landlord may by written notice to Tenant terminate this Lease. Landlord may not terminate this Lease or Tenant's right to possession of the Premises except as set forth in this Section 12.3.3. Upon termination Tenant shall restore the Premises as required by Section 16.2.

12.4 Remedies - Tenant. In the event of any default by Landlord of Landlord's duties, obligations, or covenants hereunder, Tenant may, in addition to all other rights and remedies provided by law or equity, terminate this Lease by written notice to Landlord and payment to Landlord of any payments then due and unpaid under this Lease.

13. FORCE MAJEURE.

13.1 Defined. An "Event of Force Majeure" includes without limitation flood, drought, earthquake, storm, fire, pestilence, lightning, or other natural catastrophe, unusually inclement weather, including but not limited to rain which falls earlier in the year, or in greater amounts, or for longer periods than has historically been experienced in the area of the Premises, epidemics, acts of God or the public enemy, war, riot, civil disturbance or disobedience, strike, labor dispute, delays by third parties in the delivery of materials to the Premises, expropriation or confiscation of facilities, changes of applicable law, compliance with any order of any governmental authority, or failure, threat of failure or sabotage of facilities which have been maintained in accordance with good industry engineering and operating practices, so long as the affected party makes good faith and reasonable efforts to remedy the delays or failures in performance caused thereby.

13.2 Limitations. The parties shall be excused for any delay or failure to perform their respective duties hereunder, except for obligations to pay money, only to the extent that such failure or delay is caused by an Event of Force Majeure. If an Event of Force Majeure causes a delay or failure in performance of only a portion of the obligations of a party under this Lease, then only that portion of performance which was delayed or prevented by such cause shall be deemed excused, and the performance of all other obligations of a party not so delayed shall not be excused. No such delay or failure in performance which is the result of an Event of Force Majeure shall be deemed excused for a period longer than the delay or failure in performance caused by such event.

14. LEGAL MATTERS.

14.1 Attorney Fees. In the event of any litigation, arbitration or alternative dispute resolution to interpret or enforce the provisions of this Lease, including any appeal, the prevailing party or parties in such litigation, arbitration or alternative dispute resolution shall be

entitled to reasonable attorney fees, expert witness fees, and costs as shall be fixed by the court or arbitrator.

14.2 Governing Law. This Lease shall be governed by and construed and enforced in accordance with the laws of the state in which the Premises are located.

14.3 Jurisdiction and Venue. Any action that may be instituted relating to this Lease shall be prosecuted in the federal courts of the state in which the Premises are located, to the extent federal jurisdiction is available. Landlord and Tenant each waive the right to object to the removal to federal court of any action instituted hereunder in state court, except on grounds of lack of federal jurisdiction.

14.4 Defense of Indemnity Claims. In connection with any indemnity provided under this Lease, the indemnifying party shall defend any Claims with legal counsel reasonably acceptable to the indemnified party.

14.5 Estoppel Certificates. Tenant or Landlord shall at any time upon not less than ten (10) days prior written notice from the other execute, acknowledge, and deliver a statement in writing: (a) certifying that this Lease is unmodified and in full force and effect (or, if modified, stating the nature of such modification and certifying that this Lease, as so modified, is in full force and effect) and the date to which the rent and other charges are paid in advance, if any; and (b) acknowledging that there are not to the certifying party's knowledge any uncured defaults on the part of the other party hereunder or specifying such defaults, if any are claimed. Any such statement may be conclusively relied upon by any prospective purchaser or encumbrancer of the Premises or encumbrancer of the interest of Tenant hereunder. A party's failure to deliver such statement within such time shall be conclusive upon such party: (i) that this Lease is in full force and effect without modification, except as may be represented by the party requesting the certificate, and (ii) that there are no uncured defaults in the requesting party's performance.

14.6 Waiver of Subrogation. Landlord and Tenant each hereby waive any and all rights of recovery against the other, or against the officers, employees, agents or representatives of the other, for loss of or damage to its property or the property of others under its control, if such loss or damage is covered by any insurance policy in force (whether or not described in this Lease) or required to be in force at the time of the loss or damage. Upon obtaining the required policies of insurance, Landlord and Tenant shall give notice to their respective insurance carriers of this mutual waiver of subrogation.

14.7 Jury Trial Waiver. EACH OF THE PARTIES KNOWINGLY, VOLUNTARILY AND INTENTIONALLY WAIVES THE RIGHT TO A TRIAL BY JURY IN RESPECT OF ANY LITIGATION BASED ON THIS LEASE, OR ARISING OUT OF, UNDER OR IN CONNECTION WITH THIS LEASE, AND ANY AGREEMENT CONTEMPLATED TO BE EXECUTED IN CONJUNCTION HERewith, OR ANY COURSE OF CONDUCT, COURSE OF DEALING, STATEMENTS (WHETHER VERBAL OR WRITTEN) OR ACTIONS OF ANY PARTY HERETO. EACH OF THE PARTIES TO

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THIS LEASE WAIVES ANY RIGHT TO CONSOLIDATE ANY ACTION IN WHICH A JURY TRIAL HAS BEEN WAIVED WITH ANY OTHER ACTION IN WHICH A JURY TRIAL CANNOT OR HAS NOT BEEN WAIVED.

14.8 Waiver of Certain Damages. THE PARTIES' LIABILITY ARISING OUT OF OR RELATED TO THIS LEASE UNDER ANY LEGAL THEORY, WHETHER CONTRACT, TORT, STRICT LIABILITY, STATUTORY OR OTHERWISE, SHALL BE LIMITED TO DIRECT DAMAGES, AND IN NO EVENT SHALL LANDLORD, TENANT OR ANY OF THEIR RESPECTIVE OFFICERS, DIRECTORS, MEMBERS, PARTNERS, SHAREHOLDERS, EMPLOYEES, AGENTS OR AFFILIATES BE LIABLE FOR INDIRECT, EXEMPLARY, PUNITIVE OR CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER.

14.9 Arbitration of Certain Disputes. With respect to any provision of this Lease expressly identifying this Section 14.9 for the resolution of a dispute between Landlord and Tenant, the dispute shall be resolved by an arbitrator mutually acceptable to the parties. If the parties cannot agree on an arbitrator, then each party shall select an arbitrator, and the two arbitrators together shall select a third arbitrator to resolve the matter. The determination of the arbitrator shall be final and binding upon the parties. Landlord shall pay fifty percent (50%) and Tenant shall pay fifty percent (50%) of all costs of arbitration.

15. CONDEMNATION.

15.1 Complete Taking. If at any time during the Term of this Lease any authority having the power of eminent domain shall condemn all or substantially all of the interest of Tenant hereunder or the Facilities for any public use or otherwise, then the interests and obligations of Tenant under this Lease shall cease and terminate upon the earliest of: (a) the date of the condemnation judgment, (b) the date that the condemning authority takes physical possession of the interest of Tenant hereunder or the Facilities, and (c) the date that Tenant is, in its sole judgment, no longer able or permitted to operate the Project or the Facilities on the Premises in a commercially viable manner. Tenant shall continue to pay all amounts payable hereunder to Landlord until the termination date.

15.2 Partial Taking. If at any time during the Term of this Lease any authority having the power of eminent domain shall condemn less than substantially all of the Project or the interest of Tenant hereunder, then the interests and obligations of Tenant under this Lease as to such portion of the Project or the interest of Tenant hereunder so taken shall cease and terminate upon the earliest of: (a) the date of the condemnation judgment, (b) the date that the condemning authority takes physical possession of what is being condemned, and (c) the date that Tenant is, in its sole judgment, no longer able or permitted to operate the portion of the Project which is being condemned in a commercially viable manner, and, unless this Lease is terminated as hereinafter provided, this Lease shall continue in full force and effect as to the remainder of the Project on the Premises which can still be operated in a commercially reasonable manner. If the remainder of the Project or the interest of Tenant hereunder, in Tenant's sole judgment, is or

becomes insufficient or unsuitable for Tenant's purposes hereunder, then Tenant shall have the right to terminate this Lease in its entirety.

15.3 Apportionment; Distribution of Award. On any taking covered by Sections 15.1 or 15.2 above, all sums, including damages and interest, awarded shall be paid first to tenant in an amount equal to the aggregate of any costs or losses that Tenant may sustain in the taking, removal and/or relocation of the Facilities; and then to Landlord and/or Tenant consistent with the law of the state in which the Premises are located.

16. EXPIRATION OR TERMINATION.

16.1 Holding Over. This Lease shall terminate without further notice at the date of expiration of the Term. Any holding over by Tenant after expiration shall not constitute a renewal or extension of this Lease or give Tenant any rights in or to the Premises, except as set forth in Section 16.2.

16.2 Restoration of Premises. Upon expiration or termination of the Term, Tenant shall surrender and vacate the Premises within sixty (60) days; provided, however, that Tenant shall have a license to enter onto the Premises for eighteen (18) months following termination to: (a) remove or cause to be removed any and all Facilities from the Premises, except that any Facilities more than three (3) feet below the surface may be left in place, and Tenant shall leave in place any roads it constructed if requested to do so by Landlord and Tenant is not otherwise prohibited from doing so; (b) otherwise restore the Premises to substantially the same condition that existed on the Effective Date, to the extent it is commercially reasonable to do so; (c) reseed any areas that were vegetated prior to disturbance to commercially reasonable standards, in consultation with Landlord; and (d) implement commercially reasonable erosion control devices and procedures. If Tenant does not remove the Facilities and restore the Premises as required by this Section 16.2 within eighteen (18) months after termination, Landlord may do so and Tenant shall reimburse Landlord the reasonable and actual costs incurred by Landlord, less the salvage value of the Facilities, within thirty (30) days of receipt of an invoice from Landlord.

16.3 Removal Security. In the event that: (a) Tenant is not required to post a bond, letter of credit or similar financial assurance for decommissioning Facilities as a condition of approval from any governmental agency with jurisdiction over the Project; or (b) such a condition is imposed, but is then removed and any bond, letter of credit or similar financial assurance is actually released; then Tenant shall, on the fifteenth (15th) anniversary of the first day of the Operations Period or within one hundred and twenty days after release of the bond, letter of credit or similar financial assurance, whichever is later, post a bond, letter of credit or similar financial assurance to secure the cost of decommissioning the Facilities located on the Premises, in form and substance reasonably satisfactory to Landlord (the "**Removal Security**"). The Removal Security shall be equal to the estimated amount, if any (the "**Net Removal Costs**"), by which the cost of removing the Facilities exceeds the salvage value of such Facilities, to be determined by Tenant in its reasonable discretion. To the extent that the Net Removal Costs are zero (or negative), the Removal Security shall not be required; provided, however that Tenant shall re-evaluate the need for the Removal Security at least annually after

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the fifteenth (15th) anniversary of the first day of the Operations Period. Tenant shall not be required to deliver such Removal Security to Landlord if Tenant is in the process of repowering or otherwise redeveloping the WTGs on the Property with new WTGs (or commits in writing with notice to Landlord to do so within two (2) years after the fifteenth (15th) anniversary of the Operations Date). Once in place, Tenant shall keep the Removal Security in force throughout the remainder of the Term, provided that Tenant shall have the option at any time to obtain a single Removal Security in favor of Landlord and other landlords in the Project to secure the decommissioning of Project Facilities. Landlord may resort to the Removal Security to recover any reasonable and actual costs of removing the Facilities and restoring the Premises incurred by Landlord in accordance with Section 16.2.

17. GENERAL PROVISIONS.

17.1 Confidentiality. Landlord shall maintain in the strictest confidence, for the benefit of Tenant: (a) all the terms and conditions of this Lease; (b) all information provided by Tenant pursuant to this Lease; and (c) all information obtained by or about Tenant's site or product design, methods of operation, and methods of construction, regardless of its source; unless such information either: (i) is in the public domain by reason of prior publication through no act or omission of Landlord or its employees or agents; or (ii) was already known to Landlord at the time of disclosure and which Landlord is free to use or disclose without breach of any obligation to any person or entity ("**Confidential Information**"). Landlord shall not use Confidential Information for its own benefit, publish or otherwise disclose it to others, or permit its use by others for their benefit or to the detriment of Tenant. Notwithstanding the foregoing, Landlord may disclose Confidential Information to Landlord's lenders, attorneys, accountants and other personal financial advisors solely for use in connection with their representation of Landlord regarding this Lease or to any prospective purchaser of the Premises who has made a written offer to purchase or otherwise acquire the Premises that Landlord desires to accept; provided that in making such disclosure, Landlord shall advise the party receiving the information of the confidentiality of the information. Landlord may also disclose Confidential Information pursuant to lawful process, subpoena or court order requiring such disclosure, provided that Landlord shall give Tenant reasonable advance notice of the required disclosure and will cooperate with Tenant in limiting such disclosure and in obtaining protective orders where appropriate. Landlord shall get Tenant's written consent before issuing a press release or having any contact with or responding to the news media with any operational, sensitive or confidential information with respect to this Lease or the Project. The provisions of this Section 17.1 shall survive the termination or expiration of this Lease.

17.2 Notices. All notices or other communications required or permitted by this Lease, including payments to Landlord, shall be in writing and shall be deemed given when personally delivered, or in lieu of such personal service, five days after deposit in the United States mail, first class, postage prepaid, certified, or the next business day if sent by reputable overnight courier, provided receipt is obtained and charges prepaid by the delivering party. Notices also may be sent by e-mail or facsimile with proof of delivery, and shall be deemed given upon delivery. Any notice shall be addressed as follows:

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(i) To Landlord:

(ii) To Tenant:

Element Power Wind Development, LLC
c/o Land Administration
421 SW Sixth Avenue, Suite 1000
Portland, OR 97204

with a copy to any Transferee if required by this Lease.

Any party may change its contact information by written notice thereof to the other party.

17.3 Successors and Assigns. This Lease shall run with the land and shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns.

17.4 Waiver. No delay or omission by the parties hereto in exercising any right or remedy provided for herein shall constitute a waiver of such right or remedy, nor shall it be construed as a bar to or a waiver of any such right or remedy on any future occasion.

17.5 Effect of Headings, Terms. Headings appearing in this Lease are inserted for convenience of reference only and shall in no way be construed to be interpretations of the provisions hereof. The term "Tenant" herein includes any Transferee to the extent the Transferee has an interest in this Lease.

17.6 Amendments. This Lease may be modified, amended, or supplemented only by the mutual written agreement of the parties hereto consented to by all Mortgagees, if any.

17.7 Further Assurances. The parties shall do such further acts and things and execute and deliver such additional agreements and instruments as the other may reasonably require to consummate, evidence, or confirm the agreements contained herein.

17.8 Consent. Where rights under this Lease are conditioned upon the consent of one of the parties hereto, it shall not be unreasonably withheld, unless expressly stated otherwise.

17.9 Entire Lease. This Lease constitutes the entire agreement between the parties and supersedes all prior agreements and understandings, oral and written, between the parties hereto with respect to the subject matter hereof.

17.10 Counterparts. This Lease may be executed by the parties in one or more counterparts, all of which taken together shall constitute one and the same instrument.

17.11 **Time of Essence.** Time and strict and punctual performance are of the essence with respect to each provision of this Lease.

17.12 **Relationship of Parties.** The relationship of the parties hereto is solely that of landlord and tenant, and nothing contained in this Lease shall be construed to create an association, joint venture, trust or partnership between them.

17.13 **Hunting.** All hunting rights and privileges on the Premises are reserved to Landlord. None of Tenant, its employees, agents or invitees shall have any hunting rights or privileges on the Premises. Tenant, in its discretion, may establish zones around the improvements on the Premises within which hunting shall be absolutely prohibited. Tenant may require that hunting be suspended completely during certain periods designated by Tenant such as initial construction and erection and other periods of higher-than-usual levels of activity on the Premises. Landlord and Tenant may jointly prepare reasonable hunting rules, which either party shall have the right to enforce.

17.14 **Boundary Discrepancies.** It is possible that the as-built fence lines of the Premises may not precisely match the boundaries of the Premises described in this Lease, and that these fence lines could create one or more encroachments onto adjacent property which could potentially entitle Landlord to claim the additional property within the fence lines by adverse possession and therefore affect the rights of the Landlord, Tenant and the neighboring landowners. Consequently, in the event any such fence line encroachment exists with respect to the Premises, the boundary of the Premises described in this Lease is now and shall always be recognized as that which is subject to the terms and conditions set forth therein, as it pertains to the Project, and for no other purpose. Landlord agrees on behalf of itself, its heirs, successors or assigns that if Landlord were to acquire any property adjacent to the Premises via an adverse possession claim based on the existing fence line, Landlord waives: (a) any claim that any additional compensation is due to Landlord for improvements placed on the acquired property as part of the Project; and (b) any claim that the acquired property is not subject to any lease and other instruments for the Project executed by the record owner of the acquired property as of the Effective Date of this Lease; provided that the waiver is limited in scope and relates only to the terms and conditions in this Lease, and not for any other purpose. Landlord shall indemnify and hold harmless Tenant against any Claims asserted by any person or entity arising out of an encroachment of any kind onto property adjacent to the Premises as described in this Lease.

17.15 **Setback Waiver.** To the extent that any applicable law, ordinance, regulation or permit establishes minimum setbacks from the exterior boundaries of the Premises for Facilities (including WTGs) constructed on the Premises or adjacent real property, then Landlord waives any and all such setbacks and setback requirements for the benefit of Tenant, the owner(s) of the adjacent real property, and their respective successors and assigns. Further, if requested by Tenant, Landlord shall execute and deliver to Tenant one or more separate setback waivers in a form provided by Tenant, which Tenant may then record at its expense. This waiver shall survive the termination of this Lease for so long as WTGs or other Facilities exist on real property adjacent to the Premises.

17.16 **Memorandum of Lease.** Concurrently with execution hereof, the parties shall execute and record a memorandum of this Lease.

17.17 **Landlord as Public Official.** Landlord acknowledges that its receipt of monetary and other good and valuable consideration hereunder may represent a conflict of interest if Landlord is a government employee or otherwise serves on a governmental entity with decision-making authority (a "Public Official") as to any rights Tenant may seek, or as to any obligations that may be imposed upon Tenant in order develop and/or operate the Project ("**Development Rights**"). Accordingly, Landlord shall (a) recuse him/herself from all such decisions related to Tenant's Development Rights unless such recusal is prohibited by law or is not reasonably practicable considering the obligations of such Public Official's position; and (b) recuse him/herself from all such decisions related to Tenant's Development Rights if such recusal is required by law. If Landlord is not required pursuant to (a) and (b) above to recuse him/herself from a decision related to Tenant's Development Rights, Landlord shall, in advance of any vote or other official action on the Development Rights, disclose the existence of this Lease (but not the financial terms therein) at an open meeting of the relevant governmental entity Landlord serves on as a Public Official. Additionally, if Landlord is a Public Official and any of Landlord's spouse, child or other dependent has a financial interest in the Project, Landlord shall disclose such relationship (but not the financial terms thereof) at an open meeting of the relevant governmental entity Landlord serves on as a Public Official, prior to participation in any decision related to Tenant's Development Rights.

[signatures on following page]

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LANDLORD:

TENANT:

ELEMENT POWER WIND
DEVELOPMENT, LLC, a Delaware limited
liability company

By: Element Power US, LLC, a Delaware
limited liability company, Manager

By: _____

Its: _____

EXHIBIT A

LEGAL DESCRIPTION

<u>Parcel Number</u>	<u>County</u>	<u>Township/ Range</u>	<u>Section</u>	<u>Acreage</u>
----------------------	---------------	------------------------	----------------	----------------

Total

All that real property located in _____ County(ies), Wisconsin, more fully described as follows:

034640/00005/1790876v1

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Landowner:
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Ron Heuer Trust-Preliminary Setbacks

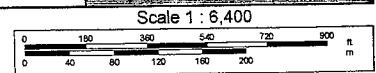


1,000' from participating home

Data use subject to license.

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www.delorme.com



Scale 1 : 6,400

1" = 533.3 ft

Data Zoom 15-0

**Kris Meixensperger
N8446 Cty. Rd. W
Malone, WI 53049**

I live in the Town of Taycheedah. Across the road from my home is the Town of Marshfield where a wind turbine industry was placed. One of the turbines from this group is 1009 feet from the front of my home.

The impact this turbine has on my life can be felt in many ways. First is the noise impact. In the summer I was able to open the windows and cool my home with the fresh air, in fact I didn't even have an air conditioner. Now I have to close my home and turn on an air conditioner causing my electric bills to increase tremendously. I also need to close my windows at night in summer in order to sleep. But, even shutting windows is no guarantee that I won't be awakened by the noise of the turbine.

The second way this turbine has negatively impacted my life is the shadow flicker. I could explain how debilitating this is, but unless you experience it, you can't really understand it (I know because I used to be one of these skeptics). I begged WE Energies to stop the turbine when this flickering occurs. I was told it could not/would not be done. Instead their solution is to buy room darkening shades for my home and they told me to close the shades when this occurs. I bought my own room darkening shades. When I close the shades I have a nearly completely darkened room. Am I supposed to sit in a dark room for a couple hours until the flickering stops? Or do I again use more electricity at my expense and turn on lights when it's completely bright outside?

If I weren't so upset about the turbine's affects, I'd be laughing at the irony of how the turbine causes me to use considerably more electricity when it was once unnecessary.

The turbine affects other areas of my life, my property value, TV and radio signals, phones, flashing red lights, etc. With all of these negative affects I was considering taking a loss on the property and just getting out – move away. In fact I held off doing remodeling to the home. The furnace did not work (I had no furnace for two years, I heated by burning wood and a small gas stove), windows were permanently sealed because they were literally falling apart, etc. But then, in March 2010 my well went bad. A problem that I've been told is not uncommon with the heavy construction affiliated

with placing turbines. Now it was too late for me to get out. With nearly \$8000 being spent on a new well, plus the property value loss, I could not afford to move.

These are the effects that I've experienced from just one turbine placed by my home. Now imagine two turbines, three turbines, or even four turbines placed within a short distance from a residence. The impact of one turbine is debilitating to a lifestyle... more than that, it becomes devastating

Please consider the impact of these multiple turbines being placed around people's homes, and the distance. And set a system that can eliminate shadow flicker on a home, monitor noise (reduce noise), and protect property owners' value.

TO THE JOINT COMMITTEE FOR REVIEW OF ADMINISTRATIVE RULES:

I AM A HOME OWNER IN MALONE WISCONSIN THE TOWNSHIP OF MARSHFIELD. I AM SURROUNDED BY THE WIND TOWERS ON THREE SIDES OF MY PROPERTY. I AM VERY MUCH IN FAVOR OF OUR COUNTRY TRYING TO CONSERVE ENERGY AND I HOPE THESE WIND TOWERS ARE ONE WAY OF DOING THIS, BUT FROM PEOPLE I HAVE SPOKEN WITH IN OTHER STATES THEY SAY THEY ARE NOT THE MOST FESIABLE WAY TO DO THIS BECAUSE OF COST TO NOT ONLY ERECT THEM BUT TO MAINTAIN THEM.

THESE ARE SOME OF MY CONCERNS:

#1. THEY ARE VERY NOISY THE WOSH WOSH SOUND ON A SUMMER NIGHT AND SOME TIMES DURING THE DAY IS NERVE WRACKING. I MOVED TO THE COUNTRY TO GET AWAY FROM ALL THE NOISE. AND WHAT I WAS TOLD THEY ARE SUPPOSE TO BE MONITORED FOR THEIR NOISE BUT AFTER ONE OF MY NEIGHBORS CHECKED THEIR NOISE OUTPUT THEY ARE MUCH NOISERER THAN THE RULE STANDARDS. IF I HAVE RULES I HAVE TO LIVE BY WHY DOSENT THE BIG ELECTRIC COMPANYS?

#2. PROPERTY VALUE: I HAVE SPOKEN WITH NUMEROUS REALATORS AND THEY ALL SAID THE TOWERS DEFINITELY BRING DOWN PROPERTY VALUES. I HAVE NOT SEEN A GREAT DROP IN MY PROPERTY TAXES TO ASSIST MY FAMILY IN HAVING TO PUT UP WITH ALL THE INCONVIENCES DUE TO THE TOWERS.

#3. ALL THE NEIGHBORS AROUND ME ARE GETTING FINANCEALLY REIMBURSED FOR HAVING THE TOWERS ON THEIR PROPERTY BUT I STILL HAVE TO LOOK AND LISTEN TO THEM AND AM GETTING NOTHING FOR ALL MY FAMILYS INCONVIENCE. NOT ONLY FROM THE NOISE BUT THEY DESECRATE THE ONCE BEAUTY OF OUR COUNTRYSIDE NOT ONLY DURING THE DAY BUT HAVING FLASHING RED LIGHTS BLINKING ALL NIGHT LONG.

#4. OUR TELEPHONE AND TELEVISION AND ALSO RADIO RECEPTION IS TERRIBLE BUT WE STILL HAVE TO PAY THOSE BILLS EACH MONTH AND GET POOR RECEPTION DUE TO THE TOWERS.

#5. THESE TOWERS WERE PUT UP IN A VERY SNEAKY WAY WITH NO HOME OWNER GETTING A CHANCE TO VOTE ON THEM. THE ENERGY COMPANY HAD NO CONCERNS FOR THE PROPERTY OWNERS AS LONG AS THEY MAKE THEIR MONEY. WHY DON'T THEY AT LEAST REINBURSE US PROPERTY OWNERS MONTHLY FOR OUR LOSSES OF NOT ONLY PROPERTY VALUES BUT ALL THE REST OF THE INCONVIENCES THESE TOWERS CAUSE.

WILLIAM NIELSEN W-2491 ASH ROAD MALONE WI.

WHAT HAVE I DONE?

Now each morning when I awake, I pray and then ask myself, "What have I done?"

I am involved with the BlueSky/GreenField wind turbine project in N.E. Fond du Lac County. I am also a successful farmer who cherishes his land. My father taught me how to farm, to be a steward of my fields, and by doing so, produce far better crop production. As I view this year's crops, my eyes feast on a most bountiful supply of corn and soybeans. And then my eyes focus again on the trenches and road scars leading to the turbine foundations. What have I done?

In 2003, the wind energy company made their first contacts with us. A \$2000

"incentive" started the process of winning us over, a few of us at a time. The city salesman would throw out their nets, like fishermen trawling for fish. Their incentive "gift" lured some of us in at first. Then the salesmen would leave and let us talk with other farmers. When the corporate salesmen returned, there would be more of us ready to sign up; farmers had heard about the money to be made. Perhaps because we were successful farmers, we were the leaders and their best salesman. What have I done?

Sometime in 2004 or 2005, we signed \$4000.00 turbine contracts allowing them to "lease" our land for their needs. Our leases favored the company, but what did we know back then? Nobody knew what we were doing. Nobody realized all the changes that would occur over which we would have no control. How often my friends and I have made that statement! What have I done?

I watched stakes being driven in the fields and men using GPS monitors to place

Unfortunately, my dear friends and neighbors. Later, a 4 foot deep by 2 foot wide trench started diagonally across my field. A field already divided by their road was now being divided again by the cables running to a substation. It was now making one large field into 4 smaller, irregularly shaped plots. Other turbine hosts also complained about their fields being subdivided or multi cable trenches requiring more land. Roads were cut in using anywhere from 1000 feet to over a 1/2 mile of land to connect necessary locations. We soon realized that the company places roads and trenches where they will benefit the company most, not the land owner. One neighbor's access road is right next to some of his out buildings. Another right next to his fence line. What have I done?

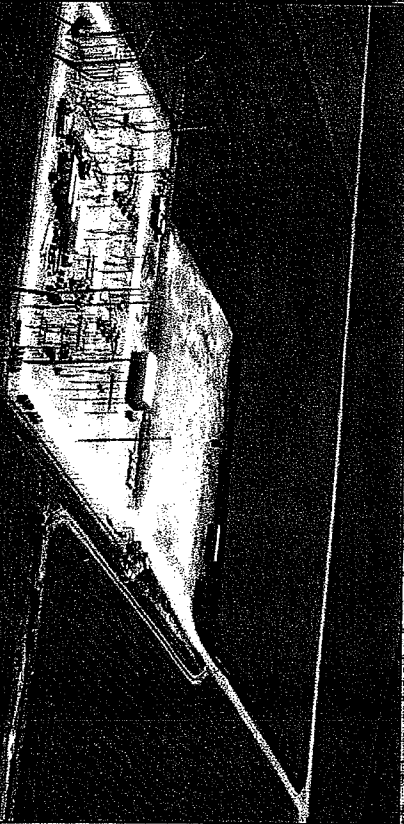
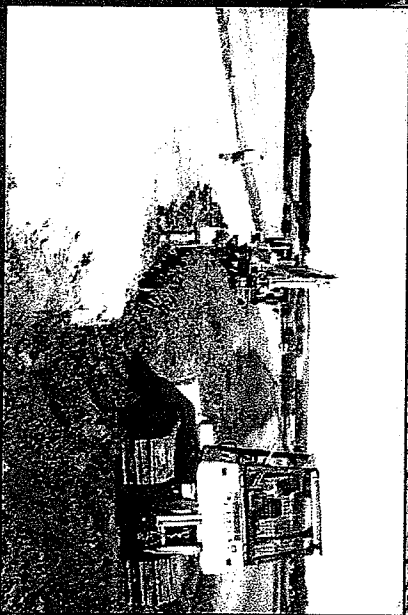
At a wind company dinner presented for the farmers hosting the turbines, we were repeatedly told -- nicely and indirectly -- to stay away from the company work sites once they start. I watch as my friends faces showed the same concern as I had, but none of us spoke out. Months later, when I approached a crew putting in lines where they promised me they would definitely would not go, a representative told me I could not be here. He insisted that I leave. The line went in. The company had the right. I had signed the lease. What have I done?

Grumbling started almost immediately after we agreed to a 2% yearly increase on our 30 year lease contracts. Some felt we should have held out for 10%. What farmer would lock in the price of corn over the next 5 years. Yet alone lock one in at 2% yearly for 30 years? Then rumors leaked that other farmers had received higher yearly rates, so now contracts varied. The fast talking city sales folk had successfully delivered their plan. Without regard for our land, we were allowing them to come in and spoil it. All of the rocks we labored so hard to pick in our youth were replaced in a few hours by miles of roads packed hard with 10 inches of large breaker rock. Costly tilling we installed to improve drainage has now been cut into pieces by company trenching machines. What have I done?

Each night, a security team rides down our roads checking the foundation sites. They are checking for vandals and thieves. Once, when I had ventured with guests to show them foundation work, security stopped us and asked me, standing on my own property, what I was doing there. What have I done?

Now, at social functions, we can clearly see the huge division this has created among community members. Suddenly, there are strong-sided discussions and heated words between friends and, yes, between relatives about wind turbines. Perhaps this is of greater consequence than the harm caused to my land! Life is short and my friendships precious. What have I done?

I tried, as did some of the other farmers, to get out of our contracts, but we had signed a binding contract and a contract is a contract. If you are considering placing wind turbines on your property, I strongly recommend that you please reconsider. Study the issues. Think of all the harm versus benefits to your land and, in the future, to your children's land by allowing companies to lease your land for turbines.



This was written by Don Bangert of Chilton after he interviewed a landowner in a Northeast Fond du Lac County for two hours. Don wrote this story and then showed it to the landowner who wishes to remain anonymous. The landowner approved this for publication.

WHAT HAVE I DONE?
PLEASE DO NOT DO
WHAT I HAVE DONE!

Dear Senators and Representatives,

I am contacting you regarding the Public Hearing for the Wind Siting Rules. As our State wrestles with tough economic choices we must look hard at the costs involved with all the places our hard earned money is spent. The huge taxpayer subsidies given to wind developers is a very good return on their investment (over 30%), but not a good investment for taxpayers. I repeatedly see calculations by the proponents of wind energy showing the great efficiency of wind turbines. The truth is that the inefficiency's of wind energy greatly outweigh the amount of money spent to put them in place and continually support them. Wind energy projects are not financially or technically viable. Please allow developers to go to the private market for financing of these projects and end corporate welfare.

Even in the most favorable of sites, where there is ample wind, wind facilities produce power at about 38 percent of actual capacity. In areas of modest wind, like ours in Southwestern Wisconsin, wind turbines would produce a projected 7 - 27% of their stated capacity. If the true capacity of wind turbines were actually stated in relation to their cost we, as taxpayers, cannot support investment in them.

There are many other issues surrounding wind turbines that still need to be addressed such as, wind turbine syndrome, shadow flicker, decreased property values, inability to sell property, turbine decommission (there are many obsolete and abandoned wind turbines in California alone that litter the countryside), low-frequency noise, the absolute need for a back-up energy source during calm periods (nuclear, coal, or ??), bird and bat destruction, etc.

The question is:

Will the people in office and in charge of taxpayer's money spend that money on a technology that is questionable at best, inefficient, and pushed mainly by a select few because of the large amount of money to be made, or invest taxpayer's money in proven, efficient, clean power generation such as anaerobic digesters for biogas or nuclear power plants? Please stop the stake-holders on the PSC board from controlling the issues about wind turbines. Please increase setback distances and set safe parameters for noise and shadow flicker to prevent health problems associated with wind turbines. The wind advocates should not mind having to meet safe health parameters, because they say there are no negative health issues related to wind turbines. Also, the State of Wisconsin needs to have impartial scientists do epidemiological studies to find out why people are so unhappy with the existing wind farms in our state before any further construction should occur.

Respectfully,
Patrick Klar
1617 Klar Road
Platteville, WI 53818
608-348-5772

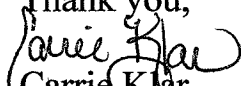
Regarding: Senate Bill 9 (LRB-0989)

Dear Senators and Representatives:

Please support Senate Bill 9. I am very concerned about the health and safety of rural citizens that will be forced to live in industrial wind farms. I believe further studies need to be done to investigate why there are so many health related complaints in industrial wind farms that are currently operating in our state. From my own research, I believe it there should be sound decibel limits of 35 Decibels to provide for sleep. Children may require even lower decibel limits according the the World Health Organization.

I am also concerned about the ecological affect that will occur. Bat populations are already threatened by white nose syndrome. Again, further research needs to be conducted to protect Wisconsin's wildlife. Another concern are migratory birds including raptors.

Please support further research and protect the health and safety of Wisconsin's rural citizens the wildlife we are entrusted to protect.

Thank you,

Carrie Klar

1617 Klar Rd.
Platteville, WI 53818
608-348-5772

2-9-2011

To the Great State of Wisconsin Representatives

This is a letter regarding the Blue Star-Greenfield Wind farm around Johnsbury, WI.

Our personal experience with this project has been as follows.

We are all for green energy, but feel used. We agreed to the first contract to place a turbine on our land. When presented with the second contract the person with that contract didn't offer any important information regarding it, only that he could notarize it. We didn't sign. Instead we took it to our attorney. He advised not to sign and so we didn't.

There are three turbines sitting very close to our house - one at 1056 ft, the other two not much farther.

These turbines are very noisy in certain weather conditions especially on foggy or rainy/icy days.

It sounds as though we are living next to an airport where the airplanes never land or leave - just hover.

Our T.V. reception has been severely affected. Before the turbines we were able to get very good T.V. from rabbit ears. Not any more. The energies has put up an antennae for us but has need repair many times and at this time is not working well again.

We get flicker at certain parts of the year. That can be very unsettling. In the winter it encompasses the entire yard.

Our lands will be our retirement. We don't know what we will be able to get for it in terms of dollars. With the turbines so close, who would want to buy it?

We also don't know what it is doing to our health. We wake up some nights because of the noise.

Please consider putting these
turbines at a further set-back from
houses.

We need to find alternative
energy but consider our communities
and people in the mix.

Signed
Frustrated Residents

Bernie & Rose Petrie
242199 Ash Rd
Malone, Wis

53049

920-795-4256

Dear Honorable Members of the Joint Committee for Review of Administrative Rules,

I am a resident of the Town of Brothertown and member of the Town Plan Commission. Prior to my retirement, I worked 32 years for Calumet County in the Planning Department first as code administrator and later as director. Over those years much of the responsibility involved administering and enforcing both County Ordinances and State Administrative Codes. An important commonality of those rules were that they were there to protect the health, safety, and welfare of the County's citizens.

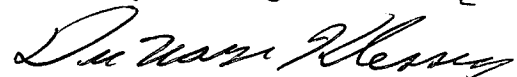
Are these Rules protecting the health and safety of Wisconsin's citizens? You, as our lawmakers, have a very important responsibility of protecting the health and safety of the lives of your residents. This can't be taken lightly.

When these Rules are reviewed, it is very difficult to conclude that the setback and noise criteria are protecting peoples' health and safety. A setback of ~~3.1 times maximum blade tip height~~^{1250'} from a non-participating residence is very inadequate as well as the 45dBA noise level at night. Studies conducted by Health Organizations, that are science based, indicate a minimum of ½ mile. A survey in the year 2000 was conducted by the University of Wisconsin Extension in the Town of Lincoln, Kewaunee County. It resulted from an uproar by the Town's citizens after living with a wind farm for 2 years. One of the survey questions was "How close to the wind turbine would you consider buying or building a home?" 61% of the respondents wanted to be over ½ mile with 42% indicating over 2 miles. Only 17% indicated 800' to ¼ mile. These are results from people living with a wind farm with turbines much smaller than the ones now used. The Town Chairman of Lincoln Township, Mr. Arlin Monfils, indicated that he would not want to see any wind turbines closer than ½ mile from homes after going through all their problems.

Also another consideration should be all the testimony received last October by the Senate Subcommittee on these very Rules. There were countless people that testified expressing how their lives were being severely impacted in a negative fashion by wind farms. This was input from Wisconsin people on farms recently completed. Do we want more and more wind farms constructed with Rules that are inadequate?

I would also like to share several visuals that are identifying how our lives in the Town of Brothertown will be impacted by a proposed wind farm. These pictures are showing a area of 4 miles by 4 miles in which there are 52 turbines proposed with a total of 190 existing homes. How can this be safe? This proposed farm has truly torn our community apart. We need much better protection. We ask for your help.

Thank you,
DuWayne Klessig

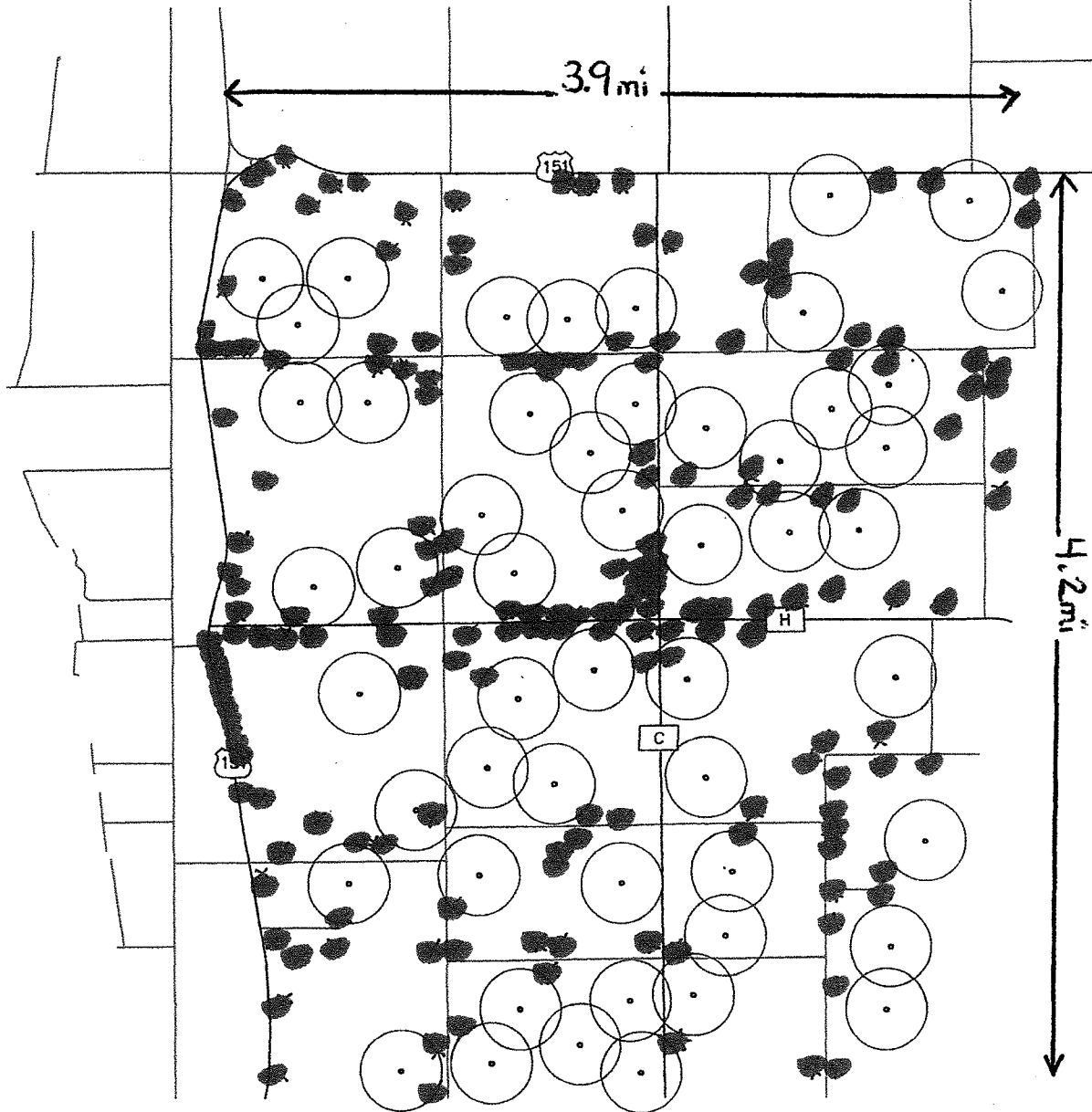


52 turbines
190 residences

Average of 3.7 residences per turbine

How Can This Be Safe?

Proposed Brothertown, WI Industrial Wind Factory Layout
Locations From FAA Website
Circles are 2000 feet in diameter



Disclaimer: to the best of our knowledge these proposed turbines are accurate.
They are mapped according to the latitude and longitude locations from the FAA website.

**RESOLUTION PERTAINING TO PROPOSED WIND SITING RULE
(Wis. Admin. Code § PSC 128.14(3) Noise Limits)**

TO THE MANITOWOC COUNTY BOARD OF SUPERVISORS:

1 WHEREAS, the Public Service Commission has proposed to create Wis. Admin. Code § PSC
2 128 relating to the siting of wind energy and has submitted the proposed wind siting rule to the
3 legislature for review pursuant to Wis. Stat. § 227.19; and
4

5 WHEREAS, the Public Service Commission has included Wis. Admin. Code § 128.14
6 pertaining to noise criteria and sub. (3) of that rule that sets an absolute limit for the noise
7 attributable to a wind energy system to no more than 50 dBA during daytime hours and 45 dBA
8 during nighttime hours, even though it acknowledges that “[t]here is information that tends to
9 support a nighttime noise limit lower than a 45 dBA seasonal limit, perhaps as low as 35 dBA year
10 round” and that “there is no definitive evidence to support a specific noise threshold”; and
11

12 WHEREAS, the Board of Health is responsible for the health of all citizens in Manitowoc
13 County, has studied the proposed wind siting rule containing the noise criteria, and has concluded
14 that the rule does not set noise limits that adequately protect the public health; and
15

16 WHEREAS, Manitowoc County established a Wind Energy Systems Advisory Committee to
17 study all aspects of siting wind energy systems prior to adopting a wind energy systems ordinance;
18 and
19

20 WHEREAS, the Wind Energy Systems Advisory Committee studied the issue of noise,
21 examined the regulations adopted in other jurisdictions in the United States and abroad, found that
22 a 5dBA increase in the sound level was clearly apparent, and recommended the adoption of a
23 relative, rather than absolute, noise standard in order to best protect the public health; and
24

25 WHEREAS, the Manitowoc County Board of Supervisors concluded that an absolute noise
26 limit did not adequately protect public health and established a relative standard that limited the
27 noise generated by the operation of a wind energy system to no more than 5 dBA above the ambient
28 noise level as measured at any point on property adjacent to the parcel on which the wind energy
29 system is located; and
30

31 WHEREAS, Manitowoc County concurs with the U.S. Environmental Protection Agency’s
32 finding that “noise is a significant hazard to public health” and finds that an absolute noise limit fails
33 to adequately protect the public health;
34

35 NOW, THEREFORE, BE IT RESOLVED that the Manitowoc County Board of Supervisors
36 finds that Wis. Admin. Code § PSC 128.14(3) pertaining to noise limits fails to adequately protect
37 the public health; and
38

39 BE IT FURTHER RESOLVED that Manitowoc County Board of Supervisors directs the
40 county clerk to send certified copies of this resolution to the President of the Wisconsin State Senate,
41 Senator Fred Risser, and to the Speaker of the Wisconsin State Assembly, Representative Michael
42 Sheridan, for referral to the standing committees that are reviewing the proposed rule; and
43

44 BE IT FURTHER RESOLVED that the Manitowoc County Board of Supervisors strongly
45 recommends that the Legislature's standing committees object to the rule as proposed and take such
46 action as is necessary to require that the Public Service Commission promulgate a rule that
47 adequately protects the public health by establishing a relative standard that limits the noise caused
48 by the operation of a wind energy system to no more than 5 dBA above the ambient noise level as
49 measured at any point on property adjacent to the parcel on which the wind energy system is located.

Dated this 21st day of September 2010.

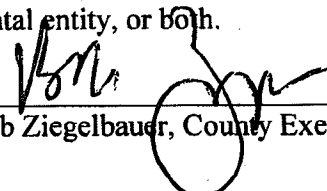
Respectfully submitted by the
Board of Health


Andy Schneider, Chair

LEGAL NOTE: Reviewed and approved as to form by Corporation Counsel. SR

RESOLUTION PERTAINING TO PROPOSED WIND SITING RULE
(Wis. Admin. Code § PSC 128.14(3) Noise Limits)

I respect the prerogative of the members of the Manitowoc County Board of Supervisors to voice their opinions on legislative issues. Therefore, it is my practice to neither approve nor veto a legislative policy resolution that has been enacted by the County Board in order to allow the County Board, acting as the legislative branch of county government, to freely express its sentiment on legislative and public policy issues or to request action by a governmental entity, or both.



Bob Ziegelbauer, County Executive

9/23/10

Date

No. 2010/2011 - 49
Manitowoc Voting System
Vote Summary Report
09-21-2010

All Reports
Report , 1A , 2/3 Majority Based on Attendance

1A. Resolution Pertaining to Wind Siting Rule.

Seat	Dist	Attn	Name	Aye	Nay	Abs
1	15	*	Wagner, Catherine E.....	[X]	[]	[]
2	11	*	Vogel, Randy S.....	[X]	[]	[]
3	3	*	Metzger, Rita	[X]	[]	[]
4	18	*	Muench, Mary	[X]	[]	[]
5	17	*	Maresh, Susie	[X]	[]	[]
6	4	*	Brey, Jim	[X]	[]	[]
7	21	*	Gerroll, Rick	[X]	[]	[]
8	20	*	Hoffman, Chuck	[X]	[]	[]
9	2	*	Schmidt, Kevin	[]	[]	[]
10	7	*	Vogt, Norbert A.....	[X]	[]	[]
11	14	*	Konen, Faye	[X]	[]	[]
12	12	*	Behnke, Kevin	[X]	[]	[]
13	16	*	Schneider, Andrew	[X]	[]	[]
14	1	*	Rappe, Edward C.....	[X]	[]	[]
15	5	*	Dufek, Gregory	[X]	[]	[]
16	23	*	Henrickson, Rick	[X]	[]	[]
17	10	*	Markwardt, Don	[X]	[]	[]
18	9	*	Panosh, Joseph	[X]	[]	[]
19	6	*	Hansen, Paul B.....	[X]	[]	[]
20	19	*	Korinek, Dave	[X]	[]	[]
21	25	*	Burke, Laurie	[X]	[]	[]
22	24	*	Weiss, Don	[X]	[]	[]
23	22	*	Bauknecht, Michael	[X]	[]	[]
24	13	*	Waack, Melvin	[X]	[]	[]
30	8	chair	Tittl, Paul	[X]	[]	[]

Pass

On this 21 day of September 2010 by a vote of:
Aye = 24 Nay = 0 Abs = 0 Absent = 0

Attest: _____


Jamie Aulik, County Clerk

Hello, My Name is David Korinek and I am a county board supervisor in Manitowoc County.

I served on the committee that created our Industrial Wind Turbine ordinance. We spent 1 ½ years creating our rules. Our committee had balanced membership, including the current president of Renew WI.'s board of directors. The PSC's wind siting council membership did not achieve that balance, with 70% of members owing their livelihood to the wind industry. That is not a recipe for good rule making.

I would like to express my concerns with the rules the PSC has created. Manitowoc County decided to use the worldwide standard of 5 DBA over ambient for our noise restriction. It adjusts with background noise, rather than picking an arbitrary number for the standard, as the PSC has done, which is higher than what the World Health Organization recommends. Manitowoc County's Board of Health has passed a resolution through our county board supporting the 5dba over ambient standard and I will submit it with my testimony.

Manitowoc County believes in property rights!! Siting a 500 ft. industrial turbine 550 ft. from my property line and 1250 from my home could take 700 ft of my property for a corporation's turbine safety setback. Worse yet the PSC has determined in their own research, that to meet their 45 dba. night time noise restriction, that same turbine should be 2200 ft from my home! That puts my home 950 feet on the wrong side of the PSC's noise setback. That is a Taking of Property by a Govt. Agency without compensation, using contradictory rules not designed to protect citizens but to promote industry.

The bottom line is that siting Turbines in WI. is tougher than in states with large open areas and few homes. If a turbine company needs to buy some property or sign neighbors to easements to place turbines, so be it. To sacrifice citizen's safety, health, and property values for a wind companies profit margin is just wrong. 2640 ft. should be the minimum setback; 1800 ft is already a compromise!!

Thanks for your time

**David Korinek
1316 Rockledge rd.
Mishicot WI. 54228
920-755-4644**

Lori Morehouse

4432 Mill Road

Denmark Wisconsin 54208

I have been a special education teacher in the Freedom Area School District for over 20 years. Part of my job there is to be an advocate for my high school students with learning disabilities and to instill in them self-advocacy skills. I'm here today in Madison, as I was last October, to do just that, to advocate for myself, my family, and my neighbors as to why the current rules proposed by the very biased Wind Siting Council and approved by the PSC are inadequate and need to be suspended. These proposed rules do not address the health and safety concerns of those living in a wind turbine project.

For the past 21 years I've lived in Morrison Township in the southeastern part of Brown County where my husband and I own 140 acres. I am not against renewable energy, nor is my husband. We had the first totally geothermally heated and cooled home in the state of Wisconsin.

We live in the area of the proposed Ledge Wind Project of Invenergy. There is the possibility of 54, 400 foot industrial wind turbines being built in our rural township. I have been called a NIMBY. They are correct in saying I do not want a 400 foot mechanical monster in my backyard, but, I also don't want it in anyone else's backyard either. They don't belong there. The current proposed wind siting rules would have these turbines in my backyard, as well as in the backyards of my neighbors and friends. The setbacks need to be changed to 1/2 mile, 2640 feet, from a property line, not 3.1 times a height of the turbine.

These turbines do not belong in anyone's backyard until the state health department conducts an epidemiological study of existing residents who live in wind project areas. I'm not willing to live in the largest proposed wind turbine project in the state until there is unbiased, reliable, valid health studies done to prove that myself, husband, my children, or our seven young grandchildren will not be harmed. There presently is no objective health studies done that prove living with turbines in your backyard is safe.

How precious is your drinking water? The Ledge wind energy project in our township creates a risk for groundwater contamination from the manure spreading on fields where turbines are being hosted. Due to the karst features in the project, the impact of the excavations and 81 miles of trenches, puts our groundwater supply at substantial risk. The proposed turbine locations are adjacent to shallow bedrock karst fractures, spring heads, and sinkholes. Over 100 wells in Morrison Township were contaminated in 2006. 23 wells were replaced at a total cost of over \$300,000. Why would we continue to risk damaging our water supply by developing a wind turbine project when the geological features of the Niagara Escarpment puts us at significant risk for contamination of our groundwater?

Would you be willing to risk your property values being lowered by 40% or more because of turbines being sited too close to your home? If the wind developers say there is no loss of property value, then a

property protection plan for these impacted areas should be provided by the wind turbine project developers. This should be included in the siting rules.

Should town officials be able to sign contracts with wind developers while at the same time working on local ordinances that affect the town, its residents, and the wind developers? This scenario has happened across the state. New statewide siting rules should address the need for wind developers to disclose their intentions of developing a project publicly before any town officials sign contracts with them. There is a continued climate of deception, greed, mistrust, and personal self-interest surrounding this entire wind development process. This biased atmosphere has also lent itself to the Wind Siting Council, where nine of the fifteen members were directly conflicted.

Last fall my husband and I attended the First International Symposium on The Global Wind Industry and Adverse Health Effects held in Ontario, Canada. Like all of the presenters, including doctors, specialists, lawyers, authors, and professors, who came from all over the world including Canada, the United Kingdom, Australia, and various states in the US, we paid for all our own expenses. These experts presented three days worth of information, studies, and research on the negative effects of living close to wind turbines. These adverse health effects include noise concerns, especially low frequency noise concerns, sleep deprivation, and mental health issues. I will be presenting further written documentation from this conference to this Joint Administrative Committee.

The current rules proposed by the PSC are inadequate, seriously lacking, and need to be suspended. Please take more time to study the concerns presented today and error on the side of safety. Remember your constituents who are living or will be living in a wind turbine ghetto for years and years. The wind developers don't live in the wind turbine ghettos. I thank you for the opportunity to speak today. What a real life civics lesson that we get to experience today at the Capital. It is one I can share with my high school students tomorrow at school. Thank you for listening to my concerns.

Lori Morehouse

4432 Mill Rd.

Denmark, WI 54208

920-864-2223 Home

INTERNATIONAL SYMPOSIUM

THE GLOBAL WIND ENERGY AND
ADVERSE HEALTH EFFECTS

Loss of Social Justice?

SPEAKERS

October 29 to 31, 2010 in Picton, The Waring House,
Prince Edward County, Ontario, Canada

THE SOCIETY FOR
WIND VIGILANCE

WWW.WINDVIGILANCE.COM

MESSAGES OF SUPPORT

Many from around the world wanted to attend the FIRST INTERNATIONAL SYMPOSIUM: THE GLOBAL WIND INDUSTRY AND ADVERSE HEALTH EFFECTS: Loss of Social Justice? but were unable to do so. Support has been received from individuals and organized groups.

In an effort to acknowledge these, a snapshot of these messages is provided to Symposium attendees. A comprehensive list will be posted on The Society website after the Symposium. www.windvigilance.com

The comments and messages received represent the opinions and concerns expressed by the individual and groups submitting them. Any errors or omissions are unintended.

TO THE CHAIR - NEW ZEALAND

Daniel Shepherd
Department of Psychology
Auckland University of Technology
Auckland
New Zealand
daniel.shepherd@aut.ac.nz

Robert Y. McMurtry, M. D., F.R.C.S.(C), F.A.C.S.
Chair
The Society for Wind Vigilance
23.08.2010

Dear Dr McMurtry,

Ténā koutou.

I regretfully write to inform you that I am unable to attend the Society's conference planned for the end of October. In lieu of attendance I send words of support for both the conference and the Society at large. The line up of presenters hints at a stimulating and dynamic conference, and the success of the event seems assured. I sincerely hope this meeting will not be isolated, and I will keep a keen eye open for future conferences.

The output of the society has been of great utility to many communities in New Zealand faced with the decision of supporting or opposing wind turbine installations. The Society has consistently provided critiques of research and review documents that are laudable for both their balance and impartiality, and the level of insight afforded by the expertise of their creators. The ability of these works to inform communities of the risks and benefits of wind power cannot be overstated, and I suspect their impact goes far beyond any metrics you might currently use to track their use.

Of those speaking at the conference I note a number who have given up time to assist community groups in New Zealand. On behalf of these groups I would like to extend an expression of immense gratitude to these individuals, who include Richard R. James, Nina Pierpont, Christopher Hanning, and Michael A. Nissenbaum. To all members of the Society a message, keep up the good work, your efforts are appreciated by many.

Kia ora
(be well, be healthy)

Daniel Shepherd
Auckland, New Zealand

ONTARIO

Congratulations on the First International Symposium on the Adverse Health Effects of Industrial Wind Turbines. This is a great opportunity for members of our organization to hear from a wide range of international experts on topics of importance to our fight.

Those participating will no doubt leave armed with even more information that will assist in convincing neighbours and hopefully communities that they have a stake in this. It should also help us as we work with local councils and health organizations.

International medical experts will join with renowned academics from North America and other public figures to share much needed information in a format that is credible and valuable to us and the broader public. Wind Concerns Ontario is proud to support this symposium.

*John Laforet, President,
Wind Concerns Ontario*

AUSTRALIA

From all over the world we will be watching the discussions and the information presented at your symposium about the health effects of wind turbines. We are so grateful that you are all doing this. Only two days ago I was at a protest rally against two turbines going up at Leonards Hill, near Daylesford in Victoria, Australia. The nearest home to these turbines will be only 500 metres away. People there are desperate. Our governments just keep signing the rights of the rural residents away to wind developers.

Governmental Planning Panels ignore legitimate claims and worries from country residents, worries about health effects from turbines...We are so grateful for the time you are putting in at the symposium about health effects from turbines.
...Good luck with your investigations. We are all behind you.

*Renate Metzger,
Smeaton, Victoria, Australia*

EPAW (European Platform Against Windfarms)

EPAW supports the first International Symposium...427 federations and associations from 21 European countries (representing hundreds of thousands of citizens) have united into a European platform (EPAW) to transmit the following demands to the European authorities:

- a moratorium suspending all wind farm projects
- a complete assessment of the economic, social, and environmental impacts of wind farms in Europe.

EPAW objects to industrial wind farms that...are degrading the quality of life of those living in their vicinity, affecting the health of many...

We applaud and support the first International Symposium gathering so famous expert speakers. Wind power endangers the health of people who live near wind turbines and some affected residents can only try to sell their homes and move away! We thank you for your commitment to this important cause.

*Jean-Louis Butré,
Chairman of EPAW*

GERMANY

Dear Carmen, dear members of the Society for Wind Vigilance, dear organizers, scientists, experts and visitors of this important symposium in Canada!

The members of EPAW - European Platform against Windfarms - in Germany support your International Symposium and your struggle to protect the health of human beings, social structures and nature against industrial wind energy by exposing the dangers caused by wind power plants for health and social justice.

Today there are some 22.000 wind turbines in Germany and the number is increasing all the time... We represent thousands of German victims...including those in the northernmost region in Germany, where once was the cradle of the German wind power, who are suffering since

more than two decades from the impact of wind turbines. The symptoms, which Nina Pierpont calls WTS...many of us already know very well... Many people are too frightened to speak openly for their civil rights...I speak from painful, personal experience!...Living beside wind turbines between 300 to 1000 m away is like a trip to hell!

We, the German members of EPAW, want to thank you for this important international Symposium and your dedication to uncover the danger of the emissions by wind turbines for health and social life!"

*Jutta Reichardt from
"Windwahnmarsch",
Schleswig-Holstein, Germany
Spokeswoman of EPAW
(European Platform against Windfarms)
for Germany*

JAPAN

We are Japanese concerning about wind farm developments. Big wind is destroying nature and local communities in Japan too. People near wind farms are suffering from low-frequency noise from the turbines.

Although the Japanese government has just started a survey on the low-frequency noise, we suspect they will not solve the problem seriously.

We support the First International Symposium. We are really sorry not to be able to join you. But we believe it will be successful. And we believe it will be a great step for us all.

Yuki Tsuruta Oike

NOVA SCOTIA, Canada

To Carmen Krogh, Members of Windvigilance, Dr Nina Pierpont, Participating Scientists and Everybody at the Symposium!

We want to express our full support for this Symposium...Our social peace is gone by recklessly acting wind companies, who "successfully" were splitting communities and even friends and families. Local politicians were turning their backs on us and united with the wind lobby.

REAL PROPERTY TAKINGS

I was listening to a discussion on "takings" in relationship to noise, shadow flicker and property values during a recent wind siting council meeting. There was some disagreement as there is on many of the topics and it was decided to refer the question on takings to legal counsel. The following meeting it was stated that "staff" had determined that unless 100% of the property or the value of the property was taken, that it would not be considered a "takings". What I found interesting was why legal counsel did not give his opinion on the matter (he seemed to be in the room for some of the meeting as he commented on something later), but yet staff gave their "opinion" and the matter was dropped.

AWEA siting handbook refers to "an assessment of potential impacts to neighbors and other sensitive receptors is often prudent" and refers to property boundaries for noise limits, not homes.

Developers should be forced to sign a property value protection agreement. If they are adamant that the turbines do not affect property values, they should not have a problem signing an agreement. There can be no takings without compensation. NO ONE should be allowed to diminish another's quality of life and property value for their own financial gain. This includes all property, improved or vacant land. I did some research myself and came up with the following on takings. A zoning regulation that deprives the land owner of the economic value of the property might be challenged as a constructive taking.

PARTIAL TAKINGS

It is often the case that a landowner is not completely deprived of his property, but instead suffers a restriction or impairment of his or her right to use it. For example (and as is frequently the case), a government may need to run a utility through private property, or need to alter a shoreline such that the property is no longer on the waterfront. The property may need to be flooded to create a dam, or a building on the property may need to be relocated to make access to another point. In such cases, a partial taking may be effected, and the landowner is entitled to proportional compensation. (Source: What Constitutes a "Taking", Find Law)

"CONSTRUCTIVE" TAKING OR REVERSE CONDEMNATION

Still another form of taking may occur when there is no actual property being taken from a person. Instead, governmental activity on one property may so severely deplete the value of adjacent or neighboring property so as to constitute a "constructive taking," often referred to as inverse or reverse condemnation. Fumes, noises, vibrations, changes in flow of ground water, or toxic pollutants are some of the more common interferences that may constitute constructive takings. Examples include properties affected by airport noise and fumes, waterfront properties affected by rerouted water, or livestock farms affected by nearby noise or ground vibration. In each of these circumstances, property owners may be entitled to compensation from the governmental entity. (Source: What Constitutes a "Taking", Find Law)

TEMPORARY TAKINGS

Finally, a taking need not be permanent; it may be effected and justified only under limiting circumstances. For example, in time of war or insurrection, a government may need to exercise control and dominion over lands otherwise not needed for public welfare or safety. Again, a landowner may be compensated for the temporary impairment or deprivation in his or her use of private property. (Source: What Constitutes a "Taking", Find Law)

"NOR SHALL PRIVATE PROPERTY BE TAKEN FOR PUBLIC USE, WITHOUT JUST COMPENSTION"

THE FIFTH AMENDMENT TO THE UNITED STATES CONSTITUTION

"THE PROPERTY OF NO PERSON SHALL BE TAKEN FOR PUBLIC USE WITHOUT JUST COMPENSATION THEREFORE"

THE WISCONSIN CONSTITUTION

In regards to some in the wind energy industry referring that those that are being negatively affected by noise, shadow flicker, infrasound, and loss of property values as being collateral damage and should make a sacrifice for the greater good:

The United States Supreme Court has also stated that the Fifth Amendment to the United States Constitution is "designed to bar government from forcing some people alone to bear burdens which, in all fairness and justice, should be borne by the public as a whole". If the damage to an individual property owner is so great "that he ought not to bear it under contemporary standards, then the courts are inclined to treat it as a "taking" of the property". (Armstrong v. United States 1960)

Private property is held in subordination to the rights of society. Although one owns property, they may not do with it as they please, any more than they may act according to their personal desires. As the interest of society justifies restraints upon individual conduct, so also does it justify restraints upon the use to which property be devoted. It was not intended by these constitutional provisions to so far protect the individual in the use of his property as to enable him to use it to the detriment of society. (State v. Harper 1923)

I think we should all do our part and practice good conservation, something we all can do, without any negative effect on our neighbors. Let's put Wisconsin on the map for being a leader in responsible energy usage and conservation, but more importantly that we place more value on the health and safety of our residents than profits and politics.

While most takings involve the actual physical occupation of private land, it has long been recognized that private property may also be taken as a result of the enactment of statutes and regulations. In the seminal case of *Pennsylvania Coal Co. v. Mahon*, Justice Oliver Wendell Holmes, Jr., speaking for the Court, specified that "while property may be regulated to a certain extent, if regulation *goes too far* it will be recognized as a 'taking'.

We are in danger of forgetting that a strong public desire to improve the public condition is not enough to warrant achieving the desire by a shorter cut than the constitutional way of paying for the change." (*Pennsylvania Coal Co. v. Mahon*)

"When . . . [the] power [of eminent domain] is exercised it can only be done by giving the party whose property is taken or whose use and enjoyment of such property is interfered with, full and adequate compensation, not excessive or exorbitant, but just compensation." The Fifth Amendment's guarantee "that private property shall not be taken for a public use without just compensation was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." Just compensation in partial taking condemnation cases must include compensation for the part of a property that is actually taken, as well as compensation for any damage that the taking causes to the part of the property that is not taken. (Find Law, Just Compensation)

Under the constitutional definition of "just compensation," all factors that make up market value must be taken into account in determining just compensation in direct condemnation cases.

Under the Michigan and United States constitutions, a condemning agency must pay a property owner "just compensation" when the agency takes the owner's property for a public purpose. Generally, just compensation is measured by determining the market value of the property that is taken. But when only part of a property is taken, the part that is not taken, sometimes called the "remainder," can experience a decrease in value attributable to the taking. The condemning agency must compensate the owner for any such decreases, because just compensation must leave the property owner in as good a position as the owner would have been had the taking never occurred. Numerous Michigan decisions have discussed the decreases in value attributable to partial takings that must be part of just compensation, and on occasion have discussed using the "cost to cure" some or all of the negative effects of a partial taking as an appropriate measure of compensation. Regardless of the approach that is taken to the problem, the property owner must always receive "just compensation" for losing its property.

This rule requires that the property's market value before the taking be compared with its market value afterward, and the difference serves as the amount of just compensation.

In cases like the present one, where there is a partial taking, just compensation is measured by the amount that the value of the remainder of the parcel has been diminished. This loss is usually expressed in terms of the diminution of the fair market value of the remainder of the property. And, fair market value is found by considering and evaluating all the factors and possibilities that would have affected the price that a willing buyer would have offered to a willing seller for the land under the circumstance. (Source: Calculating Just Compensation in Partial Taking Condemnation Cases by Jerome P. Pesick)

COST OF NOISE ANNOYANCE

The socio-economic impact of noise: A method for assessing noise annoyance.

Numerous attempts have been made to calculate a "cost" or to set a "price" on community noise annoyance. Factors that influence this "price" include the following:

- psycho-physiological effects, stress, etc.
- sleep disturbances (and resulting productivity loss)
- communication problems
- (possible) hearing damage

The price is likely to be reflected in a depreciation of property values. Studies have revealed that there is a linear relationship between noise level and change in property value (in Norway, roughly 0.5% per dBA). In other words, the change in value per decibel is independent of the absolute level.

A similar relationship has been found for the annoyance score. A given change in noise exposure is related to a certain change in annoyance score regardless of absolute noise level or degree of annoyance. By using noise exposure data as a common parameter, it is possible to relate annoyance directly to a sum of money, and any given change in annoyance can be expressed in monetary terms. (Source: Noise and Health, A quarterly inter-disciplinary International Journal)

Lynn Korinek
1316 Rockledge Rd
Mishicot, WI 54228

The wind siting rules were created to take away the "Patchwork" effect of local control despite the fact a state appeals court told Calumet County they could not use "blanket" standards. We now have a one size fits all set of rules that will have negative health effects and financial impacts on landowners, because it was written by a council stacked with those having a financial interest in the industry.

Claims are made about loss of jobs if setbacks are increased to protect our health, safety and property rights. At what personal and financial cost to the landowner, ratepayer and taxpayer should we "provide subsidized jobs"?

An important point needs to be made clear. Act 40 does not direct rules to be written to create or save jobs or to make sure wind turbines are sited regardless of negative effects, it distinctly states to set rules that provide reasonable protection from any health effects.

The PSC is responsible to protect us from rate increases and Clean Wisconsin and the Citizens Utility Board promote themselves as advocating on behalf of ratepayers for affordable rates. Knowing we have a glut of electrical capacity, they actively promote industrial wind energy aware that it increases utility rates. In a recession, we the taxpayers and consumers are being forced to subsidize energy we do not need. Wind is not free.

Wisconsin already has higher electric costs than all but 5 states, yet a utility rate increase requested by the PSC to subsidize the cost of renewable energy, was passed by the Joint Finance Committee during the lame duck session, resulting in a rate increase of \$740 million dollars to rate payers over the next 4 years. Asking for responsible siting rules to protect us is not a jobs killer. Increasing utility rates, that's a jobs killer.

Wind is not the only renewable. Act 40 fails by not addressing whether wind is the best solution to the energy needs of the area being served. Utilities are forced to create power we do not need to meet the RPS, resulting in industrial wind turbines being forced into areas they do not belong. Wisconsin should be promoting safe, reliable, low cost, energy efficient renewable solutions to residential and commercial customers that will not have negative health effects and lower property values. How many jobs would be created if ACT 40 were repealed, and the state would promote nuclear, geothermal, solar, and most of all energy efficiency? Instead Clean WI and Cub are fighting the expansion of Point Beach, because they say, we do not need the power. If they want to make it about jobs, that expansion would create many high paying sustainable jobs.

Clean, RENEW, CUB and the PSC know that WE Energies has excess capacity until 2024 even without the Glacier Hills turbines, and that the project would literally have no impact on reducing emissions, but the project was permitted regardless. WE Energies ratepayers will now be paying over \$525 million for energy that is not needed to satisfy demand, and those forced to live within the boundaries will be new victims of the PSC allowing turbines too close to homes.

Commissioner Azar commented that staff informed her based on research and computer modeling it would take a 2200 ft setback to meet the 45dba nighttime noise limit sited in the wind siting rules. I would like to submit the response I received from the records request I submitted regarding that statement. I also received a map of the Glacier Hills project, showing the noise setbacks if anyone is interested in viewing it.

I would like to ask that you suspend the rules as they fail to do so. I ask for a 2640 ft setback, a 5dba over ambient noise limit, a property value protection agreement and a moratorium on any new construction due to excess capacity in the state. Thank you for allowing me to speak here today.

Lynn Korinek
1316 Rockledge
Mishicot, WI 54228
920-755-4644

ACT 40 FLAWS AND REASONS TO SUSPEND THE WIND SITING RULES

- 1) Commissioner Callisto choose the members of the wind turbine committee by himself and only after complaints, the list of members was taken to the other two commissioners for their vote.
- 2) The committee was stacked with wind energy proponents that will benefit financially from development of wind turbines.
- 3) One of the "public" members is the President of RENEW, which resulted in two members of RENEW being on the council.
- 4) The rules do not include a property value agreement. If the developer is so determined that the turbines do not lower property values, they have no excuse to refuse an agreement.
- 5) No engineering studies were submitted to prove that a 1.1 setback is adequate for turbine collapse, blade throw or ice fling.
- 6) Leases are not regulated.
- 7) The language related to the noise restriction does not exclude ambient. The 45dba limit is too high and well below the 5dba over ambient recommended by the WHO.
- 8) Developers are allowed to self test.
- 9) All setbacks must be from property lines.
- 10) Conflict of Interest with local officials has been a problem and is not addressed.
- 11) PSC staff stated it would take 2200 foot setback to meet the 45dba noise limit, the 1250 feet setback is meaningless.
- 12) ACT 40 does not address the fact that Wisconsin has an excess electrical capacity.
- 13) Renewable energy cost is too high and impedes job growth in industry. Using data from the U.S. Energy Information Administration, the average family of four would have household electric bills in 2016 of \$188.66 if the power was supplied by coal. If wind were used to supply 100% of the electricity used by this family, the cost would be \$339.58, an increase of 55%. These numbers would devastate the industries in Wisconsin that rely on large amounts of electricity in their manufacturing process.
- 14) Wind Turbine projects requires huge taxpayer subsidies to be profitable to the developer
- 15) Wind projects will inhibit new development in the area. This will eliminate hundreds of jobs for new home and business construction and erode the tax base by decreasing the appraised value of the existing homes.
- 16) Wind turbines do not decrease emissions from other electricity generating sources. In studies in California and Colorado, the wind turbine projects actually increased emissions because of the cycling of coal and natural gas power plants to ensure a steady flow of electricity during periods of little wind. World-wide, not a single coal plant has been shut down because of wind turbines.
- 17) Eliminate the Renewable Portfolio Standard. Wisconsin business cannot afford the addition cost of subsidized renewable energy. Force the marketplace to innovate and engineer new solutions to the problem. We should not be throwing money at the wrong solution simply because it is here. Force the wind industry to prove scientifically that they are the long term solution.
- 18) Wisconsin currently has about 300 wind turbines in operation or under construction. To meet the 2025 RPS mandate an additional 12,000 turbines will be required. Where will the state put them? The marginal wind available is in the Eastern quarter of the state, which is also the most densely populated area of Wisconsin. The experiences of residents in Fond du Lac County have proven that wind turbines do not mix well in populated areas.



Public Service Commission of Wisconsin

Eric Callisto, Chairperson
Mark Meyer, Commissioner
Lauren Azar, Commissioner

610 North Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

September 30, 2010

Lynn Korinek
1316 Rockledge Road
Mishicot, WI 54228

Re: Public Records Request ORR 2010-026

Dear Ms. Korinek:

I am writing again in response to one of your letters that the Public Service Commission received September 13, 2010, addressed to Deborah Erwin. In this letter you make a Public Records Request for:

[A]ny and all specific calculations, studies and data including but not limited to sound study research and data, computer modeling research and data and testimony related research and data pertaining to the comments made by Commissioner Azar during the August 19th 2010 PSC meeting, stating that staff informed her based on research and computer modeling, it would take a 2200 ft setback to meet the 45dba nighttime noise limit sited in the wind siting rules.

The Commission's initial response to your letter was dated September 15, 2010. Enclosed with that response was a map that Commission staff had prepared for Commissioner Azar. This map used the Glacier Hills Wind Project as an example and showed how a 45 dBA maximum noise limit would have affected turbine siting for that project.

After receiving the map and reviewing other research materials that the Commission had earlier sent to Ms. Anita Roberts of Mishicot, you called me to explain your Public Records Request further. You stated that you wanted any further records of the Commission, demonstrating how the noise contour lines were drawn on the Glacier Hills map that show the 45 dBA noise threshold and its distance from each turbine.

Commission staff creates these maps by using the ArcGIS computer program, which is commercially available software from:

esri
380 New York St.
Redlands, CA 92373-8100

ArcGIS produces the map based on data stored in electronic files known as "shapefiles." To produce a wind farm map, different shapefiles contain information about a host of relevant subjects, such as turbine locations, roads, municipal boundaries, railroad lines, electric collector

Lynn Korinek
Page 2

circuits, church locations, home locations, and noise contours at different dBA levels. The information from each shapefile can be inserted into the map.

A computer model creates the shapefile that contains noise contour data. For its Glacier Hills Wind Project, Wisconsin Electric Power Company contracted with Hessler Associates to develop noise contour data. Hessler Associates produced a report, which is Appendix R to the Glacier Hills project application. That report explains the computer model that Hessler Associates used, the input data, and the results. You can find the report from Hessler Associates on the Commission's Electronic Regulatory Filing system, at PSC REF#: 103302.

Hessler Associates then produced the shapefile with noise contour data and delivered it to the Commission. Because this shapefile consists of electronic data, a user needs the ArcGIS software to make it meaningful.

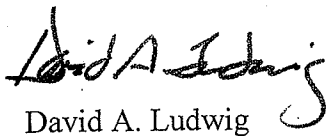
In summary, the Commission records that are the basis for the noise threshold lines on Commissioner Azar's map are the Commission's copy of the ArcGIS program, the Hessler Associates report and the noise contour shapefile. For the purposes of the Public Records Law, "record" is defined in Wis. Stat. 19.32(2). That statute excludes "materials to which access is limited by copyright, patent or bequest; and published materials in the possession of an authority other than a public library which are available for sale." Because the ArcGIS program is copyrighted material and commercially available for sale, it is not a "record" under the Public Records Law. The Hessler Report is on the Commission's website, so you can download a copy of it at your leisure.

I can e-mail a copy of the noise contour shapefile to you on request. Please recognize that it is meaningless without the necessary ArcGIS program, but if you are interested in viewing this record feel free to contact me and provide me with your e-mail address. If I don't hear from you to request a copy of the shapefile, this letter concludes the Commission's response to your Public Records Requests.

Please do not hesitate to contact me at (608)266-5621 if you have any further questions or concerns.

This determination is subject to review by mandamus under Wis. Stat. § 19.37(1) or upon written application to the Dane County District Attorney or the Wisconsin Attorney General.

Sincerely,



David A. Ludwig
Acting Deputy General Counsel



CROPP COOPERATIVE

INDEPENDENT *and* FARMER-OWNED

RE: Public Comments for PSC 128 Wind Siting Rules
Before the Joint Committee for Review of Administrative Rules.
Wednesday, February 9 at 10:00 a.m.
Capitol, 412 East

I am submitting these comments on behalf of CROPP Cooperative ("CROPP"), a farmer-owned cooperative. With 1,625 farmers nationwide, CROPP Cooperative encourages a farming future emphasizing ecological and economic stability. CROPP's Organic Valley® brand is the nation's largest farmer-owned certified organic brand, used to market organic dairy, juice, soy, and produce products.

Not only is CROPP one of the largest employers in Southwest Wisconsin, over 500 of our farmer-owners are located in Wisconsin. Despite a down economy, CROPP's revenue reached \$622 million in 2010 and we expect a 19% growth in 2011. Our farmers and our consumers are committed to our renewable energy efforts including our Cashton Community Wind project for which we have been working on for the past 2 years. We have partnered with Gunderson Lutheran and Wisconsin Western Technical College to create a community wind project that supports the local economy while providing a job training site and electricity to 1,000 homes in the area.

We also have 64 farmers in the state of Wisconsin that are committed to using renewable energy sources on their farms. Wind turbines provide our farmers with a reliable, homegrown source of energy as well as a consistent source of income. Suspending or reworking PSC 128 will significantly impact our ability to move forward on our Cashton Wind Project as well as our farmer's abilities to move forward with many of their wind turbine projects in a timely manner.

We have participated in the public hearing process for the past year and a half and we strongly urge you to support the PSC rules as it was passed in December. As passed, the wind siting rule will support economic development in the state by providing manufacturing, construction, operation, maintenance, and development while providing

sources of revenue and energy for our rural communities and our farmers. Not only have our farmers shown strong interest in the installation of renewable energy systems; our customers demand sustainably-grown products. Suspending the rule now, before it has an opportunity to work, would send a mixed signal to our farmers and partners considering investing in the wine industry in Wisconsin. We need to create regulatory certainty now to restore confidence and create jobs in rural Wisconsin.

We thank you for the opportunity to consider CROPP Cooperative's comments on this very important issue.

2-9-11

My name is Dean Anhalt. I am a Supervisor with the Town of Mishicot in Manitowoc County. I have been dealing with wind turbine issues for more than 6 years.

In May of 2010 the Town's of Mishicot, Two Rivers, and Two Creeks in Manitowoc County and the Towns of Carlton and West Kewaunee in Kewaunee County drafted a joint letter expressing our concerns with proposed wind siting rules. which was submitted to the PSC for consideration.

The concerns are:

Setbacks should be taken from the property lines of the adjoining non-participants.

Setbacks should be large enough so as not to create shadow flicker or excessive ambient noise on adjacent property.

Setbacks should be large enough not to create a loss of wind or property rights for the adjoining property.

Decommissioning expenses should be backed by a bond fund from the developer.

Town road damage needs to be addressed during decommissioning as well as during construction.

Emergency Communication Interference caused by wind turbines will be corrected by the developer in conjunction with the political sub-divisions.

We also concur and endorse the concerns set forth by the Towns of Morrison, Wrightstown, and Glenmore in Brown County in their submission to the PSC, document # 133746, requesting World Health Organization standards for turbine noise.

We are not people whose daily employment is to promote wind energy. We are not wind farm developers. We are not individuals who seek to promote their ideals on people living elsewhere.

We are elected officials responding to citizen concerns looking to protect our constituent's health and safety and personal and property rights. We are educated on this subject and have seen the results of wind farms elsewhere.

According to the January 28, 2011, edition of the Wisconsin State Farmer, "Walker's wind siting proposal strips local control." "This unreasonable proposal is a steamroller driven by anti-wind special interests bent on denying local governments the ability to decide what's in their best interests" says Michael Vickerman of RENEW Wisconsin.

What kind of statement is this? Wind promoters have been working to take local control away for years. It began with state statute 66.0401 which was a legislative restriction on the ability of municipalities to regulate wind and solar except for issues that dealt with health and safety. So my county, Manitowoc County like others, wrote an ordinance which protected health and safety. Wind supporters lobbied that ordinances like these were too restrictive and got local control taken away and put in the hands of the PSC.

Through all this, property and wind rights have been lost. Wind developers have always pushed for minimal lot line setbacks so turbines can be legally placed on small parcels. With this they only have to come to terms with one landowner while using wind over the neighboring parcels free of charge. When using wind over adjacent lands, the developer, through State statutes, can control what is done on that land in order to protect wind access to their turbine. These lands may become unviable to host turbines of their own as the wind is already being used by someone else. Unsafe zones are also cast over these properties.

We need setbacks large enough to protect wind and property rights. Each landowner should be able to decide if their rights are for sale and then negotiate compensation. The State should not be deciding this for them.

Where I live we have two nuclear plants providing base load power to our state day in and day out. The plants provide good jobs to our area. These people spend money locally and have built homes adding to our tax base. We need to open up our state to new nuclear expansion.

We need economical power, especially in this day and age.

The promotion of conservation and efficiency is very important.

Do we actually need more power production in the State?

Are we siting wind turbines solely to meet State renewable guidelines?

According to the developer in our area this is what allows them to build their project.

According to the recent Strategic Energy Assessment prepared by the PSC, Wisconsin has a very significant and potentially expensive excess capacity.

Are we going to stop using facilities we currently have in exchange for wind power?

I want our leaders to make fiscally responsible decisions and use common sense when addressing our energy needs. We need to revamp and rethink our renewable goals.

We need to make changes to the wind siting rules.

Dean Anhalt
Supervisor, Town of Mishicot
Manitowoc County

Comments by the Towns of Mishicot, Two Creeks, Two Rivers,
Manitowoc County, Wisconsin, and the
Towns of Carlton and West Kewaunee,
Kewaunee County Wisconsin

The towns of Mishicot, Two Creeks, Two Rivers, Manitowoc County and the towns of Carlton and West Kewaunee, Kewaunee County respectfully submit our comments and concerns in regard to the May 14, 2010, draft of the Chapter 128 rules for wind energy systems.

The towns concur and endorse the concerns set forth by the Towns of Morrison, Wrightstown and Glenmore, Brown County, Wisconsin - Ref. PSC REF# 133746.

We submit the following for consideration by the PSCW when developing rules for Wind Energy Systems so that public safety and health are preserved.

Setbacks should be taken from the property line of the adjoining non-participants.

Setbacks should be large enough so as not to create shadow flicker or excessive ambient noise on adjacent property.


Setbacks should be large enough not to create a loss of wind or property rights for the adjoining property.

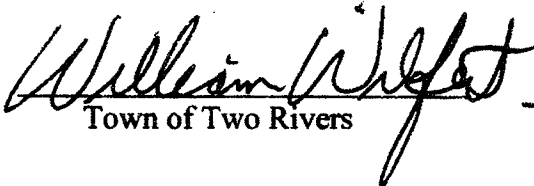
Decommissioning expenses should be backed by a Bond Fund from the developer.

Transportation should also include damage caused to roads from the decommissioning of the wind turbines.

EMS - Emergency Communication Interference caused by Wind Turbines should be corrected by the developer in conjunction with the political sub-divisions within a year.


Town of Mishicot


Town of Two Creeks


Town of Two Rivers


Town of Carlton


Town of West Kewaunee

10. <undisclosed-recipients:>
Sent: Wednesday, October 06, 2010 8:57 AM
Subject: Wi electricity supply [W.eb.bd]

Study says state has more electricity supply than it needs

By JUDY NEWMAN | jnewman@madison.com | 608-252-6156 | Posted: Tuesday, October 5, 2010 5:35 pm | (2) Comments

Wisconsin has more electricity supplies than it needs, thanks to a buildup of generation and the effects of the recession, but getting power to customers is "an ongoing challenge," a new report says.

The recession has dramatically cut projections for future energy needs, according to a draft version of the Strategic Energy Assessment, a review conducted every two years by the Wisconsin Public Service Commission.

Peak energy demand is now expected to grow 1 percent a year statewide between 2011 and 2016, a sharp drop from projected annual increases of 2.1 percent in the 2008 report.

In individual comments, commissioner Lauren Azar said the recent phase of adding power generation has been "prudent" but coupled with the recession, Wisconsin has "very significant (and potentially expensive) excess capacity." Azar repeated her call for the Legislature to give the PSC more authority for long-term, comprehensive energy planning, rather than the current utility-by-utility assessment.

The draft report, which will be open for public comment until Jan. 7, also said Wisconsin is "well on its way" toward getting 10 percent of its electricity needs from renewable sources by 2015.

Posted in Govt-and-politics, Govt_and_politics on Tuesday, October 5, 2010 5:35 pm Energy Assessment, Electricity Supply, Psc, Public Service Commission, Lauren Azar

10/7/2010

Public Service Commission of Wisconsin (PSC)

Submitted: 6/24/2010 11:08:34 PM

COMMENTS FILED ELECTRONICALLY IN

Wind Siting Rules

1-AC-231

Commentor Information:

Name: Glen R. Schwalbach, P.E. for towns of Morrison, Wrightstown, and Glenmore
Address: 1090 Moonriver Dr
City: De Pere State:WI Zip:54115
E-mail: glenschwalbach@netzero.com
Phone: 920-680-2436

Comment:

Submitted to: Public Service Commission of Wisconsin
Docket No. 1-AC-231 Draft Chapter 128--Wind Energy Systems

Request by the Towns of Morrison, Wrightstown and Glenmore
Brown County, Wisconsin
June 23, 2010

Issue: Request to delay issuing the PSCW wind siting standards until epidemiological studies of health complaints from Wisconsin's current wind farms are thoroughly completed.

The towns of Morrison, Wrightstown, and Glenmore in Brown County are very concerned about the mounting evidence that there are serious negative impacts on human and animal health caused by wind turbines. It appears it is not only reasonable to delay the issuance of wind siting standards but it would be irresponsible to not do so in light of new studies and ongoing complaints of residents in and near Wisconsin's existing wind farms.

In general, scientifically and statistically relevant studies have been limited. But, a very important report was published March 2010 by the World Health Organization (WHO) entitled "Night Noise Guidelines for Europe" (available at euro.who.int/en/what-we-publish/abstracts/night-noise-guidelines-for-europe).

The report is based on a six-year evaluation of scientific evidence by thirty-five scientists from medical and acoustical disciplines. WHO indicated that now governments have justifications to regulate noise exposure at night. WHO sets the limit for annual average exposure to not exceed 40 decibels (dB) outside of a residence.

WHO stated, "Recent research clearly links exposure to night noise with harm to health. Sleep disturbance and annoyance are the first effects of night noise and can lead to mental disorders. Just like air pollution and toxic chemicals, noise is an environmental hazard to health". WHO stated that they hope their new report will prompt governments to invest effort and money in protecting health from this growing hazard.

Our towns ask the PSCW to acquire the WHO report and evaluate its application to setting appropriate sound levels for wind turbines.

The PSCW's draft rules do not address low frequency noise levels. It is not known whether the WHO report addresses this issue but other studies have described the likely effects. This is another area where epidemiological studies are needed before wind turbine setbacks can be reasonably proposed.

Besides sleep disturbance, there are complaints of other physiological problems. It is not acceptable to ignore or minimize the significance of these impacts as just quirks of human imagination.

Also, there is evidence that existing wind farms in Wisconsin are negatively affecting farm animals. Whether it is noise or some other physical phenomena, studies and testing should be done before setting siting standards.

At a public meeting of the Brown County Health Department and the Brown County Human Services Committee, reputable medical and health experts stressed the importance of epidemiological studies to determine the true nature of health impacts of wind turbines.

The State Board of Health pointed out that the lack of funding is a hurdle. But a conviction to do the right thing should prompt the PSCW to make a case to pursue the money issue with state legislators as well as our U.S. senators and representatives. Certainly, our towns would help in this endeavor. That said, it is even more appropriate for the wind developers and their associations to offer funding for independent studies since such studies should reduce future litigation. Electric utilities should have a stake in this effort as well. This is an opportunity to involve the University of Wisconsin research capabilities in both human health and animal health.

It appears that Act 40 does not set a deadline for completing the siting rules. This week a state senator who was one of the leaders in passing the wind siting law agreed that studies should be done to be sure the rules are adequate. If one or two years were used to study the existing wind farms while delaying any new installations, the developers would still have time to help utilities meet their 15% RPS by 2015. Again, if needed, our towns would help in getting the support of legislators.

Our towns implore the PSCW and the Wind Siting Council to not ignore the evidence of potentially serious health impacts and to not set standards until they have done the obvious and reasonable step of studying the health impacts of existing wind turbine installations in Wisconsin. Professional ethics demands no less. We believe our request aligns with the PSCW's responsibility to protect the citizens of Wisconsin.

Submitted for the towns by Glen R. Schwalbach, P.E.

I affirm that these comments are true and correct to the best of my knowledge and belief.
Glen R. Schwalbach, P.E. for towns of Morrison, Wrightstown, and Glenmore

4) NON-SEVERABILITY OF WIND RIGHTS FROM SURFACE RIGHTS

Recommendation: Wind rights should not be severed from the land.

Explanation: The intent of this policy recommendation is to ensure that the economic benefits of wind energy development stay connected to the land, and thus the local community as much as possible. The impact of this policy would be that wind rights cannot be sold or leased in perpetuity separately from the land.

Note that a similar provision is included in South Dakota statute (§ 43-13-17 to 43-13-19; Source: SL 1996, ch 260, § 4).

5) DECOMMISSIONING AND SITE CLEAN UP FUND

Recommendation: Wind project owners should be required to maintain a fund with adequate resources to cover the costs of decommissioning and site clean up.

Explanation: Many wind agreements are vague and include minimal incentives to ensure that the project owners follow through with site clean up after decommissioning. Provisions in many contracts leave too much chance that landowners will be left with the responsibility of removing equipment.

6) INSURANCE AND INDEMNITY PRACTICES

Recommendation: Wind developers must maintain liability insurance at a minimum level specified in the land agreement. The developer must indemnify the landowner against liabilities for injuries or claims caused by the developer's exercise of rights granted in the lease or easement.

Explanation: Landowners should not be held liable for issues related to the wind project.

7) GUIDELINES FOR SETBACKS

Recommendation: Turbines should be sited no less than five times their rotor diameter from property lines, unless written permission is given by the neighbor. An easement or lease on the neighbor's land would be considered written permission.

Explanation: This recommendation is designed to protect wind rights of all landowners and minimize the impact of

wind turbines on neighbors. Wind turbines produce wake effects 8-11 rotor diameters downwind. **Requiring a setback of 5 rotor diameters from property lines provides a buffer that will protect the wind rights of all landowners in the vicinity of a wind project.** We believe clear standards for property line setbacks are critical to preventing disputes over wind rights now and in the future. Without standards, conflicts among neighbors and among wind developers can arise. A prolonged or heated conflict over wind rights could delay or limit wind project development opportunities for a community.

This recommendation is based on the Minnesota Environmental Quality Board's wind access buffer rule that requires turbines to be placed 5 rotor diameters or more away from a project site's perimeter as a condition for granting permits on wind projects greater than 5 MW.

Alternative Recommendation: Establish a *Resource Based Compensation Model* for wind energy development where compensation is provided based on both real estate and wind resource usage.

Explanation: Wind energy development engages two primary natural resources: land and the wind blowing across it. Current models for compensating landowner hosts of wind projects are based on the use of the land for the placement of turbines, associated equipment and access roads. The wind resource consumed by a wind turbine extends approximately 8-11 rotor diameters downwind and approximately half as far laterally. A resource based compensation model for wind energy development would compensate all landowners in this "wind pool" or "wind print" in addition to the landowner providing real estate for the turbine. The need for mandated setbacks could be eliminated if all landowners providing wind resource are compensated. This model has the advantages of encouraging more collaboration within a community, preventing taking of anybody's wind resource without compensation, and providing the developer with maximum flexibility in siting turbines in the best wind locations. Disadvantages of this model include the possibility of complicating the land agreement process by the need for developers to negotiate with more landowners.

A fuller explanation of the Resource Based Compensation Model for Wind Energy Development will be available on the Windustry website later in the fall of 2005.



MICHELS CORPORATION

817 W. Main Street • P.O. Box 128 • Brownsville, WI 53006-0128
920/583-3132 • Fax 920/583-3429
www.michels.us

February 9, 2011

Senator Leah Vukmir
Representative Jim Ott
Joint Committee for Review of Administrative Rules
State Capitol
Madison, WI 53708

RE: PSC 128 (CR 10-057)

Dear Sen. Vukmir and Rep. Ott:

Michels Corporation supports the development and construction of wind energy projects in the state of Wisconsin. As background, Michels Corporation recently constructed the Forward Energy Center in Brownsville, WI. This 129 MW project had over 200 people employed as laborers, operators, ironworkers, and electrical workers, in addition to many support personnel who all worked together to get this project built safely and on time. Michels is proud of our environmental record on this project situated near the Horicon Marsh. We performed electrical construction for the Blue Sky Green Field, Butler Ridge and Glacier Hills projects, in addition to complete construction of the Shirley Wind project. While Michels is a diversified utility contractor, wind farm construction is an important part of our business.

We support the process the PSC used to identify the wind tower siting setback of 1,250 ft. The process was fair, balanced, and including various key stakeholders. Restricting the setback further would negatively impact the ability of wind developers to build wind generation projects in Wisconsin, and drive jobs and income to surrounding states. If given the opportunity, Michels, and our work force, would much rather work close to home and see the direct economic benefits of these projects enjoyed by Wisconsin businesses and Wisconsin workers – not those in a neighboring state.

The economic benefit of these projects goes all the way down to the local gas station. The BP station near the Forward Energy project daily sold hundreds of extra sodas and coffees during construction and Cunningham's Feed Mill restaurant and bar in Knowles had full lunch tables virtually every day during the 6-month peak construction period.

For each 100 MW wind project we employ on average 125 people over the duration of project, with 6-8 employed long term for maintenance. There are four 100 MW projects that likely would not be built if the 1,250 ft. setback is increased. This directly affects Michels and our employees.

Thank you for allowing us to offer our comments supporting wind farm development right here in America's Dairyland!

Sincerely,

Christopher J. Deschane
Business Development Manager

"BUILDING AMERICA, CHANGING THE WORLD"

BROWNSVILLE, WI • SEATTLE, WA • MILWAUKEE, WI • HARRISBURG, PA • NEENAH, WI • TOPEKA, KS
GREEN BAY, WI • EDMONTON, AB • PEORIA, AZ • BURNSVILLE, MN • SALEM, OR • WOODLAND, CA

"AN EQUAL OPPORTUNITY EMPLOYER"

February 9, 2011

Joint Committee for Review of Administrative Rules
Room 412 East
State Capital, Madison WI

My name is Larry Lamont and I regrettably live in an industrial wind turbine area.

I have three minutes to describe some of the situations I will live with the rest of my life.

I was a supporter of wind generation until after they were put up in my back yard. I learned so much. The impact has been a lot bigger and more intrusive than they had been portrayed.

Where do I begin?

Constant noise – even when not turning we hear the energy wasting transformer hum, continuous distracting motion, shadow flicker, environmental impacts, loss of “flight for life”, real and potential health problems, very obnoxious red flashing FAA warning lights, interference of radio reception, and according to the Wisconsin Realtors Association, up to a 40% reduction in property value.

Living inside the perimeter of a wind farm I can address all these problems. I bought 78 serene acres 40 years ago thinking I would be safe from intrusion by others. Not so. We have many omnipresent intruders. Three near the 1250-foot limit recommended by the PSC, one only 1101 feet from my house. Way to close.

I will first address the most persistent problem – noise, specifically the post-construction noise study. It seems that once the test is passed they will never be checked again and they are free to roar. I would like to make comment to three troubling statements in this study. First – The lead engineer is hard of hearing. After spending the better part of a week on site he said he did not witness the often described “whoosh-whoosh” of the turbines. Say what? Second – The report is very hard to understand. They even had trouble because they reported the cut in speed at 3m/sec when it should be 3.6m/sec. The significant of this is that the turbines were not producing electricity 71% of the time that day, just spinning slowly in the breeze. Thirdly – what is really meant by the engineer hired by the utility requiring all parties to meet before the test “to ensure a successful test”?

I borrowed a noise meter; on this meter I have had turbine noise readings as high as 63dbA. This is 20 TIMES the recommended 50dbA level. Remember these are on a logarithmic scale. Nobody is monitoring these abuses. Does anybody care – other than the people that have to live with under these conditions?

Monitoring should be continuous, unannounced and with no per-agreements. Noise is noise.

I passed my drivers test because I stayed under the posted speed. Does this exempt me from further monitoring – Hell no. Nobody is monitoring turbine noise. Why have guidelines if nobody gives a rip if they are ignored.

Our township has a nuisance ordinance. There are five definitions of causing or being a nuisance. The turbines are blatant violators of four of these categories. Here again the wind farms are beyond the law. They are not being monitored or held accountable. And they think they are good neighbors.

Another issue that bothers me is Vickermans band of 15 members that were selected to advise the PSC on wind tower placement. What a folly. Judging from their job descriptions who would ever have predicted this select group would support wind energy almost without reservation. What a waste of time and money. This is like asking a select group of tavern owners if they favor prohibition or not.

And I'm not totally buying into the green energy thing. Proponents say that the energy is carbon free. Nobody has talked about the large trail of energy and carbon that it takes to build, deliver and maintain these behemoths. It is the most expensive and least dependable way to generate electricity. 10 cents per kwh as opposed to 3-4 for coal and 2-3 for nuclear. And we still have to maintain all our other forms of generation because of there undependability.

If this information doesn't slow down the green theme a little check out some towers. Many are covered with dark splotches from a lubricant or something. Many blades are streaked with the same stuff. How much of this stuff are they splattering around the countryside?

These are a financial boon to those few that 'host' these things. \$175,000 per tower over the life span is nothing to sneeze at. The rest of us put up with all these conditions for nothing. Many of the "hosts" are unhappy also but they cannot be too vocal.

And finally, I get so frustrated when the press and media buys into how great these things are as told to them by the well funded industry that build them or distributes there product. When affected residents try to explain their problems with living near the towers we get the "some people just do not like these things" explanation. I challenge them to come live with us for a while and then try to think of anything you do like about them.

I would welcome any response to my comments. Did you hear them, do you understand? Any questions?

Larry Lamont
W 2362 Ash Rd
Malone, WI 53049

9 February 2011

PSC128 Hearing

My name is Matt Pugh, Customer Service Operations Manager from American Superconductor Corporation. We are a global electrical power technologies company with approximately 200 employees here in Middleton and New Berlin, Wisconsin.

Over the course of the past five years – through the economic downturn – we have grown our local employee base by more than 156%. We have plans to continue growing here in the years ahead. But if the state's policy on wind power changes, we might very well have to focus our hiring efforts elsewhere.

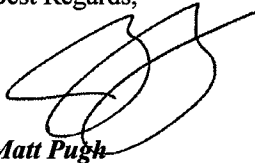
A vast majority of AMSC's revenues today come directly from the wind power market, and Wisconsin serves as our center of excellence for wind turbine power electronics and controls. We also manufacture grid interconnection solutions for wind farms and solar plants at our facilities here in the state.

Our company currently is planning to erect a wind turbine in Wisconsin. This will serve as a qualification bench for our next-generation power electronics, blade technology, generators and turbine controls, enabling AMSC to remain at the forefront of the wind industry. This is critical to our company's success and will help us continue to grow our headcount in the state.

AMSC also is uniquely positioned to bring a new wind turbine manufacturer into this state. We currently are working with a dozen wind turbine manufacturers worldwide, including two of the world's top ten producers. Some of these companies are looking to establish operations here in the U.S. A manufacturer like this would create hundreds of new green collar jobs and also would require a host of partners who could supply towers, blades and other critical components. A strong local market will foster new manufacturers and their suppliers. Wisconsin is one logical locale for this new manufacturer and supply chain, but only if support for the industry remains strong.

We urge this Committee to uphold PSC 128 for the sake of our company, our employees and our state.

Best Regards,



Matt Pugh
Customer Service Operations Manager
American Superconductor Corp.

8401 Murphy Drive
Middleton, WI 53562
Ph: +1 608.828.9236
Mobile: +1 608.215.4307
mpugh@amsc.com
www.amsc.com

AMERICAN SUPERCONDUCTOR CORPORATION
8401 MURPHY DR, MIDDLETON, WI 53562
TEL: +1 608.828.9236 FAX: +1 608.831.4609

Why are we promoting Wind Energy in Wisconsin?

(negative impacts to Property owners)

Tim Harmann

4544 Mill Road

Denmark, WI 54208

Running for Town Supervisor in the Town of Morrison, Brown County, Wisconsin

Property Owners

What is the Return on Investment (ROI) on Subsidizing Wisconsin Wind Energy with Tax Dollars?

- Carbon Emissions
 - Bentek Energy Study
 - http://www.bentekenergy.com/files/userfiles/file/BENTEK%20-%20Executive%20Summary%20-%20How%20Less%20Became%20More_100416.pdf
 - 3 Page Executive Summary
 - RPS (renewable portfolio standards) "must take" mandate on wind energy causes cycling of coal plants to accommodate inconsistent wind power and therefore has had minimal or no impact on reducing carbon emissions. In some cases emissions are actually increased due to introduction of wind energy.
 - ROI: Basically little, no, or negative benefit on emissions
- Wisconsin Wind Class
 - Department of Energy
 - http://www.windpoweringamerica.gov/maps_template.asp?stateab=wi
 - Wisconsin is a Class 1 (Poor) and Class 2 (Marginal) wind state
 - Large subsidies of tax dollars to support wind projects that can never break even
 - 35% overcapacity of power in Wisconsin (why create more expensive power?)
 - Wind Averages 20% of installed name-plate capacity in Wisconsin
 - Do the math...It doesn't make any sense
 - ROI: Huge unnecessary spending, Negative payback
- Targeting Niagara Escarpment (class 2 - marginal)
 - Bedrock and Aquifers are only a few feet from the surface on the Niagara Escarpment causing runoff pollution and well issues. This is already a fragile area.
 - http://www.co.brown.wi.us/departments/page_1efd5d9c60d3/?department=097c0e79486a&subdepartment=7c17181709a3
 - Wells in the Town of Morrison have a history of issues
 - In 2006, over 34% of the wells tested exceeded the state drinking water standard for nitrate/nitrite (ppm N) of 10 ppm and 19% tested positive for bacteria.
 - ROI: Negative benefit to our health and water supply

- Health issues are one of the negative returns on this investment
 - Need a ½ mile setback from a property line and 5 dba over ambient to protect Wisconsin citizens who pay these taxes to subsidize wind that has no positive ROI
 - I've personally interviewed 10 people in the Blue Sky Green Fields WE Energies project near Fond Du Lac and they are experiencing sleep and noise issues
 - 4 of 10 allowed me to video our interviews
 - <http://www.youtube.com/watch?v=34oOPKNJv-E>
 - http://www.youtube.com/watch?v=9PvPXU0io_A
 - <http://www.youtube.com/watch?v=pzh106w1IRA>
 - <http://www.youtube.com/watch?v=GlbzYXSM0zs>
 - Overall ROI: Negative impacts and not enough citizen protection
- Our new Governor Scott Walker
 - Realizes that expensive wind energy and the resulting costly expansion of our over-taxed transmission lines will increase the cost of energy to manufacturers who are considering Wisconsin
 - We're restricting job creation in Wisconsin by promoting negative ROI, expensive, and inefficient wind energy.
 - Isn't responsible spending needed by ALL IN THIS ECONOMY(or any economy)?
 - We need to get on a single course/mission, working together to get out of this recession and emerging strong and moving forward
 - We cannot allow minimal setbacks which will allow more wind turbines and more wasteful tax spending with no ROI
 - ROI: Wisconsin Unattractive for Manufacturing/Business creation
- What about the Property Value Loss for homes near wind turbines
 - <http://www.wind-watch.org/documents/wind-turbine-impact-study/>
 - Appraisal Group One Study of Wind Turbines on Property Values
 - 24% - 47% loss in property value depending on size of parcel, improvements, and proximity to wind turbine
 - Why "Wind Farm Ghetto"?
 - Each turbine has a circle of Property Value "Taking" around it.
 - Shorter Setbacks = greater number of homes in the "Taking" circle
 - I personally quit making improvements to my beautiful home because my property improvement ROI has become negative due to the proposed wind turbines around my home.
 - Area Contractors suffer because large projects aren't started
 - Area retailers suffer because improvements ^{aren't} are made
 - Apprehensiveness to invest due to uncertainty about the wind projects (very much like the recession and struggling stock market)
 - Hard enough to attract talent to cold weather states now we're making it difficult for them to buy or build homes in Wisconsin rural areas
 - ROI: Huge loss to Property owners in the "Taking" circle.

Where is the positive return on our Tax investment? It doesn't exist!

What do we need to stop doing?

- Quit forcing more expensive power on our struggling businesses.
- Quit splitting up communities over wind. We need to work together.
- Quit killing the property values and property rights of citizens near wind turbines.
- Quit trying to reduce setbacks to force wind turbines too close to people
- Quit impacting health and sleep
- Quit killing the retailer's and contractor's businesses near wind ghettos.

What are some solutions?

- Reject subsidies on projects that don't have an ROI and do little of nothing to reduce emissions
- Put subsidies into research grants to find an innovative renewable energy replacement for coal that doesn't have all the side effects of wind power.
 - Wind companies could use their experience in renewable energy to find a viable solution that has an ROI and reduces emissions.
 - Solution could even create less expensive power than coal
 - Create jobs in Wisconsin and put us on the map
- Give subsidies/incentives to coal plants to install cleaner emission systems.
 - Wouldn't that solve everyone's problems?
- If we must subsidize wind turbines (and I would like a logical explanation of why we would invest tax dollars here) we must provide protection to Wisconsin citizens and businesses:
 - ½ mile setbacks from property lines and 5 dba over ambient to reduce the negative impacts of wind turbines

Sources are below that were referenced above:

http://www.windpoweringamerica.gov/maps_template.asp?stateab=wi

Department of Energy:

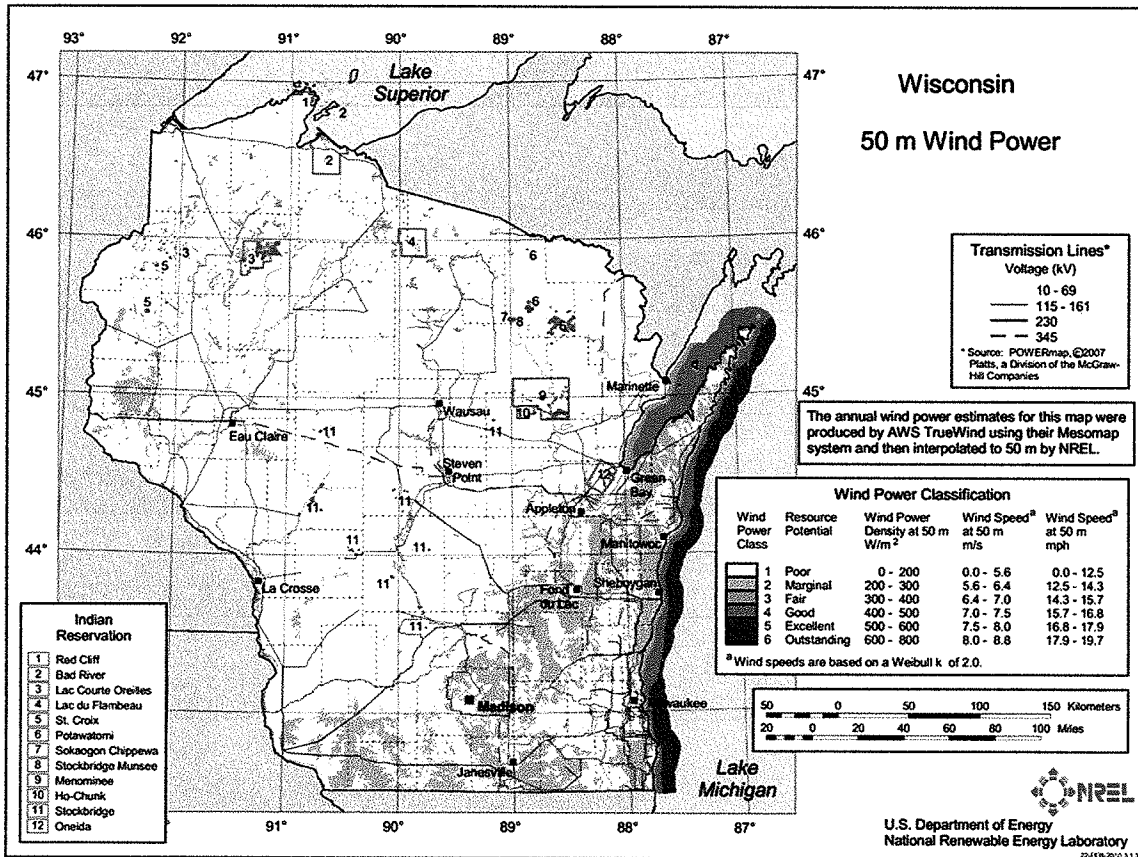
The Department of Energy's Wind Program and the National Renewable Energy Laboratory (NREL) published a wind resource map for the state of Wisconsin. This resource map shows wind speed estimates at 50 meters above the ground and depicts the resource that could be used for utility-scale wind development. Future plans are to provide wind speed estimates at 30 meters, which are useful for identifying small wind turbine opportunities.

As a renewable resource, wind is classified according to wind power classes, which are based on typical wind speeds. These classes range from Class 1 (the lowest) to Class 7 (the highest). In general, at 50 meters, wind power Class 4 or higher can be useful for generating wind power with large turbines. Class 4 and above are considered good resources. Particular locations in the

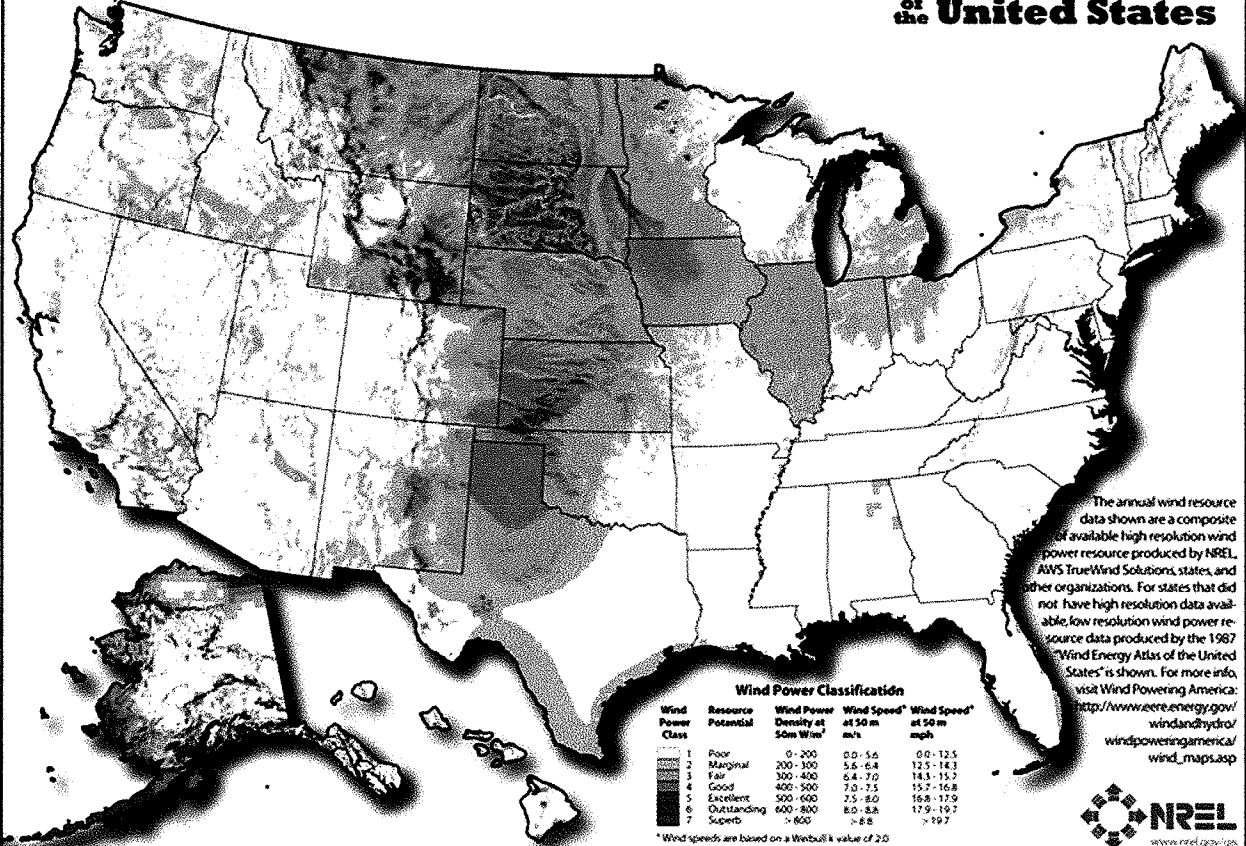
Class 3 areas could have higher wind power class values at 80 meters than shown on the 50-meter map because of possible high wind shear. Given the advances in technology, a number of locations in the Class 3 areas may be suitable for utility-scale wind development.

This map shows the highest wind resources in Wisconsin are concentrated in the southern and eastern part of the state. Class 3 areas are predominately located on capes and exposed coastal locations along Lake Michigan and Green Bay. Particular locations in the Class 2 and Class 3 areas could have higher power class values at 80 meters than shown on the 50-meter map because of high wind shear. Given the advances in technology a number of locations in the southern and eastern part of Wisconsin may be suitable for utility-scale applications.

Note: Wind resource at a micro level can vary significantly; therefore, you should get a professional evaluation of your specific area of interest.



Wind Resource (50m) of the United States



The annual wind resource data shown are a composite of available high resolution wind power resource produced by NREL, AWS TrueWind Solutions, states, and other organizations. For states that did not have high resolution data available, low resolution wind power resource data produced by the 1987 "Wind Energy Atlas of the United States" is shown. For more info, visit Wind Powering America: http://www.were.energy.gov/windandhydro/windpoweringamerica/wind_maps.asp

Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50m Win*	Wind Speed* at 50 m m/s	Wind Speed* at 50 m mph
1	Poor	0 - 200	0.0 - 5.6	0.0 - 12.5
2	Marginal	200 - 300	5.6 - 6.8	12.5 - 14.3
3	Fair	300 - 400	6.8 - 7.0	14.3 - 15.5
4	Good	400 - 500	7.0 - 7.5	15.5 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	> 800	> 8.8	> 19.7

* Wind speeds are based on a Weibull k value of 2.0



Author: Billy Roberts - December 12, 2008

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy.



Groundwater and Well Information

In 2006, the Town of Morrison experienced a never before seen well contamination problem. Over 34% of the wells tested exceeded the state drinking water standard for nitrate/nitrite (ppm N) of 10 ppm and 19% tested positive for bacteria. While the Department of Natural Resources officially stated that the source of the problem was undetermined, the karst features in the area proved that significant well contamination issues could continue to plague the area.

Karst is any terrain based on a layer of soluble bedrock, usually, though not always, of carbonate rocks. In Brown County, and most of northeast Wisconsin, karst forms on limestones (calcium carbonate) and dolomites (magnesium calcium carbonate), found primarily along the Niagara Escarpment or as locally referred to as "the ledge". Common natural Karst features include:

1. **Sinkholes** - Depressions in the ground surface caused when sediment overlying the bedrock washes into bedrock into bedrock channels and cavities or by the collapse of cave roofs. Sinkholes vary in size and have slopes ranging from gradual to severe. Surface water draining into sinkholes can enter nearby wells quickly.
2. **Bedrock outcroppings** - Limestone or dolomite bedrock protruding from the

- ground surface.
3. **Springs** - Water flowing out of the ground from subsurface flow paths.
 4. **Disappearing or sinking streams** - Small surface streams that enter subsurface flow paths.
 5. **Earth cracks** - Cracks from a few inches to several feet formed when a limestone formation leans toward an unsupported area such as a valley.
 6. **Flaggy soil** - Soil with "flags" of small limestone pieces mixed with the soil. The mapping of flaggy soils is a useful identifier of limestone bedrock a short distance beneath the surface.

Karst makes for beautiful scenery, but it is very vulnerable to groundwater pollution, due to ease of water flow. Natural filtration is nearly non-existent in karst areas. To make matters worse, cave conduits act as natural sewer lines, and sinkholes become personal garbage dumps in small towns and rural areas, which puts the local drinking water supplies at risk. It is only recently that these problems are beginning to be addressed.

<http://www.wind-watch.org/documents/wind-turbine-impact-study/>

Wind Turbine Impact Study

[[Alternate short URL for linking](#) • [HOME](#)]

Author: Appraisal Group One

This is a study of the impact that wind turbines have on residential property value. The wind turbines that are the focus of this study are the larger turbines being approximately 389ft tall and producing 1.0+ megawatts each.

The study has been broken into three component parts, each looking at the value impact of the wind turbines from a different perspective. The three parts are: (1) a literature study, which reviews and summarizes what has been published on this matter found in the general media; (2) an opinion survey, which was given to area Realtors to learn their opinions on the impact of wind turbines in their area; and, 3) sales studies, which compared vacant residential lot sales within the wind turbine farm area to comparable sales located outside of the turbine influence.

The sponsor for this study was the Calumet County Citizens for Responsible Energy (CCCRE) (Calumet County, Wisconsin), which contracted our firm, Appraisal Group One, to research the value impact that wind turbines have on property value. Appraisal Group One (AGO) protected against outside influence from CCCRE by having complete independence to the gathering of facts, data and other related material and the interpretation of this data to the purpose of this study. AGO chose the location of the study, the search parameters, the methodology used and the three-step approach to the study. AGO does not enter into any contract that would espouse any preconceived notion or have a bias as to the direction of the study and its findings. The purpose of the study was to investigate the value impacts of large wind turbines, the issues influencing these impacts and to report these findings on an impartial basis. ...

The geographic area of this study was focused in Dodge and Fond du Lac Counties. These two counties have three large wind farms. They are:

- WE Energies – Blue Sky Green Field wind farm which has approximately 88 wind turbines and is located in the northeast section of Fond du Lac County, bordering Calumet County to the north.
- Invenergy – Forward wind farm which has approximately 86 wind turbines and is located in southwest Fond du Lac County and northeast Dodge County.
- Alliant – Cedar Ridge wind farm which has approximately 41 wind turbines and is located in the southeastern part of Fond du Lac County.

Of these three wind farms, only the WE Energies and Invenergy wind farms were used in the sales study since the Alliant – Cedar Ridge wind farm did not have enough viable sales within the turbine influence area to use as a base of comparison. The Realtor survey was limited to Fond du Lac and Dodge Counties, that being the area which had the three wind farms. ...

Summary of Findings & Conclusion of Impact

The survey indicated that in all but two scenarios (those being Questions #8 and #9), over 60% the participants thought that the presence of the wind turbines had a negative impact on property value. This was true with vacant land and improved land. Where the group diverted from that opinion is when they were presented with a 10-20 acre hobby farm being in close and near proximity. In these cases 47% (close proximity) and 44% (near proximity) of the participants felt that the wind turbines caused a negative impact in property value.

The answers showed that bordering proximity showed the greatest loss of value at -43% for 1-5 acre vacant land and -39% for improved properties. Next in line was the close proximity showing a -36% value loss for 1-5 acre vacant land and -33% for improved property. Last in line was the near proximity, showing a -29% loss of value for a 1-5 acre vacant parcel and -24% loss in value for improved parcels. These losses show a close relationship between vacant land and improved land. This pattern was replicated regarding the bordering proximity for a hobby farm, whereas 70% believed it would be negatively impacted. Lastly, the opinions regarding the impact of the wind turbines due to placement, that being in front of the residence or behind the residence, showed that in both situations most participants believed there would a negative impact (74% said negative to the front placement and 71% said negative to the rear placement).

In conclusion, it can be observed that: (a) in all cases with a 1-5 acre residential property, whether vacant or improved, there will be a negative impact in property value; (b) with 1-5 acre properties the negative impact in property value in bordering proximity ranged from -39% to -43%; (c) with 1-5 acre properties the negative impact in property value in close proximity ranged from -33% to -36%; (d) with 1-5 acre properties the negative impact in property value in near proximity ranged from -24% to -29%; (e) in all cases the estimated loss of value between the vacant land and improved property was close, however the vacant land estimates were always higher by a few percentage points; (f) it appears that hobby farm use on larger parcels would have lesser sensitivity to the proximity of wind turbines than single family land use; and (g) placement either in front or at the rear of a residence has similar negative impacts.

My name is Sandra Johnson, and I wish to thank you for the opportunity to ask this committee to "Suspend the Rules" as sent to you by the PSC. I am a resident of the Holland township in southern Brown County.

As a retired Green Bay science teacher, several questions came to mind when a proposed wind turbine project in our community jumped from 4 or 5 turbines as told to our town board to 100 1.5 Megawatt 40-story turbines in four townships.

Why would a wind energy corporation keep the real number of turbines in their project quiet for over 2 years, and how did they accomplish that? Often turbine contracts have a confidentiality clause which prohibits a participating landowner to speak to anyone -- not the press, not their neighbors.

And the second clause often included is the "Right of First Refusal". If that landowner finds that for whatever

reason-- health or economic -- after the turbines go online that his family cannot live there, the wind project owner or investors get first bid on that home and the land that goes with it. And who ends up with that land?? It's a win for the wind corporation and a loss to the local community.

About ten years ago, when the Lincoln Township wind project in Kewaunee County went online, ground current problems rose and Scott Srynka said that "...trucks have grown more frequent hauling away the (cow) carcasses." He added, "Thirteen turbines were proposed for my land, but we decided to wait. Thank goodness we did, or we'd be out of farming." Is Wisconsin the "dairy state" or isn't it??

Some citizens are no longer waiting for answers. They are taking action. In the Dec. 7th. 2010 Contra Costa Times it was reported that a judge in California settled a two year case brought against NextEra Resources by that state and environmental groups. The 1,300 plus annual raptor

deaths (Golden Eagles, hawks, falcon and owls) in the Altamont Pass in the northern part of the state was unacceptable. NextEra got a \$2.5 million fine, must replace 2,400 old turbines over the next 4 years. If that does not reduce greatly the bird kills, NextEra must remove even those newer turbines. High bird and bat kill numbers as reported here by our state DNR in 3 Wisconsin wind projects can't be seen as an asset to tourism which is another big Wisconsin industry.

Tom Tanton, engineer and former member of the California State Energy Board for 35 years says, “. . .most of the ‘stimulus’ cash grants to wind. . .actually ended up overseas. . . Wind energy is not economically competitive and utilities are forced . . .to pass along the higher costs to their customers. . .”.

Finally, in a December show on Late Night with David Letterman, his guest reported that Texas billionaire T. Boone Pickens is working to get back \$200 million dollars

that he invested in an order for industrial wind turbines. He has shifted away from wind to a focus on natural gas. What does he know about wind energy that you do not?

Thank you for your time.

Sandra Johnson

1893 Wayside Rd.

Greenleaf, WI 54126

(920) 532-4725

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and straps, also purchased
e donation, will be used at
accidents when any ex-
n needs to be performed.
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e steady, whether it is on
on its roof, or even on top
her vehicle. This will keep
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to occupants and lessens
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the rescue.

FT teams were formally
ed in Brown County a
of years ago, after the
f Green Bay Firefighter
Voulf in a house fire on
Bay's east side. Much
and practice is done on a
asis to participate on the
he Denmark RIT team
ipment is assigned to En-
L2 at station one, located
illage of Denmark.. Den-
re responded to 38 acci-
it of 90+ calls in the last
ir.

Shirley 'Un-Winds'

Shirley Wind Project for sale, developers
still keen on addressing residents' concerns



Shadow flicker is the effect caused by sun-
light shining through the spinning blades of a
wind turbine. This effect is most dramatic when
it falls on windows, causing strobe-like light-
ing conditions. While this effect is typically
minimized during the planning phase of a wind
project by carefully selecting the locations of
turbines, as wind farms move into more heavily
populated areas, it becomes nearly impossible to
avoid shadow flicker entirely.

Current zoning in the Town of Glenmore,
where Shirley Wind LLC is nearing completion
of the much debated 20 megaWatt wind farm,
limits shadow flicker on residential structures,
where it can most bother people, to 20 cumula-
tive hours per year. Upon hearing complaints
from one area resident about shadow flicker,
Shirley Wind looks to take the high road.

According to sources at the wind farm, the
renewable energy developer is investing in soft-
ware upgrades that can read all of the variables
that determine whether or not shadow flicker
will fall on residences. John Maserjian of Cen-
tral Hudson Gas & Electric (CHG&E) which
owns roughly 90 percent interest in the facility
says, "Shad-

Central Hudson Gas & Electric Corpora-
tion (CHG&E) of Poughkeepsie, NY, which
owns roughly ninety percent of the Shirley Wind
Project, has begun the process of selling the 20
megaWatt energy production facility. The proj-
ect has yet to even be completed, and already the
utility is courting buyers, although they say the
move has more to do with a shift in corporate
strategy versus the pros and cons of the Shirley
installation itself.

John Maserjian, CHG&E spokesman for
the Shirley Wind project confirms, "That is true.
In October our Board of Directors announced
a change in strategy for CH Energy Group,
and we're looking to refocus the company on
our utility operations in New York and also our
fuel distribution operations in the Mid-Atlantic
area. So we're looking also to 'unwind' our in-
vestments in renewable energies including the
Shirley Wind investment. We're moving in that
direction. We're not at the point where we can
announce any prospects or interest, but we're
taking the preliminary steps."

CHG&E also has minority investments of
about \$5 million in two other wind projects, a

Continued on page 3

Continued on page 3

Continued from page 1

ow flicker is something that occurs during certain times of the day, certain times of the year. There's a lot of variables—cloud cover, wind direction, things like that. We anticipate that some residents may be affected for a limited time during limited times of the year. There are several options and ways that we can reduce shadow flicker, and we'll certainly employ those once the wind project testing is finished and we're actually running the wind farm."

Shirley Wind appears to have been prompt and responsive to residents' concerns. While many area residents have voiced concern over the project for various reasons—including property values, health and safety risks, and aesthetic conflicts, many wind advocates cite the Glenmore project as an example of how to do wind project responsibly. Maserjian notes, "One of the things that interested us (CHG&E) in the Shirley Wind Project from the beginning was that the initial developer had really done an admirable job in laying out the ground work for the project—in involving the property owners and the community at large."

That initial developer, Emerging Energies LLP, says they are very proud of the project, and have plans in the works for additional projects in the state.

Shirley Wind has also received at least one complaint from a resident about the noise produced by the turbines. Shirley Wind officials report they met directly with the affected residents to discuss the issue. Project manager John Roberts says they are working on an adapted baffle for the nacelle, or rear generator housing part of the turbine, to abate some of the noise produced by the motor. Upon final completion of the construction phase of the project, developers will, as required by the town, measure noise levels to determine compliance with current ordinances.

Maserjian explains, "As with any project like this there may be some concerns raised, and of course it's always our goal to address those concerns head-on and to the best of our ability satisfy those citizens. We're going to work with the property owners on a case by case basis to see how we can satisfy them best. Some may have issues that may require us to do something else. We'll take that into consideration as we work with them."

ENGAGEMENT



Jeff and Char Marcell of Schofield announce the engagement of their daughter Tara Ann Marcell to Garrett James Lancelle son of Paul and Nancy Lancelle of Denmark. Tara graduated from D.C.E.

ementary Education from St. Norbert College. Tara is currently employed at D.C. Everest School District teaching first grade at Rothschild Elementary School.

Garrett graduated from Denmark High School and earned a Bachelor's degree in Elementary Education from St. Norbert College. Garrett is currently a substitute teacher in the Edgar and D.C. Everest school districts.

Continued from page 1

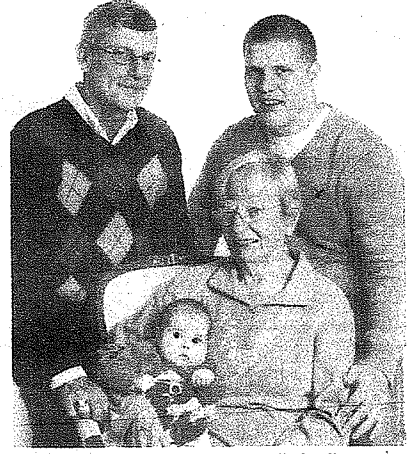
7.5-megawatt wind farm located in Atlantic City, NJ and a 24-megawatt facility in Bear Creek, PA. Maserjian says CHG&E is 'unwinding' (a fancy term for selling) all of their investments in renewable, not just the Shirley project. "There's a biomass plant in upstate New York that produces steam and electricity from wood products that's located near a lumbering site that's for sale as well. We also have an interest in an ethanol plant in Nebraska that will be sold," he said.

In a press release dated October 28, 2010, just under two weeks before the quiet ribbon cutting for the Shirley Wind facility, CHG&E Chairman of the Board, President and C.E.O. Steven V. Lant said, "[W]e have concluded that we do not possess the same strong competencies and competitive advantages in renewable energy. These investments do not typically display the risk and return profiles that are consistent with our financial objectives, requiring higher levels of leverage and more volatility than we are comfortable with. As we announced last quarter, we have discontinued development efforts in this area, and we will now begin to unwind the existing investment portfolio in an orderly manner."

The unexpected news will probably excite wind farm critics, who in addition to any number of personal concerns, have called wind turbine development a costly mistake. Many critics of the subsidized fledgling wind industry claim the costs associated with wind energy raise the flag of increased electricity prices as well as irrecoverable tax moneys used to spur development.

Bill Rakocy, one of the founders of project developer Emerging Energies LLP, declined comment on the impending sale, but the move appears somewhat unexpected. Maserjian continues, "It was not our intention to sell the project when we first made the investment, but over the course of the year we reevaluated our strategy and our operations, and decided that it would be in the best interest of our investors to sell, or 'unwind', our renewable energy investments."

.....and Olivia makes four



Four generations that is The Lancellis

man Jr, Andy Nicholson and Troy Streckenbach, will be present.

In addition to the County

The Denmark Lit

The Denmark Library had a special visitor for story time on Wednesday, January 26. Corduroy the Bear joined the library's little friends for bear stories,

Brown County Ve

Brown County Veterans Services has changed the schedule for the Denmark Out Station Days. Beginning in 2011 Jerry Plolus, Veterans' Service

All Saints F

All Saints Catholic Grade School proudly announces their 2nd Quarter Honor Roll.

Grade 8: "High A" Jared Phillips;

"A" Nick Kufalk, Jacolyn Younk & Victoria Younk

"B" Duncyn Neta & Heather Schaefer

Grade 7: "A" Nathan Ciriacks

"B" Colin Kafka, Chad Kropp, Johan Rau, Evan Rys

Our Savior's S

Our Savior's Lutheran Church is once again hosting their Sunday "Soup To Go" Chili and Creamy Chicken &

Smith Country S
(Formerly Don Smith)

New Location • New Merchandise •

Now at 4742 City Hwy R - Halfway between Denmark & Gre...
Follow Main St S - Miles south of former location.

Hours: Mon. - Fri. 9-6 • Sat. 10-5

Carpet Mats 14" x 22" All Weather Door Mats Large Assortment 99¢	28
Candy Bars Hershey, Nestle & More 39¢ ea. Or 3 for \$1.00	
Ajax 2X Ultra Laundry Detergent 42 loads, 64 oz. \$3.99 ea. 6 for \$21.00	Crt

Altamont wind energy company to pay \$2.5 million and replace turbines to reduce raptor deaths

By Denis Cuff

Contra Costa Times

Posted: 12/06/2010 12:11:30 PM PST

Updated: 12/06/2010 05:20:18 PM PST

The largest wind energy producer in the Altamont Pass area of eastern Alameda and Contra Costa counties has agreed to replace 2,400 wind turbines within four years and pay \$2.5 million in a legal settlement to reduce deaths of eagles, hawks and other raptors hacked by turbine blades.

The settlement between NextEra Energy Resources, the state, and several environmental groups was announced Monday by the state Attorney General Jerry Brown.

One environmental leader praised the deal as a model for producing wind energy while minimizing the heavy toll the whirling turbine blades take on hundreds of raptors each year.

"We think that is a landmark agreement that balances the need for clean energy with protections for wildlife," said Michael Lynes, conservation director for the Golden Gate Audubon Society. "This is an aggressive schedule for replacing turbines with new ones. It will go a long way toward reducing the kills in the Altamont area."

The settlement resolves a debate about whether the company was making sufficient progress toward a previous legal pledge to reduce bird kills by 50 percent from 2007 to 2010.

"Rather than focus on the 50 percent debate, we agreed to get something in place that uses modern technology to

increase protections for the birds," Lynes said. "This does not resolve all the problems with avian mortalities, but it is a big step forward toward reducing them."

New wind turbines are much larger and produce much more energy than old ones, reducing the number of blades that birds can fly into.

Under the deal, NextEra agreed to replace 2,400 of its turbines within four years. If it falls behind schedule, the company also pledges to shut down all its existing turbines no later than 2015.

The company also pledged to put the new turbines in environmentally friendly locations. Many turbines installed in the Altamont Pass in the 1970s and 1980s were placed in swales between ridges where golden eagles like to soar while looking for prey, biologists say.

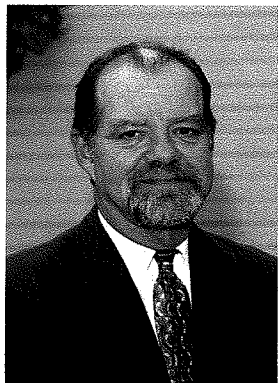
The wind company said it would contribute \$1.25 million to the California Energy Commission for research on reducing bird kills at Altamont Pass.

The wind company will give another \$1.25 million to the East Bay Regional Park District and the Livermore Area Recreation and Park to improve and protect raptor habitat.

According to an 2004 state study, wind turbines at Altamont Pass kill an estimated 1,766 to 4,271 birds annually, including 880 to 1,330 raptors such as golden eagles, hawks, falcons and owls.

The Altamont Pass is a prime breeding and migratory area for raptors.

Thomas Tanton



Mr. Tanton is President of T² & Associates, a firm providing consulting services to the energy and technology industries. T² & Associates are active primarily in the area of renewable energy and interconnected infrastructures, analyzing and providing advice on their impacts on energy prices, environmental quality and regional economic development. Mr. Tanton has 40 years direct and responsible experience in energy technology and legislative interface, having been central to many of the critical legislative changes that enable technology choice and economic development at the state and federal level. Mr. Tanton is a strong proponent of free market environmentalism and consumer choice, and frequently publishes and speaks against alarmist and reactionary policies and government failures.

As the General Manager at EPRI, from 2000 to 2003, Mr. Tanton was responsible for the overall management and direction of collaborative research and development programs in electric generation technologies, integrating technology, market infrastructure, and public policy. From 2003 through 2007, Mr. Tanton was Senior Fellow and Vice President of the Houston based Institute for Energy Research. Mr. Tanton was also a Senior Fellow in Energy Studies with the Pacific Research Institute until 2010. Until 2000, Mr. Tanton was the Principal Policy Advisor with the California Energy Commission (CEC) in Sacramento, California. He began his career there in 1976. He developed and implemented policies and legislation on energy issues of importance to California, and U.S. and International markets, including electric restructuring, gasoline and natural gas supply and pricing, energy facility siting and permitting, environmental issues, power plant siting, technology development, and transportation. Mr. Tanton completed the first assessment of environmental externalities used in regulatory settings. Mr. Tanton held primary responsibility for comparative economic analysis, environmental assessment of new technologies, and the evaluation of alternatives under state and federal environmental law. Mr. Tanton served as Guest Lecturer for the Master in Environmental Science program at California State University Sacramento (CSUS), lecturing on power plant and electric grid technologies and their comparative environmental impacts.

Main Concerns with Wind Energy Development

Tom Tanton 10/6/2010

Wind energy is primarily built for tax purposes

During the past decade, the wind and other renewable energy industries have been incredibly successful in getting federal and state government officials to grant them generous tax breaks and subsidies, including state Renewable Portfolio Standards. The wind industry, which has received nearly \$4.5 billion in "stimulus" program cash grants during the past year from the Obama Administration, apparently has plenty of cash to finance its intense lobbying. Most of that money actually ended up overseas. Wind energy is subsidized 20-30 TIMES conventional sources per unit of production. Even so, it is not economically competitive, and utilities that are forced to produce or buy electricity from renewable energy facilities pass along the higher costs to their customers via their monthly bills.

Wind energy does not offset any petroleum or petroleum imports

A persistent myth is that increasing wind- and solar-generated electricity will reduce our dependence on foreign oil and thus boost our energy security. Less than 1% of our electricity is generated using petroleum, so any renewable generation will have no appreciable effect on petroleum demand.

Wind energy can easily INCREASE emissions of greenhouse gasses

As shown in several recent engineering studies the volatility (short term fluctuations in output on the order of minutes due to gusty winds) forces other power plants connected to the grid to operate in "mirroring" mode ramping quickly up and down. Just like your car in stop and go traffic, as opposed to thoroughfare speed, this drastically reduces those plants efficiency, leading to increased fuel consumption and GHG emissions. Only by sophisticated "dispatch" modeling of an individual grid along with wind data can it be determined whether, on net, fuel use and GHG emissions increase or decrease. To date, no wind developer have ever done such a modeling effort subject to peer or regulatory review.

Wind energy is a threat to wildlife and endangered species

Wind resource areas often are coincident with critical habitat and/or migratory flyways. Many of these conflicts are for protected, threatened and endangered species. Wind energy development has long had significant issues with avian and bat mortality, even given the relatively few wind turbines installed to date. More wind turbines will pose greater threats. For example, in California's Altamont Pass area, one of the nation's oldest development area, over 500 Golden Eagles are slaughtered each year. Further, the additional transmission lines necessary to serve wind developments pose special threats as well.

Living too close to wind turbines imposes health and safety risks to the public

The tip speed of modern wind turbines approaches 200 MPH when operating. Ice and blade throw, from the top of a 300 foot tower, while infrequent, poses serious safety risks to the public within about ¾ to a mile. Further, the noise from wind turbines can cause health effects, as documented by Dr. Nina Pierpont and others. Industrial wind turbines produce significant amounts of audible and low-frequency noise. Dr. Oguz A. Soysal, Professor and Chairman of the Dept. of Physics and Engineering at Frostburg State University in Maryland, measured sound levels over half a mile away from the Meyersdale, PA, 20-turbine wind farm. Typical audible (A-weighted) dB (decibel) levels were in the 50-60 range, and audible plus low-frequency (C-weighted) dB were in the 65-70 range. 65-70 dB is the loudness of a washing machine, vacuum

cleaner, or hair dryer. A difference of 10 dB between A and C weighting represents a significant amount of low-frequency sound by World Health Organization standards. The noise produced by wind turbines has a thumping, pulsing character, especially at night, when it is more audible. The noise is louder at night because of the contrast between the still, cool air at ground level and the steady stream of wind at the level of the turbine hubs. This nighttime noise travels a long distance. It has been documented to be disturbing to residents 1.2 miles away from wind turbines in regular rolling terrain, and 1.5 miles away in Appalachian valleys. At night, the World Health Organization (WHO) recommends, the level of continuous noise at the outside a dwelling should be 45 dB or less, and inside, 30 dB or less. These thresholds should be even lower if there is a significant low-frequency component to the sound, – as there is for wind turbines. Higher levels of noise disturb sleep and produce a host of effects on health, well-being, and productivity. Effects of noise-induced sleep disturbance include fatigue, depressed mood or well-being, decreased performance, and increased use of sedatives or sleeping pills. Measured physiologic effects of noise during sleep are increased blood pressure and heart rate, changes in breathing pattern, and cardiac arrhythmias.

The decibel is logarithmic. Increasing the dB level by 10 multiplies the sound pressure level by 10. Increasing the dB level by 20 multiplies the sound pressure level by 100 (and 30 dB multiplies by 1000, etc.). Thus the 65 dB measured day and night half a mile from the Meyersdale wind farm, for example, has a measured intensity 100 times greater than the loudest continuous outdoor nighttime noise (45 dB) recommended by the WHO.

Savage, Bill

From: BOB & KEVIN GEHRING [jordanelectric@nconnect.net]

Sent: Wednesday, February 09, 2011 10:02 AM

To: Rep.Pridemore

Subject: PSC 128 Hearing

February 9, 2011

State Representative Don Pridemore
Madison WI

Re: Public Hearing PSC 128 (CR-057)

Please present the following at the referenced hearing relating to siting of wind energy systems. I will be unable to attend the hearing.

I have lived in the Town of Herman southeast Dodge County for the past 19 years on my 150-acre farm. My family and I have lived within the Butler Ridge Wind Energy system for the past two years it has been operational. There are six 410' turbines within 2000 feet of our home.

We have been subjected to a never-ending assault on our quality of life. We are subjected to noise from the operation of the 1.5-mw gearbox GE turbines and blade noise. The continual whine of the 2000 horsepower equivalent motor perched 200 feet in the air is unavoidable. Only the proper setbacks from dwelling spaces would eliminate this continual scourge. The existing setbacks do not provide adequate protection from this noise, the proposed rule change would.

We are subjected to shadow flicker from the rotating blades. It is just like placing a ceiling fan under a light bulb. Increasing the required setback distances would eliminate this problem.

The current setbacks were not scientifically developed but were advanced as a workable model by the wind turbine industry to get the projects built. I would not mind sacrificing if the wind energy system would provide a common benefit for the people. Wind energy does nothing to lessen our dependence on reliable, dispatchable electricity. It cannot be stored and creates a redundant expensive unreliable electric distribution system. The taxpayers and ratepayers have been forced to pay for an antiquated, unreliable form of energy, which was abandoned 80 years ago. Wind has not changed since.

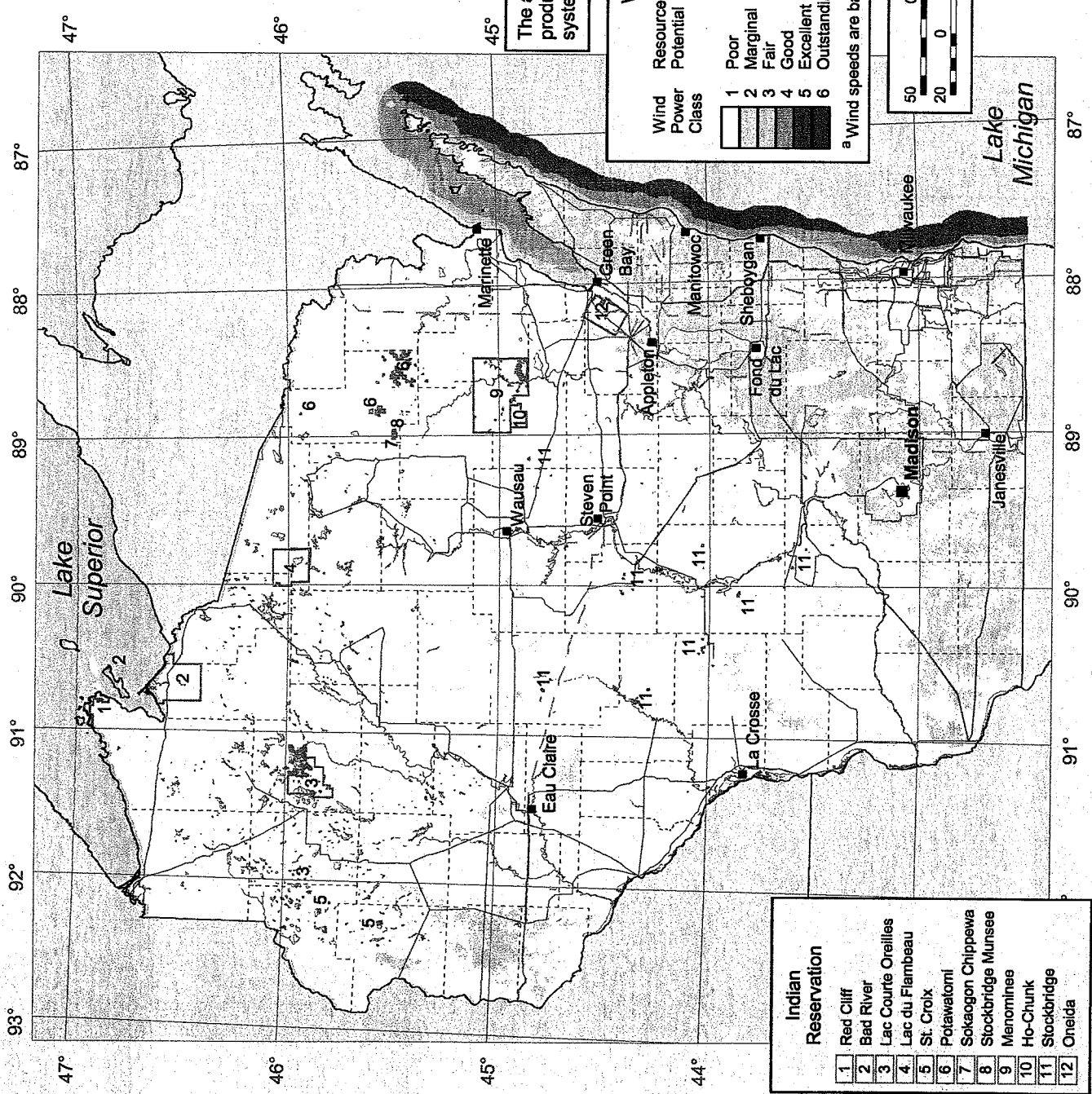
The current setback is inadequate and does not protect my rights as a property owner.

Sincerely,

Kevin Gehring
W2017 Illinois Road
Iron Ridge, WI 53035

2/9/2011

Wisconsin 50 m Wind Power



Transmission Lines*
Voltage (kV)

10 - 69
115 - 161
230
345

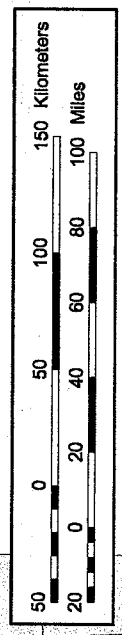
* Source: POWERmap, ©2007
Platts, a Division of the McGraw-Hill Companies

The annual wind power estimates for this map were produced by AWS TrueWind using their Mesomap system and then interpolated to 50 m by NREL.

Wind Power Classification

Wind Power Class	Resource Potential	Wind Density at 50 m W/m ²	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
1	Poor	0 - 200	0.0 - 5.6	0.0 - 12.5
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7

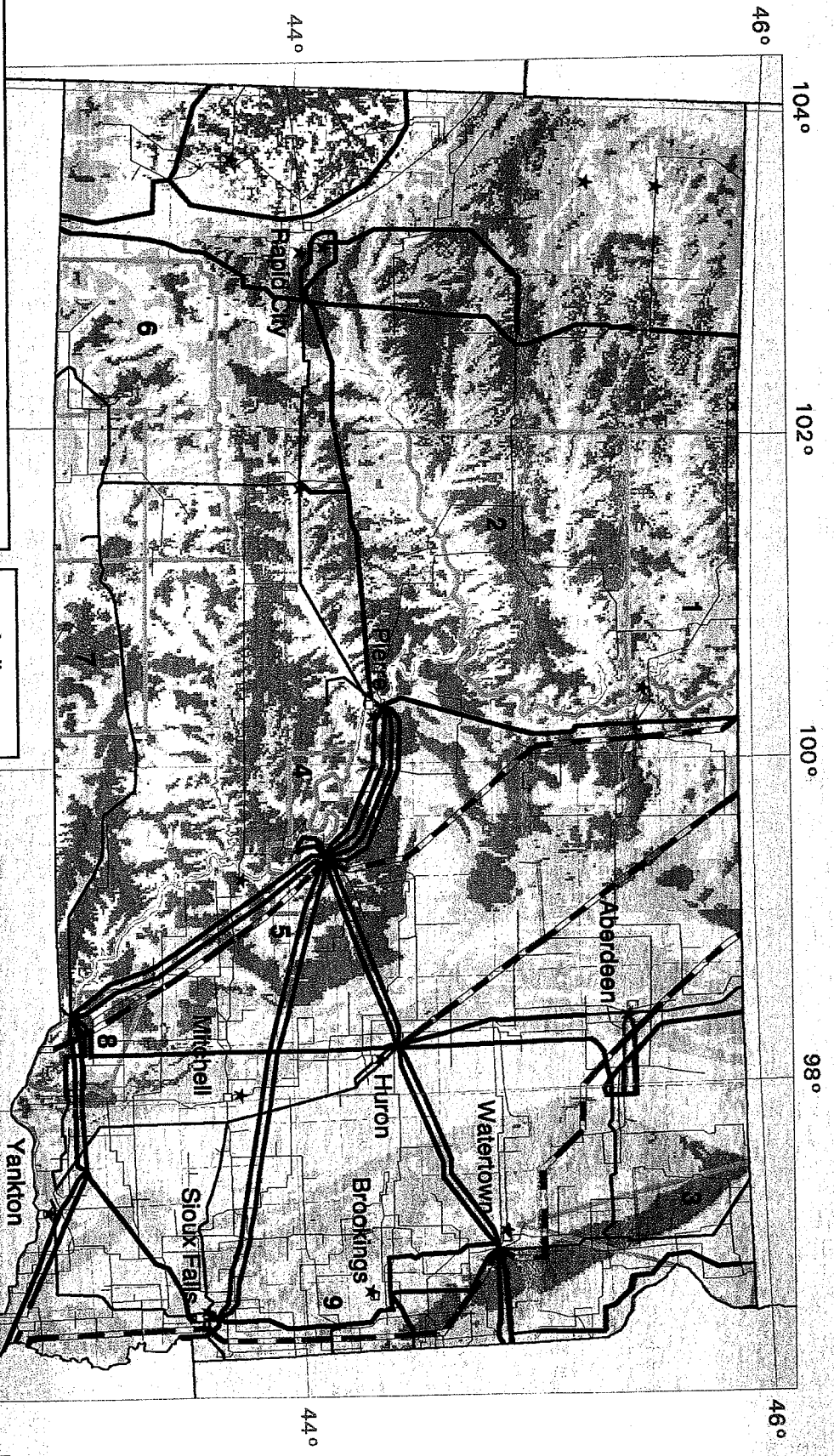
^a Wind speeds are based on a Weibull k of 2.0.



Indian Reservation

1	Red Cliff
2	Bad River
3	Lac Courte Oreilles
4	Lac du Flambeau
5	St. Croix
6	Potawatomi
7	Sokaogon Chippewa
8	Stockbridge Muncie
9	Menominee
10	Ho-Chunk
11	Stockbridge
12	Oneida

South Dakota - Wind Resource Map



Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m ²	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

^a Wind speeds are based on a Weibull k value of 2.0

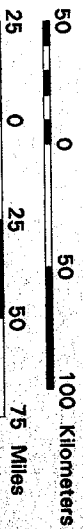
Indian Reservations

- 1 Standing Rock
- 2 Cheyenne River
- 3 Lake Traverse
- 4 Lower Brule
- 5 Crow Creek
- 6 Pine Ridge
- 7 Rosebud
- 8 Yankton
- 9 Flandreau

Transmission Line Voltage

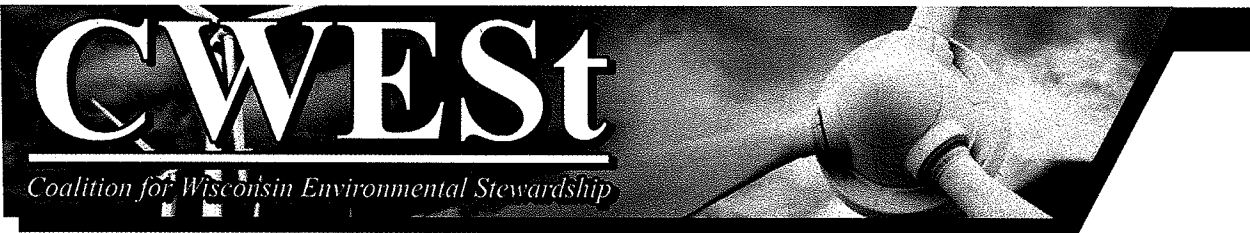
- 69 Kilovolts
- 115 Kilovolts
- 230 Kilovolts
- 345 Kilovolts

★ Meteorological Station with Wind Data
 □ City or Town



U.S. Department of Energy
 National Renewable Energy Laboratory





Dedicated to making sure that wind turbines get sited the *RIGHT WAY*.

The Windmill Ghetto

Why Building Wind Turbines in Wisconsin's Rural Communities is BAD for our State's Economy

1 – Siting Turbines in developing areas causes all other economic activity to stop. Wind developers in Wisconsin have targeted the fast growing Fox Valley region for their planned construction. Calumet County alone is expected to grow by 56% in the next 25 years.

A comprehensive appraisal study done in Fond du Lac County shows those landowners within 2 miles of a wind development will see *land values drop by an average of 40%*. This will create a “windmill ghetto” covering tens of thousands of acres. Within these wind farms, no building can or will occur.

2 – Each turbine is heavily subsidized with Federal Tax Dollars. Higher taxes and higher interest rates from exploding Federal debt will suppress job creation. It was recently exposed that GE is building a wind farm in Oregon with \$1.2 billion in tax subsidies out of a total cost of \$1.9 billion. The Manhattan Institute concludes that federal subsidies for wind amount to \$6.44 per million BTUs. The price for a million BTUs from coal was just \$2.27.

3 – Building turbines at this time will cost ratepayers money. The Heritage Foundation found that electricity generated by *wind is more than double the cost* of coal generated power - \$78/ MgW v. \$177/MgW.

We have an energy surplus in this state of around 25%. The cost of each new generation facility being built now will somehow need to be paid. Data from the PSC suggests nearly \$2 billion in capital expenditures would be necessarily to carry out the state's current 10% renewable mandate. Wisconsin already has among the highest electric rates in the Midwest. This would drive up costs and make us even less competitive.

4 – Green job “creation” causes a net job loss. Spain was one of the first and most aggressive builders of wind turbines. However, a recent Juan Carlos University study concluded that Spain had lost 9 jobs for every 4 green jobs it had created. Two-thirds of all green jobs were in construction and quickly evaporated as projects completed. Subsidies added up to 1 million Euros per wind energy job created. If the subsidies were translated into electric rates, those rates would have risen by 31%.

There will be only a handful of full time jobs associated with maintaining the turbines. How many jobs will be lost by the loss of economic activity associated with turbines crowding out more sustainable development?

5 – Wind turbines do not produce effectively in Wisconsin. The turbines in Wisconsin run only about 22% of the time. Turbines in the Dakotas run about twice as much. Wisconsin turbines are even MORE in need of subsidies and will cost the economy even more than turbines built out west, where the wind is stronger and there is less interference with other economic activity.

6 – Governor Walker's proposed wind siting regulations treat communities fairly. All neighboring property owners whether they “host” a turbine or not are considered affected parties, and developers must deal fairly with them. This does not “stop wind development” as some opponents have claimed. It merely makes developers compete against other uses for the land with the people who will have to live in the windmill ghetto.

Developers want to force wind turbines into communities where they are not wanted, with huge government subsidies and onerous regulations, bypassing community involvement, and stepping on property rights. Governor Walker's proposal is based on our constitutional rights and the free market.

For more information contact Bob Welch at 608.819.0150 or bob@thewelchgroup.org.



CREATING THE WINDMILL GHETTO

They say a picture is worth a thousand words.

This map illustrates the property rights issue for neighbors of industrial wind turbines.

Under current PSC siting regulations, turbines can exist 1000' from a home and about 500' from a property line.

Thus the person that owns parcel "A" can site a turbine and collect the contracted payments from a wind developer.

The Owners of Parcels "B", "C", "D", and "E" have their **right to build a home anywhere in the yellow circle taken from them without any compensation.** Even worse, they cannot appeal to any local government or planning committee. They have no say whatsoever in this "taking"!

Thus an owner of 23 acres can "take" the right to build a home or office from an additional 50 acres that is owned by his neighbors.

Under current law, local governments do at least have the right to ensure public health and safety and many have used that authority to make sure that yellow circles don't pop up in their communities.

Statewide siting preemption would remove even this small amount of local control from our Wisconsin communities.

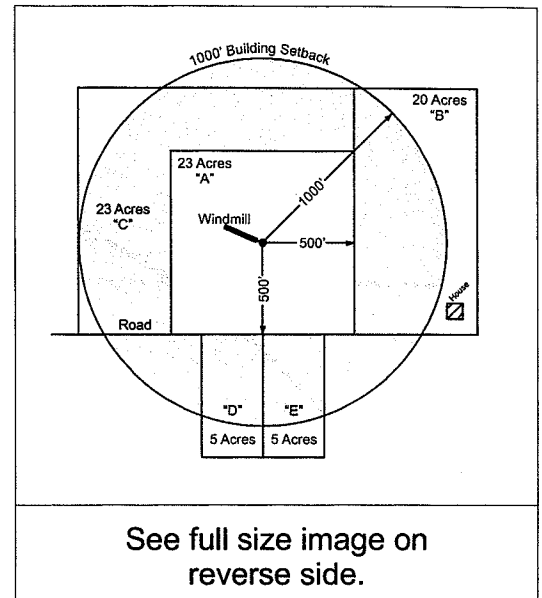
The theoretical environmental benefits of siting industrial wind turbines go to the entire planet. But the costs are overwhelmingly borne by neighboring landowners in terms of plummeting land values, loss of control over their property, and noise effects that can have long term health consequences.



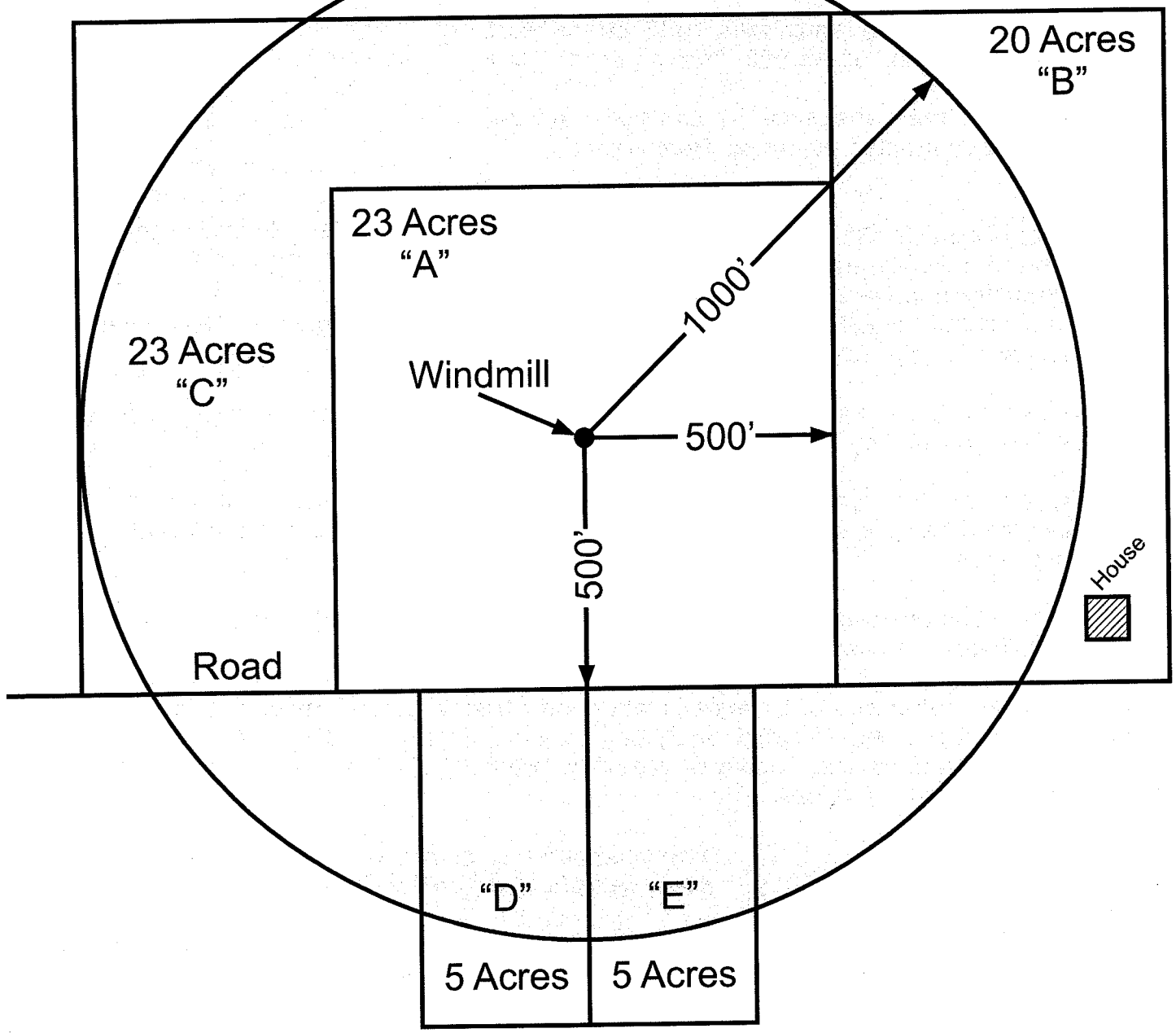
The Wisconsin Legislature can assure that the cost/benefit distribution is done more fairly.

We should insist that siting decisions are consistent with comprehensive local planning.

And any consideration of a state preemption bill should make certain that neighbors are protected either through adequate setbacks or by requiring easements from those that will have to live with the windmills.

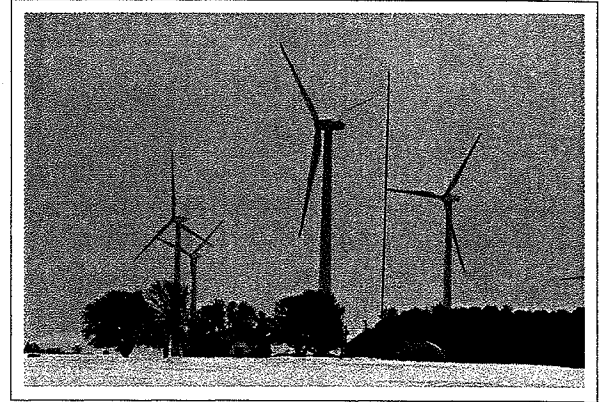


1000' Building Setback



How well do you sleep at night?

If you live near a wind farm, chances are that you don't get a good night's rest.



Studies show...

Decibel readings from a little over 1/2 mile away from a 20-turbine wind farm measure 50-60 dB. Added to the turbines' existing low frequency levels, the actual decibel reading is 60-75 dB. That's the same sound level as a washing machine, hair dryer or vacuum cleaner!

The World Health Organization recommends...

The average sound level for a good night's rest should be in the 30 dB range. Anything above 30 dB has shown an increase in sleep disturbance as well as physical side effects. What side effects? Glad you asked.



30 to 40 dB

Increased body movements, awakening, self-reported sleep disturbance and arousals. It cannot be ruled out that vulnerable groups (children, the elderly and the chronically ill) are affected to some degree.

40 to 55 dB

Sharp increase in adverse health effects, especially vulnerable groups such as children, the elderly and the chronically ill.

above 55 dB

Considered increasingly dangerous for public health. Adverse health effects occur frequently, a high percentage of the population is highly annoyed and there is some limited evidence that the cardiovascular system is coming under stress.

Please be informed of the property value, health and safety concerns of helpless citizens when considering SB-185 or amendments to the bill.

THE SOLUTION IS IN YOUR HANDS!

For more information contact CWEST's representative Bob Welch at 608-819-0150



Wisconsin Towns Association

Richard J. Stadelman, Executive Director

W7686 County Road MMM

Shawano, Wis. 54166

Tel. (715) 526-3157

Fax (715) 524-3917

Email: wtowns1@frontiernet.net

To: Joint Committee for Review of Administrative Rules

From: Richard J. Stadelman, Executive Director

Re: Clearinghouse Rule #10-057; PSC Wind Siting Rules proposed Chapter 128

Date: February 9, 2011

On behalf of the Wisconsin Towns Association, I would respectfully request the Joint Committee for Review of Administrative Rules to suspend the rules on Wind Siting, proposed in PSC 128, for the following reasons. We would ask that PSC 128 be modified as described below.

First, we want to state that the state legislature by authorizing the PSC to promulgate these rules which will limit the local governments' authority to regulate the siting of wind turbines, the state has preempted local government authority to protect their residents and property owners for public health, safety and welfare to no greater restrictions than as allowed under the rules. Therefore local governments must rely on the PSC rules to ensure that public health, safety and welfare are protected. It is our opinion and many of our members who have followed the rule development that at least two key provisions listed below should be modified by the PSC to provide the needed protections for residents and property owners of the state.

The first provision that warrants modification is the **setback of large wind turbines from nonparticipating residences on Table 1**. The setback should at the minimum be from the property line of a nonparticipating property, not the residence. The draft rule of 3.1 times the maximum blade tip height from a nonparticipating residence results in a "taking" of the nonparticipating property owners use of his or her property between the residence and the property line, without compensation. Increasing this setback to the property line also reduces some of the other impacts of large wind turbines, such as noise and shadow flicker effect. We would also suggest that the PSC consider a greater setback from the nonparticipating property line than 3.1 times the maximum blade tip height or at the minimum conduct more studies on noise before setting the distance as proposed.

The second provision that warrants modification is the **maximum noise limits at 50 dBA during daytime and 45 dBA during nighttime hours**. It is my belief that based upon existing studies that noise levels at these levels will have negative health impacts on many people in the immediate proximity of the large wind turbine (such as living in a nonparticipating residence at 3.1 times the maximum blade tip height distance from a turbine). Decreasing these maximum noise limits in combination with increasing the setback from nonparticipating property lines will better protect public health, safety, and welfare.

We want to point out that in addition to the health impact upon individuals within the immediate proximity of large wind turbines, when the impacts of setbacks and noise levels that are perceived as insufficient to protect public health, safety, and welfare, the value of properties adjoining wind turbines will likely decrease, reducing the tax base on the political subdivision,

resulting on a shifting of tax burden on local property owners outside of the immediate proximate area of the large turbines. This is a negative impact on the town government that is not sufficiently reimbursed by the municipal aid payments (shared revenue) from the large turbines.

In addition to the two key provisions that we ask the Committee to direct the PSC to modify, we believe some other provisions warrant review and reconsideration by the PSC. These following provisions should be reviewed by the PSC:

- (1) **PSC 128.02 (4) Individual Consideration.** While it may not be the intent of the current PSC to allow the future applicants for large wind turbines to have lesser standards than written in the rule, this section clearly provides the commission the authority to set lesser standards than written in the rule without limitation. This latitude creates uncertainty to local governments and the residents in the immediate proximity of proposed large wind turbines that the minimum requirements can be waived without any recourse or without protection to the public of health, safety, and welfare. This section should be modified to eliminate the authority of PSC to approve lesser standards than the minimum standards to protect the public.
- (2) **PSC 128.33 (3) Monetary Compensation.** While we commend the PSC for allowing the local government to require the large wind turbine owner to compensate the owner of a nonparticipating residence, we question why it is limited to an amount not to exceed 25% paid to the owner of a turbine host property. With a setback maximum from the nonparticipating residence of 3.1 times the height of the maximum blade tip, a nonparticipating property owner could be closer than the owner of a host property's residence and be impacted to a greater extent than a host property owner. The 25% limit should be increased.
- (3) **PSC 128.18 (4)(e) under Emergency Procedures.** While we support the requirement that the owner of the wind turbine should be required to provide annual training for fire, police, and other appropriate first responders, we would assert that the cost of time spent by the appropriate emergency personnel should be reimbursed by the owner. These large wind turbines are unique structures that warrant the special training and time spent by local emergency personnel in such training, but such time should be at the expense of the wind turbine owner.
- (4) **PSC 128.32 (4) Effect of Ownership Change on Approval.** As written this section does not provide for the political subdivision to require the new owner to show proof of compliance with such requirements as general liability, financial assurance for decommissioning, bonds for possible road damage, or other requirements that may have been specific to the original owner but not necessarily the same documents and guarantees available to the new owner. The change of ownership should not be valid until the new owner has shown proof of compliance with all such specific requirements of the original owner. This language should be written into the rule.

In general we commend the work to date of the PSC in proposing the draft rule. However, there are the two major provisions listed above that should be modified and the other sections that need clarification or rewriting to ensure that the preemption of local government authority by setting these state standards does not do harm to public health, safety, and welfare. Again, we respectfully ask your committee to suspend this rule and that further modification be made as suggested above. Thank you for your consideration.



Memorandum

To: Members, Joint Committee for Review of Administrative Rules
From: Tom Larson, Chief Lobbyist and Director of Legal and Public Affairs
Date: February 7, 2011
Re: Wind Siting Rules – Clearinghouse Rule 10-057

The Wisconsin REALTORS® Association supports the creation of statewide standards for the siting of wind turbines and was actively involved in the wind energy system enabling legislation (2009 Wis. Act 40).

However, we oppose the wind siting rules as currently drafted because they fail to adequately protect the interests of Wisconsin property owners. Specifically, we are concerned that the rules (1) will allow wind turbines to be located too close to neighboring homes and buildings, and (2) fail to adequately protect the interests of property owners from a consumer-protection standpoint.

1. Proposed setback is inadequate to protect human health, property values and use and enjoyment of property

The rules establish the following setbacks from homes and property lines:

Medium and Large Wind Energy Systems

Participating residences	1.5 times the maximum blade tip height
Neighboring residences	3.1 times the max. blade tip height (max. of 1250 feet)
Neighboring commercial and industrial buildings	None

Neighboring property lines	1.1 times the maximum blade tip height
Participating property lines	None
Nonparticipating property lines	1.1 times the maximum blade tip height

Small Wind Energy Systems (wind energy system up to 300 kw that consists of individual turbines up to 100 kw (can be up to 150 ft))

Participating residences	None
Nonparticipating residences	1.0 times the maximum blade tip height
Participating property lines	None
Nonparticipating property lines	1.0 times the maximum blade tip height

For example, if a wind turbine is 500 ft high, the setback is 1250 ft from a neighboring home, and only 750 ft from the neighboring property line or commercial /industrial building located on a neighboring property.

These distances were chosen, in part, for safety considerations (in case the turbine falls over) and fail to adequately address the following possible impacts of wind turbines on human health, use and enjoyment of property, and neighboring property values:

- **Health problems** – After wind farms have located in the area, some residents have complained of insomnia, anxiety, headaches and nausea. They have blamed their health problems on the pulsing noise coming from spinning turbines near their homes. (See “Turbines Too Loud? Take \$5000,” <http://www.nytimes.com/2010/08/01/us/01wind.html?ref=wind-power>)
- **Noise** – Depending on the turbine model and wind speed, wind turbines can create a constant “whooshing” or pulsating noise that can be heard both inside and outside a home (day and night), if located too close. Studies have shown that an “average-size” turbine (2 megawatts, 100 meters high) located 1,000 feet away can produce the same amount of noise as a suburban area during the day (51 decibels). Many studies show that repeated noise levels of 45 dBA can have adverse consequences on human health. (See “For Those Near, The Miserable Hum of Clean Energy,” <http://www.nytimes.com/2010/10/06/business/energy-environment/06noise.html?ref=wind-power>)
- **Excessive shadows on neighboring property** -- Depending upon the number of clouds and angle of the sun, wind turbines can create a “shadow flicker” (a term used to describe the shadow of the turning blades as it hits the ground) on nearby property. Some property owners have described the shadow effect on their home as being like “someone turning lights on and off inside the house at a rate of 80 times a minute” and lasting for almost an hour on sunny days. (See Wind Siting Council Final Recommendations to the Public Service Commission, August 6, 2010, Appendix E, Minority Report, pg. 12)
- **Property values** – A recent study of several Wisconsin wind farms showed that prospective buyers had a negative perception of nearby wind turbines. While the exact impact is difficult to quantify, the study indicated an average decrease in vacant residential property values ranging from 12% to 40%, depending on the size of the lot and the distance from the wind turbine. (See “Wind Turbines & Property Value,” presentation by Kurt C. Kielisch, President/Sr. Appraiser – Appraiser Group One)

Similarly, a survey of REALTORS® working in a wind turbine area indicated that the impact on neighboring vacant land ranges from a 43% decrease if the wind turbine is located very close (within 600 ft) to 29% if the turbine is located in near proximity (½ mile away). With respect to the impact on improved property, the impacts are believed to be similar, but slightly lower (39% and 24%, respectively). (See “Wind Turbines & Property Value,” presentation by Kurt C. Kielisch, President/Sr. Appraiser – Appraiser Group One)

Moreover, the proposed setback limits fail to meet setback limits (a) established by European countries, (b) recommended by wind turbine manufacturers, and (c) that are necessary to adequately protect against noise disturbance.

- In Europe, the minimum setback for turbines is generally over 1200 ft away from residences. Moreover, many countries have adopted a minimum setback of 4 x the height of the turbine or a maximum of 40 dBA at any time during the day. See Letter from Professor Jon McGowan, Renewable Research Energies Laboratory, March 14, 2008, http://www.notuscleanenergy.com/images/UMass_RERL_Letter.pdf
- Wind turbine manufacturers recommend a minimum safety zone of at least 1300 feet from a turbine. See Mechanical Operating and Maintenance Manual for the V90-3.0 MW turbine published by Vestas (<http://www.windaction.org/documents/16496>)
- According to a survey of residents living near wind turbines in Kewaunee County, individuals living within 2400 feet found noise to be problematic, 32% within 4800 feet and 4% greater than 1 mile were disturbed, and 67% reported disturbed sleep if they lived within 1200 feet. (Kabes 2001) (<http://www.windaction.org/documents/28688>)

Recommendation – To adequately address the negative impacts of wind turbines on neighboring property owners, we recommend that the proposed setback be increased to a more reasonable distance, such as to a minimum distance of at least (a) 3.1 times blade height from neighboring property lines, or (b) 1500 feet from a neighboring residence, whichever is greater. Another possibility is 1800 feet from the neighboring property line or closer, if the neighboring property owners agree.

2. Proposed rules fail to contain adequate consumer protections for property owners

In addition to insufficient setbacks, the proposed rules fail to adequately protect the interests of property owners in several other ways, as identified below.

a. Attorney review of contracts – Unlike in most transactions, property owners entering into contracts involving wind energy system easements generally receive very little, if any, independent, professional advice as to how the terms of the contract will impact them. These property owners are often pressured to sign lengthy and sophisticated lease agreements without fully understanding the meaning of the lease terms because they were not given the opportunity to obtain advice from an attorney, REALTOR®, or other knowledgeable professional before entering into the contract. Moreover, the proposed rules allow these lease agreements to contain provisions that would override the minimum state standards designed to protect the health, safety and other interests of the property owners. See e.g., PSC 128.13(5).

Recommendation -- Because the terms of these leases could have an adverse impact on the health and safety of the property owners and the value of their property, we recommend that the rules be modified to provide property owners with up to ten days

after entering into a contract with a wind energy company to have an attorney review the contract and, if necessary, terminate the contract if the attorney believes that the terms of the contract are not in the best interests of the property owner.

b. Information brochure – Many property owners are unaware of the potential health and safety risks of wind turbines if located too close to their homes or livestock. Moreover, most property owners will be unaware of the specific standards included in the wind energy rules designed to protect their interests. Most importantly, these property owners will be unaware that the proposed wind siting rules allow written lease agreements to include “waiver provisions” which allow wind developers to follow lesser standards if the property owner agrees to them in the writing.

Recommendation -- To better inform property owners about some of the potential risks related to wind energy turbines, we recommend that (a) the state produce an informational brochure that describes wind energy systems, state standards (including the waiver provision) and some of the possible impacts on property owners, and (b) wind developers be required to provide property owners with this pamphlet prior to entering into a contract. This requirement would be similar to the informational brochure given to property owners neighboring a proposed large livestock facility, as required by Wis. Stats. s. 93.90 and Wis. Adm. Code ch. ATCP 51.

c. Clarification that lease negotiators must have a Wisconsin real estate license -- Under Wisconsin law, anyone who negotiates an interest in real estate for another person (including leases) and receives compensation must be licensed in Wisconsin as a real estate broker. See Wis. Stat. §452.01(2)(a). Real estate brokers owe certain fiduciary obligations to the public (e.g., must provide services honestly and fairly, prohibited from giving false information, must disclose all material adverse information) and are regulated by the Wisconsin Department of Regulation and Licensing. See Wis. Stat. § 452.133.

Recommendation -- To ensure that those who are responsible for negotiating leases on behalf of wind developers are aware that they must be licensed as Wisconsin real estate brokers and have certain fiduciary obligations to the public, we recommend that the proposed rules be modified to specifically state that anyone who negotiates a lease on behalf of wind developer for the purpose of siting a wind turbine must have a real estate license, as set forth under Chapter 452 of the Wisconsin Statutes.

d. Additional research – The rule fails to include a requirement for the state to perform additional research on the health impacts of wind energy systems or the impacts of wind energy systems on neighboring property values. This information is important to better understand the true impacts of wind energy systems on human health and property values and whether any future modifications to the rules may be necessary.

Recommendation -- We recommend that the rules be modified to require the state to gather information and conduct further studies about the true impacts of wind energy systems on neighboring property owners.

e. Time period for addressing complaints – The proposed rules provide owners of wind turbines with 30 days to respond to a complaint and up to 45 days to make a good faith effort to resolve complaints related to the wind turbine. See PSC 128.40(2). These

time periods could cause property owners to be subject to unreasonable noise, shadow flicker and disruptions in cable and cell phone service for excessive periods of time.

Recommendation -- We recommend that the rules be modified to require owners of wind turbines to resolve all issues related to complaints within 14 days after receiving such complaints.

f. Definition of “affected nonparticipating residence” -- The rule requires wind developers to provide notice of the shadow flicker requirements to owners of “affected nonparticipating residences” but the rule does not define the term “affected.” See PSC 128.15(5). Other sections of the rule specifically define the distance a nonparticipating residence must be away from the wind energy system. (See e.g., PSC 128.14(6)).

Recommendation -- We recommend that this term be further defined.

100

Comments for JCRAR hearing regarding PSC 128
Feb. 9, 2011

My name is Chris Linn. I'm the Vice President of Marketing and Business Development at Bassett Mechanical. Thank you for allowing me to speak on the matter related to PSC 128.

Bassett Mechanical is a Wisconsin-based, family owned business with our headquarters in Kaukauna and service operations in Madison and Milwaukee. We have a 75-year history of serving many of Wisconsin's major industries including, paper, cheese and dairy, printing and packaging, and shipbuilding to name a few. While we continue to have strong ties to these long-standing Wisconsin industries, we find that renewable energy, particularly wind energy, is also a vital part of our business today and a key component of our business growth plan going forward.

I made the trip to Madison today to express my support for PSC 128. As passed, the wind siting rule is positioned to support economic development in the state by providing manufacturing, construction, operations, maintenance, development, transportation, and other jobs. It also provides guidelines to allow for the thoughtful development of wind energy in the state.

I work for a company that has been actively engaged in the Wisconsin wind industry supply chain for about 6 years. Over those 6 years we've seen the wind supply chain in Wisconsin grow significantly. Today, more than 275 companies are in the Wisconsin Wind Works directory. While I speak for Bassett Mechanical, I know that I also speak for many of the other companies in the wind supply chain when I express support PSC 128.

Bassett, like many of these companies, sees the wind industry as an important part of its future growth. For 6 years we've been manufacturing embedment rings that are used to anchor the bolts in the foundations for wind towers. To date we've supplied foundation components for more than 2000 towers and nearly half of the ones in Wisconsin. In addition to the foundation components, our business plan calls for us to manufacture towers for medium sized turbines. This part of our business plan anticipates an increase of 50-60 jobs, which is significant for a company that currently employs 340 people.

PSC 128 was developed in a very thorough, open and balanced manner. The resulting setback rules provide a fair and reasonable way for the development of wind projects while protecting property owners, peoples' health and well-being, and the environment. PSC 128 is consistent with rules established in other states and in many other countries.

continued

Any proposals that would increase the setback rules beyond 1250 feet will only serve to hurt the wind supply chain in this state, reduce our ability to develop wind energy, and severely hinder the creation of jobs related to the wind industry.

Please note that keeping the setback at 1250 ft. will have positive economic and environmental impacts, whereas, increasing it will hurt the wind industry in the state overall.

We cannot attract major players in the wind industry to Wisconsin if we have rules that are detrimental to wind energy development. For example, we know that major turbine manufacturers have avoided locating new manufacturing facilities here in favor of other states, in part because of onerous regulations affecting wind energy.

Suspending the rule now, before it has a chance to work, would send a strong negative message to those considering investments in the wind industry in Wisconsin, including those wind supply chain companies already located in the state. We need to create regulatory certainty now to retain and capture the jobs created by this industry.

Thank for the opportunity to express support for PSC 128.



WISCONSIN FARMERS UNION



February 9, 2011

Good morning Chairwoman Vukmir, Chairman Ott, and members of the Joint Committee for Review of Administrative Rules:

thank you for the opportunity to speak today. My name is Kara Slaughter, and I am here on behalf of Wisconsin Farmers Union, which is a member-driven organization committed to enhancing the quality of life for family farmers, rural communities and all Wisconsin residents.

In general, our organization is supportive of PSC rule 128. We have advocated for uniform wind siting standards from the outset, and feel that the PSC rulemaking process was fair and provided opportunity from input from all sides. As a state without any fossil fuel resources, Wisconsin needs to be open to the opportunities presented by renewable energy production, and wind energy specifically. Wisconsin Farmers Union members, the vast majority of whom live in rural areas, understand that renewable energy technologies offer them the opportunity to diversify their income streams and get in on the ground floor of a growing segment of our economy. We need reasonable wind siting rules to allow this to happen.

Do we feel the PSC rule 128 is perfect? No. The 1,250-foot setback is a reasonable one, but we'd rather see the setback calculated from the property line rather than the nearest non-participating residence. Calculating setbacks from property lines provides better property rights protection for neighboring landowners, and recognizes the dynamic nature of land use decisions.

There are a few other protections for landowners that we feel should be included in any wind standards:

1. Prohibition of non-disclosure or secrecy clauses in leases. Landowners should be allowed to review leases with attorneys, lenders and other holders of leases to ascertain the relative value of a lease offer.
2. Establishment of a registry of current standard wind leases and that they are made accessible to the public. A registry allows landowners to compare offered leases with standard leases and better ascertain the relative value of a lease offer. It also allows landowners to compare other lease terms with standard leases.
3. A prohibition on mandatory arbitration clauses.

4. Authorization for collective bargaining of leases. Allowing landowners to bargain collectively for standard lease terms throughout a region or development project would encourage fairness in the application of lease terms among multiple landowners;
5. Disclosure of actual lease payments and premiums in contracts.
6. Five working day cooling-off period. Allows a five working day cooling-off period after a lease agreement is signed. This allows a landowner a window to reconsider if, for example, his attorney has an objection to the contract language.

Wisconsin Farmers Union applauds the inclusion of the section on wind turbine decommissioning, to ensure that landowners will not be stuck with the cost of removing a turbine at the end of its useful life. Overall, Wisconsin Farmers Union believes that the Public Service Commission has taken a comprehensive look at wind siting, and reached a reasonable compromise with PSC 128.

Thank you for your time.

February 8, 2011

The Joint Committee for Review of Administrative Rules (JCRAR)
Madison, Wisconsin

Re: Wisconsin Manufacturers in Support of PSC 128 Wind Siting Rules

Dear Members of the Joint Committee for Review of Administrative Rules,

We are contacting you as leaders of business and industry in the State of Wisconsin actively engaged in the manufacture of products, and the provision of essential services to the wind energy industry in North America. We respectfully request that you support and maintain the PSC 128 Wind Siting Rules. Suspension of the PSC rules would be a counterproductive, anti-business message to send to a growing industry, and to existing employers in your state already substantially invested in the wind industry.

While wind siting rules have been debated with respect to prospective wind farm development in Wisconsin, it is essential that you also understand the impact that adverse legislative action will have on current business income, existing jobs, and capital investment already established in our state. **Diverse manufacturers throughout Wisconsin, such as Wausaukee Composites, Lindquist Machine, Bassett Mechanical, Tower Tech, Milwaukee Machine Works, Applied Plastics, MCL Industries, Boldt, Matenaer, Merit Gear, C. A. Lawton, Ingeteam, Velocity Machine, and Avanti Wind Systems, to name a few, are already actively engaged in the manufacture of wind turbine components.** In fact, a number of these companies are now established market leaders in North America in the components that they supply to the wind industry!

Prior to the financial credit crisis that led to our national recession in 2008, many of these companies enjoyed thriving production lines with hundreds of employees dedicated to the manufacture of renewable energy components. Wind component manufacturers suffered through job losses in 2009, and again in 2010, as spending has only tentatively and sporadically returned to the wind energy marketplace. While order activity is gradually increasing, economic recovery and jobs expansion in the renewable energy industry -- like most industries -- remains cautious and fragile.

The point is, restrictive legislative action such as suspension of the PSC 128 wind siting rules only makes this economic recovery more difficult. It is incorrect to assume that more prohibitive siting rules will only impact hypothetical future jobs. It is a fact that this legislation will negatively impair business and jobs already established in Wisconsin. We are writing to you as diversified manufacturers and significant employers in Wisconsin, to request that you not take regressive, anti-business legislative action against the PSC 128 wind siting rules.

The American Wind Energy Association estimates that total direct and indirect jobs supporting the Wind Energy industry in Wisconsin exceeds 2,000 jobs. More than 20 manufacturing facilities in Wisconsin currently provide essential components to the industry, and a number of these plants were purpose-built and are exclusively dedicated to wind turbine component manufacture, representing tens of millions of dollars in sunk investment. Wind-related revenue derived from these established jobs and capital investment exceeds \$200 Million, based upon conservative estimates by Wisconsin Windworks. In short, the wind energy business already represents a meaningful share of the Wisconsin economy.

Wisconsin's wind resource, estimated at greater than 103,000 MW, is ranked 16th in the United States. More than 500 MW of wind power generation is already installed in Wisconsin, 180 MW of power generation projects are currently under construction in the state, and more than 900 MW are pending development. Ours is a state with considerable wind resource potential. More importantly, it is a state with high ambition and substantial investment in the wind energy business, as evidenced by our active operations, and our numerous advocacy organizations, including Wisconsin Windworks, the Wisconsin Energy Business Association, RENEW Wisconsin, and others.

Stifling progressive investment activity with regressive regulatory action will result in eliminating Wisconsin jobs, not creating them. Implementing harsher turbine siting rules will result in discouraging corporate investment, not promoting it. And deliberately positioning Wisconsin as a pariah state in this important and growing industry is not a prudent strategy for a state attempting to redefine itself as pro-business.

JCRAR Committee Members, we ask that the PSC 128 Wisconsin Wind Siting Rules which were developed by consensus in an open, balanced and fair environment just last year, remain in place. And as business leaders with a vested interest in the wind energy industry, we wish to express our sincere interest in working with you to mutually establish a progressive renewable energy investment climate in the state of Wisconsin.

Thank you for your favorable consideration of this letter, and we look forward to future progressive collaboration with you on this very important subject.

Respectfully submitted,

David Lisle, President & CEO
Wausaukee Composites, Inc.
Wausaukee, Wisconsin

Mark Kaiser, President/COO
Lindquist Machine Corporation
Green Bay, Wisconsin

Chris Linn, Vice President - Marketing & Business Development
Bassett Mechanical
Kaukauna, Wisconsin

Mike Manna, General Manager
Milwaukee Machine Works
Milwaukee, Wisconsin

Kent Pedersen, General Manager
Avanti Wind Systems
New Berlin, Wisconsin

Chip Stringer, President
Matenaer Corporation
West Bend, Wisconsin

Joe Klein, Vice President
Applied Plastics
Oak Creek, Wisconsin

Alex Lawton, CEO
The C.A. Lawton Co.
De Pere, Wisconsin

Gary Lofquist, CEO
MCL Industries, Inc.
Pulaski, Wisconsin

Kevin Fredrick, President
Velocity Machine, Inc
Green Bay, Wisconsin

Larry Steffens, Vice President – Sales and Marketing
Merit Gear
Antigo, Wisconsin



Avanti Wind Systems, Inc.
5150 Towne Drive
New Berlin, WI 53151

P: 1 262 641 9101
F: 1 262 641 9161

I: www.avanti-online.com
E: info@avanti-online.com

Avanti Wind Testimony PSC128

February 9, 2011

Committee Members,

My name is Connie Reilly. I'm employed with **Avanti Wind Systems Incorporated** located at 5150 South Towne Drive, New Berlin, WI 53151. Our business is **100 % dedicated** to safe work **in Wind Turbines**. We supply ladders, lifts, climb assists, rescue gear and internals in addition to offering training, service and certification of those systems. Avanti and our Partner Ernst Incorporated combined; have **21** employees and capital investment exceeding 1 million dollars. I've been asked to speak to you on how our business and the state of Wisconsin benefit from the reasonable standards established under PSC 128.

Unpermitted projects in Wisconsin currently represent 572 megawatts, \$1.5 billion in investment and approximately 1.6 million job hours. Based on design this converts to Avanti revenue potential to manufacture or service the following:

- 193 to 386 lifts, climb assist systems and internals packages
- 15,000 to 31,000 meters of ladder production
- 2 to 4 additional service related jobs
- Unlimited certification and training opportunities for the life of the turbine

Now Consider the State of Wisconsin. To support the Avanti sales; up to 15000 line items per turbine could require procurement. Consider 2-3 potential sources of supply both import and local competing for the business and job opportunities. Consider the Wind farm site requirements to prepare the roads, the site, erect the turbine and maintain the installed fleet. Consider the turbine life extinguished and the requirements to dismantle the turbine recycle the waste stream restore the roads. Now; consider the Jobs, the state revenue and the taxes generated in the following industries:

- Airline, Car rentals, Hotel and Dining
- Port Clearance, Transportation, Fuel and Packaging
- Manufacturing, Supply, Equipment, Maintenance and Service.
- Land acquisition, transfers, Insurance underwriters, and Legal
- Construction and Transportation permits Lead and Follow cars.
- General management, Construction, Cabling, Electrical, Recyclers
- Education Institutes, Fire, Emergency and Rescue

So when I'm asked how does Avanti and the State of Wisconsin benefit under PSC128 I say:

Today, 2-3000 Wisconsin residents are employed directly or indirectly in Wind Energy.

Today, under PSC 128 employment and revenue generating opportunities for Avanti and the State of Wisconsin have the potential to grow.

Today, there are strong sound and shadow criteria which ensure protection of landowners.

Today, wind developers are able to efficiently site wind.

Today, we have open, balanced and fair rule making.

Today, wind development in Wisconsin is showing growth despite the economy.

Today, under existing 2010 sitting rules; we send a message that Wisconsin wants wind.

Today, enactment of the existing 2010 siting rules protects Wisconsin jobs, and the revenue flow to local governments and landowners.

Today, Avanti and the state of Wisconsin benefit under the existing PSC 128 rules.

Thank you

Survey Responses from Grant County Landowners Show Overwhelming Support for Wind Energy Development.

In the fall of 2007, Grant County landowners received a survey conducted by The Southwestern Wisconsin Regional Planning Commission.

Question 30 on the survey asked respondents if Grant County jurisdictions should pursue Ethanol Plants, Solar Energy or Wind Energy alternatives as a form of economic development. Data compiled from those surveys shows overwhelming support for Wind and Solar Energy with marginal support for Ethanol.

The proposed White Oak Wind Farm falls within Smelser Township, Cuba City, Hazel Green, Hazel Green Township and Dickeyville. Survey pages illustrating the responses to the renewable energy issues for the county and those townships follow.

The raw data for the comprehensive plans, which includes the survey data for all participating jurisdictions in Grant County, is also available at <http://www.swwrpc.org>.

The Southwestern Wisconsin Regional Planning Commission Provides intergovernmental planning and coordination of community development planning, economic development, and transportation. In response to local and regional goals, the Commission and its Staff work to enhance fiscal and physical resources and to balance local and regional development, preservation, conservation, and social priorities. SWWRPC's member counties are Grant, Green, Iowa, Lafayette, and Richland.

Executive Summary

During the fall of 2007, the South Western Wisconsin Regional Planning Commission sent comprehensive planning public opinion surveys to 18,978 residents of Grant County and 4,715 (25 percent) were returned. From the 4,715 returned questionnaires the Survey Research Center (SRC) at UW-River Falls constructed a random sample of 379 surveys based on the number of occupied housing units in each jurisdiction. For example, the city of Boscobel, with 1,174 occupied housing units, represents 6 percent of the total occupied housing units in the County (18,559), so we wanted 6 percent of the overall County sample to come from the city of Boscobel (24 observations). The 379 surveys provide estimates that are accurate to within plus or minus 5 percent of the reported value.

The demographic profile of the sample of 379 surveys was compared to data from the 2000 Census of Population and Housing and was found, in general, to align very closely with it. Key features of the demographic profile of the sample are: about 70 percent include two adults and no children, very few reported being unemployed, they are solidly middle class (few with very low or very high incomes), and most have lived in Grant County for a long time (71 percent report having lived in Grant County for 25 or more years).

Key findings of this study include:

Quality of Life

- The predominant reasons people gave for living in Grant County is the “small town atmosphere” (58 percent) and to be “near family and friends” (56 percent).
- The next most common reason cited for living in Grant County (to be near a job) was cited by only 40 percent of respondents.

Community Facilities

- More than half of respondents rated all community services (ambulance, fire, etc.) as good or excellent.
- Substantial minorities rated street and road maintenance (36 percent) and police protection (24 percent) as fair or poor.
- Those younger than 55 are significantly more concerned about the quality of street and road maintenance than are older residents.
- Men are more concerned about the quality of police protection than are women.

Communication Preferences

- People in the County prefer to get information about planning efforts via direct mail (70 percent) and newsletters (56 percent).

Natural and Cultural Resources

- Grant County residents place a high value on natural and cultural resources in their jurisdictions.

Economic Development

“Government should work toward guiding development without giving away services or over burdening the developer or individual land owner.”

“... my husband has to drive to Madison everyday to have a good paying job with benefits. Grant County should provide more opportunities for people to get an education or learn a new skill WHILE working at the same time...”

“Lack of good restaurants.”

Grant County residents were asked to provide their opinions about a number of economic development issues and their responses are summarized in Table 7. The first set of questions asked if the location of commercial and/or industrial activities involving truck traffic and manufacturing should be limited. Only about one-quarter of respondents would allow such activities to occur anywhere in the County but a majority agree or strongly agree that it should be limited to inside a city or village (53 percent) or near a city or village (79 percent). This result is consistent with the concern noted above about preserving farm land in the County. Male respondents were significantly more likely to agree that manufacturing activities should be located within cities or villages and less supportive of allowing them to be sited near a city or

Limit manufacturing involving truck traffic to:	Count	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
in city or village	347	14%	39%	28%	7%	12%
near a city or village	347	16%	63%	8%	3%	10%
anywhere in Grant county	339	7%	19%	38%	20%	16%
	Count	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
Coordinate new businesses recruitment	358	53%	40%	2%	2%	3%
Require water and sewer services	360	26%	45%	11%	4%	14%
Grant County should provide land with infrastructure	360	16%	43%	19%	7%	15%
Grant County should pursue	Count	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
ethanol plants	361	22%	33%	23%	9%	13%
solar energy	366	39%	45%	5%	1%	10%
wind energy	372	48%	43%	2%	2%	6%

village or anywhere in the County than were women. Higher income households were, similarly, more likely to favor location of manufacturing businesses within cities or villages and less supportive of allowing them to locate anywhere in the County.

Virtually all respondents (93 percent) agreed or strongly agreed that Grant County should coordinate efforts to recruit new businesses and industry. Likewise, there is majority support for requiring developments at the edge of cities and villages to have municipal sewer and water (71 percent agree or strongly agree) and that all Grant County jurisdictions should provide at least some land with infrastructure for industrial and commercial developments (59 percent agree or strongly agree). Men are significantly more skeptical about the wisdom of providing infrastructure at public expense for industrial or commercial developments than are women.

Respondents were asked to weigh in on whether Grant County should pursue the development of three types of renewable energy to promote local economic development: ethanol, solar and wind energy. Interestingly, the only one of these options for which there is significant opposition is ethanol (about one-third disagree or strongly disagree that this option should be pursued). On the one hand, this is surprising given the clear and substantial impact that ethanol has had on the corn market in the U.S. during the past two years. On the other hand, press accounts with concerns about the sustainability of the rate of growth in this industry, concerns about the impact of these plants on local air quality and water supplies, and the increase in animal feed prices caused by ethanol make this level of opposition understandable. Men and those from higher income households are particularly skeptical about ethanol as a driver of local economic development.

Finally, Grant County residents were asked to provide their opinions about the importance of various types of economic activities to the Grant County economy. Figure 6 illustrates the fact that almost all respondents recognize agriculturally-related business as important or very important to the County's economy; only 4 percent disagree or are neutral with respect to this assessment. All of the items listed in Figure 6 gathered the support of strong majorities. Home based businesses had the lowest level of agreement that they are important or very important to the County's economy and even this option was supported by 71 percent of County respondents.

SUMMARY OF KEY POINTS – ECONOMIC DEVELOPMENT (COUNTY COMPARISON)

- When compared to the County average, support for wind energy is somewhat weaker in Smelser (though still a very solid majority). Town residents held similar views on the development of ethanol plants and solar energy.
- Residents of Smelser also hold similar views on commercial and industrial development as the County as a whole. However, Smelser residents are more likely to agree that development should be located in an existing city or village than other county residents.
- While Smelser residents are more likely to view tourism and recreation business development more important than the county average, all other forms of business development received similar ratings.
- Like the county, agriculturally-related business development is rated most important by residents of Smelser.

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	Smel	Cnty	Smel	Cnty	Smel	Cnty	Smel	Cnty	Smel	Cnty
26. Commercial or industrial buildings and activities involving truck traffic and manufacturing should be located:										
a. In an existing city or a village	27%	14%	49%	39%	14%	28%	3%	7%	7%	12%
b. Near a city or village	16%	16%	61%	63%	12%	8%	4%	3%	7%	10%
c. Anywhere in Grant County	6%	7%	19%	19%	37%	38%	25%	20%	13%	16%
27. Coordinate business recruitment	52%	53%	39%	40%	4%	2%	1%	2%	3%	3%
28. Provide land & infrastructure for industry/commerce	19%	16%	39%	43%	25%	19%	3%	7%	14%	15%
29. Required muni water & sewer	31%	26%	39%	45%	10%	11%	4%	4%	17%	14%

30. Grant County jurisdictions should pursue the following energy alternatives as a form of economic development:

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	SMel	Cnty	Smel	Cnty	Smel	Cnty	Smel	Cnty	Smel	Cnty
a. Ethanol Plants	24%	22%	30%	33%	23%	23%	13%	9%	11%	13%
b. Solar Energy	42%	39%	45%	45%	4%	5%	1%	1%	7%	10%
c. Wind Energy	41%	48%	36%	43%	7%	2%	5%	2%	11%	6%
d. Other	26%	28%	21%	8%	5%	0%	0%	0%	47%	63%

SUMMARY OF KEY POINTS – ECONOMIC DEVELOPMENT (COUNTY COMPARISON)

- Like Grant County residents generally, those in Cuba City feel that commercial and industrial development should generally occur in or near an existing city or village.
- Residents of Cuba City feel more strongly that all Grant County jurisdictions should provide at least some land with infrastructure for industrial and commercial uses either owned publicly or privately.
- Like the overall County sample, Cuba City supports alternative energy development. By a small margin, Cuba City residents support the pursuit of ethanol plants more enthusiastically than the overall County average.

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	Cuba City	Cnty	Cuba City	Cnty	Cuba City	Cnty	Cuba City	Cnty	Cuba City	Cnty
26. Commercial or industrial buildings and activities involving truck traffic and manufacturing should be located:										
a. In an existing city or a village	11%	14%	44%	39%	36%	28%	2%	7%	7%	12%
b. Near a city or village	18%	16%	72%	63%	3%	8%	1%	3%	6%	10%
c. Anywhere in Grant County	6%	7%	27%	19%	43%	38%	11%	20%	13%	16%
27. Coordinate business recruitment	60%	53%	37%	40%	1%	2%	0%	2%	1%	3%
28. Provide land & infrastructure for industry/commerce	28%	16%	46%	43%	14%	19%	2%	7%	10%	15%
29. Required muni water & sewer	28%	26%	48%	45%	7%	11%	3%	4%	13%	14%

30. Grant County jurisdictions should pursue the following energy alternatives as a form of economic development:

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	Cuba City	Cnty	Cuba City	Cnty	Cuba City	Cnty	Cuba City	Cnty	Cuba City	Cnty
a. Ethanol Plants	26%	22%	38%	33%	16%	23%	7%	9%	13%	13%
b. Solar Energy	43%	39%	41%	45%	6%	5%	0%	1%	10%	10%
c. Wind Energy	53%	48%	36%	43%	3%	2%	1%	2%	7%	6%
d. Other	12%	28%	12%	8%	0%	0%	0%	0%	76%	63%

30. Grant County jurisdictions should pursue the following energy alternatives as a form of economic development:

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	Haz Gn	Cnty	Haz Gn	Cnty	Haz Gn	Cnty	Haz Gn	Cnty	Haz Gn	Cnty
a. Ethanol Plants	21%	22%	34%	33%	27%	23%	8%	9%	10%	13%
b. Solar Energy	30%	39%	51%	45%	8%	5%	2%	1%	10%	10%
c. Wind Energy	51%	48%	37%	43%	5%	2%	2%	2%	6%	6%
d. Other	10%	28%	20%	8%	0%	0%	0%	0%	70%	63%

Residents of the Village of Hazel Green have marginally higher levels of interest in home-based businesses than the overall County average.

31. Rate the importance of the following:

	Very Important		Important		Unimportant		Very Unimportant		Not Applicable	
	Haz Gn	Cnty	Haz Gn	Cnty	Haz Gn	Cnty	Haz Gn	Cnty	Haz Gn	Cnty
a. Ag Related Business	59%	59%	35%	38%	2%	2%	0%	0%	5%	1%
b. Commercial & Retail	27%	33%	63%	59%	5%	7%	0%	1%	5%	1%
c. Downtown Devel	26%	31%	54%	52%	17%	11%	3%	2%	0%	4%
d. Home-Based Bus	11%	17%	70%	54%	16%	22%	0%	3%	3%	4%
e. Ind & Manufacturing	30%	40%	63%	50%	2%	8%	3%	1%	2%	1%
f. Tourism & Rec	23%	36%	63%	55%	9%	7%	3%	1%	2%	1%

SUMMARY OF KEY POINTS – ECONOMIC DEVELOPMENT (COUNTY COMPARISON)

- Compared to the County, Town of Hazel Green residents have higher levels of agreement that commercial or industrial development that involves truck traffic be located in existing cities or villages.
- Residents of the Town of Hazel Green have lower levels of agreement to require new development at the edge of an existing city to connect to municipal water and sewer.
- The level of support for the development of alternative energy as a tool for economic development is very similar to the overall County average, with the possible exception of ethanol plants. Respondents from the Town of Hazel Green may be slightly less likely to support ethanol plant developments than the County average.

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	T Haz Grn	Cnty	T Haz Grn	Cnty	T Haz Grn	Cnty	T Haz Grn	Cnty	T Haz Grn	Cnty
26. Commercial or industrial buildings and activities involving truck traffic and manufacturing should be located:										
a. In an existing city or a village	13%	14%	49%	39%	24%	28%	4%	7%	9%	12%
b. Near a city or village	7%	16%	73%	63%	7%	8%	4%	3%	10%	10%
c. Anywhere in Grant County	10%	7%	24%	19%	35%	38%	20%	20%	10%	16%
27. Coordinate business recruitment	50%	53%	45%	40%	1%	2%	0%	2%	4%	3%
28. Provide land & infrastructure for industry/commerce	24%	16%	41%	43%	19%	19%	4%	7%	13%	15%
29. Required muni water & sewer	18%	26%	46%	45%	18%	11%	1%	4%	18%	14%

30. Grant County jurisdictions should pursue the following energy alternatives as a form of economic development:

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	T Haz Grn	Cnty	T Haz Grn	Cnty	T Haz Grn	Cnty	T Haz Grn	Cnty	T Haz Grn	Cnty
a. Ethanol Plants	14%	22%	34%	33%	26%	23%	14%	9%	13%	13%
b. Solar Energy	36%	39%	48%	45%	8%	5%	0%	1%	7%	10%
c. Wind Energy	44%	48%	40%	43%	6%	2%	0%	2%	9%	6%
d. Other	24%	28%	18%	8%	0%	0%	0%	0%	59%	63%

SUMMARY OF KEY POINTS – ECONOMIC DEVELOPMENT (COUNTY COMPARISON)

- Village of Dickeyville residents were generally less supportive of commercial and industrial buildings and activities involving truck traffic and manufacturing in an existing city or village.
- Relative to the County, residents feel slightly more strongly that jurisdictions should provide at least some land with infrastructure for industrial and commercial uses.

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	Dville	Cnty	Dville	Cnty	Dville	Cnty	Dville	Cnty	Dville	Cnty
26. Commercial or industrial buildings and activities involving truck traffic and manufacturing should be located:										
a. In an existing city or a village	7%	14%	32%	39%	42%	28%	8%	7%	12%	12%
b. Near a city or village	21%	16%	61%	63%	7%	8%	2%	3%	8%	10%
c. Anywhere in Grant County	9%	7%	24%	19%	45%	38%	6%	20%	16%	16%
27. Coordinate business recruitment	49%	53%	45%	40%	3%	2%	1%	2%	2%	3%
28. Provide land & infrastructure for industry/commerce	21%	16%	44%	43%	19%	19%	3%	7%	13%	15%
29. Required muni water & sewer	21%	26%	48%	45%	18%	11%	0%	4%	14%	14%

- Residents of the Village of Dickeyville give similar high support of pursuing alternative solar and wind energy as do County residents as a whole. As was true with the County, Village residents are less enthusiastic about ethanol plants as a form of economic development.

30. Grant County jurisdictions should pursue the following energy alternatives as a form of economic development:

	Strongly Agree		Agree		Disagree		Strongly Disagree		No Opinion	
	Dville	Cnty	Dville	Cnty	Dville	Cnty	Dville	Cnty	Dville	Cnty
a. Ethanol Plants	19%	22%	32%	33%	33%	23%	4%	9%	13%	13%
b. Solar Energy	38%	39%	46%	45%	9%	5%	0%	1%	7%	10%
c. Wind Energy	51%	48%	43%	43%	2%	2%	0%	2%	4%	6%
d. Other	13%	28%	0%	8%	0%	0%	0%	0%	88%	63%



My name is Marjorie Nett.

Thank you for allowing me time to speak.

I live in the town of Brothertown in Calumet County.

In 2007, I was invited to serve on the Ad Hoc Committee advising on the Wind Energy Ordinance to preserve and protect the public health and safety of the citizens in Calumet County. During my research I discovered that the nation turns to the National Academies such as

- a. National Academy of Sciences
- b. National Academy of Engineering
- c. Institute of Medicine and
- d. National Research Council

for independent, objective advice on issues that affect people's lives worldwide.

This book was published not just for Wisconsin, not just for the United States it was published for the World when considering Wind Energy Projects.

I would like to quote two items from this book..

On Page 153, the 3rd bullet states – Turbine... noise usually is most critical within a half-mile of a project. Efforts to reduce potential noise impacts on nearby residents therefore may be most important within that distance.

On Page 159, the first sentence under Mitigation

Measure and Standards – Noise produced... by wind turbines generally is not a major concern for humans beyond a half-mile. 2640 ft.

Most of your research has already been studied by these National Academies. I would like to provide you with the contact information, address and phone number, in order for you to get additional copies of this report. Please use this book as a resource when drafting the recommendations for the people of Wisconsin.

In summary, setbacks should be no less than 2640 feet from property lines to protect the land owners' rights and land values and to reduce potential noise impacts and shadow flicker concerns.

I ask that you protect me and my family from becoming "collateral damage" as the wind companies have already been known to call us.

I need your help to change the PSC wind siting rules.

Thank you for your time and consideration.

Margorie Nett
W4815 Dick Rd
Chilton WI 53014

920-418-1203

BOOK title - "Environmental Impacts of
Wind - Energy Projects."

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Margorie Nett
W4815 Dick Rd
Chilton WI 53014

920-418-1203

Attached is Appendix E: Minority Report

taken from:

Wind Siting Council

Final Recommendations
To the Public Service Commission

Wind Siting Rulemaking
Pursuant to 2009 Wisconsin Act 40

August 9, 2010

APPENDIX E: MINORITY REPORT

Introduction

We appreciate the opportunity to attach a minority opinion to the Wind Siting Council's final report to the Commission. As described in the report, the Council worked very hard for over four months to make sure that the viewpoints of the varying interested parties were heard, and we have reached consensus on a number of issues. However, there are several issues—which we believe are the most important issues—on which the Council simply was not able to reach consensus. We believe that this inability can in large part be explained by the make-up of the Wind Siting Council and by a process that did not insist on the best quality information and did not elicit critical thinking in the participants.

We acknowledge and respect the vast range of facts, opinions, and interests represented in the Council's membership. The motivation of individual Council members to protect the economic investments of each of the parties involved—property owners, turbine hosts, local governments, developers, and energy companies—is clear and easy to understand. The primary concern of this minority report, written by persons living among wind turbines, by realtors, and by a town official, is protecting the quality of life for people living near wind energy developments who have not chosen to participate in those developments. We believe it is the responsibility of a governmental body to provide an opportunity for citizens to consent on some on the most contentious issues relating to wind energy development.

We believe that our views are not adequately addressed in the straw proposal and the report presented by the Council to the Commission. We worked hard to listen to ideas that differ from our own, and we appreciate the opportunity to hear differing views over the many hours of meetings. However, our concerns with the product of the Wind Siting Council is not with the loss of votes on particular issues, it is with the failure of the process to address the realities of the effects of large wind turbines on nearby populations, to bring quality information into critical areas, and to explore the economic implications of locating an industrial facility next to a residential area.

We would ask the reader to be tolerant of the varying writing styles that result from multiple authors and to excuse indications of frustration that were not removed from the text. Council members supporting this minority opinion include a member representing towns, both realtor members, and a landowner living in the vicinity of a wind energy system. Our opinions are also supported by another landowner living in the vicinity of a wind energy system, Gerry Meyer, who served as one of our alternates to the Council.

Our issues of concern include:

- The Composition of the Wind Siting Council
- Health
- Noise
- Shadow Flicker
- Property Values

APPENDIX E: MINORITY REPORT

Wind Siting Council Membership

Wind turbine siting has been a contentious issue in this state—separating families, communities and abandoning Wisconsin residents to their fate. Recognizing this state of affairs, the legislature in Act 40 designated appointments to a Wind Siting Council that were intended to produce an evenly-balanced composition. Unfortunately, the appointments made were heavily weighted on the side of members having a direct or indirect financial interest in promoting wind development in the state.

It may have been more appropriate to have had all three Commissioners discuss these appointments at one of their open meetings. In future, there may be need for some legislative committee oversight in future Wind Siting Council member selection, since these decisions ultimately promote outcomes that could unnecessarily burden Wisconsin citizens in the name of “the greater good.”

The following is the language in the statute that prescribed the composition of the Wind Siting Council:

2009 WISCONSIN ACT 40

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. 15.797 of the statutes is created to read:

15.797 Same; council. (1) WIND SITING COUNCIL.

(a) In this subsection, “wind energy system” has the meaning given in s. 66.0403 (1) (m).

(b) There is created in the public service commission a wind siting council that consists of the following members appointed by the public service commission for 3-year terms:

1. Two members representing wind energy system developers (Developer Members)
2. One member representing towns (Towns Member) and one member representing counties (Counties Member)
3. Two members representing the energy industry (Energy Members)
4. Two members representing environmental groups (Environmental Members)
5. Two members representing realtors (Realtor Members)
6. Two members who are landowners living adjacent to or in the vicinity of a wind energy system and who have not received compensation by or on behalf of owners, operators, or developers of wind energy systems (Landowners)
7. Two public members (Public Members)
8. One member who is a University of Wisconsin System faculty member with expertise regarding the health impacts of wind energy systems (UW Faculty Member)

The Table following indicates the degree of compliance with the legislation and identifies those with direct or indirect financial or organizational interests in the promotion of wind energy systems in the state. Commentary is found on the pages following the table:

APPENDIX E: MINORITY REPORT

Membership on the Wind Siting Council called for in 2009 Wisconsin Act 40
As appointed by the Public Service Commission
a check with the legislative language and
identification of financial or organizational interests in the promotion of wind energy systems

SECTION 1. (b) There is created in the Public Service Commission a wind siting council that consists of the following members appointed by the Public Service Commission for 3-year terms:

NAME	AFFILIATION	APPOINTMENT MATCHES LEGISLATIVE LANGUAGE?	INDEPENDENT OF FINANCIAL OR ORGANIZATIONAL INTEREST IN THE PROMOTION OF WIND ENERGY SYSTEMS?
1. Two members representing wind energy systems developers.			
Tom Green	Wind Capitol Group	YES	NO
Bill Rakocy	Emerging Energies of Wisconsin, LLC; CREWE Member	YES	NO
2. One member representing towns and one member representing counties.			
Doug Zweizig	Town of Union (Rock Co.) (Town wrote an ordinance)	YES	YES
Lloyd Lueschow	Green County (no industrial wind activity)	YES	YES
3. Two members representing the energy industry.			
Andy Hesselbach,	WE Energies; CREWE Member	YES	NO
Dan Ebert,	WPPI Energy; CREWE Chair	YES	NO
4. Two members representing environmental groups.			
Michael Vickerman	RENEW Wisconsin	YES	NO
Ryan Schryver	Clean Wisconsin	YES	NO
5. Two members representing realtors.			
George Krause Jr.	Choice Residential LLC	YES	YES
Tom Meyer	Restaino & Associates	YES	YES
6. Two members who are landowners living adjacent to or in the vicinity of a wind energy system and who have not received compensation by or on behalf of owners, operators, or developers of wind energy systems.			
Dwight Sattler	Landowner 3,700 feet from a turbine	YES	YES
Larry Wunsch	Landowner 1,100 feet from a turbine	YES	YES
7. Two public members.			
David Gilles	Godfrey & Kahn former WPSC General Council	NO	?
Jennifer Heinzen	Lakeshore Technical College, Pres. RENEW WI	NO	NO
8. One member who is a University of Wisconsin System faculty member with expertise regarding the health impacts of wind energy systems.			
Jevon McFadden	Assigned to the Wisconsin Department of Health Services. Employed by the Federal CDC. Admitted non-expert on this subject.	NO	?
Number of members not matching the legislative language		3	
Number of members independent of financial or organizational interest			6

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Commentary on the composition of the Wind Siting Council:

- Three of the members of the Wind Siting Council were also members of the Coalition for Clean, Responsible Energy for Wisconsin's Economy (CREWE), having a history of working in concert on the wind siting issue. "CREWE is a coalition group that formed to advocate meaningful energy policy change consistent with the Governor's Global Warming Task Force final report, which will have a positive impact on Wisconsin's economic development and security and foster job creation. CREWE's membership consists of Alliant Energy, EcoEnergy, Johnson Controls, Xcel Energy, C5•6 Technologies, Madison Gas and Electric, Orion Energy Systems, Forest County Potawatomi Community, Wisconsin Energy Corp., Emerging Energies of Wisconsin, MillerCoors, American Transmission Co. and WPPI Energy." <http://wicrewe.com/>
- The legislation called for two "public members," presumably, in the simplest term, persons who represent the best interests of the public. The definition of "general public" found at [allwords.com](http://www.allwords.com) (<http://www.allwords.com/word-general+public.html>) would be:
 1. *Those members of the public who have no special role in a specific public area, such as an airport, hospital or railway station; there will typically be restrictions on their access.*
 2. *Members of the public not in the attentive public of any given issue; laypersons.*

The two people appointed were far from laypersons on the issue of wind energy systems in Wisconsin:

"David J. Gilles is a shareholder and a member of the environmental and energy law practice group in the Madison office and has expertise in energy regulatory law matters. He also works with the antitrust, consumer protection and government practice team. Prior to joining the [Godfrey & Kahn] firm, Dave served as General Counsel to the Public Service Commission of Wisconsin (2003-2007). The Commission is an independent regulatory agency, responsible for overseeing public utilities providing electric, gas, water and telecommunications services to the public. As General Counsel, Dave was responsible for all legal matters affecting the agency. Dave supervised and directed legal representation in state and federal courts and before the Federal Energy Regulatory Commission and Federal Communications Commission. While at the agency, legislation streamlining procedures for approval of energy facilities was enacted (2003 Wisconsin Act 89). In addition, legislation setting renewable resource portfolio standards for energy providers became law (2005 Wisconsin Act 141)." (http://www.gklaw.com/attorney.cfm?attorney_id=300)

Jennifer Heinzen is the President of RENEW Wisconsin. For an example of her advocacy for increased use of wind energy systems in Wisconsin, see her response to perceived anti-wind comments of State Representative Bob Ziegelbauer. <http://renewmediacenter.blogspot.com/2009/01/response-to-comments-of-state-rep-bob.html>

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- Probably the most problematic appointment to the Wind Siting Council was the person appointed to serve as the “University of Wisconsin System faculty member with expertise regarding the health impacts of wind energy systems.” The person appointed is an employee of the Wisconsin Department of Health Services, an agency that has taken a position on the issue of wind turbines and health: “the information currently available to the Division of Public Health does not support the conclusion that existing setback criteria would result in adverse health impacts to the public.” (Letter from Seth Foldy, State Health Officer and Administrator, Division of Public Health to Kendall Schneider, Chair, Town of Union (Rock County) Town Board, September 4, 2009) This carefully worded conclusion is strikingly similar to McFadden’s conclusion in his presentation to the Wind Siting Council on May 17, 2010: “Evidence does not support the conclusion that wind turbines *cause* or are *associated with* adverse health outcomes.” As an employee of the Bureau of Environmental and Occupational Health, McFadden is presumably subordinate to Foldy and therefore constrained in his conclusions to those of his agency.

Act 40 called for an independent researcher, a faculty member in the University of Wisconsin system. The person appointed is not a faculty member, but an adjunct assistant professor:

Definitions are found in the Wisconsin Administrative Code: UWS 1.04 Faculty. “*Faculty*” means persons who hold the rank of professor, associate professor, assistant professor, or instructor in an academic department or its functional equivalent in an institution.

and the Faculty Policies and Procedures University of Wisconsin—Madison (As approved by the Faculty Senate on 15 May 1978, with subsequent amendments as of 4 May 2009)

1.02. UNIVERSITY FACULTY. A. The university faculty consists of all persons who hold the rank of professor, associate professor, assistant professor, or instructor with at least a one-half time appointment in UW-Madison, or with a full-time appointment jointly between UW-Madison and UW-Extension.)

Directory search at the University of Wisconsin—Madison:

1 match

Name JEVON MCFADDEN

E-mail

Phone

Title ADJUNCT ASST PROF

Division SCHOOL OF MEDICINE AND PUBLIC HEALTH

Department POPULATION HEALTH SCIENCES

Adjunct professors, as can be learned from Wikipedia, are “Typically part-time non-salaried, non-tenure track faculty members who are paid for each class they teach. This position does not always require a completed PhD.” (http://en.wikipedia.org/wiki/Professor#United_States_and_Canada) Therefore the Wind Siting Council did not have the quality of instruction in the peer-reviewed literature on the health impacts of wind energy systems envisioned by the legislators. Instead of a researcher who is accountable to the University and the community of scholars for the quality of assessment on this question, the Council had a member who only looked like a faculty member, who has not published any investigation into such questions, and acknowledged that he had only informed himself in the relevant literature for a few years.

We want to be clear that our concerns about the composition of the Wind Siting Council are not criticisms of the individuals appointed. In each case, these individuals were appropriate

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representatives of their roles and organizations. They were hard-working and conscientious members of the Council. Our critique is with the effect that these appointments had on the process of the Council's deliberations and with the pre-determination of the recommendations contained in the Council report.

The legislatively-desired diversity of the Council was clearly distorted in the appointment process, and the consequences of that act can be seen in the conduct and product of the Council. At the first meeting, Council members are described in the Council report as sharing "his or her background, experience and thoughts on wind development." However, none of the three members of CREWE mentioned that part of their experience, even though they had been working together to advance that organization's agenda at that time. It is clear that those expecting regulation from the Commission's rules and those Council members associated with them would have a strong voice in the recommendations for those regulations.

The Council Chair repeatedly urged the Council to work toward a consensus and even suggested specific ways in which opposing positions might be accommodated, but the majority operated to deflect information or proposals that might interfere with the agenda of ensuring that local jurisdictions would not be able to restrict wind farm development. The imbalance in favor of increased ability to site wind farms resulted in

- an inadequate and biased review of the scientific literature,
- little review of state and national regulations,
- no examination of the ordinances passed in Wisconsin by local jurisdictions (even though these ordinances were frequently cited as the rationale for the Council), and
- a series of majority votes in favor of relaxed regulation of wind energy systems.

The pattern of voting by this block of members can be seen in the *Wind Siting Council Straw Proposal Amendment Ballot: Data Tabulation* distributed on July 9, 2010.

Had the Commissioners vetted the Wind Siting Council applicants as a group in an open meeting, perhaps the council would have been a more diverse group applying equal consideration for the promotion of wind development and minimizing burdens for the residents of Wisconsin.

Health

The Wind Siting Council failed to address health issues adequately in their recommendations for the wind siting rules.

The following pages are a personal account from a resident in the Forward Energy project. They illustrate how some Wisconsin residents' health is being impacted while living in a wind facility, his increasing awareness of how his neighbors are affected, and his experience in interacting with health professionals.

World wide, wherever large industrial wind turbines are erected, there are numerous complaints of health effects. Most common, and immediately after turbines begin to turn, are headaches and loss of sleep.

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On May 17th wind siting council member Jevon McFadden gave a presentation titled "Wind Turbines: A Brief Health Overview." His research did not include any visit or interview with current wind farm residents, nor did it include overnight stays in homes within a wind farm. It mostly included information obtained from reports obtained on the internet. I feel there are serious flaws in that presentation. I will only cite two of those slides. On slide 68 the second bullet point reads, "Persons with sleep problems should be medically evaluated". That seems to be a needless visit to the doctor as wind farm residents did not have this sleep problem before the turbines began turning. It is not because some of those residents are getting older as one council member suggested; it is the frequent jet-flying-over sound or thumping sounds that often last for days at a time that are the catalyst of the problem. The third bullet point of slide 68 states, "Symptoms of sleep disturbance, vertigo, tinnitus, anxiety, etc. may represent serious underlying medical conditions." Again, these symptoms were not present before the turbines were installed.

In correlation to the symptoms beginning just after or shortly after the wind turbines began turning, the symptoms (depending on their severity) go away immediately after leaving the wind farm for vacation or in some cases abandoning homes out of desperation. Sleep returns immediately, and headaches cease right away. Some residents report that they no longer dream, however dreams return when they sleep away from their home. Ringing in the ears takes several days to clear up, while more serious internal problems may take months to improve.

One young woman in the Forward project had intestinal ulcers that began after the turbines began turning that went away in the following months after her family abandoned their home and moved to a peaceful cul-de-sac in a nearby village. The mother of the same family and a woman in a home less than a mile away both had compromised immune systems. Of course, this was diagnosed by doctors. After moving from their homes,, their health and weight improved observably. These, of course, are only a few of an unknown number of persons in the state who have been affected by the placement of wind turbines adjacent to their properties. We urge the Public Service Commission to determine the extent of the problems before permitting the siting of additional turbines.

Before continuing, we will list some, however probably not all, of the health effects experienced by residents living where wind turbines are not responsibly sited: headaches, sleep deprivation, anxiety, dizziness, chest palpitation, stress, depression, anger, nausea, exhaustion, irritability, lack of motivation, loss of short term memory, tinnitus, intestinal ulcers, and reduced immunity system.

The Wind Siting Council heard numerous times from member Larry Wunsch (an uncompensated landowner living adjacent to or in the vicinity of a wind energy system member) about what it is like to live 1,100 feet from a large industrial wind turbine regarding sound, health, and shadow flicker. Council member Dwight Sattler has stated he only hears the turbine to the south east of his home sometimes and does not experience shadow flicker. Mr. Sattler estimated to the council that the single turbine is at least ½ a mile from his home (Other estimates are 3000+ feet away.). This difference between these two members demonstrates irresponsible vs. responsible siting. Those of us in the minority were expecting responsible siting rules from this council.

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Slide 72 of Dr. McFadden's presentation states, "Encourage concerned individuals to report symptoms or illness to a healthcare provider" and "Encourage health officials to continue to assess new evidence as it becomes available." The actual words stated were, "Health officials both at the state and local levels are advised to continue to assess new evidence as it becomes available. This is standard practice with regards to all issues of potential public health impact."

The following is one personal account (An interested Department of Health Services could easily learn of many others.): *On May 18, 2010, I called my clinic. Both my wife and I have been to the doctor concerning our symptoms. My wife especially had a doctor patient conversation of the diseases caused by sleep deprivation. Those diseases include high blood pressure, diabetes, heart disease and fibromyalgia. I called the clinic to find out if they report our visits concerning the negative health affects of living too close to large industrial wind turbines to the county or state health departments. The answer, "No, we do not," "We only report communicable diseases and specific requests from the health department." I again called our doctor on July 27, 2010 to see if they had been requested to submit information to the county and state health departments concerning patients with illnesses due to wind turbines too close to their homes. "No, no such request had been made". Based on the information received from my doctor and clinic, I do not believe health issues caused by wind turbines will "filter" to the state health department from visits to our "local health care provider."*

How many people go to their doctor and then report to their county or state health departments that they made a medical appointment and the results of that visit? How many residents living in a wind farm would even think about calling their county or state health department to let them know of their symptoms? I think the health departments would admit that not many would. Yet, locally we hear many complaints of residents with sleep deprivation, headaches (caused by sound and shadow flicker), and many other health concerns.

In a public meeting of the Brown County health department, Dr. McFadden stated that cortisol levels are inconclusive. If a patient has a cortisol level of 254 (A person's cortisol level should be less than 100.) during a period of high sleep deprivation caused by five wind turbines with $\frac{3}{4}$ of a mile of his home and the day after a 21-day shut down of the Forward Project the patient's cortisol level is 35, it should raise high red flags to the state Department of Public Health and the public health representative on the wind siting council that there could be a health concern related to the wind turbines.

Residents that self-report health issues seem to be in question of their reliability by Dr. McFadden. If we go to our doctor for any symptom not necessarily wind energy-related, our doctor will ask us what brings us today. Our doctor will ask questions related to the issue at hand, often very detailed, to help him/her assess the situation and determine the next steps in tests or treatment. Those answers would be self reported. I believe many patients would anticipate those questions and may even have details mentally prepared or written down

On June 9th, Wind Siting Council Chair Dan Ebert introduced his straw proposal. In his statements explaining his proposal, he concluded: "Having read through a number of the studies and having heard Jevon's presentation, I don't believe there is sufficient analysis

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and evidence to suggest that we need to weigh in on the health issues at this point.” That was taken as a slap in the face to council member Larry Wunsch and his alternate Gerry Meyer and many other wind farm residents in the Wisconsin wind farms and wind farms around the world that are suffering from the effects of industrial wind turbines being irresponsibly placed too close to their homes. The “majority” has downplayed the health issues during the Council’s work time.

We agree that, like many other sounds and daily happenings, some people are more sensitive to surroundings than others. In the case of wind energy there seem to be many residents that are sensitive to not just the loud, very obvious sounds, but also the low frequency sound that often is not heard, but felt by the body. Low frequency sound was barely addressed or was downplayed by the Council. The peer-reviewed literature of Nina Pierpont, and studies done by Dr. Christopher Hanning, Dr. Carl, Phillips, Dr. Robert McMurtry, Dr. Amanda Harry, Dr. Michael Nissenbaum and others, including sound engineer Rick James, were ignored or dismissed.

Numerous times during the wind siting council meetings it was brought up that any decisions on health had to be based on science. If government agencies are not willing to do epidemiological studies, how will science ever determine the health issues related to wind energy? At the Brown County Health Department meeting on May 25th, concerned residents challenged Dr. McFadden and the state health department representatives at the meeting to come up with a questionnaire for current wind farm residents. Part of that request was based on the observation that there were already enough “lab rats” to study rather than create more victims of wind energy. The fact is: That wherever large industrial wind turbines are erected there are health issues.

This conclusion is supported by a physician who has surveyed studies conducted on those affected by wind turbines: “*Large industrial wind turbine developments do not belong in close proximity to locations where people live and work.*”[his italics] (Herbert S. Coussons, MD, “Re: Health Impacts and Setback Guidelines for Wind Siting Council,” PSC REF#: 130689) Dr. Coussons cites authoritative sources to document the levels of sound that disturb sleep, and summarizes: “At 30—40dB measurable objective sleep disturbances are seen. At 40—55dB adverse health effects are seen. Above 55dB is dangerous to public health. Experience has shown industrial wind turbines cause noise that exceeds 40 dB when in close proximity.” This summary suggests that the Wind Siting Council report is recommending a sound level—45 dBA at night and 50dBA during the day—that will disturb sleep and flirts with producing adverse health effects. The problems that result from disturbed sleep are “deficits of concentration, attention and cognitive performance, reduced vigilance, malaise, depressed mood, and irritability,” problems that have distinct implications for health.

While those seeking to minimize the health effects of wind turbines argue for clear causality in order to permit any attention to health concerns, there is recent work that points to the mechanisms through which disturbance from infrasound wind turbine noise takes place. Where Dr. McFadden’s presentation dismisses the possibility of lower levels of infrasound being a problem, since it cannot be “heard,” Alec N. Salt and Timothy E. Hullar have identified the mechanism in the inner ear that could account for the complaints resulting from proximity to working wind turbines: “In most studies of wind turbine noise, this high level, low frequency noise is dismissed on the basis that the sound is not perceptible. This fails to take into account the fact that the OHC [outer hair cells] are stimulated at levels that are not heard.” (Alec N. Salt

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and Timothy E. Hullar, Department of Otolaryngology, Washington University School of Medicine, "Responses of the ear to low frequency sounds, infrasound and wind turbines," June 2010) This work is now part of the peer-reviewed scientific literature and is likely to be followed by more conclusive evidence of a causal path from wind turbine noise to health effects.

Dr. Carl Phillips, an epidemiologist familiar with the science of epidemiology and with the state of research on questions of wind turbines and health effects, concludes that there is reason for investigation to ensure that siting decisions would not cause harm:

In summary, there is substantial evidence to support the hypothesis that wind turbines have important health effects on local residents. If forced to draw a conclusion based on existing evidence alone, it would seem defensible to conclude that there is a problem. It would certainly make little sense to conclude that there is definitely no problem, and those who make this claim offer arguments that are fundamentally unscientific. But there is simply no reason to draw a conclusion based on existing evidence alone; it is quite possible to quickly gather much more useful information than we have.

(Carl V. Phillips, MPP PhD, "An Analysis of the Epidemiology and Related Evidence on the Health Effects of Wind Turbines on Local Residents," PSC REF#: 134274)

On pages 25-26 of his report, Dr. Phillips sketches out a research design that could be used to examine Wisconsin residents' experience with wind farms already permitted and operating. It is irresponsible to neglect to evaluate the effects of decisions already made before making further decisions. Chairman Callisto has attempted to reassure those concerned with the upcoming rules by saying, "I think they're going to be flexible to accommodate new studies," he said. "Rules get modified all the time. Nothing's written in stone." (quoted in "Wind turbine debate spins toward Sept. 1 deadline," The Daily Reporter, June 29, 2010.) Unfortunately, wind turbines are installed in concrete foundations weighing hundreds of tons that will not be modified for decades. In the case of Council-member Larry Wunsch, the turbine permitted under PSC rules to be placed 1,100 from his home has been operating for over five years and will likely continue to operate, though the Council Chair has acknowledged that it should not have been permitted given what we know now. We believe that it would be better to aggressively pursue knowledge of the potential for effects on human health now than to make decisions again that will be regretted later.

Health issues are not limited to humans. One Forward resident, before abandoning their home, also had problems with their alpacas birthing at not normal times of the day and in three cases had still-born or aborted births, where before the turbines were erected there were no reproductive problems. In a neighboring wind project, a man who has raised chickens all his life now has a variety of health issues in his chickens. When the chickens were moved to a relative's property outside the area of the wind farm, the chickens' health returned. In the smaller Wisconsin Public Service project near Algoma, a beef farmer who had not had health concerns with his animals prior to the wind farm had some animals get ill and others die after the turbines were erected. In the Forward project, few if any deer are seen; however residents two miles outside the project are seeing more deer than ever. The same results are reported for turkeys. The concern for wildlife was not addressed in the Wind Siting Council proceedings (such concerns were stated to be the responsibility of the Department of Natural Resources) even though "environmental" groups were part of the make up of the Council.

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Noise

Given that noise from large wind turbines is the source of most complaints from Wisconsin residents, the approach taken by the Wind Siting Council to understanding this issue and to proposing reasonably protective noise standards was seriously flawed.

- Where Act 40 stipulated that a member of the Wind Siting Council be "a University of Wisconsin system faculty member with expertise regarding the health impacts of wind energy systems," the person appointed was not a member of the UW—System faculty but was an adjunct assistant professor whose primary work location was a state agency with an established position on the question of health impacts of wind energy systems. Further, he publicly stated that he was not an expert.
- The Wind Siting Council report is in error in stating that the Council surveyed peer-reviewed scientific research regarding the health impacts of wind energy systems. The Council was given a PowerPoint-assisted talk on the subject. The PowerPoint slides have been made available, but the presenter has publicly refused to provide the text of the report, even though this text has been used by others to make presentations elsewhere in the state.
- The summary regarding "Noise" in the Council report relies on sources that have not been provided to Council members, either in copies or links. In addition, a significant number of the sources in the Council report were not included in the presentation given to the Council. It is impossible to claim that the Council surveyed literature to which they were not given access or of which they had no knowledge.
- The oral report provided to the Council and the presentation included in the Council report shows the selection and use of sources to justify a pre-determined conclusion and does not reflect either an expert or objective survey of the relevant literature. In contrast, the report provided on the docket by Carl V Phillips, "An Analysis of the Epidemiology and Related Evidence on the Health Effects of Wind Turbines on Local Residents," (PSC REF#: 134274) provides a discussion of the issues by an expert and experienced analyst. Phillips details the flaws and limitations of industry-sponsored reports that minimize the effects of noise and proposes timely and efficient approaches to studying the effects of wind turbine noise on the Wisconsin residents already exposed. Neither the Phillips report nor any other assessment of the effects of noise from wind turbines on proximate populations has been considered in Council meetings. After the PowerPoint presentation, the issue was declared closed.
- Selection and use of sources to support a pre-determined point is illustrated by the casual setting aside of recommendations from such organizations as the World Health Organization, Vestas, the New Zealand Wind Energy Association, The National Research Council of the National Academies, and the Minnesota Department of Health (Environmental Health Division) while basing the recommendation for sound levels on studies done in Europe with smaller turbines and greater setbacks than are presently permitted in Wisconsin.
- The majority on the Council that voted for the recommended standard cannot explain the meaning of the noise standard they have voted for. This can be seen in the following two-minute video from a Council meeting: <http://www.youtube.com/watch?v=29RmKZ8raT0> This discussion took place July 15, 2010 after the decisive vote was taken on the noise standard. In an earlier written "straw" ballot, five members of the Council had voted for a

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standard to allow 25 dBA over the ambient or background sound. (This was not one of the choices on the ballot, "25 dBA" had to be written in under "Other.") In the July 15 meeting, Council members were asked how much louder a 25 dBA difference was. Initially, no one on the Council could say. Finally, Dr. McFadden volunteered 500 times louder, probably meaning 500 percent or five times louder. Because of the logarithmic nature of the decibel scale, the difference is closer to six times louder. What is remarkable is that none of those who had just voted for a standard they did not understand sought to clarify or reconsider what they had just decided. This is an unfortunate demonstration of the quality of decision making on which recommendations in the Council report have been based.

- Since the Council approach to the examination of this central issue fails to meet the literal requirements of Act 40, the recommendations of the Council regarding a noise standard should be set aside, and a process that matches what was required in the Act (a survey of the literature by the Council guided by an independent and qualified researcher) should be initiated.

James P. Cowan, INCE BD. Cert. presented "Wind Turbine Generator Noise Issues" to the Council on June 2, 2010. (http://psc.wi.gov/apps/35/ERF_search/content/SearchResult.aspx Noise Presentation Cowan 06-02-10) Mr. Cowan said that in his experience a 2 megawatt 100-meter wind turbine generator would produce 45 dBA at a 2,000 foot setback and that in central New York state, 2,000 feet was a typical setback. He added that at a 1,000 foot setback the sound would be approximately 6 dBA louder, or about 51 dBA.

Setbacks, other than for safety, were not recommended in the Council report because Council members were agreed that setbacks are a crude device for addressing the problems of noise and shadow flicker. Nevertheless, distance is the only sure mitigation for these problems. In lieu of better information or the kind of study recommended below, we would recommend a 2,640-foot setback from homes with a sound level standard set to 5 decibels above ambient sound pressure to wind farm residents. This is a modest set back compared to the call of doctors, scientists, physicists and sound engineers from around the world for setbacks of 1.2 miles and more.

Shadow Flicker

We do not believe the Council has sufficiently addressed the issue of shadow flicker. We believe that a non-participating property owner should not have to deal with the annoyance of *any* amount of shadow flicker. Non-participating property owners should have the right to freely enjoy their property without shadow flicker annoyance.

A property owner has an interest in the private use and enjoyment of his or her land. What a neighboring property owner does on his or her own property needs to stay there, and should not have spillover effects on other properties. Shadow flicker is an annoyance that can affect the use and enjoyment of a non-participating landowner's property. This annoyance should not be taken lightly. Council member Larry Wunsch who lives in a wind farm is affected by shadow flicker on his property at various times of the year. He has stated that this effect in his home is like someone turning the lights on and off inside the house at a rate of 80 times a minute and lasting for an average of 50 minutes daily on non-cloudy days for six weeks in the spring and six weeks in the fall. Shadow flicker affects the total property for considerably longer periods.

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Shadow flicker can be predicted at the time a wind turbine's placement is being considered, and shadow flicker can be prevented from falling on a neighbor's land or buildings through proper siting and setbacks. Therefore, such interference should be avoided unless a waiver is granted by a landowner. Further, we believe that property owners have a right to enjoy the entire property surrounding their residence; we recommend at a minimum that site planning should identify locations for turbines that do not result in shadow flicker at or around gardens, barns, and other areas of a property used on a regular basis.

Council-member Larry Wunsch is the only Council member that lives with shadow flicker. Mr. Wunsch has testified with and provided other members of the Council a DVD of how shadow flicker can take away the enjoyment of a person's land. Our recommendation is to eliminate the hours of exposure that is recommended in the Council report and instead have zero tolerance for shadow flicker on a non-participating property owner's land.

Property Value

The Council was clearly divided on the question of whether locating wind turbines next to a residential property would decrease that property's value. The Council heard testimony and reviewed studies that made the case for loss of property values. It was very apparent to the minority of the Council (The minority included a landowner living adjacent to a wind turbine who is trying to sell his property and two realtors.) that the majority's opinion varies greatly from the minority's opinion and seeks a much different outcome. In the minority's opinion, the evidence showing close proximity to wind turbines to be undesirable to buyers and negative with respect to one's property value is clear and convincing.

The main argument that was used to claim there is no effect of proximity of wind turbines to property values is that any loss of property values is directly and mainly related to the loss of value because of current economic conditions. The Council majority, most of whom have a vested interest in the development of wind energy, has relied heavily on what is known as the "Berkeley Study" as their main source of support that no value loss occurs due to wind turbines. (The "Berkeley Study" citation is: B. Hoen Wiser, R., Cappers, P., Thayer, M., and Sethi, G. (2009) "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis," Ernest Orlando Lawrence Berkeley National Laboratory. It was funded by the Office of Energy Efficiency and Renewable Energy Wind & Hydropower Technologies Program of the U.S. Department of Energy under Contract No. DE-AC02-05CH1123.)

However, the Berkeley Study has not held up to the scrutiny of other investigators. Michael McCann of McCann Appraisal LLC in Illinois conducted a very thorough review and provided a written analysis in response to the Berkeley Study: "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis" dated Dec 14, 2009 thoroughly details the flaws within the Berkeley Study.

Albert R. Wilson, a specialist in environmental financial risk management and impaired value analysis, concluded that the Berkeley Study does not meet professional standards ("Wind Farms, Residential Property Values, and Rubber Rulers," can be found at <http://www.masterresource.org/2010/02/is-doelawrence-berkeley-labs-wind-power-impacts-study-junk-science/#more-7526>):

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While I have other issues with the Report (and again reiterate that I have no opinion on the influence of wind farms on residential sales prices), the concerns I have addressed here lead to the conclusion that the Report should not be given serious consideration for any policy purpose. The underlying analytical methods cannot be shown to be reliable or accurate.

Kevin F. Forbes, Ph.D (Associate Professor, Catholic University of America, "Reflections on the Integration of Wind Energy into the Power Grid") also demonstrated why we cannot rely on the study's conclusions (document provided to the Commission, pages 6 & 7). The sample used in the study was incapable of finding any effects of wind turbine proximity to property values, and therefore concluding that there are no effects is the scientific equivalent of a fisherman coming up empty and claiming there were no fish in the lake.

The Council minority would recommend that the proper method for arriving at a reasonable "value factor" would use credentialed professionals within the appraisal industry, rather than rely on speculations on the effects of the economy or dependence on such a deeply flawed study.

The Council minority found credible the direct testimony presented by Mr. Kurt Kielisch, ASA, IFAS, SR/WA, R/W-AC President and Senior Appraiser of the Appraisal One Group. His testimony was directly relevant to our local area and State. Appraisal One Group is an appraisal firm specializing in forensic appraisal, eminent domain, stigmatized properties, and valuation research. His presentation (based on "Wind Turbine Impact Study," Appraisal Group One, 9/9/2009) provided insightful and well-documented information on the impact on property values that wind farms and wind turbines have had locally.

His organization's study and report consisted of a literature review, a survey of real estate professionals, and comparable property appraisals in the area of three of Wisconsin's currently operating wind farms consisting of 88, 86, and 41 wind turbines. He informed the Council that value of any property was based on perceptions of a buyer. His findings have demonstrated that local buyer's perceptions of proximity to wind turbines have been found to be negative, resulting in an average of 30% decrease in the areas studied.

Mr. McCann produced an 82-page report, "Wind Turbine Setbacks," dated June 8, 2010, where he gives his professional opinion regarding wind turbine setbacks and how they affect property values. He provides opinions and recommendations on how to minimize these concerns correspond very closely with those in the report provided to the Council by The Appraisal One Group, dated 9/9/2009.

Some on the Council stated, if there were a negative effect on property values, the shared revenue provided to local jurisdictions would result in a reduction of property taxes and make up for any effects on property values. Andrew Reschovsky's analysis of how this has worked in Wisconsin is summarized as ("An Analysis of Shared Revenue Utility Aid," PSC REF#:134042):

In Wisconsin, utilities are generally exempt from local property taxation. However, county and municipal governments are compensated for their loss of property tax revenue through a state-financed grant program known as shared revenue utility aid. This paper describes the utility aid program and explains why revenue from utility aid will most likely be used to increase spending on municipal or countywide public

APPENDIX E: MINORITY REPORT

services or to reduce municipal or county property tax mill rates. The paper concludes that these benefits of utility aid accrue to all property owners within the recipient jurisdictions and that they would not provide disproportionately larger benefits to landowners who are within close proximity of a wind turbine farm.

So we can't rely on shared revenue to address the property value problem

Strong evidence from areas that have had wind farms sited and operating much longer than we have experienced here in Wisconsin allows us to predict what will happen in this state. The evidence is far too convincing to allow us to dismiss the reality that wind farms do greatly negatively impact property values and that this effect can no longer be ignored or minimized.

Council member Andy Hesselbach of WE Energies commented that it is the preference of wind energy developers to site wind turbines closest to property lines, as it provides the developer the largest area to maximize the number of wind turbines and minimize development costs. This preference was confirmed by Council-member Michael Vickerman, of RENEW Wisconsin. Encroaching on a non-participating neighboring property without a negotiated easement is a common cause of conflict, results in a loss of property value, and has been argued to be a "taking" of personal property rights. ("Takings: Balancing Public Interest and Private Property Rights, *Wisconsin Briefs* from the Legislative Reference Bureau, Brief 98-2 April 1998)

Given that locating a wind farm adjacent to existing developed properties has been shown to negatively affect property values, providing an equitable Property Value Protection plan in the rules recommendations will help protect the interests of all parties involved.

Summary

Wind siting rules to adhere to the intentions of Act 40 need to be more restrictive than the ones proposed in the majority report in order to protect the health and safety of non-participating neighbors. The value of their property needs to have protection, and the quality of life rural residents intended to enjoy needs to be protected rather than taken from them.

The minority recommends three areas for study that could greatly increase understanding and reduce the contention that is likely to follow from following the recommendations of the Council report:

Health

Those seeking to minimize or deny the health impacts of wind energy systems do not deny that the operation of wind turbines has disturbed and will disturb the sleep of those living nearby. They also cannot deny the well-understood consequences of inadequate sleep. What they attempt is to have us ignore is the possibility that proximity to wind turbines is known to *directly* cause the symptoms that wind-farm neighbors experience. This narrow space on which they have based their argument is diminishing. In addition to the widespread reports of health effects and the phenomenon of neighbors abandoning their homes, there is an increasing amount of the kind of peer-reviewed scientific literature that wind farm proponents have been calling for that is documenting the symptoms and identifying the mechanisms by which wind farm noise can be found to cause them.

APPENDIX E: MINORITY REPORT

Wisconsin has a large number of residents living close enough to wind turbines already operating in the state. Carl Phillips ("An Analysis of the Epidemiology and Related Evidence on the Health Effects of Wind Turbines on Local Residents," PSC REF#: 134274) has provided a protocol by which a timely and affordable investigation could be conducted to learn about the health impacts that are occurring in this state. It would seem to be responsible to conduct such a study before permitting additional turbines. We would recommend a delay in the permitting of further wind development in Wisconsin until epidemiological studies can be conducted and evaluated.

Safety Setbacks

The Wind Siting Council's considerations of safety setbacks from a wind turbine were inadequate given the potential for harm. The only distances discussed were 1.1 the height of the turbine and 1 time the height of the turbine. The Council was not clear on the source for the 1.1 standard, though it seemed to be a standard used for cell towers. Wind turbines differ from cell towers in that there is a large weight at the top (the nacelle and blades) and in that there are large moving parts. A council member whose utility operates a wind farm reported that there have been cases of wind turbines falling over. Even though there was a request for staff to provide information from authoritative sources for the consideration of setback distance, the Chair said that it would not be necessary. The discussion became more bizarre when a Council member proposed landowners being able to ignore a safety setback, claimed that a safety setback was unnecessary, and said that it should be renamed as a "courtesy setback." In short, the recommendation from the Wind Siting Council cannot be relied upon, and an engineering study to establish safety setbacks from wind turbines is required.

Property Values

Since there is much contention about the effects of wind turbines and property values, and since the Appraisal One study might be dismissed because of its sponsorship, it might be productive for the Public Service Commission to obtain its own study of the issue. The two realtors on the Council would strongly recommend that the issue of property rights and property value effects need to be addressed in order to ensure that wind farm developers and operators are not benefitting from imposing economic hardship on their neighbors.

Wind industry advocates urge the use of science in developing policy for the regulation of wind energy systems. We agree that the discipline of science in the making of observations and reaching conclusions is indispensable to reaching sensible and long-lasting decisions. We also would promote direct observation of realities. When people are abandoning their homes, when they find it difficult or impossible to sell their homes, when symptoms experienced in the vicinity of wind turbines do not occur in other environments, it is not useful to dismiss such reports as inaccurate or hysterical. We would recommend that a body that permits wind turbine installations, whether local jurisdictions or the Wisconsin Public Service Commission, has a responsibility to inform themselves of the consequences of their permitting decisions.

By the same token, we have attempted to be as accurate as possible in our description of the working of the Wind Siting Council, of the literature we have cited, and of the experiences Wisconsin citizens are having living among wind turbines. If we have been in error, we would

APPENDIX E: MINORITY REPORT

desire to have the record corrected, so that we can proceed with a more accurate grasp of the situation.

Finally, we believe that all members of the Wind Siting Council have an interest in increased use of renewable sources of energy in Wisconsin. We in this minority are concerned that the recommendations in the Council report will not address the problems that led to the Council's creation. The standards recommended will, we believe, lead to continuing and increased dissention between proponents of wind development and local governments, and among citizens. We would prefer rules for the siting of wind energy systems that will reduce such conflict because we think that siting turbines in ways that people can live with will provide a sustainable source of energy for Wisconsin.

Respectfully submitted,

George Krause, realtor (Council member)

Tom Meyer, realtor (Council member)

Larry Wunsch, landowner living in the vicinity of a wind energy system (Council member)

Doug Zweizig, towns representative (Council member)

Thank you for your hearing our concerns today.

I am very concerned that the Wind Siting Rules allow the property rights of a nonparticipating landowner to be taken away from him because of a wind turbine nearby, by restricting what he can build on his own property. He can be prevented from erecting a silo, from erecting his own wind turbine, from planting trees, or from doing anything that would interfere with the flow of wind to someone else's wind turbine. The developer is not required to negotiate any wind access easement agreement in which the nonparticipating landowner is compensated for a loss of certain uses of his property. Those property rights are simply "taken", without consent, and without even being notified. The Wind Siting Rules do nothing to address this injustice.

The Wind Siting Rules need to require a notice, such as the following, as a part of the application:

Notice of Possible Property Restrictions.

The applicant shall deliver by certified mail or by hand a notice to the owner of any property, which the applicant proposes to be restricted by the permit. The notice shall state that the permit, if granted, may affect the rights of the notified owner to develop his or her property and to plant vegetation.

The Wind Siting Rules also need to require wind access agreements, such as the following, as a part of the application:

Wind Access Agreements.

The applicant shall provide evidence (a signed statement from the applicant and countersigned by the landowner) that the applicant has negotiated with adjacent landowners and has obtained written agreements with all landowners whose wind rights may be affected by the Wind Energy System or who could otherwise potentially interfere with the applicant's wind access.

In conclusion, placing a wind turbine next door must not be allowed to legally restrict the use of my property without a wind access easement agreement that I consent to and which compensates me for my lost property rights. This is an obvious taking of property rights that needs to be rectified.

PSC 128.01 Definitions.

(22) "Wind access easement" means a written document that creates a legal interest in real property that restricts the use of the property to avoid interference with the wind resource on another property.

Jim Vanden Boogart
7463 Holly Mor Rd.
Greenleaf, WI 54126

YES NEARLY 2000 COMMENTS POSTED) BUT NOT SERIOUSLY
PUBLIC HEARINGS IN FONDUQUAC CONSIDERED

OTHER STATES WHERE TURBINES ARE PLACED ARE NOT PLACED
NEAR PEOPLE RESIDENCES



WIND: POWERING A CLEANER, STRONGER AMERICA | WWW.AWEA.ORG

**Statement of the American Wind Energy Association (AWEA) and
Wind on the Wires (WOW) before the “Joint Committee for the Review of
Administrative Rules” on PSC 128 Rules Set to Take Effect on March 1, 2011**

Good morning, my name is Jeff Anthony. I am a resident of Milwaukee, WI and I work for the American Wind Energy Association, AWEA, as its Director of Business Development. AWEA is based in Washington, DC and is the national trade association for the wind energy industry. I am also representing Wind on the Wires, our regional partner in the Upper Midwest. They are a non-profit advocacy organization based in Minnesota and have responsibility for addressing regulatory and legislative issues in Wisconsin and other Midwestern states on behalf of the wind energy industry.

AWEA and Wind on the Wires are here today to encourage this Committee to take no action on the PSC 128 rules that are scheduled to take effect on March 1st. These comprehensive, statewide rules were developed over a two-and-a-half year period and reflect a fair and open process that involved many different stakeholders. The result was some very stringent, yet workable rules for wind project siting. These rules are critical to making sure Wisconsin is indeed “OPEN FOR BUSINESS” to investment and jobs growth by the wind energy industry.

Wisconsin has almost 500 megawatts (MW) of operating wind power capacity on-line in the state today, but only 54 MW were added in 2009 and only 20 MW were added in 2010. These projects bring direct economic benefits to Wisconsin each and every day – not to mention cleaning the air we breathe every day. And each year, the operating wind projects in Wisconsin:

- Provide annual property tax payments by wind project owners of \$870,000
- As well as annual land lease payments to property owners of \$1.35 million

Onerous wind siting restrictions by some municipalities are the primary culprit for why Wisconsin continues to fall behind our neighboring states:

- Indiana has over 1,000 MW of wind projects installed
- Minnesota and Illinois both have over 2,000 MW installed
- And Iowa has well over 3,000 MW installed, producing almost 15% of the state’s electricity and reaping the benefits of thousands of jobs in the wind energy industry in the state.

Wisconsin has almost 1000 MW of new projects ready for development, but these projects will never see the light of day if our state cannot present a stable and predictable set of siting requirements. The siting rules set to take effect on March 1st provide exactly the kind of stable and predictable environment that wind project developers need.

The siting bill introduced earlier last month in the Governor's special legislative session would have gutted the rules developed through a lengthy, multi-stakeholder, consensus-based process and indicated to developers that Wisconsin was "CLOSED FOR BUSINESS" for future wind project development. This would have eliminated \$1.8 billion worth of investment in new wind projects in the state and deprived the construction industry in Wisconsin of over 2 million hours of construction labor. This bill would have had serious impacts on Wisconsin manufacturers who supply components to the wind energy industry as well.

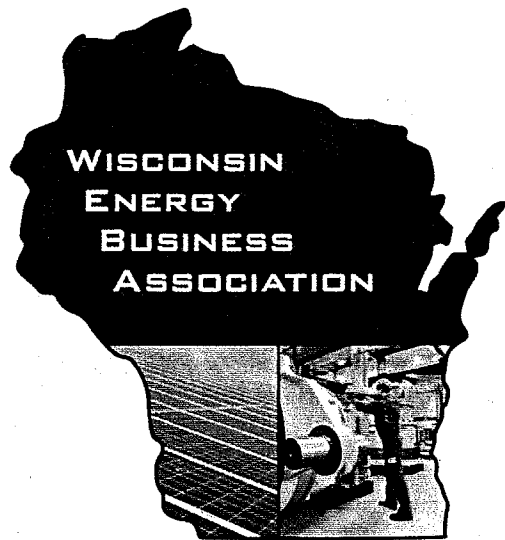
This hearing today is intended to review the new rules developed in 2010. These rules represent a compromise – a compromise which by definition means that no party or stakeholder got what they wanted. Indeed, the wind energy industry had to concede on several points and ended up with rules that are more stringent than most states in the U.S. on setback distances, sound requirements, and shadow issues. But the open, consensus-driven process yielded something that all parties can abide by. These rules should not be abandoned before they have even been allowed to take effect. The uncertainty and lack of a stable regulatory environment, caused by one group of stakeholders that perhaps did not get its way on every issue, is jeopardizing hundreds of jobs and millions of dollars in investment over the next couple of years in this state.

The existing rules also provide the necessary protections for landowners and neighbors. The rights of these parties were fully considered and incorporated into the rules contained in PSC128.

If Wisconsin is serious about economic development, then it must look to establish a stable environment for wind project development, and for wind turbine component manufacturing in the state. Turbine manufacturers and makers of major components want to locate factories (and jobs) close to where projects are being installed. States that are "open for business" to the wind energy industry, like Iowa, Kansas, and Texas, are reaping the benefits of associated manufacturing jobs as well. In Wisconsin over 2,000 existing jobs that directly or indirectly support the wind energy industry are at stake, as well as \$1.8 billion dollars of new wind project investment and over 2 million construction job hours in the next few years.

Implementation of the existing PSC 128 wind siting rules must proceed ahead. These rules should be allowed to take effect, as planned on March 1st. To suspend the rules will basically hang a "CLOSED FOR BUSINESS" sign on the state to the wind energy industry and will ship jobs to Iowa, Illinois, and Minnesota in droves.

Thank you for the opportunity to present the case for strong economic growth and jobs creation in the state of Wisconsin.



TESTIMONY TO THE JOINT COMMITTEE FOR REVIEW OF ADMINISTRATIVE RULES

ATTORNEY JEFF VERCAUTEREN
ON BEHALF OF THE WISCONSIN ENERGY
BUSINESS ASSOCIATION*

FEBRUARY 9, 2011

Senator Vukmir, Representative Ott, and members of the Committee, thank you for the opportunity to testify on the uniform wind siting rules promulgated by the Public Service Commission. I am testifying today on behalf of the Wisconsin Energy Business Association ("WEBA"), a trade association of over 60 businesses and organizations promoting reliable, secure, and cost-effective energy solutions to strengthen our economy and support market-driven innovation and supply chain growth in the energy sector. Our members include TowerTech, Badger Transport, Bonestroo Engineering, and Wind Capital Group.

Texas Governor Rick Perry gave a speech in 2008 titled "Texas is Wide Open for Business," touting improvements in the legal and regulatory market to make the state more attractive to new investment, including wind energy development. In a speech last month, he again reinforced the importance of more predictable regulations in encouraging and fostering economic growth over the past decade, a decade in which his state created more jobs than any other state in the nation. Texas is also the leading producer of wind energy in the country.

That type of regulatory certainty has been lacking for the wind energy industry in Wisconsin over the past decade, a result the uniform wind siting rules in PSC 128 will help reverse if allowed to take effect on March 1. Without these rules, Wisconsin will continue to lose investment opportunities to neighboring states with more favorable regulatory climates.

PSC 128 is needed to establish a reasonable approach to regulating wind energy systems in our state. Far too many wind projects remain stalled because of ordinances that essentially ban such projects. As promulgated, PSC 128 maintains strong protections for neighboring landowners, including strict sound and shadow criteria that ensure a safe setback distance. It also provides monetary compensation to neighboring landowners within a half-mile of a turbine.

Much of the debate over the past month has centered on the issue of neighboring landowners, and it is important to protect those property rights. However, the property rights of host landowners have been lost in the debate. Wind energy is a substantial new crop for Wisconsin farmers allowing small family farms to remain in operation in the face of increasing economic difficulties. As Governor Perry said in 2008, "I am especially encouraged by the fact that many families in rural Texas, whose grip on their land was slipping because of the rising cost of farming . . . can now keep their land because of revenues from hosting wind turbine towers."

We must strike an appropriate balance between the property rights of neighbors and hosts. PSC 128, through its strong sound, shadow, and setback standards, does just that. We must also

embrace the kind of regulatory certainty that has allowed states like Texas to remain prosperous and competitive, even in the midst of a national economic recession. The renewable energy supply chain in Wisconsin has become an increasingly important sector of our economy over the past decade. It is a key element of the renaissance of Wisconsin manufacturing that we must encourage. We must lift the burden of intrusive government policies on this important industry and allow Wisconsin manufacturers and contractors to function in a free market that includes opportunities for reasonable and responsible wind energy development.

Accordingly, we respectfully request that the Committee take no action and allow PSC 128 to take effect on March 1. Thank you. I would be glad to answer any questions that Committee members may have.

BRIEF SUMMARY OF PSC 128	
Setback from Property Lines	1.1 times total turbine height
Setback from Nonparticipating Residences	The lesser of 3.1 times total turbine height or 1,250 ft.
Sound Limits	50 dBa (day), 45 dBa (night)
Shadow Standard	Not to exceed 30 hours/year
Shadow Mitigation	Mandatory above 20 hours/year
Neighbor Payments	Allows municipalities to require developers to offer annual payments to nonparticipating residences within one-half mile of a turbine. Sets annual payment levels of \$600, \$800, and \$1,000, based on the number of turbines within one-half mile.

***THE WISCONSIN ENERGY BUSINESS ASSOCIATION IS A COALITION ORGANIZED BY WIND ON THE WIRES AND RENEW WISCONSIN. FOR ADDITIONAL INFORMATION, PLEASE CONTACT LEE CULLEN, JEFF VERGAUTEREN, OR SHAINA KILCOYNE, 608.251.0101, CULLEN@CWFB.COM, VERGAUTEREN@CWFB.COM, KILCOYNE@CWFB.COM.**



WISCONSIN ENERGY BUSINESS ASSOCIATION MEMBERS

ADDISON WIND LLC, *RANDOM LAKE*
AGRI-WASTE ENERGY, INC.
AMERICAN WIND ENERGY ASSOCIATION
BADGER TRANSPORT, *CLINTONVILLE*
BALDWIN DAIRY, *BALDWIN*
BONESTROO ENGINEERING, *GREEN BAY*
BROADWIND ENERGY
BUSINESS BIOMASS SOLUTION,
MIDDLETON
CLEAN WISCONSIN
CLEAR HORIZONS LLC, *MILWAUKEE*
CONVERGENCE ENERGY, *LAKE GENEVA*
D&D EQUIPMENT COMPANY, *CHILTON*
E3 COALITION LLC, *VIROQUA*
ECOMANITY LLC, *ELKHART LAKE*
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CAMPBELLSPORT
ELEMENT POWER
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ORGANIC VALLEY FAMILY OF FARMS,
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EASTMAN
PROCORP ENTERPRISES, *MILWAUKEE*
RENEW WISCONSIN
RENEWEGY, *OSHKOSH*
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SEVENTH GENERATION ENERGY
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STORMFISHER BIOGAS
SUN & DAUGHTERS RENEWABLE
ENERGY, *RHINELANDER*
SURING DIGESTER LLC, *SURING*
SUSTAINABLE LIVING GROUP,
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URBANRE VITALIZATION GROUP LLC,
MILWAUKEE

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VERTERRA ENERGY, *MILWAUKEE*
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WIND ON THE WIRES
WIND WISCONSIN, *MIDDLETON*
WISCONSIN ENVIRONMENT
WISCONSIN FARMERS UNION

WISCONSIN ENERGY BUSINESS ASSOCIATION IS A LEADING BUSINESS TRADE
ASSOCIATION PROMOTING RELIABLE, SECURE, AND COST-EFFECTIVE ENERGY SOLUTIONS
TO STRENGTHEN OUR ECONOMY AND SUPPORT MARKET-DRIVEN INNOVATION AND SUPPLY
CHAIN GROWTH IN THE ENERGY SECTOR.

RENEW Wisconsin

222 South Hamilton Street, Madison, WI, 53703 • 608.255.4044 • www.renewwisconsin.org



Statement of RENEW Wisconsin before the Joint Committee for the Review of Administrative Rules on PSC 128 Rules Set to Take Effect on March 1, 2011.

Good morning, my name is Michael Vickerman. I am here to represent RENEW Wisconsin, a nonprofit advocacy and education organization based in Madison. Incorporated in 1991, RENEW acts as a catalyst to advance a sustainable energy future through public policy and private sector initiatives. We have over 300 total members, and more than 60 businesses around the state, including Biogas Direct (Prairie du Sac), Bleu Mont Dairy (Mount Horeb), Bubbling Springs Solar (Menomonie), Crave Brothers Farm (Waterloo), Convergence Energy (Lake Geneva), Emerging Energies (Hubertus), Energy Concepts (Hudson), Full Circle Farm (Seymour), Full Spectrum Solar (Madison), GDH, Inc. (Chilton), H&H Solar (Madison), Kettle View Renewable Energy (Random Lake), Michels Wind Energy (Brownsville), North American Hydro (Neshkoro), Northwind Renewable Energy LLC (Stevens Point), Pieper Power (Milwaukee), Organic Valley (LaFarge), Quantum Dairy (Weyauwega), Renewegy (Oshkosh), and Seventh Generation Energy Systems (Madison).

On behalf of all our members that have an interest in wind generation, RENEW Wisconsin took the lead in bringing together diverse groups and companies and forging a broad and bipartisan coalition to support legislation establishing statewide permitting standards for all wind generators in the state of Wisconsin. The fruit of that labor, 2009 Act 40, was signed into law in September 2009.

I am here today to encourage this Committee to take no action on the PSC 128 rule that is scheduled to take effect on March 1st. The Commission's rule is a good-faith compromise that balances the state's interest in promoting a preferred energy resource with the interests of neighboring landowners.

I would like this committee to consider the following points:

- **The statewide rule promulgated by the PSC is the culmination of two uninterrupted years of agency involvement in wind siting proceedings. The record built on the major issues is nothing short of encyclopedic.**
- **A longer setback distance is not necessary given PSC 128's strict regulation of sound propagation and shadow flicker duration.** Both the maximum allowable nighttime sound threshold (45 dBa) and the maximum

allowable duration of shadow flicker (25 hours a year) are very strict thresholds in comparison to what other states have adopted.

- **Payments from wind generation facilities support rural economies.** The counties and towns hosting Wisconsin's four largest operating windpower installations receive more than \$1.5 million in payments in lieu of taxes each year. Landowners hosting the 251 turbines in these projects receive more than \$1.2 million per year combined. Not counting payments for transmission-related infrastructure, these four wind projects pump nearly \$3 million annually to local governments, host landowners and neighboring residents. (See the January 12th, 2011, article in the *Fond du Lac Reporter*)
- **There is no credible evidence that existing wind development in Wisconsin has depressed property values statewide.** In 2008 and 2009, Poletti and Associates, an Illinois real estate appraisal firm, investigated the impact of the Lincoln and Rosiere wind projects on nearby land sales and home construction activity. Analyzing seven years' of sales data, the *Poletti* study concluded that the 31 turbines in Kewaunee County have not an effect on area property values. Moreover, since 1999, when the turbines were placed in service, more than 10 houses have been constructed within one-half mile of a turbine there.

The PSC rule will provide wind energy developers with regulatory certainty -- a clearly defined set of requirements which they must comply with in order to obtain a permit. Such stability and clarity in the wind permitting arena has been absent from Wisconsin for the last 13 years, which, more than any other reason, explains why Wisconsin utilities own more wind generating capacity in Iowa and Minnesota (329 MW) than they do in Wisconsin (235 MW). There is one sure way that Wisconsin leaders can demonstrate their commitment to nurturing wind energy-related businesses and the jobs that will emerge from their activities, and that is to allow the PSC 128 rule to take effect as scheduled on March 1st. Thank you very much for your time and consideration.

Respectfully submitted,
Michael Vickerman
February 9, 2011

Wind farm payouts approach \$3 million

Energy developer payouts used to offset local taxes

BY COLLEEN KOTTKE • The Reporter • January 12, 2011

Local municipalities are profiting from the wind. While many residents in Fond du Lac and Dodge counties live nowhere near the turbines dotting the landscape, the revenue stream from the towering towers is helping to offset increases in property taxes.

Last year, owners of Wisconsin's four largest wind energy projects paid out nearly \$2.8 million in rent to landowners hosting turbines and payments in lieu of property taxes to local governments, according to figures compiled by RENEW Wisconsin, a statewide renewable energy advocacy organization.

Fond du Lac County, which is home to 166 wind turbines, received a revenue payment of \$625,000. Dodge County received \$296,000 in payments for hosting 85 wind turbines.

"While we didn't designate the income for anything in particular, we did use it to pay the bills of the county. Ultimately, it saves on property tax," said Fond du Lac County Executive Allen Buechel.

Formula

Towns and counties do not collect property taxes from wind turbines but instead receive payments based on the generating capacity of each turbine, allocated under a formula adopted by the state Legislature in 2003.

Of the total revenue paid out to local governmental entities, counties retain two-thirds of the payments while townships hosting the turbines receive one-third. Payments to those local governments in Fond du Lac and Dodge counties will reach almost \$1.6 million for 2010.

Wind energy developers negotiate lease agreements with landowners to host turbines on their property. Payments can be as high as \$7,000 per turbine each year. Estimated rental payments to all Fond du Lac

and Dodge county landowners will total slightly more than \$1.2 million for 2010. Property owners hosting the 88 wind turbines in the Blue Sky Green Field wind farm in townships of Marshfield and Calumet divvied up a total of \$440,000 paid to them by WeEnergies.

Marshfield Township Chairman John Bord said the \$121,000 received from WeEnergies was used to keep rising property taxes in check in the town.

"Without that income, taxpayers would have felt the loss of state revenue even more," Bord said.

Invenergy issued \$516,000 in payments last year to Fond du Lac County and the townships of Byron, Oakfield, LeRoy and Lomira hosting the Forward Wind Energy Center. Property owners leasing land for the 86 wind turbines shared \$430,000 in income.

Both government and landowners in the townships of Eden and Empire received \$477,000 from Wisconsin Power & Light, owner of the Cedar Ridge wind farm.

Every little bit of income helps, especially when state shared revenue dollars keep decreasing and municipal costs keep rising, said Byron Town Chairman Francis Ferguson. The town of Byron received an annual payment of \$50,000.

"It's not a deal where we're getting rich on this," Ferguson said. "We would like to see the townships get a larger share of the money than the county since we have to provide the service for the

turbines.”

Byron was among several townships in the state that supported legislation authored by state Rep. Daniel LeMahieu, R-Cascade, in 2009. Assembly Bill 270 sought to modify utility aid payments paid by wind farm developers. The measure failed to reach the floor for a vote.

Financial support

Michael Vickerman, executive director of RENEW Wisconsin, said the revenues from the wind farms help support farm families and rural Wisconsin communities.

“It’s a much better deal for the state than sending dollars to Wyoming and West Virginia for the coal imported to Wisconsin to generate electricity,” he said in a press release.

Gary Haltaufderheide, an employee of Madison-based Land Services Company, which negotiates land leases for large projects, like pipelines and wind turbines, said, “Farmers are smart business people, and they’re very satisfied with the payments. One farmer saw the lease as a way to cover tuition payments for a child entering college.”

While many neighboring landowners are still unhappy with the presence of the wind turbines, Ferguson said he has not heard one complaint from a hosting landowner.

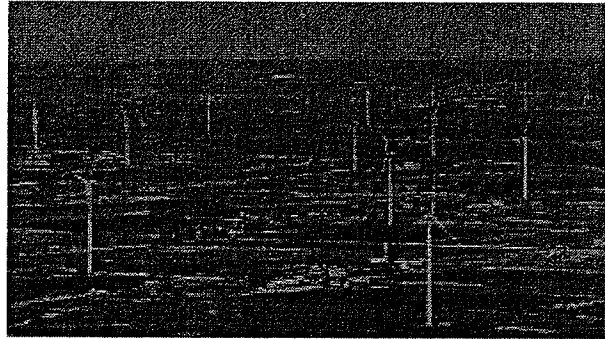
“The host doesn’t seem to have a problem with them, but the folks living a half-mile from the turbines seem to,” Ferguson said.

The four wind projects — Forward, Blue Sky Green Field, Cedar Ridge and Butler Ridge (Dodge County) — comprise nearly 90 percent of Wisconsin’s wind generation fleet.

When calculated over a 20-year contract period, total revenue is expected to exceed \$60 million, taking inflation into account.

Will wind developers target the area for additional wind farms in the future? Buechel is not sure.

“Some developers have been looking at the west side of the county, and there’s talk of doing more on the east side of the county. But there’s nothing that I’m aware of that’s planned right now,” Buechel said.



Invernergy of Chicago operates the Forward Energy Wind Center near Brownsville in Dodge County. (The Reporter file photo)

A REAL ESTATE STUDY
OF THE PROPOSED LEE-DEKALB WIND ENERGY CENTER
LEE AND DEKALB COUNTIES, ILLINOIS

Prepared for
FPL Energy Illinois Wind, LLC

Prepared by
POLETTI AND ASSOCIATES, INC.
302 West Clay Street
Suite 100
Collinsville, Illinois
618/344-3270

March 2009

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IMPACT ON THE VALUE OF THE SURROUNDING PROPERTIES

One means of estimating a wind power electric generating farm's impact on surrounding property values is to compare sale prices of properties within a Target Area to prices of similar properties within a Control Area. The Target Area is a zone in proximity to an operating wind generating electric farm and is defined by a combination of distance, intervening land uses, and visibility of the facility. The Control Area is the region outside of the target area that is considered to be a zone where property values would not be affected by an operating wind farm.

Since this is a proposed project, it was necessary to investigate property sales around two other operating wind farms. The wind farms used are the Lincoln and Rosiere wind farms in Kewaunee County, Wisconsin and the Mendota Hills Wind Farm in Lee County, Illinois.

ROSIERE AND LINCOLN WIND FARMS, KEWAUNEE COUNTY, WISCONSIN

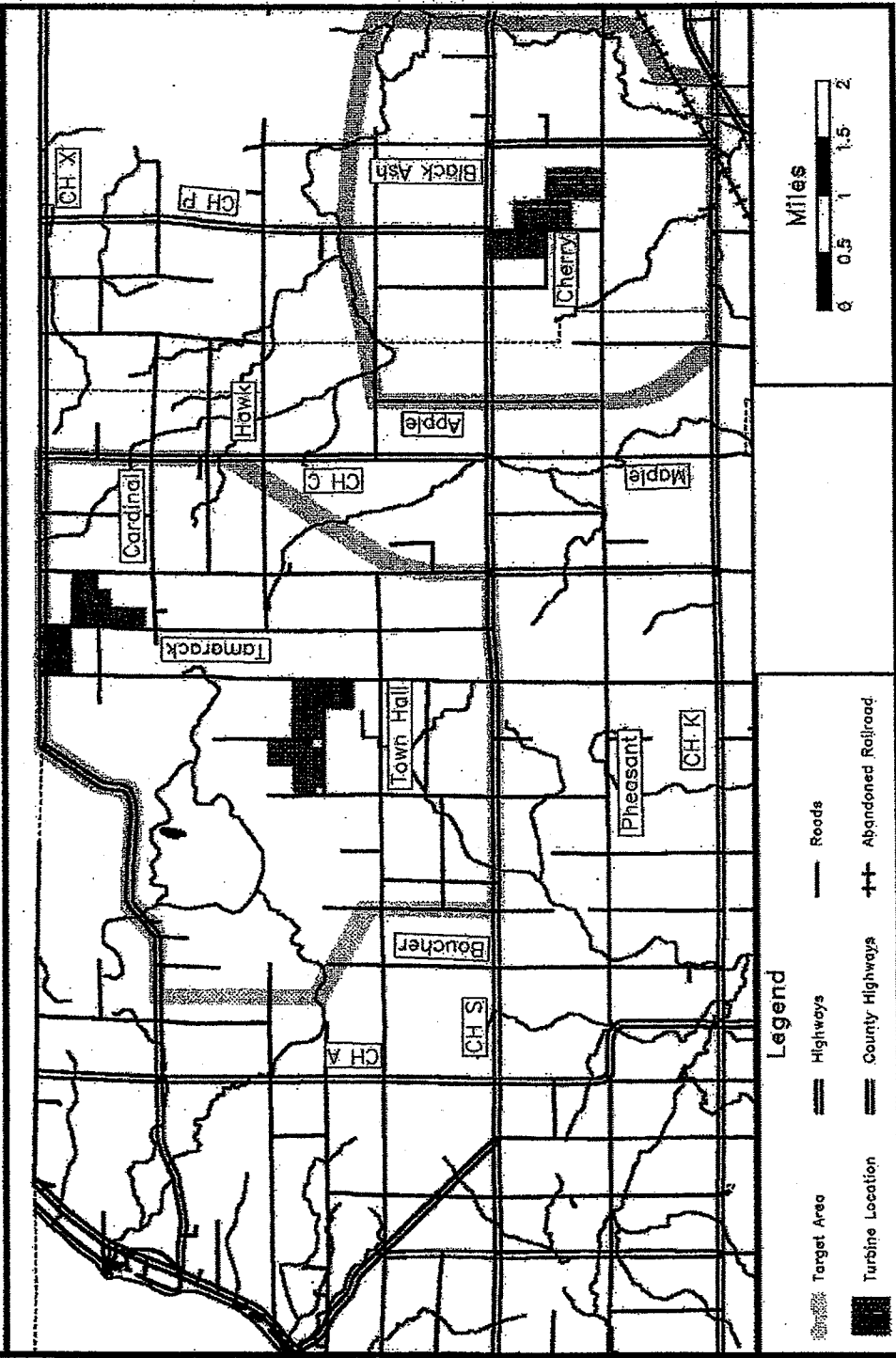
There are two wind farms located within Kewaunee County that have operated since 1998. The farms are located within Red River and Lincoln townships about midway between Lake Michigan and Green Bay. The larger of the two farms is the Rosiere Wind Farm located along Red River and Town Line Road. This wind farm is operated by Madison Gas and Electric and has a total of 17 turbines located on 476 acres. The Lincoln Wind Farm is operated by Wisconsin Public Service and is located near Gregorville. It comprises 14 turbines located on 237 acres. Although smaller than those proposed for the subject project, the design of the turbines is similar to those at the subject.

Land use in the area is primarily agricultural with some commercial establishments located in smaller communities such as Casco and Luxembourg. Most residential development consists of houses located on tracts between one and ten acres. Development throughout both townships has continued since the turbines were constructed in 1998. The topography is somewhat rolling and is generally similar to that at the subject site.

Sales were gathered from Joe Jerabek, the Town of Lincoln Assessor and Gary Taicher, the Town of Red River Assessor. The years that sales were available were from January of 1998 through December of 2004 for the Lincoln Township and January of 2001 through December of 2004 for Red River Township. Sales that occurred between related parties (such as family members), as the result of judicial actions or in lieu of foreclosure, or involved governmental units were eliminated from consideration. Such sales do not represent transactions that meet the requirements of the definition of market value. Also eliminated from consideration were sales to Wisconsin Public Service and Madison Gas or Electric for similar reasons. The studies are detailed below.

Target areas were defined for each wind turbine farm. The Target Areas are illustrated in Figure 3. The Control Area lies outside the Target Area. The Control Area does not include the western most portion northwestern portion of Section 18 and the western half of Section 8 of the Red River Township. This area is near Highway 57 and Green Bay. This area was excluded because of overall better road access to the City of Green Bay and because of the influence of shore front property and bay view on prices of land and homes when compared to those without views of the bay or quick access to City of Green Bay.

Fig. 3: Target Area of Rosiere and Lincoln Wind Farm.



Small Residential Tract Acreage

A review was made of the selling prices of residential acreage. These tracts are defined as comprised of five acres or less. There were a total of nine sales within the Target Area and twelve sales within the Control Area. The sales are summarized in Table 2. The average selling price per acre within the Target Area was \$6,548 while within the Control Area it was \$5,785. These two prices are similar, indicating that there is no difference in the overall price of land within the Target Area versus smaller residential tract sales in the Control Area.

Special mention is made of Sale 9 within the Target Area. This sale is located on Cherry Road approximately 1,900 feet from the nearest operating turbine and has a direct view of the wind farm. This property sold for a price per acre of \$23,333. There was an existing old house on the property, which was torn down for a new house. The cost for removal of the existing house is not included in the \$23,333 per acre. If Sale 9 is ignored, then the overall price per acre of Target Area is \$4,450 per acre.

A statistical comparison was made of the two means to ascertain if there was, in fact, a significant difference between the two indicated prices. This analysis does not include Sale 9. This analysis indicated that the calculated t statistic for the sample was 0.577. This is less than the Standard t of 1.729 indicating that at the 95% confidence interval, there is no significant difference in the mean sale price per square foot of small residential tracts within the target and control areas.

Table 2: Small Residential Tract Sales.

Sale	Parcel No.	Address	Grantor	Grantee	Sale Price	Size	Book/ Page	Sale Date	\$/Ft ²
Target:									
1	31 010	5 021 X	Sprngdl. DF	Chaudoir	\$1,800	1.000	341/011	Nov-99	\$1,800
2	31 010	14 151 Black Ash	Wery	Miller	\$6,500	1.000	420/207	Feb-03	\$6,500
3	31 010	22 12 S	Jeanquart	Dufek	\$2,400	2.980	336/355	Jul-99	\$805
4	31 010	22 14 Cherry	Cravillon	Naze	\$5,000	5.000	338/303	Sep-99	\$1,000
5	31 010	35 151 P	Mertens	Srnka	\$1,500	0.085	346/362	May-00	\$17,647
6	31 010	35 151 P	Mertens	Neuzil	\$300	0.120	318/895	May-98	\$2,500
7	31 010	35 151 P	Mertens	Vogel	\$2,000	2.000	337/589	Aug-99	\$1,000
8	31 018	12 153 Tamarack	Schlise	Challis	\$20,000	4.600	402/782	Sep-02	\$4,348
9	31 010	27 092 N7875 Cherry	Fenendael	Peinar	\$21,000	0.900	472/110	Aug-04	\$23,333
Average:									\$6,548
Average Sales 1 through 8:									\$4,450
Control:									
10	31 010	3 061 Fir	Dutil Trust	Hackett	\$3,000	5.000	351/130	Sep-00	\$600
11	31 010	10 165 Hawk Rd	Nicolet Brd.	Streck	\$10,900	1.600	375/146	Sep-01	\$6,813
12	31 010	11 15 Hawk Rd	Moreau	Paul	\$500	1.000	341/690	Dec-99	\$500
13	31 010	19 151 S	Kinnard Fms	Beaurain	\$300	0.210	430/225	Apr-03	\$1,429
14	31 010	19 014 Martin	Dhuey Trust	Cochart	\$2,000	1.400	428/17	Apr-03	\$1,429
15	31 010	29 131 Maple Rd	Deprey	Doperalski	\$10,000	1.000	333/256	Apr-99	\$10,000
16	31 010	29 131 Maple Rd	Deprey Tr.	Petry	\$10,000	1.500	342/235	Jan-00	\$6,667
17	31 010	29 135 Maple Rd	Martin	Deprey	\$12,900	2.000	349/555	Aug-00	\$6,450
18	31 010	33 12 K	Strnad	Spitzer	\$28,000	4.500	350/173	Sep-00	\$6,222
19	31 010	33 061 Maple Rd	Deprey	Moreau	\$2,400	2.300	334/457	Jun-99	\$1,043
20	31 018	30 163 E0478 Thiry	Pallet	LeGrave	\$17,500	1.000	462/636	Apr-04	\$17,500
21	31 018	30 166 E0496 Thiry	Nachtwey	LeGrave	\$14,000	1.300	461/169	Apr-04	\$10,769
Average:									\$5,785

Sample	Sample Size	Degrees Of Freedom	Sample Mean	Sum Of Squares	Standard Deviation
Target:	9	8	\$4,450	226,288,635	5318.47
Control:	12	11	\$5,785	297,570,905	5201.14
Combined:	21	19		523,859,540	

Variance:	27,571,554.7
Variance of Difference of Means:	5,361,135.64
Standard Deviation:	2,315.41
Calculated T =	0.577
Standard T at 95% 19 Degrees of Freedom:	1.729

Residential Tract Acreage

A review was made of the selling prices of residential tract acreage. These tracts are defined as comprising between five acres and twenty acres. The sales are summarized in Table 3. These sales indicated that the average selling price within the Target Area was \$2,494 per acre while within the Control Area it was \$1,747. These two prices are close together and would indicate that there is no difference in the overall price of land within the Target Area versus small residential tract sales in the Control Area.

Table 3: Residential Tract Sales.

Parcel No.	Address	Grantor	Grantee	Sale Price	Size	Book/ Page	Sale Date	\$/Ft ²
Target:								
31 010 22 021 P		Rhoades	Shaw	\$76,000	14.040	327/27	Oct-98	\$5,413
31 010 35 151 K		Mertens	Jahnke	\$15,000	18.100	343/888	Mar-00	\$829
31 010 36 13	Chestnut	Salzsieder	Nell	\$6,000	6.000	316/642	Apr-98	\$1,000
31 010 36 161	SH 54	Salzsieder	Nell	\$8,400	7.000	453/230	Nov-03	\$1,200
31 010 36 161	SH 54	Salzsieder	Nell	\$11,600	12.000	453/232	Nov-03	\$967
31 018 24 161 S		Englebert	Johnson	\$100,000	18.000	365/845	Jun-01	\$5,556
Average:								\$2,494
Control:								
31 010 9 15	Hawk Rd	Horak	Alberts	\$6,136	9.000	335/675	Jun-99	\$682
31 010 20 151	CH "S"	Dhuey	Theys	\$2,000	6.000	324/401	Oct-98	\$333
31 010 20 06	Spruce Rd	Dhuey	Jandrin	\$10,000	12.500	313/817	Feb-98	\$800
31 018 3 022	E1531 Cnty Ln.	Laluzerne	Ahlswede	\$15,000	10.000	373/219	Oct-01	\$1,500
31 018 3 051	County Line	Mork	Jonet	\$23,300	17.300	388/236	Mar-02	\$1,347
31 018 3 111	X & Rocky Road	Dalebroux	Derenne	\$42,000	19.000	444/348	Aug-03	\$2,211
31 018 16 16	Town Hall	Dalebroux	Besaw	\$27,300	13.000	452/516	Nov-03	\$2,100
31 018 19 16	SS	Mertens	Brenneke	\$35,000	7.000	357/882	Jan-01	\$5,000
Average:								\$1,747

Large Tract Acreage

A review was made of the selling prices of large tract acreage. These tracts are defined as comprised of more than twenty acres. They are used for agricultural purposes or very large residential tracts. Sales between family members and related parties as well as those comprising swamp and forested land were not included in the analysis. The agricultural sales are summarized in Table 4. These sales indicated that the average selling price within the Target Area was \$1,418 per acre while within the Control Area it was \$1,602. These two prices are close together and indicate that there is no significant difference in the overall price of land within the Target Area versus large tract sales in the Control Area.

A statistical comparison was made of the two means to ascertain if there was, in fact, a significant difference between the two indicated prices (see Table 5). This analysis indicated that the calculated t statistic for the sample was 0.881. This is less than the Standard t statistic of 1.678 indicating that at the 95% confidence interval, there is no significant difference in the mean sale price per square foot of large tracts within the target and control areas.

Table 4: Large Tract Sales.

Sale	Parcel No.	Address	Grantor	Grantee	Sale Price	Acres	Book/ Page	Sale Date	\$/Acre
Target:									
1	31 010	6 153 Spruce Rd &	CHerison	Pagel's	\$108,000	72.0	394/62	Jun-02	\$1,500
2	31 010	7 05 Tamarack Rd	Hurley	Jandrin	\$37,500	25.0	469/662	Jul-04	\$1,500
3	31 010	21 031 Apple	Kinnard	Peters	\$63,800	75.0	335/341	Jun-99	\$851
4	31 010	22 04 P	Morse Trust	Sogge	\$58,000	40.0	397/709	Aug-02	\$1,450
5	31 010	22 06 Partridge	Golapske	Moynihan	\$112,500	40.0	442/103	Aug-03	\$2,813
6	31 010	27 14 Cherry Rd	Pelnar	Yunk	\$29,155	35.0	324/181	Oct-98	\$833
7	31 010	27 05 S. Cherry	Duescher	Petersilka	\$40,000	36.0	342/652	Jan-00	\$1,111
8	31 010	27 091 Cherry	Almonte	Fenendael	\$36,000	39.0	355/450	Feb-01	\$923
9	31 010	27 08 Cherry	Miller	Zellner	\$80,000	40.7	392/639	Jun-02	\$1,966
10	31 010	33 08 Hemlock	Vandermause	Maedcke	\$60,000	41.0	447/625	Sep-03	\$1,463
11	31 010	33 03 Hemlock	Annoye	Srnka	\$63,000	70.0	318/192	May-98	\$900
12	31 010	34 111 Hemlock	Annoye	Strand	\$26,000	34.4	316/829	Apr-98	\$756
13	31 010	35 12 E4386 K	Mertens	Hoagland	\$40,000	40.0	343/352	Feb-00	\$1,000
14	31 010	35 12 K	Mertens	Hoagland	\$40,000	40.0	431/738	Feb-03	\$1,000
15	31 018	23 061 Town Hall	Haske	Watson	\$110,000	34.3	472/683	Sep-04	\$3,207
Average:									\$1,418
Control:									
16	31 010	3 061 X & Fir	Dutil	Pagel's	\$45,204	34.7	388/118	Mar-02	\$1,303
17	31 010	3 022 Elm	Dutil Trust	DeGrave	\$45,200	34.7	373/820	Oct-01	\$1,301
18	31 010	3 11 Fir	Huettl	Pagel's	\$63,000	35.0	453/937	Dec-03	\$1,800
19	31 010	4 05 X	Forsch	Pagel's	\$49,600	33.0	462/307	Apr-04	\$1,503
20	31 010	4 03 X	Menne	Pagel's	\$99,800	66.5	430/516	Apr-03	\$1,501
21	31 010	5 13 C	Delfosse	Pagel's	\$58,400	39.2	454/163	Dec-03	\$1,490
22	31 010	9 15 Fir	Horak	Kinnard	\$35,000	50.0	339/233	Oct-99	\$700
23	31 010	9 16 N8967 Fir	Kinnard	Pagel's	\$50,000	57.7	421/715	Sep-02	\$866
24	31 010	9 141 P	Horak	Pagel	\$180,500	260.0	317/645	May-98	\$694
25	31 010	10 121 Hawk Rd	Pinchart	3 M Tree F	\$65,000	39.4	375/26	Nov-01	\$1,650
26	31 010	11 063 CH P	Horak	Postotnick	\$24,000	20.0	320/682	Jul-98	\$1,200
27	31 010	11 063 P	Postotnik	Krzewina	\$33,000	20.0	347/496	Jun-00	\$1,650
28	31 010	11 063 P	Horak	Postotnick	\$33,000	20.0	347/495	Jun-00	\$1,650
29	31 010	11 032 Black Ash	Massey	Leitzinger	\$90,000	60.0	342/146	Jan-00	\$1,500
30	31 010	13 04 Hickory	Gostein	Blair	\$87,500	40.0	437/129	Jun-03	\$2,188
31	31 010	14 04 Black Ash	Tollefson	Parins	\$40,000	40.0	400/795	Aug-02	\$1,000
32	31 010	14 03 Black Ash	Carr	Destree	\$73,500	40.0	439/867	Jul-03	\$1,838
33	31 010	14 08 Black Ash	Massey	Destree	\$40,000	41.0	338/414	Sep-99	\$976
34	31 010	14 111 Cherry & Part	Deer Trail	Miller	\$50,000	72.6	321/902	Aug-98	\$688
35	31 010	15 061 Hawk Rd	Mertens	Sautebin	\$40,000	40.0	352/831	Dec-00	\$1,000
36	31 010	20 101 Spruce	Dhuey Trust	Kinnard	\$30,000	20.0	433/377	Jun-03	\$1,500
37	31 010	29 131 Pheasant Rd.	Mueller	Pinchart	\$108,700	58.7	452/751	Nov-03	\$1,852
38	31 010	29 131 Pheasant Rd.	Deprey Tr	Mueller	\$104,000	186.6	391/220	May-02	\$557
39	31 010	32 011 Maple Rd	Deprey Tr	Massart	\$40,000	20.0	342/878	Feb-00	\$2,000
40	31 010	32 05 Pheasant Rd.	Frisque	Kinnard	\$47,000	21.3	476/574	Nov-04	\$2,207
41	31 010	32 10 C	Pinchart	Kinnard	\$60,000	40.0	382/721	Jan-02	\$1,500
42	31 010	32 011 Pheasant Rd.	Mueller	Anderson	\$86,000	40.0	455/397	Dec-03	\$2,150
43	31 010	32 06 E2995 Pheasan	Deprey Tr	Mueller	\$183,000	100.0	391/219	May-02	\$1,830
44	31 010	32 021 Pheasant Rd.	Mueller	Kinnard Fa	\$242,000	118.0	455/378	Jan-04	\$2,051
45	31 018	3 111 X & Rocky Rd.	Dalebroux	Derenne	\$38,000	20.0	444/343	Aug-03	\$1,900
46	31 018	20 073 H	Nellis	Bader	\$70,000	20.0	369/631	Jul-01	\$3,500
47	31 018	20 141 S	Dalebroux	Jacobs Tr.	\$235,000	94.0	452/90	Nov-03	\$2,500
48	31 018	21 071 A	Dalebroux	Euclide	\$124,200	43.8	465/119	Apr-04	\$2,836
Average:									\$1,602

Table 5: Statistical Analysis of Large Tract Sales.

Sample	Sample Size	Degrees Of Freedom	Sample Mean	Sum Of Squares	Standard Deviation
Target:	15	14	\$1,418	7,521,028	732.95
Control:	33	32	\$1,602	13,231,030	643.02
Combined:	48	46		20,752,058	
Variance:					451,131.7
Variance of Difference of Means					43,746.10
Standard Deviation:					209.16
Calculated T =					0.881
Standard T at 95% 46 Degrees of Freedom:					1.678

Single Family Residential Values

A number of homes have sold within the target area surrounding the two operating wind farms in Kewaunee County. A total of seventy-nine improved sales were reviewed. Of these, 33 sales were within the Target Area and 46 sales were within the Control Area. These sales are summarized in Appendix I. Sales between relatives or other related parties, commercial establishments and mobile homes were removed from the analysis as not being truly indicative of values for a single-family residential property. This left a total of 26 sales within the Target Area and 39 sales within the Control Area. The overall average price within the Target Area was \$62.19 per square foot and \$68.60 per square foot within the Control Area. The two averages are very close indicating that there is no apparent difference between the target and control area prices. A statistical comparison was made of the two means to ascertain if there was a difference between the two indicated prices (see Table 6). This analysis indicated that the calculated *t* statistic for the sample was 0.688. This is less than the Standard *t* statistic of 1.671 indicating that at the 95% confidence interval, there is no significant difference in the mean sale price per square foot of all residences within the target and control areas.

Table 6: Statistical Analysis of All Residential Properties.

Sample	Sample Size	Degrees Of Freedom	Sample Mean	Sum Of Squares	Standard Deviation
Target:	26	25	\$62.19	19,782	28.13
Control:	39	38	\$68.60	65,630	41.56
Combined:	65	63		85,412	
Variance:					1,355.7
Variance of Difference of Means:					86.91
Standard Deviation:					9.32
Calculated T =					0.688
Standard T at 95% 63 Degrees of Freedom:					1.671

These homes vary significantly in characteristics such as total size, style, age, amount of associated land, and number of outbuildings. Because of the magnitude of these differences, comparing an overall average sale price of all sales within the Target Area to an average sale price within the Control Area would not be meaningful.

To increase the reliability of the study, certain criteria were applied to the sales. Only houses constructed after 1960 were used because these homes are more similar in style, construction techniques, amenities, condition, and utility than homes constructed before this time frame. Homes located on tracts larger than five acres or those with newer large outbuildings were not used because of the possibility of the extra land and buildings distorting the price

per square foot. Bi-level and tri-level homes also were not included in the study because they tend to sell for less per square foot than do one-story and two-story homes and because it is often difficult to accurately estimate the actual amount of living space. Consequently, these types of homes would tend to skew results in the sample.

A total of 19 sales remained in the sample with 6 sales being located within the target area and the remaining 13 within the control area. The sales used are summarized in Table 7. The overall per square foot price range for houses within the target area was from \$77.47 to \$108.75 with an average of \$92.64. In comparison, the overall per square foot price range for houses within the control area was from \$68.59 to \$122.75 with an average of \$91.53 or \$1.11 lower than that within the Target Group. A statistical comparison was made of the two means to ascertain if there was, in fact, a significant difference between the two indicated prices. This analysis indicated that the calculated t statistic for the sample was -0.147 . This is less than the Standard t of 1.740 indicating that at the 95% confidence interval, there is no significant difference in the mean sale price per square foot of residences within the target and control areas. Overall, it is concluded that there is no measurable difference between improved residential sales within the Target and Control Area.

Table 7: Sales of Residences Constructed After 1960.

Sale	Parcel No.	Address	Sale Price	Acres	Sale Date	Age	Ft ²	\$/Ft ²	Sum Of Squares
Target Area:									
17	31 010	27 05 N8015 Cherry	\$162,000	5.00	Oct-02	2001	1,850	\$87.57	26.0
25	31 018	3 161 E1650 X	\$80,000	1.10	Feb-02	1980	1,000	\$80.00	160.0
26	31 018	3 162 E1658 X	\$121,500	1.50	Sep-02	1998	1,232	\$98.62	36.0
27	31 018	13 093 E2225 Fameree	\$119,000	1.10	Feb-03	1983	1,536	\$77.47	230.0
28	31 018	15 151 E1596 Town Hall	\$184,000	5.00	Mar-04	1995	1,692	\$108.75	260.0
29	31 018	15 151 E1596 Town Hall	\$175,000	5.00	May-02	1995	1,692	\$103.43	116.0
Average:								\$92.64	828.0

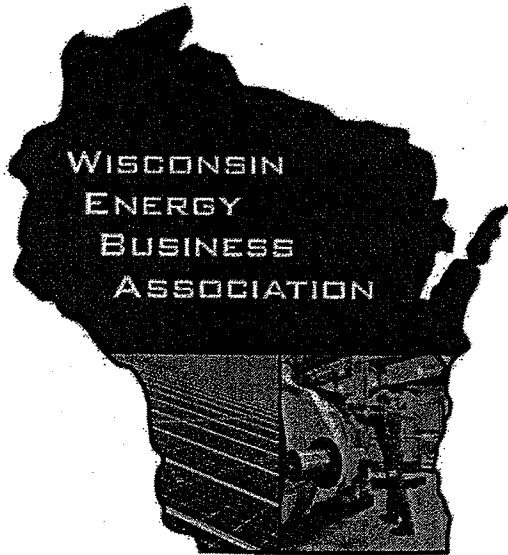
Control Area:									
42	31 010	17 141 N8601 C	\$172,000	1.00	May-02	1980	1,569	\$109.62	327.0
54	31 010	31 103 N7452 RR<L	\$150,000	1.29	Mar-04	1988	1,222	\$122.75	975.0
55	31 010	32 111 E2962 K	\$120,400	2.00	Sep-99	1972	1,544	\$77.98	184.0
57	31 010	32 051 E3009 Pheasant	\$127,000	2.00	Jul-02	1991	1,361	\$93.31	3.0
58	31 010	32 122 E3088 K	\$171,000	0.92	Jul-03	1974	1,808	\$94.58	9.0
65	31 018	9 093 N9047 A	\$118,000	1.79	Jul-01	1995	1,465	\$80.55	121.0
67	31 018	18 013 E457 Macco	\$175,000	1.00	Jun-02	1987	2,370	\$73.84	313.0
68	31 018	18 012 Macco	\$137,500	3.00	Jul-01	2001	1,838	\$74.81	280.0
69	31 018	19 133 N8207 H	\$103,000	1.00	Oct-01	1978	1,104	\$93.30	3.0
70	31 018	25 012 E2497 S	\$139,900	1.50	Dec-02	1966	1,500	\$93.27	3.0
75	31 018	28 092 N7805 A	\$179,000	2.70	Sep-03	1977	1,608	\$111.32	392.0
76	31 018	32 121 E642 K	\$129,000	3.00	Jul-02	1985	1,344	\$95.98	20.0
77	31 018	33 012 N7655 A	\$207,000	2.90	Jul-02	1976	3,018	\$68.59	526.0
Average:								\$91.53	3,156.0

Sample	Sample Size	Degrees Of Freedom	Sample Mean	Sum Of Squares	Standard Deviation
Target:	6	5	\$92.64	828.0	12.87
Control:	13	12	\$91.53	3,156.0	16.22
Combined:	19	17		3,984.0	

Variance:	234.4
Variance of Difference of Means:	57.09
Standard Deviation:	7.56
Calculated T =	0.147
Standard T at 95% 17 Degrees of Freedom:	1.740

Additional Information

Joe Jerabek, the assessor for Town of Lincoln, provided some anecdotal data. He indicated that construction was continuing in the area and that there was no apparent affect from the wind turbines located in his township. His analysis, based on assessment levels, indicated that the overall percentage level of assessment in the area had declined which would indicate an increase in property value. He also stated that new construction was occurring along Cherry Road, which is approximately 1,750 feet from nearest wind turbine. This was confirmed by a visual inspection of the area.



MEMORANDUM

TO: ALL LEGISLATORS

FROM: WISCONSIN ENERGY BUSINESS ASSOCIATION

DATE: JANUARY 27, 2011

RE: BAN ON WIND DEVELOPMENT IN WISCONSIN (SS-SB-9/SS-AB-9)

The Wisconsin Energy Business Association opposes Special Session SB/AB 9, a bill that would mandate 1,800-foot setback distances between wind turbines and neighboring property lines. No other statewide regulation in the country imposes setback requirements of that length from property lines. The bill as drafted would layer the 1,800-foot setback requirement on top of the already strict standards embedded in the statewide wind siting rule adopted by the Public Service Commission (PSC 128) in 2010. There is not one live wind generation project in the state, including those that have already been permitted by local governments, that could comply with such a setback requirement if the Legislature adopts this bill.

Creating such an inhospitable permitting environment for large wind energy systems would have immediate detrimental consequences to the state's economy and well-being. These consequences include: (1) loss of in-state manufacturing, transportation, construction, and project maintenance opportunities; (2) loss of jobs in businesses directly or indirectly connected to wind energy development; (3) loss of project revenues to host landowners, neighboring residences, and local governments; and (4) increased dependence on both electricity imports and increasingly expensive out-of-state fossil fuel sources.

Recently, the Wisconsin Realtors Association (WRA) circulated a memorandum in support of the proposed *de facto* ban on windpower development in Wisconsin. The WRA memo presents a highly distorted and at times inaccurate view of the wind siting debate, especially relating to economic impacts. The Wisconsin Energy Business Association takes this opportunity to respond to the distortions and unproven claims in that document and present a more accurate picture of wind energy's contribution to Wisconsin's economic health and well-being.

1(a). There is no credible evidence that existing wind development in Wisconsin has depressed property values in Kewaunee County. Wisconsin Public Service Corporation (WPS) and Madison Gas & Electric (MGE) own and operate two of the oldest commercial wind projects in the United States. Placed in service in June 1999, these two projects are located within four miles of each other in the Kewaunee County townships of Lincoln and Red River. Over their 11½ years of operation, the Kewaunee County projects have been a rich source of data for several studies examining the impacts of wind generators on nearby property values. One study, conducted by the Illinois firm of Poletti and Associates, was published in March 2009. Employing a conservative methodology to filter out the effects of related party sales and utility purchases, the Poletti study concluded that the presence of wind turbines had no statistically significant effect on sale prices of small, medium, or large tracts, nor on the sale prices of single



family homes. Moreover, a number of new houses have been constructed in proximity of the MGE and WPS projects. Source: <http://www.wiwindinfo.net/studies/Poletti%20Study.pdf>.

Indeed, between 1999 and 2010, eight new houses were constructed within one-half mile of WPS's Lincoln project, and seven new houses were built between one-half-mile and one mile of the same installation. Source: Joe Jerabek, Zoning Administrator, Lincoln Township.

1(b). There is no credible evidence that existing wind development in Wisconsin has depressed property values statewide. Of the state's 316 commercial wind turbines, 168 are located in Fond du Lac County, 85 in Dodge County and 31 in Kewaunee County. According to data compiled by the Wisconsin Taxpayers Alliance on property values and levies, total equalized valuation in Wisconsin peaked in the 2008/09 reporting period (\$498,431,959,545), and has declined by 3.7% in the ensuing two years (\$480,629,166,495). Yet equalized valuation in the three counties with the most wind turbines outperformed the statewide average. In the case of Fond du Lac County, equalized valuation actually **increased** by 1.2% during that time, while Dodge and Kewaunee counties managed smaller declines than the statewide average during that period (2.7% and 2.4% respectively). Source: <http://www.wistax.org/facts>.

1(c). The WRA's property value study contains several methodological errors and weaknesses that greatly reduce its value. To support its contention that wind turbines can lower residential property values by as much as 40%, WRA relies on a 2009 study that was introduced in the Public Service Commission's Glacier Hills Wind Park proceeding (6630-CE-302). However, there is much in that study that does not stand up to scrutiny, including:

- Extremely limited data samplings;
- Limited time window following project completions (12 months);
- Comparing 2009 values (a bust year) with 2005 values (a boom year) without adjusting for vastly different macroeconomic conditions;
- Comparing unimproved properties with improved properties; and
- Comparing interior properties with properties with views of Lake Winnebago.

In contrast to the rushed nature of the study cited by WRA, data from the *Poletti* study captures seven years' worth of property sales. Moreover, in its comparison of property sales between the target area and the control area, the *Poletti* study, unlike the study cited by WRA, filters out the variables that can greatly affect sale prices.

2. WRA's discussion of windpower's impacts on commercial and residential construction is wholly one-sided and overlooks the benefits from building energy-producing systems on rural land. In its memo, WRA casts the economic impacts of windpower development strictly in terms of lost jobs and tax revenues accruing from diminished construction activity. As shown by the level of home-building in proximity to the Kewaunee County wind projects, this is a false dichotomy. Wind turbines do not preclude the construction of nearby buildings. Moreover, WRA's formulation fails to acknowledge any part of windpower's well-documented benefits to the building industry, as well as to rural landowners and governments, manufacturers, transportation businesses, and consulting engineers.

The following is a sampling of positive economic impacts from commercial wind development.

- Wisconsin's largest wind generation facility, We Energies' 88-turbine, 145-megawatt Blue Sky Green Field installation generated about 400,000 job-hours of construction activity.

That figure is likely to be eclipsed by We Energies' newest project, the 90-turbine, 162-megawatt Glacier Hills installation in Columbia County, which will begin operation later this year. Combined, both projects represent about \$700 million in capital investment and will account for about 850,000 job-hours of construction work.

- The counties and towns hosting Wisconsin's four largest operating windpower installations—Blue Sky Green Field, Forward Energy Center, Cedar Ridge and Butler Ridge—receive more than \$1.5 million in payments in lieu of taxes each year. These same governmental units receive additional compensation for hosting the transmission-related infrastructure associated with the wind generation. Landowners hosting the 251 turbines in these projects receive more than \$1.2 million per year combined. All told, these four wind projects pump more than \$3 million annually to local governments, host landowners, and neighboring residents.
- A number of Wisconsin companies directly participate in the construction of in-state wind projects. The entities include *Boldt Construction* (Appleton), *Michels Wind Energy* (Brownsville), *The Manitowoc Companies* (Manitowoc), *Tower Tech* (Manitowoc), *Wausaukee Composites* (Wausaukee and Cuba City), *RMT WindConnect* (Madison), *Edgerton Contractors* (Oak Creek), *Hooper Construction* (Madison), *Sanderfoot Wind and Excavating* (Appleton), and *Wondra Construction* (Iron Ridge). Among Wisconsin participants in the global supply chain are *Aarrowcast* (Shawano), *ABB* (New Berlin), *American Superconductor* (Middleton), *Avanti Wind Systems* (New Berlin), *Bassett Mechanical* (Kaukauna), *Strohwig Industries* (Richfield), *Magnatek* (Menomonee Falls), and *Merit Gear* (Antigo).

3. WRA's characterization of the rule's promulgation is inflammatory and untrue. The siting rule promulgated by the Public Service Commission in December 2010 is the culmination of two uninterrupted years of fact-finding, technical hearings, public hearings, preparation of an Environmental Impact Statement (EIS) on what will become the state's largest wind energy facility, and advice from a 15-member advisory body created by statute. The evidentiary groundwork for the siting rule started with the Glacier Hills Wind Park proceeding. From the beginning, the PSC reviewed We Energies' application with the understanding that its decision would have implications for future wind proceedings, including dockets to establish rules for wind projects under 100 MW. The agency sought in May 2009, and received in June 2009, an extension of the 180-day review period to 360 days. As the agency reviewed the application, it built a comprehensive record on all the issues that would later emerge in the wind siting docket (1-AC-231). An EIS was prepared to expand the agency's understanding and knowledge of such issues as sound, shadow, property values, and groundwater. One group opposed to Glacier Hills, the Coalition for Wisconsin's Environmental Stewardship (CWEST), received intervenor compensation to underwrite the submittal of testimony on sound and property values.

The PSC's management of the wind siting rulemaking proceeding (1-AC-231) was similarly deliberative and inclusive. Kicked off two months before the Commission order on Glacier Hills, the rulemaking docket was structured to provide the Wind Siting Council sufficient time to review the issues and formulate recommendations to the PSC. Agency staff worked diligently to support the Council, which met over 20 times before issuing its report to the PSC in August. In June Commissioners attended public hearings in Tomah, Fond du Lac, and Madison. Between the Commission staff's draft rule, the Siting Council's recommendations, and the Glacier Hills order, the PSC had before it several well-digested proposals from which to select policy options for incorporation in the new rule.

As indicated in the following chronology, the PSC started wrestling with the wind siting issue in early 2009. From that point forward until December 2010, it built up a record on both proceedings that could be considered encyclopedic. To describe the PSC's deliberations in these proceedings as "ramming" is a cheap shot that is completely contradicted by the evidence.

History—Two Full Years of Deliberation on Wind Siting Issues:

- We Energies files an application to build the Glacier Hills project on October 2008. The CPCN application was deemed complete in January 2009.
- A joint legislative hearing was held May 2009 on a bill (SB 185) directing the PSC to establish uniform permitting standards for wind energy systems.
- The PSC decides in June 2009 to prepare an EIS. The draft EIS was issued in July and the final EIS was issued in September.
- Governor Doyle signs Wisconsin 2009 Act 40 into law on September 30, 2009.
- Technical hearings are held on Glacier Hills in November 2009. In the same month, the PSC initiates the wind siting rulemaking proceeding (1-AC-231).
- The PSC approves Glacier Hills in January 2010.
- In March 2010, the PSC convenes the first meeting of the 15-member Wind Siting Council required under Act 40 to make recommendations to implement the legislation.
- The PSC issues draft siting rule in May 2010, triggering a 45-day comment period.
- The PSC holds three public hearings on the draft rule in June 2010.
- The Wind Siting Council submits its report in August 2010 to the PSC.
- In August the PSC issues its decisions on the rule's contents over the course of four open meetings. The rule (PSC 128) is sent to the Legislature for review.
- The Senate Energy and Utilities Committee holds a hearing on the rule. After the hearing, it sends a letter to the PSC requesting changes to the rule.
- The PSC makes changes to the rule on December 9, 2010, and sends the rule back to the legislative committees, which took no action on the rule. PSC 128 is set to take effect March 1, 2011

4. A longer setback distance is not necessary given PSC 128's strict regulation of sound and shadow. In structuring wind siting rules, an agency has the option of pursuing two different pathways to ensure adequate protection of public health and safety. One way to accomplish that objective is through setback distances. The other pathway involves strict regulation of the physical impacts of wind energy systems. In the case of PSC 128, the maximum allowable nighttime sound (45 dBA) and the maximum allowable duration of shadow (25 hours per year) are very strict relative to statewide standards promulgated elsewhere in the United States. In addition, PSC 128 enumerates a number of measures available to a local government to use when a turbine's impacts exceed the thresholds. Among the remedies that a developer could be required to employ is curtailment of the turbine in violation. Because curtailment results in loss of income, it is a remedy that all project owners will strive to avoid at all costs.

It is the combination of stringent sound and shadow standards coupled with tough penalties for noncompliance that makes PSC 128 a formidable rule of which no prudent developer would want to run afoul. The approach taken by the PSC ensures adequate protection of public health and safety. Thus, there is no justification based on public health and safety to extend required setback distances beyond what is provided in PSC 128.

WISCONSIN ENERGY BUSINESS ASSOCIATION IS A LEADING BUSINESS TRADE ASSOCIATION PROMOTING RELIABLE, SECURE, AND COST-EFFECTIVE ENERGY SOLUTIONS TO STRENGTHEN OUR ECONOMY AND SUPPORT MARKET-DRIVEN INNOVATION AND SUPPLY CHAIN GROWTH IN THE ENERGY SECTOR.

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STEVENS POINT
NORTHERN BIOGAS, *LITTLE SUAMICO*
NORTHERN POWER SYSTEMS, *HARTFORD*
ORGANIC VALLEY FAMILY OF FARMS,
LA FARGE
PENNAN ENERGY, *MIDDLETON*
PRAIRIE SOLAR POWER & LIGHT,
EASTMAN
PROCORP ENTERPRISES, *MILWAUKEE*
RENEW WISCONSIN
RENEWEGY, *OSHKOSH*
RITGER LAW OFFICE, *RANDOM LAKE*
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SYSTEMS, *MADISON*
SIERRA CLUB - JOHN MUIR CHAPTER
STORMFISHER BIOGAS
SUN & DAUGHTERS RENEWABLE
ENERGY, *RHINELANDER*
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TOWER TECH SYSTEMS, INC., *MANITOWOC*
URBANRE VITALIZATION GROUP LLC,
MILWAUKEE
URIEL WIND
VERTERRA ENERGY, *MILWAUKEE*
WAVE WIND LLC, *SUN PRAIRIE*
W.E.S. ENGINEERING, *MADISON*
WIND CAPITAL GROUP, *MADISON*
WIND ON THE WIRES
WIND WISCONSIN, *MIDDLETON*
WISCONSIN ENVIRONMENT
WISCONSIN FARMERS UNION

To the Joint Committee for Review of Administrative Rules,

I ask that you please suspend Clearinghouse Rule 10-057.

I, as a citizen of Wisconsin, am quite frankly appalled at the indifferent attitude of public officials when it comes to public health and safety and wind turbines. Wisconsin currently has hundreds of wind turbines operating in this state with the intention to open the gates to install thousands more. We currently rely on the wind project owner/operators to report if there are problems associated with wind turbines. It would be sensible and appropriate for a state agency that has a responsibility to protect the public's health, safety and welfare, to objectively survey the existing wind projects and investigate alleged effects.

I had attended or listened to all of the Wind Siting Council meetings. On one occasion the subject of TV interference was brought up. After a lengthy discussion the question was asked by Chair Ebert, "just how many people are we talking about"? The answer from an electric utility council member was, about 200! This was a revelation—these are an estimate from only one current wind project in Wisconsin with 88 wind turbines! To reach the wind energy electrical generation goals implemented in the Global Warming Task Force Report¹, the state of Wisconsin will be looking at over 10,000 wind turbines by 2024.

Although TV interference may not be considered a public health and safety issue per se, if you discount severe weather warnings and other emergency transmissions, the subject of alarm should be the number of people involved. Who knows what that number will be? Do you know? What does that tell you about the numbers of other unreported impacts of shadow flicker, noise and vibration?

The Plan Commission in our town wrote a letter to the State of Wisconsin Public Health Department in 2009. With the help of previous wind committee members, the letter included public health and safety issues that they felt were important based on their knowledge of reported and, yes, personally-experienced effects from wind turbines. The Plan Commission also asked if the State of Wisconsin would be interested in investigating the alleged impacts to public health and safety referencing the Minnesota Department of Health report entitled, "Public Health Impacts of Wind Turbines"²:

The Plan Commission received a letter back from the State of Wisconsin Public Health Department with what they felt was a bureaucratic response. They were told that the public health department had 10 years of experience regarding wind turbines. The Plan Commission asked them to share those 10 years of information by officially requesting the public records. In fact the records request asked for all and any information

¹ http://dnr.wi.gov/environmentprotect/gtfgw/documents/Final_Report.pdf Page Numbered 15

² www.health.state.mn.us/divs/eh/.../windturbines.pdf

regarding wind turbines and public health and safety, including any and all information on environmental noise and public health and safety.

The Plan Commission received the public documents from the State of Wisconsin Public Health Department. The only inclusions were current email correspondence from health officials in Calumet County, Fond du Lac County and one from Green Bay, a copy of the Minnesota Health Dept. report listed above from May of 2009 and a letter from another town. We were surprised and disappointed that this was the extent of 10 years of information and that the Wisconsin Department of Public Health considered that this was an adequate record on which to base such a dismissive conclusion. (To note: copies of these documents are available, of course, to those interested).

Dr. Jevon McFadden, a federal CDC employee, assigned to the Wisconsin Public Health Department, was chosen as the wind siting council members' expert for health effects in regard to wind turbines and wind siting by the PSC. Dr. McFadden's presentation on May 17, 2010 was a perfect case of how two people, given the same information, can arrive at different interpretations³.

Dr. McFadden stated that he had contacted public health agencies in Maine, Minnesota and Canada that supported his findings. Following are their conclusions, which were somewhat marginalized in Dr. McFadden's presentation:

Maine Center for Disease Control and Prevention, from "Wind Turbines," by Dora Anne Mills, MD, MPH, Maine Public Health Director, State Health Officer, and Director - Maine CDC, June 21, 2009. <https://maine.gov/dhhs/boh/wind-turbines.shtml>

"In my reading of peer-reviewed medical and public health literature, mostly from Europe and Canada, I found no evidence of adverse health effects from the noise generated by wind turbines except for those associated with annoyances from the audible noises.

These effects, however, are mitigated or disappear with proper placement of the turbines from nearby residences.

So, although the noise qualities are different, it seems as though what was found to be true of airports and highways is true of wind turbines: It is primarily a matter of distance.

However, there is no one proper distance for all wind turbines.

Research indicates that a number of factors determine proper placement, including the height of the wind turbine, the surrounding topography, wind conditions, and wind direction.

³ http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=132106

As with airports, annoyance levels are difficult to assess and vary from person to person.

Careful measurements of different noise frequencies in a variety of weather conditions should assure proper placement of wind turbines that protect against annoyances and resulting effects.”

Minnesota Department of Health, “Public Impacts of Wind Turbines,” May 22, 2009:
www.health.state.mn.us/divs/eh/.../windturbines.pdf

“Wind turbines generate a broad spectrum of low-intensity noise. At typical setback distances higher frequencies are attenuated. In addition, walls and windows of homes attenuate high frequencies, but their effect on low frequencies is limited. Low frequency noise is primarily a problem that may affect some people in their homes, especially at night. It is not generally a problem for businesses, public buildings, or for people outdoors.

The most common complaint in various studies of wind turbine effects on people is annoyance or an impact on quality of life. Sleeplessness and headache are the most common health complaints and are highly correlated (but not perfectly correlated) with annoyance complaints. Complaints are more likely when turbines are visible or when shadow flicker occurs. Most available evidence suggests that reported health effects are related to audible low frequency noise. Complaints appear to rise with increasing outside noise levels above 35 dB(A). It has been hypothesized that direct activation of the vestibular and autonomic nervous system may be responsible for less common complaints, but evidence is scant.

The Minnesota nighttime standard of 50 dB(A) not to be exceeded more than 50% of the time in a given hour, appears to underweight penetration of low frequency noise into dwellings. Different schemes for evaluating low frequency noise, and/or lower noise standards, have been developed in a number of countries.

For some projects, wind velocity for a wind turbine project is measured at 10 m and then modeled to the height of the rotor. These models may under-predict wind speed that will be encountered when the turbine is erected. Higher wind speed will result in noise exceeding model predictions.

Low frequency noise from a wind turbine is generally not easily perceived beyond ½ mile. However, if a turbine is subject to aerodynamic modulation because of shear caused by terrain (mountains, trees, buildings) or different wind conditions through the rotor plane, turbine noise may be heard at greater distances.

Unlike low frequency noise, shadow flicker can affect individuals outdoors as well as indoors, and may be noticeable inside any building. Flicker can be eliminated

by placement of wind turbines outside of the path of the sun as viewed from areas of concern, or by appropriate setbacks.

Prediction of complaint likelihood during project planning depends on: 1) good noise modeling including characterization of potential sources of aerodynamic modulation noise and characterization of nighttime wind conditions and noise; 2) shadow flicker modeling; 3) visibility of the wind turbines; and 4) interests of nearby residents and community.

To assure informed decisions:

Wind turbine noise estimates should include cumulative impacts (40-50 dB(A) isopleths) of all wind turbines. Isopleths for dB(C) - dB(A) greater than 10 dB should also be determined to evaluate the low frequency noise component. Potential impacts from shadow flicker and turbine visibility should be evaluated.

Any noise criteria beyond current state standards used for placement of wind turbines should reflect priorities and attitudes of the community.”

A letter from Health Canada (Canada’s federal health department):

“Sent by e-mail to EA@gov.ns.ca 1
Safe Environments Program
Regions and Programs Branch, Health Canada
1505 Barrington Street, Suite 1817
Halifax, NS B3J 3Y6

August 6, 2009
ATL-2008/09-006 / OF6-3-107

Steve Sanford
Environmental Assessment Officer
Nova Scotia Department of Environment
Environmental Assessment Branch
P.O. Box 442
Halifax, NS B3J 2P8
Subject: Health Canada’s response to the Digby Wind Power Project Addendum, Digby, Nova Scotia¹

Dear Mr. Sanford:

Thank you for your letter July 9, 2009, requesting Health Canada’s review of the above-mentioned Project with respect to issues of relevance to human health. Health Canada has reviewed the report, and has the following comments with respect to noise.

- Section 2.1 (Site Layout Review) and Table 1 (Summary of Effects and Significance Prediction Comparison of Site Layouts) – The revised layout adopted by the proponent appears to yield sound levels that should normally be below Health Canada’s acceptable

threshold value of 45 dBA for sleep disturbance at the exterior of the building of the nearest sensitive receptor (WHO, 1999). However, if a 5 dBA to 8 dBA increase in sound due to the proximity of the ocean were assumed and an additional +/- 3dBA were included to account for model uncertainties, noise levels may exceed 45 dBA. Thus, predicted sound levels, even under assumed worst-case conditions, may underestimate measured levels by 5 dBA or greater. For example, at another wind farm in Nova Scotia, maximum sound levels were estimated to be 49 dBA using ISO9613-2₂, however, measured values were as high as 54 dBA when wind speeds were 5 m/s blowing on-shore from the ocean (Howe, Gastmeier Chapnik Limited, 2006₃).

- Health Canada advises that noise monitoring be undertaken under varying climatic conditions in order to ensure that noise levels do not exceed the acceptable level, and if exceedences are identified, that appropriate mitigation be implemented to reduce the noise level to an acceptable level.

¹ Stantec. 2009. Digby Wind Power Project Addendum. Addendum to Environmental Assessment Registration Document. Prepared for SkyPower Corp. July 3, 2009.

² ISO (International Standards Organization) ISO9613-2. 2003. Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation.

³ Howe Gastmeier Chapnik Limited (HCG Engineering). 2006. Environmental Noise Assessment Pubnico Point Wind Farm, Nova Scotia. Natural Resources Canada Contract NRCAN-06-00046.

- Section 3.2.2 (Effect of Water on Noise Levels) – The report states that “*it has generally been considered that the increased background wind noise will cause some masking of the sound levels from the turbines*” and “*if there is an enhanced stability, the wind that causes background sound may not increase as much as that which causes sounds from the turbines*”. These statements can be misleading as turbine noise is likely to be audible to the nearest receptors in the form of continuous low-level or intelow frequencies at approximately 50 Hertz. As such, Health Canada advises the following:
 - Please omit statements about noise masking as they can be misleading; and
 - Please ensure that nearby residents are informed that turbine noises may be audible in terms of a low-level continuous or intermittent swooshing, as well as at low frequencies around 50 Hertz.
- Section 3.2.3 (Noise Mitigation) – The report states that “*noise monitoring [will be conducted] on a routine basis or complaint basis*”. In addition to the plan for monitoring and complaint resolution, which is intended to help mitigate any adverse community reaction, it is advisable to also implement a communication strategy. Accurate information with respect to potential acoustical effects related to the operation of the turbines is an essential part of any effective communication strategy.
 - Please ensure that any communication effort presents factual information with respect to expected noise levels, including information pertaining to the audibility of operational noises (low-level continuous, intermittent swooshing or low frequency noise), and also includes the potential effects of specific noise levels on human health (see the following comment below).
- Appendix B (Addressing Concerns with wind Turbines and Human Health) – The final

sentence in Appendix B states that "*there is no peer-reviewed scientific evidence indicating that wind turbines have an adverse impact on human health*". In fact, there are peer-reviewed scientific articles indicating that wind turbines may have an adverse impact on human health. For example, Keith et. al. (2008), identified annoyance as an adverse impact on human health that can be related to high levels of wind turbine noise. In addition, there are several articles by Pedersen (and others) related to wind turbine annoyance (as referenced below). The relationship between noise annoyance and adverse effects on human health is also further investigated in the manuscript by Michaud et. al (2008).

- Health Canada advises that this statement be revised to indicate that there are peer-reviewed scientific articles indicating that wind turbines may have an adverse impact on human health.

References:

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- Michaud, D.; S.H.P. Bly, and S.E. Keith. 2008. Using a change in percentage highly annoyed with noise as a potential health effect measure for projects under the Canadian Environmental Assessment Act. *Canadian Acoustics*, 36(2): 13-28.
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- Pedersen, E. and Persson Waye, K. 2008. Wind turbines – low level noise sources interfering with restoration? *Environmental Research Letters*, 3: 1-5.
- Pedersen, E. and Persson Waye, K. 2007. Wind turbine noise, annoyance and self-reported health and wellbeing in different living environments. *Occup. Environ. Med.* 64: 480-486.
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- World Health Organization (WHO). 1999. *Guidelines for Community Noise*. Eds. B. Berglund, T. Lindvall, D. H. Schwela. WHO: Geneva.
- Van den Berg, F. Pedersen E., Bouma, J. and Bakker, R. 2008. Project WINDFARM perception. Visual and acoustic impact of wind turbine farms on residents. FP6-2005-Science-and-Society-20 Project no. 044628: 1-99.

If you have any questions, please feel free to contact me at the contact information below.

Sincerely,

Allison Denning,
Regional Environmental Assessment Coordinator
Health Canada, Atlantic Region
Tel: (902) 426-5575
Fax: (902) 426-4036
Allison_Denning@hc-sc.gc.ca
cc: Tom Ferris, Manager, Safe Environments Program, Health Canada

Anne-Marie Lafortune, Senior Environmental Health Assessment Advisor, Health Canada
Derek McDonald, Canadian Environmental Assessment Agency”

It is clear, in all three of these cases, that these agencies accountable for public health have reached conclusions that Dr. McFadden chose not to include in his presentation (although he clearly implied that his presentation was consistent with their positions) and that contradict his conclusions. These agencies all recognize the concerns with wind turbine noise and state that this noise needs to be taken into account in placing wind turbines and needs to be monitored to ensure that acceptable levels are maintained. I think that the Wind Siting Council and the Public Service Commission should've been more cautious in using Dr. McFadden's selective and misleading presentation to conclude that turbine noise is not a health concern.

In conclusion, wind developers will come and go. The lasting effects of their work will be the Wisconsin Legislators' legacy. Please consider conducting a quality survey of the residents in the projects you have already permitted, so that we can learn from that experience and be responsible in the future siting of wind projects in Wisconsin.

Respectfully Yours,

Cathy Bembinster
Healthy Wind, Wisconsin
18002 W. Cty Rd C
Evansville, WI 53536

To: The Joint Committee for the Review of Administrative Rules.

From: Kevin Kawula, Natural Area Restorationist, Owner and Operator of Lone Rock Prairie Nursery, Rock County Parks Volunteer, Town of Spring Valley Planning and Zoning Committee Secretary, Rock County Conservationists Board Member, Concerned Citizen. 13133 W. Dorner Rd., Brodhead WI, 53520 (608) 876-4255
Re: Public Hearing to Suspend PSC 128

I am asking the Joint Committee for the Review of Administrative Rules to suspend PSCW Wind Siting Rule 128 as written.

PSC 128 does not go far enough to protect the citizens of Wisconsin from wind turbines sited too closely to non-participating peoples' homes, nighttime industrial wind turbine noise, has no accountability measures to ensure industrial wind developers fulfill CO2 emission reduction claims or provide so-called green jobs, and provides no repeat no protection for Wisconsin wildlife which is bearing the brunt of industrial wind turbines physical impacts on the environment.

The Wind Siting Council, which was supposed to help advise the PSC Commissioners with creating PSC 128, had no 'Environmental' or 'Citizen' representation that did not have a conflict of interest or tie to the wind industry or the PSC. I volunteer to fill that void. I have 18 years experience in natural area restoration, am an independent small business owner, and know full well what industrial wind turbines are capable of doing and not doing.

Industrial wind turbines kill bats by the score, and birds by the dozen. They lead to torn up fields with compacted soils and ruined hydrology. They lead to shadow flicker that hurts, and can be felt with the eyes closed. They create buzzing and queeziness in the head and body.

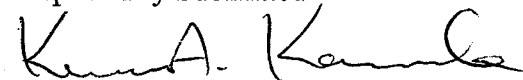
Suspend the rules, and start planning overnight trips to the Horicon - Fond Du Lac area. Don't tell the wind developers, get a nice place to stay in town, or if you hear somebody here today, set up a slumber party. I understand the Wirtz's home might still be available.

The industrial wind turbines in Wisconsin (around 330) will kill over 12,000 bats though barotraumas this year, because wind developers insist on nighttime wind generation for income. People can't sleep and wildlife suffers and dies.

I am hoping if the JCRAR would, as the first Committee to date, take up the nighttime challenge, suspend PSC128, and give Wisconsin a fighting chance against a heartless industry.

I am attaching a copy of my testimony to the PSCW regarding their wind siting rules, which points out in further detail the lack of safety, lack of scientific proof, inequity in wind generation income, and a complete absence of environmental accountability or responsibility.

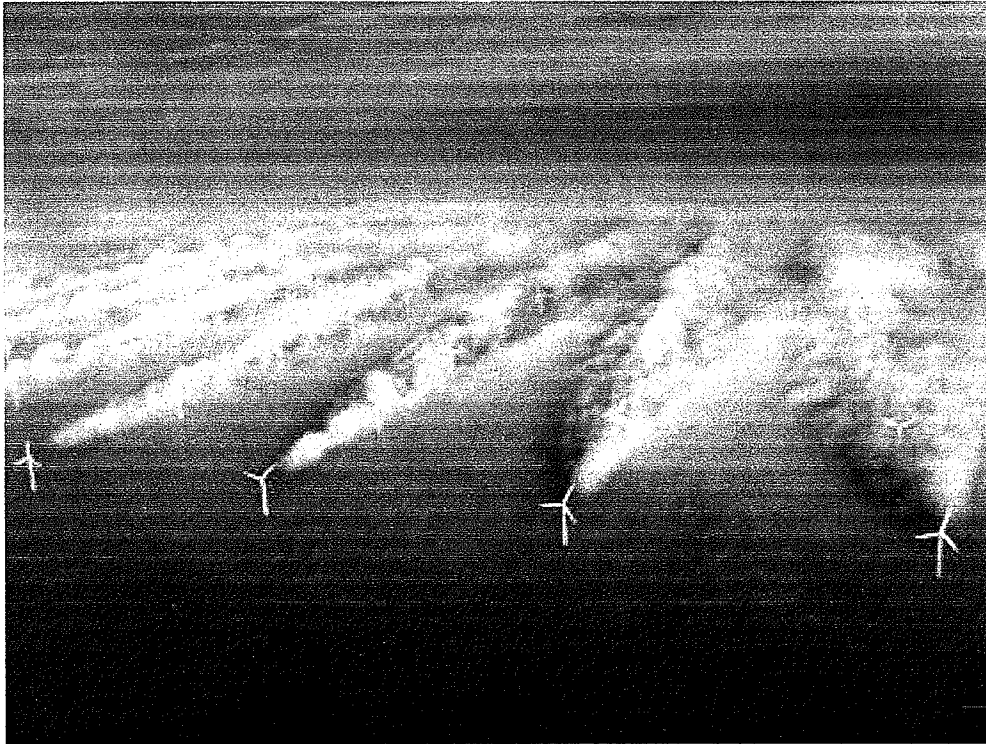
Respectfully Submitted


Kevin Kawula

To: The Public Service Commission of Wisconsin
From: Kevin Kawula, Natural Area Restorationist, Owner and Operator of Lone Rock
Prairie Nursery, Rock County Parks Volunteer, Town of Spring Valley Zoning
Board Secretary, Rock County Conservationists Board Member, Concerned Citizen.
Re: PSCW Draft Wind Siting Rules, Straw Proposal Amendment Ballot, and Addressing
the absence of a Wildlife Representative on the Wind Siting Council.

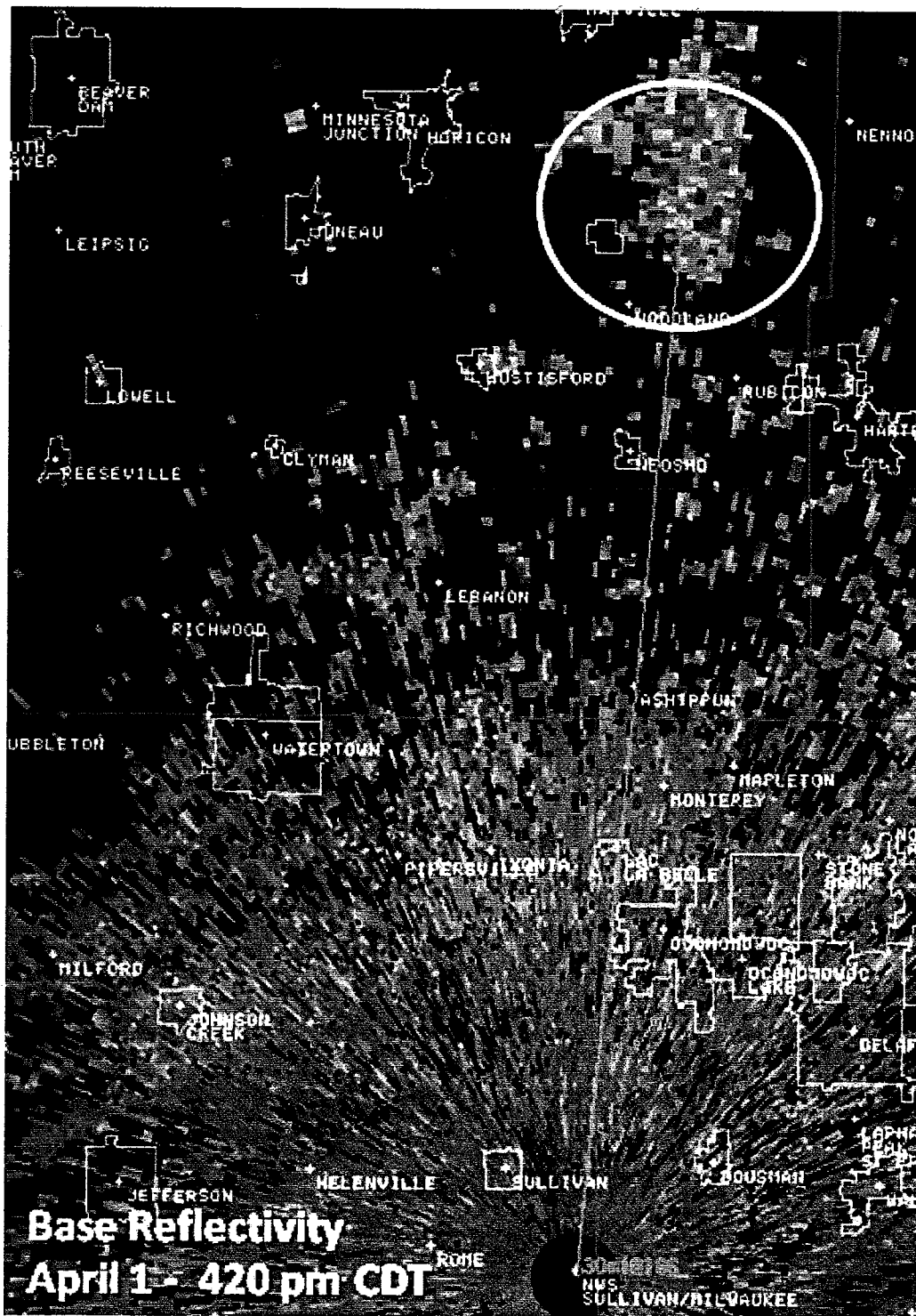
I would like to address the Draft Rules and Straw Proposal at the same time.

What neither the Draft Rules or the Straw Proposal accomplish, is address the inherent trouble with industrial scale wind energy, the size of the machines. Spinning something the size of a 747 or larger will have definite physical impacts. For every action there is a reaction. Please look at the image below. Will the effects of these industrial wind turbines be captured within 1,000 feet?



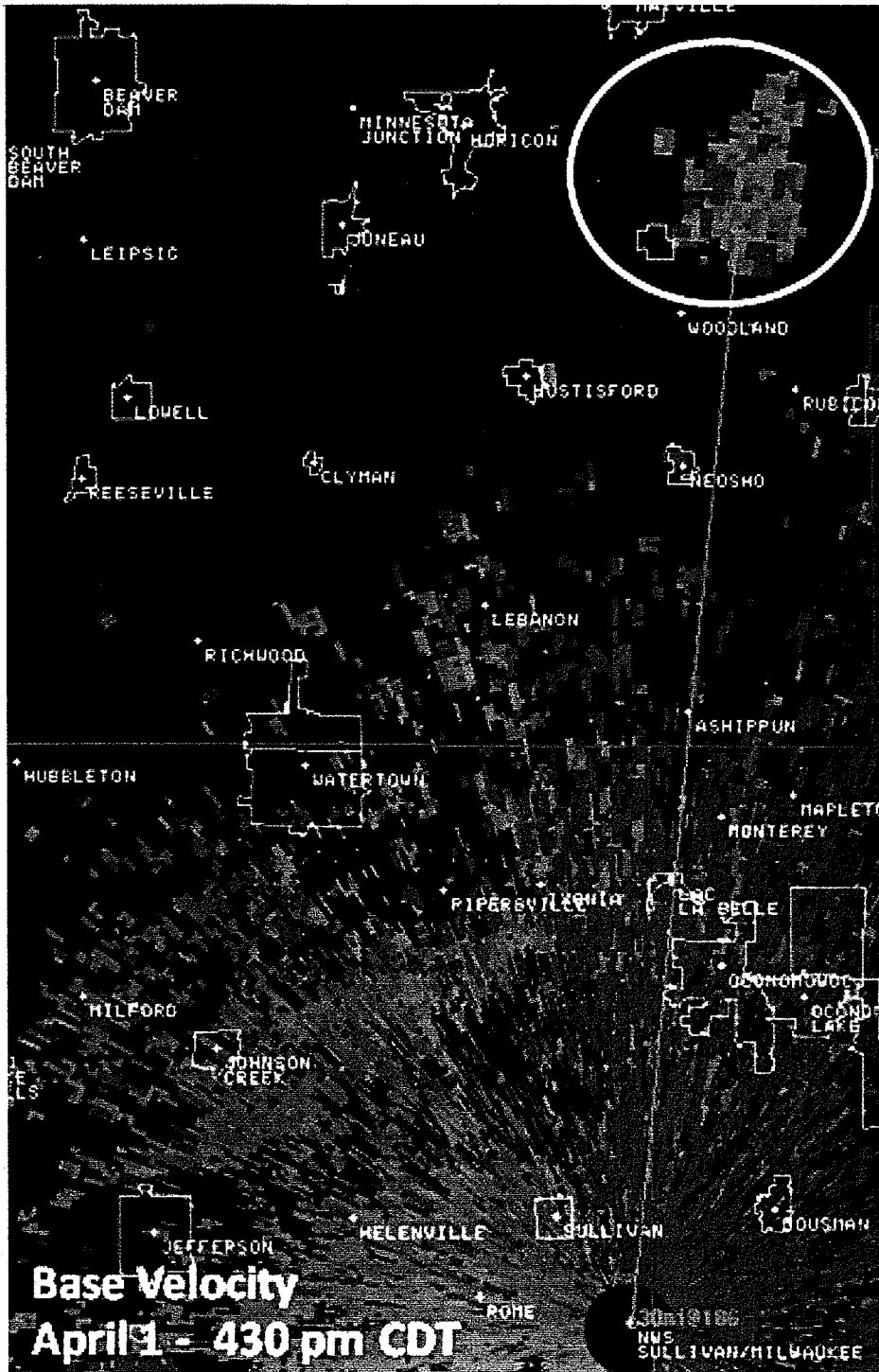
Denmark Wind Project at Sea, Turbulence and Wake expressed in clouds and mist.

These physical effects are also captured by weather radar, but the false reading/interpretation of these radar images as storms or tornados, may be over looking the very real and physical impact areas represented by the images. It would be useful to have these weather radar images reviewed to help assess what wind turbine wakes are exacting on a community.

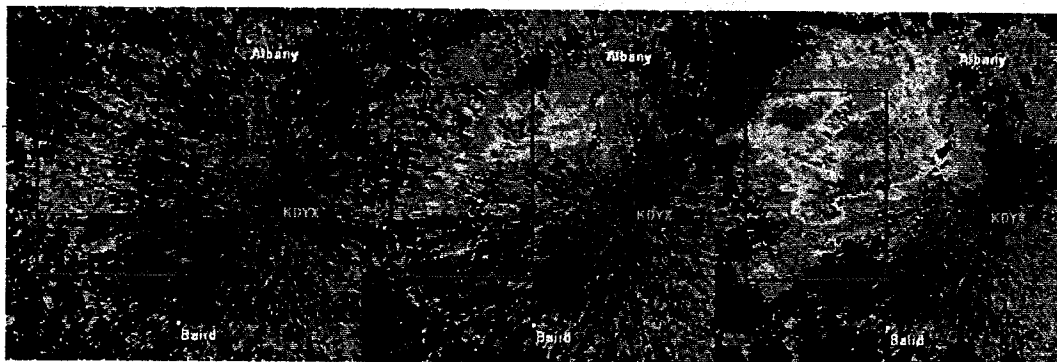
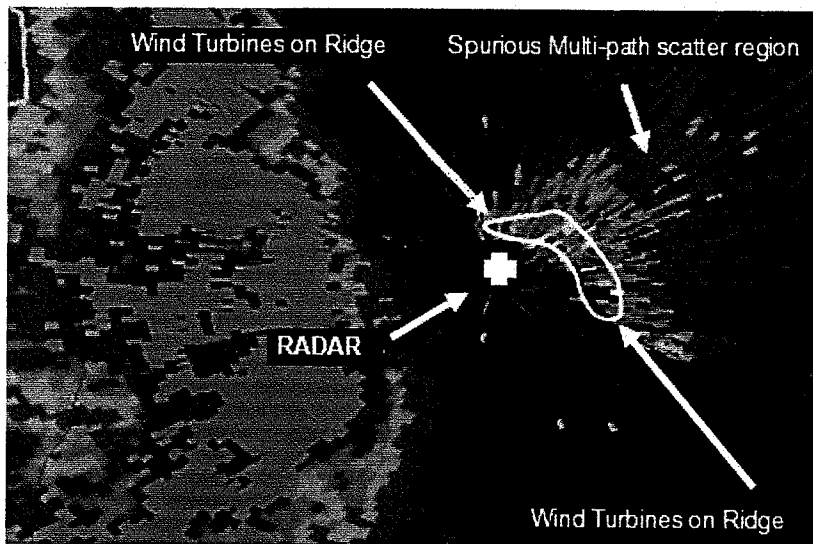


#1 - A small part of the electromagnetic energy radar beam sent from the radar is reflected back by the rotating turbines. The radar processes this "returned energy" as an

area of precipitation and plots it accordingly on the map. This contamination of the base reflectivity image as illustrated in the above image, has an effect on the radar algorithms used to estimate rainfall and to detect certain storm characteristics.

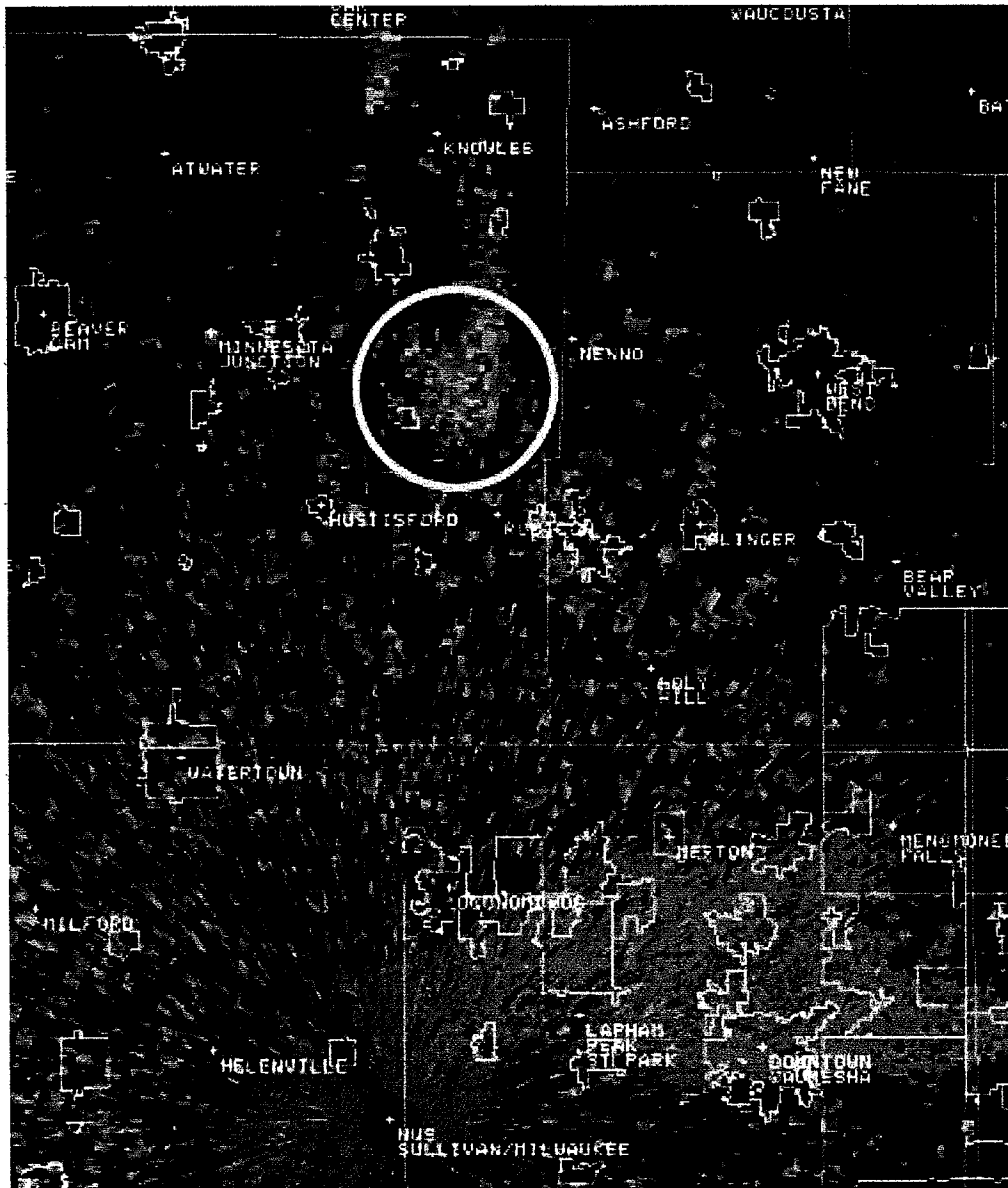


- * Thunderstorm or winter storm characteristics could be masked or misinterpreted, reducing warning effectiveness in the vicinity of, and downrange of the wind farm.
- * False signatures contaminating Doppler velocity data in the vicinity and downrange of the wind energy facility could reduce forecaster's situational awareness, particularly during hazardous/severe weather events.
- * Data masking or contamination if thunderstorms develop over the wind farm may negatively impact warning effectiveness.
False precipitation estimates could negatively impact flash-flood warning effectiveness.

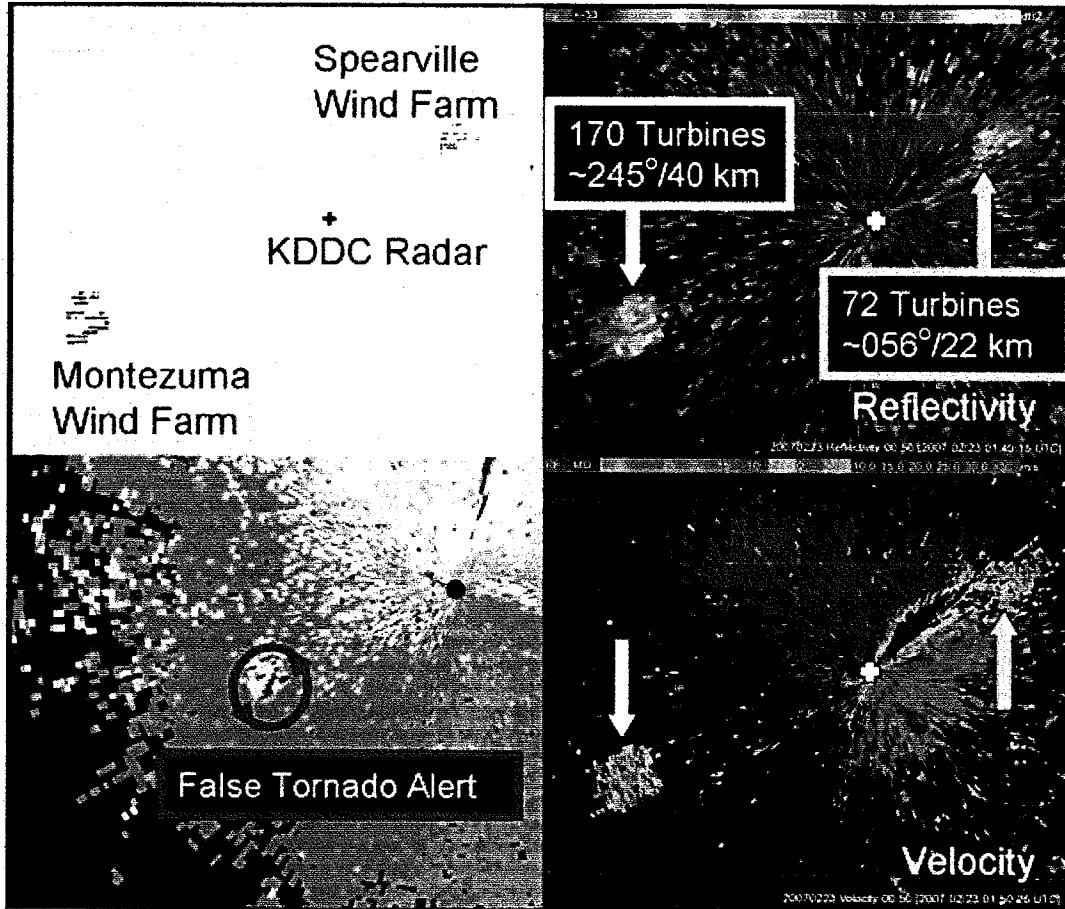


#5 - Sequence (left to right) of 0.5 deg reflectivity images showing thunderstorms developing over a wind farm (purple rectangle) 10-16 nm (18-30 km) west of Dyess AFB, TX WSR-88D. Left: thunderstorms have not yet developed, high reflectivity values due to wind turbines alone. Middle and Right: storm has developed to where in right image a distinct notch structure, indicative of severe weather, formed – note: turbine and weather echoes indistinguishable

#2 - The rotating turbines also impact the velocity base data as you can see from the above image. This velocity data is used by radar operators and by a variety of algorithms in the radar's data processors to detect certain storm characteristics such as mesocyclones, tornado vortex signatures, and relative storm motion.



#3 - The above two hour animation (not animated here) from the evening of April 1, between 915 pm and 11 pm CDT shows the persistent interference from the Butler Ridge wind turbine farm on the KMKX base reflectivity radar image. (animated version available at www.wind-watch.org/documents/wind-farm-interference-showing-up-on-doppler-radar/)



These physical impacts cannot be captured with a safety/noise/shadow flicker setback of 1,000 feet. 1,000 feet is an industrial turbine spacing distance used to mitigate turbine wake impacts on each other. In the PSCW's Glacier Hills EIS, chapter 2, p.13, 2.1.2 Turbine Spacing – it states that the wind turbines selected for the Glacier Hills project would require a spacing of 1,200 to 2,000 feet between each other to minimize the effect of wake and turbulence caused by the wind turbines operating. Homes and non-participating residences receive less respect and consideration than do other industrial wind turbines.

The proper compromise setback to allow industrial wind development is 2,640 feet.

Hosting or easement properties can sign to have the turbines as close as 1,000 feet. A person who signs an easement contract to allow a turbine 1,000 feet from their residence (Good Neighbor Easement) should expect to receive \$8,760 per year (\$1.00 for each hour of the year) for living with the turbine's impact.

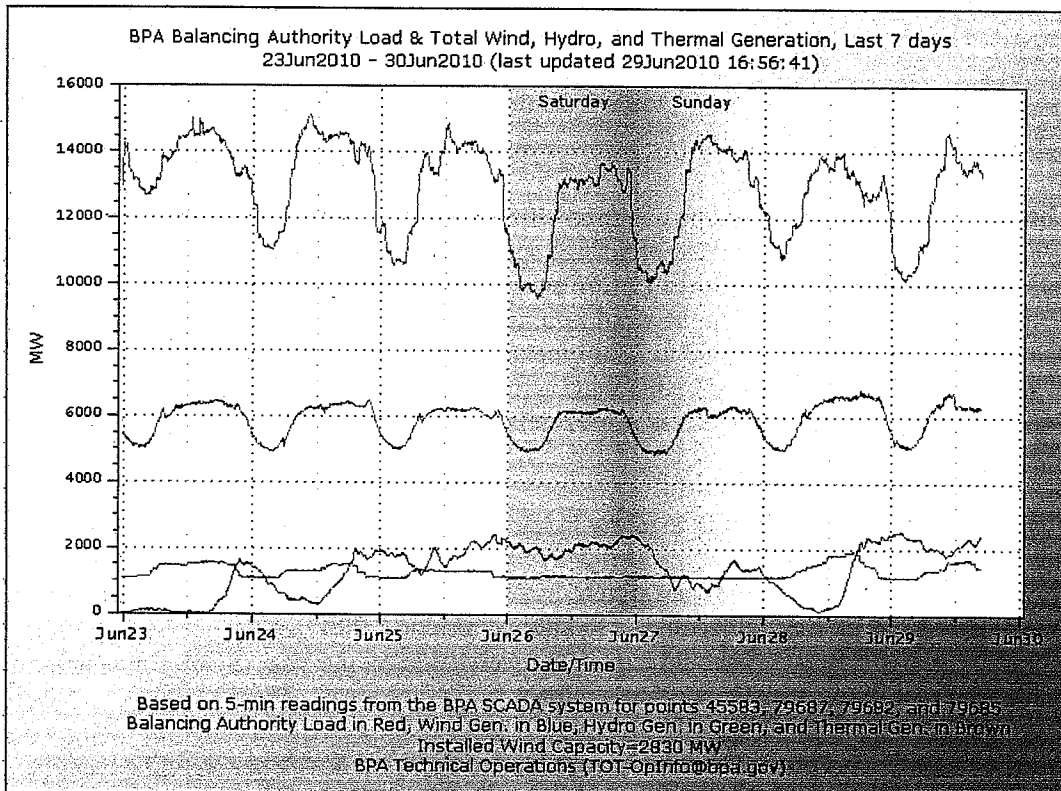
Wind turbine project properties which lease land to the wind developer should expect to receive 10% of the generation income for each - (1.5MW wind turbine operating at 25%

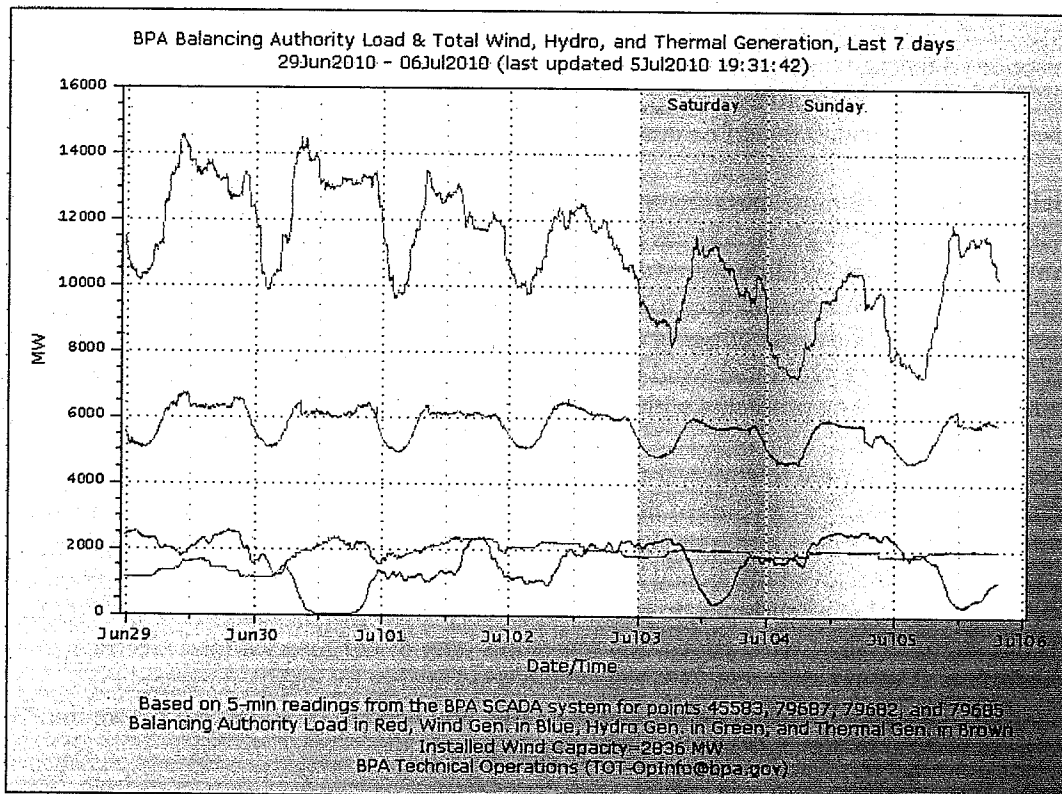
capacity for an average yearly production of 3,750,000 KWh, [via public meetings with Wes Slaymaker, EcoEnergy LLC/EcoMagnolia LLC/EcoAvalon LLC working with, WPPI-Evansville Water and Light, Evansville Wisconsin] valued at 10 cents per KWh with Green Credits [via Focus on Energy Program, Implementation of Community Based Wind Power Businesses in Wisconsin, Page 47, Under 'Revenues' "PPA Rate (Inc. Green Tag) | \$0.10000") turbine hosted less nighttime generation (up to 50% of annual wind turbine generation, see below), or approximately \$18,750 per turbine per year. No turbine should be sited 1.1 times the height of the machine from any residence or non-contracted property line. That is cruelty.

Due to the trouble with industrial wind turbine nighttime noise, and a lack of clear evidence that nighttime wind generation has an impact on curbing baseload thermal generation CO2 emissions, nighttime curtailment of industrial wind turbines must become mandatory, unless a utility can prove a real time social benefit to the reduction of a coal burning facility operation. Any nighttime wind generation, or operation of the turbines, must be approved ahead of time by the hosting Counties, Towns, and residents.

We benefit as a society from timely and accurate weather forecasts and storm alerts, and the same timeliness and forecasting should be expected of the technologically advanced wind industry when it comes to nighttime generation requests. The following charts are from the Bonneville Power Authority, available on line at:

www.transmission.bpa.gov/Business/Operations/Wind/baltwg.aspx





BPA Thermal generation (in Brown) never goes below 1,200MW, has a daily rise in output, and then returns to baseload output. The Wind Generation (in Blue) does not appear to have that much impact at all on thermal generation except when it does not generate during the daytime load cycle. It is the non-impact of Wind at night on Thermal Generation that the Commission needs to address with nighttime curtailment unless proven to reduce emissions.

Wind generation numbers from the Midwest Independent Transmission Systems Operator (MISO) also raise CO2 reduction questions. Mainly how effective is the wind generation at reducing the need thermal generation? The MISO generation cycle begins at 4am. Load demand and generation rise at a steady rate until peak demand at 2pm-4pm, and then taper off until then end of the evening (8pm-10pm) to baseload operating levels until 4am the following morning.

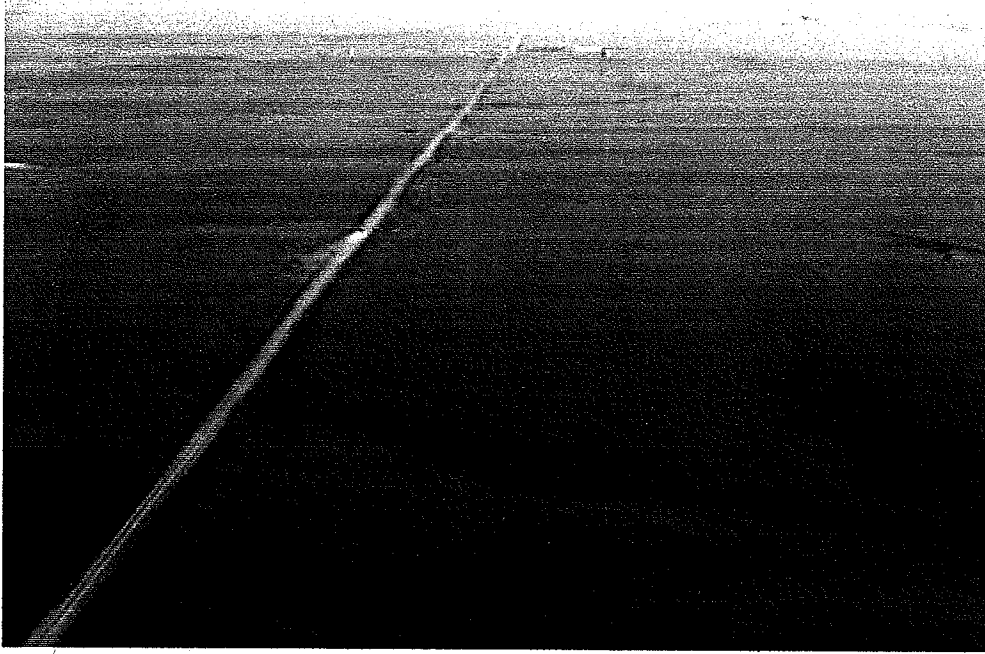
From April 15th 2010 through July 6th 2010, 19 days (23.2%) gained wind generation from their 4am starting levels through 2pm-4pm, while 40 days (48.8%) lost wind generation from 4am through the 2pm-4pm peak load time. 18 days (21.95%) saw an initial loss of wind generation and then a gain, while 3 days (3.65%) saw an initial gain and then a loss of wind generation. One day was positive, negative, and then positive again, and one day information for the morning was missed. It is the wind generation loss, initial loss days, initial gains and then loss days (the majority 61 vs. 19 or 74.4% of

the days vs. 23.2%), which the Commission needs to evaluate, in order to verify CO2 reduction claims by the wind project operators. How is a MISO system's operator to respond to falling wind generation just when the daily generation load needs to be filled? Would it be more effective to ramp up the coal facilities, or the natural gas? And, should the wind return which would be ramped down?

Safe setbacks, nighttime curtailment, and reviewing CO2 reduction claims of industrial wind turbines will begin to address a missing element on the Wind Siting Council, an Environmental and Wildlife Representative. Renew Wisconsin is not an environmental operation. Clean Wisconsin tries to do better, but lacks any real environmental impact assessment capability past clinging to the hope that the retirement of coal plants will be tied to the siting of additional wind farms, and a 'community wind' loophole can be used to sidestep real siting problems with the same size machines.

Renew and Clean want to site over ten thousand industrial wind turbines in our state, and that is just wrong. They as part of the industrial wind lobby would like to see 200 to 300 industrial wind turbines built per year until 2025. That is 4,500 turbines, running at nameplate capacity, but given efficiency issues, Wisconsin will really need to site 12,000 to 15,000 industrial wind turbines, to reach a 2025 RPS wind generation goal of 5,562GWh. (While 5,562 GWh of wind generation represents only 6% of forecast total electrical generation, it would represent 24% renewable wind energy by installed nameplate capacity. This gap, shortfall, nameplate loophole, will need to be addressed before the damage is done to our state and wildlife populations.)

The acreage needed to site this many wind turbines would be over one million acres. The Commission and Governor Doyle are discussing the largest land fragmentation in this state since the introduction of the steel plow, and the development of paved roads. Does the Commission and Governor Doyle Really want Wisconsin to end up looking like this Elk River wind project in the Flint Hills of Kansas?



This is unplowed prairie habitat used to raise grass fed beef, before construction, be sure to notice the three-branched creek in the foreground.



The three-branched creek is in the bottom right corner of this post construction photo. This photo is the definition of wildlife habitat fragmentation.

Problems with bird and bat mortalities, surrounding the inappropriate siting and operation of industrial wind turbines, have been acknowledged. Problems will continue so long as wind turbine operators seek their corporate profits at the expense of environmentally ethical and responsible standards. There is a misunderstanding, on the part of industrialists and policy makers, of how Wisconsin wildlife populations work and survive.

Wildlife populations live and survive on a very narrow margin, especially during migration. This margin is much narrower than that of any utility or shareholder. Migrating birds, bats, and insects need enough potential refugia enroute to nesting and brooding habitats. Fragmentation of these refugia along migration greenways by industrial wind turbine complexes, will lead to migrating population dislocations and additional wildlife deaths. Migrating animals do not have the energy reserves or time to detour the multiple manmade obstacles they encounter. These obstacles provide some of the bird and bat deaths the wind proponents hide behind. But, building 12,000 industrial wind turbines would exacerbate migration corridor obstacles and habitat losses, by removing additional migration opportunities and habitat over vast swaths of Wisconsin.

Agricultural land offers little nesting opportunity, but acts as defacto greenways, feeding, commuting to feeding, and nest protection habitat. The associated edge habitat of agricultural land is vital for the watch of predators, especially aerial predators. Filling

Wisconsin with 410 foot tall spinning industrial wind turbines will impact/remove the remaining wildlife nesting, feeding, and rearing habitats. In the PSCW's Glacier Hills EIS, chapter 2, p.13, 2.1.2 Turbine Spacing – it states that the wind turbines selected for the Glacier Hills project would require a spacing of 1,200 to 2,000 feet between each other to minimize the effect of wake and turbulence caused by the wind turbines operating. This means that Glacier Hills would impact, or remove, nearly all of the project area's 17,300 acres plus an additional 200-1000 feet beyond the project area's perimeter from existing wildlife habitats.

What does this fragmentation mean for the potentially negative impacts on bat populations? The Glacier Hills EIS states...

4.3 BATS

"Bat mortality has exceeded bird mortality at most wind farms where post-construction monitoring of both animal groups has been conducted. Many species of bats are long-lived and have low reproductive rates. This is particularly worrisome because even if the mortality rates for birds and bats from wind turbines were similar, wind turbines can have a more significant impact on bat populations than bird populations, with the exception of rare bird species. Bat Conservation International estimates that more than 50 percent of American bat species are in decline. As the number of wind projects continues to increase, the cumulative impact on bat populations could be serious. Wind turbines may be more deadly for bats than other structures, such as towers or buildings, on a per structure basis."

Chapter 4, p. 39, "Post-construction mortality studies are being conducted at three recently completed wind projects in Wisconsin. These projects have land cover (i.e., wooded areas, wetlands, and fallow fields within an agricultural matrix) similar to that present within or adjacent to the Glacier Hills project boundary. In addition, the projected bat activity levels based on pre-construction surveys at one of WEPCO's recently constructed wind farm projects (Blue Sky Green Field) were similar to the pre-construction estimates for the Glacier Hills project. The initial post-construction field data from the Blue Sky Green Field project show a high level of bat mortality.¹⁴ Thus, it is possible that bat mortality at Glacier Hills could also be high."

There is a simple reason for this. The Wisconsin Wind Resource Assessment Program Final Report (WRAP Final Report), states in the report's figures, p.2 "...wind speeds are highest at midday and again late at night to early morning" (10pm to 6am). Industrial wind turbine average yearly generation numbers and income depend on this "late at night to early morning" (10pm to 6am) wind resource. This is prime bat feeding time, and low electricity usage time (no baseload CO2 emission reductions). Cut in speeds on turbines are not the issue. The issue is a devaluing of wildlife to profit an industry. Nighttime winds partly explain Wisconsin's higher than average bat mortalities. The Glacier Hills site map is an excellent tool for forecasting that Glacier Hills will also be a bat killer. Bats prefer to feed within a ¼ mile of roosting and brooding. Roosting for bats in Randolph and Scott will mostly likely be trees or woodlands, and feeding takes place largely over wetlands and streams where insects are plentiful. The Glacier Hills project area is wedged into a river, stream and wetland complex. Nighttime operation of Glacier Hills wind turbines during the bat breeding and migration seasons will cause bat deaths.

It is the alarmingly high number of bats that are dieing and will be killed if nighttime curtailment, and greater sensitivity to wildlife land usage needs are not addressed by the Wind Siting Council, The Commission, and ultimately Governor Doyle.

The number of bats being killed is 40.54 per wind turbine per year. This is the post construction mortality number for Blue Sky Green Field 88 turbine project. Which Means that Blue Sky Green Field project is killing between 3,500 and 3,600 bats per year. This number is consistent with bat mortality levels Cedar Ridge and Forward Wind. This means that if Renew and Clean Wisconsin achieve their lobbying goals of siting an additional 200 to 300 wind turbines each year until 2025 the bat deaths would reach a staggering 131,200 to 192,700 bats killed per year for the 4,753 wind turbines in the state. To reach the RPS goal of 5,562 GWh with 12,000 to 15,000 wind turbines the bat deaths would climb to 486,400 to 608,000 per year.

These kill rates are unsustainable, and it is unlikely that we would see the higher bat kill numbers as the surviving populations would crash, or be driven from the million plus acres occupied by wind turbines. We could see periodic migration season death spikes as bats, which do not know of the wind turbine areas (the young), enter Wisconsin wind project sites. It would devastate Wisconsin's balance of nature for decades to lose our bats to a greedy few.

It is the size of the industrial wind turbine that is causing the bat deaths. Bats are not being struck by the blades, but are suffering catastrophic damage to their lungs as they fly into the low-pressure zone that is created by the spinning blades. This drop in pressure causes the bats' lungs to expand rapidly, rupture, fill with fluid and blood, and they drown. It is called – Barotrauma – deep-sea divers get a version of it called “the bends”, when raised to quickly from the depths. Birds have different lung structures, so they are not as readily affected, but bats are mammals with lungs similar to ours, so take a deep breath, imagine you can stop inhaling until your lungs burst, and you are drowning to death. Could this pressure flux be what wind project residents are suffering from, along with the noise, disturbed sleep, and shadow flicker?

Perhaps now with physical evidence of the dead bats, the images of physical impacts from photos and radar, and the absence of clear proof that coal burning is reduced in our electrical generation mix by adding wind turbines, the PSCW will consider adding a true voice(s) for our wildlife and environmental concerns.

I would like to recommend Shari Koslowsky, Conservationist with the DNR, at sharikoslowsky@wisconsin.gov (608) 261-4382, to consult with the Wind Siting Council before their final recommendations are presented to the Commission.

The Commission should not rush to a judgment for a September 1st decision. This Commission and Governor Doyle won't want to be remembered as the people who turned Wisconsin into the 'Gulf Coast' of midwest industrial wind development.

Respectfully submitted, Kevin Kawula, 13133 W. Dorner Rd., Broadhead, Wi, 53520

To: Joint Committee for the Review of Administrative Rules (JCRAR)
From: Douglas Zweizig, Ph.D., Vice Chair, Wind Siting Council
Re: Clearinghouse Rule #10-057; PSC Wind Siting Rules proposed Chapter 128
Date: February 9, 2011

My name is Douglas Zweizig.

I am a retired UW—Madison professor from the School of Library and Information Studies. I conducted national survey research studies, and I directed doctoral students in the conduct of original research. I'm also a member of my Town's Plan Commission, and I serve as Vice-Chair of the PSC's Wind Siting Council.

I am here today to request the Joint Committee for Review of Administrative Rules to set aside PSC 128 (CR 10-057).

I am one of the authors of the Wind Siting Council's minority report to the Public Service Commission. (See Appendix E of <http://psc.wi.gov/mediaRoom/documents/WSC%20Final%20Report%20and%20Cover%20Letter%208-9-2010.pdf>) That minority report details grave concerns about the basis for the wind siting rules that are before us today. I am here to request that the rules be suspended because they were produced without a thorough or responsible audit of the negative impacts of industrial-scale wind turbines.

The rules as written will not protect the health, safety and welfare of impacted Wisconsin residents and communities. As you may know, the majority of the Wind Siting Council members had a direct or indirect financial interest in pushing for rules that favored the wind industry. The rules reflect this, resulting in setbacks that are too short, limits on noise and shadow flicker that are too lax, and nearly non-existent remedies for citizens with complaints.

In Act 40, the legislature required an independent and qualified researcher "with expertise regarding the health impacts of wind energy systems" to be a member of the Wind Siting Council.

Instead, the Public Service Commission appointed a junior physician staff member of the state Division of Public Health who was just out of medical school. He openly and publicly admitted he had no expertise in the issue of health effects and wind turbines. He had collected no data and had made no observations himself on the health effects of wind energy systems.

His research consisted of reviewing existing literature using very narrow criteria. This resulted in a whitewashed report to the Council which ignored not only the first-hand experience of Wisconsin residents who are clearly having trouble living with wind turbines, but also disregarded even the most basic recommendations of the World Health Organization on nighttime noise limits necessary for healthful sleep. (www.euro.who.int/_data/assets/pdf_file/0017/43316/E92845.pdf) The most common health complaint from wind project residents is not mysterious: turbine vibration and noise interrupts their sleep. Health problems associated with chronic sleep deprivation from nighttime noise are well known. The PSC should be directed to carry out the quality of study called for in Act 40.

The main argument against more protective guidelines is an economic one. Wind energy proponents tell you the very setbacks that will protect the health of Wisconsin residents are "job killers." You have been told over and over that wind energy systems will create jobs and provide a clean, effective source of energy with no negative consequences.

Of course, we are all interested in increased jobs for Wisconsin, but those who claim that short setbacks will not only do no harm but will also result in over 7,000 wind-related jobs in our state should be required to prove it, not just claim it.

The MacIver Institute recently attempted to document Wisconsin jobs related to wind energy and were able to identify only 31 jobs that were specifically tied to wind energy-related products. (<http://maciverinstitute.com/2010/08/facts-about-green-job-creation-elusive-as-the-wind/>) What's the truth here? Shouldn't we know?

In the name of questionable job creation, you are asked to accept siting rules that clearly disregard negative impacts to human health, wildlife, and property values in order to promote unsubstantiated claims of improved air quality and job growth.

If the PSC is to create wind siting rules for the entire state, then provisions for accountability must be part of those rules.

The rules must ensure the following things: that wind development does no harm to people, property values, wildlife, or habitat; that it provides an economical power source; and that it reduces output from coal-fired power plants in our state.

As Vice-Chairman of the Wind Siting Council, I am here to say the rules as put forth by the PSC do not meet these requirements and to ask that you suspend them.

I would be glad to answer any questions you may have.

Douglas Zweizig
6037 North Finn Road
Evansville, WI 53536
(608) 882-4335
Town of Union (Rock County) Plan Commission
dougzweizig@hotmail.com



My name is Marilyn Nies. My husband and I signed a contract with a wind developer 3 ½ years ago. Since then we attended an informational meeting on wind power. We were shocked to hear about stray voltage. It never occurred to us when we signed the contract that our six year old daughter has three separate heart conditions. One of them is an electrical impulse disorder. What could happen to her if the electricity were to ground out in our pond and she is in there. I know it sounds farfetched but when we were at a Brown County board meeting Dr. Jevon Mc Fadden said "We know some individuals are more susceptible than others, for instance people with heart conditions".

No scientific studies have been done to prove or disprove whether living this close to turbines is safe. We are going to have to live with this for 35-40 years. What is it going to hurt to put a halt on things for a year or two and get the studies done? That is fraction of the time we have to live with this. The wind companies keep saying is there is no evidence of harm. Of course not, nobody has looked! The PSC siting panel says "go to the doctor, get a base line". Why do we have to be guinea pigs! There are turbines in other locations where the studies could be done.

We were lied to by the wind company. We were told the turbines would be 1000' minimum from our house. Now all the sudden the PSC siting committee comes up with the recommendation of 1.1 times the turbine height for us fools that signed our rights away. That is only a 10% safety factor. So on a calm day if this thing tipped over it would only be 44' from my house! Now what would happen if it were windy? We had a tornado go through this area in August, I am certain turbine blade debris fly further than 44'. Worse yet, what if my kids were outside playing? To top it all off the World Health Organization recommends 1/2 mile or 2640'. How come the PSC siting panel knows more than the WHO?

(<http://www.healthywindwisconsin.com/Health%20Impact%20and%20Setback%20G....pdf>)

To make matters worse we have been avidly pursuing with the wind company to get out of our contract. Using our daughter's heart conditions and we were lied to as our reasoning. They don't care, they will not let us out of our contract. Then they had the nerve to say "Remember your confidentiality clause!"

The Brown County, Manitowac, and Kewaunee boards have all come out and said these do not belong here (front page of the Press Gazette newspaper). We have a

sensitive karst rock topography here along the ledge. Everywhere they break through the karst rock the manure is going to follow the path of least resistance and enter our drinking water. NOBODY is listening! If we truly need that much electricity put up another nuclear plant.

Marilyn Nies
8122 Morrison Road
Greenleaf, WI 54126
920-265-1934

February 9, 2011

Representatives of Wisconsin
Joint Committee for Review of Administrative Rules

Re: PSC 128 Wind Siting Rules

Wisconsin legislative members reviewing wind turbine siting rules PSC 128:

I own and operate a Wisconsin based business with 4 employees that is involved in wind and renewable energy technology. I moved here 5 years ago in part due to progressive policy on renewables and the prospects for work, as well as the quality of life for myself and my family. WES Engineering assists schools and businesses who are interested to install wind turbines to offset some or all of their energy use or sell energy to a utility. These clients are very committed to improving the air quality in Wisconsin and demonstrating leadership in reducing the carbon footprint of their entities.

I am expressing my support for the adoption of the PSC 128 wind siting rules as written. These reasonable regulations and setbacks for wind turbines in Wisconsin will allow Wisconsin businesses like mine to design and construct wind energy projects around the State where there are good wind resources. These projects employ many Wisconsin businesses in design, construction and operations. The projects also include benefits for the local communities, including revenues, employment and energy generated from a Wisconsin resource without any carbon emissions, water usage, or other harmful emissions. There are operating wind projects in Wisconsin with satisfied neighbors and communities, the Montfort project west of Dodgeville has operated nearly ten years with few complaints, and 20 large wind turbines.

I realize wind turbines can have negative impacts on neighboring properties, but believe the PSC rules are some of the most stringent in the Midwest and offer a compromise that allows wind turbine projects to continue while also affording more protection for neighbors. Many tall structures in Wisconsin have similarly been seen at times as a blight that should not be allowed (cell towers and transmission towers), but each persists in WI and the rest of the world as necessary components of a modern world.

This country was made great and important in the world through technological advancement and industry, not always the best for peace and quiet living, but certainly the best to maintain our world leadership position. Let's keep some reasonable regulations allowing wind turbines to be sited in the State.

Thank you for your time.

Sincerely,

Wes Slaymaker, P.E.

President
WES Engineering Inc.
www.WESengineering.com
wes@WESengineering.com
608-259-9304

Feb. 8, 2011

It is my understanding that there is no big demand for this energy as of yet. Our current supply of nuclear is only running at 60% so why be in such a hurry? Why not take some time and get it right first? Find something better, something you can depend on or store for when the energy is needed. Why be in such a hurry to destroy peoples lives, community and health. I don't understand, when there is a product on the market, say a drug, a vehicle or childs toy that may have a safety issue it is immediately pulled off the shelf and not returned unless it is fixed or proven to be safe. Why should these million dollar turbines be any different. They have not be placed so close to homes in the past to know how dangerous they may be to peoples health, to animals or our water supply. There have been many many complaints that should be looked into before the project goes any further.

Please I ask that you take the time and do more research before so many peoples lives are put in schambles.

Feb 8, 2011

you who can't make it to the hearing on Wed., it is not notarized written testimony will be accepted. If you wish to submit written testimony, I can notarize them if they are brought down to Madison on Wed.

If you would like have your testimony notarized, please include your name at the end of your testimony:

Windsor
BROWN

On 2-8-11, personally appeared before me, Biese

who appears to be the person described in and who executed the foregoing instrument, and acknowledged that he/she executed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

Schultz
Signature

2014
Notarization Date

InboxLight.aspx?n=167928456

cause I am
retiring. I am
paying taxes
less being
I turbines that
community of good
I am sure
we not stand up
and do what is
tax payers instead
all be many more
amilies torn apart
of what these
ity value or
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Testimony of Alexander DePillis to JCRAR, 09 February, 2011

Hello and thank you for the opportunity to speak. I've been involved in wind siting for a long time, and will speak on ~~two issues: local control and criteria that go into a wind siting standard.~~

I started working in Wisconsin in 1992, developing wind and solar power products and projects. I served in the state Division of Energy for eight years, as the renewable energy engineer. During that time I, along with a representative from the Public Service Commission and the DNR, drafted a model ordinance to give local governments a starting point. I subsequently worked for two wind power companies, working mostly in the early stages of developing wind projects. Now I consult on wind power and solar hot water projects.

Back when I worked at the Division of Energy, my colleagues and I developed the model ordinance because we saw a clear need. Some one, a homeowner or a wind power company, would ask for land-use permission, and the local government would be flummoxed. It wasn't anything like what they had dealt with before. It was a little like a communications tower, if they had ever dealt with that, but there was a state law they never heard of that said they had to deal with it differently. (That's state statute 66.0401).

The uncertainty, exacerbated by delays and moratoriums and subcommittees, led to some ugly political dynamics. And more importantly, no good resolution.

Convening a group to deliberate and come up with some official standards was 10 years overdue. It finally gave local governments a blueprint for how to deal with these wind power proposals, both small and large. Their jurisdiction is defined and their citizens are protected with minimum standards.

Very dedicated people on the Wind Siting Council gave their very best effort to come up with a detailed, reasonable rule. They had tons of public input. The original legislation even has a built-in review by the DNR, and requires the Siting Council to report back to the legislature. I urge you to respect the effort and the process and wait to make changes depending on how well the new rule works.

Finally, let's acknowledge that you've pretty much heard it all. All the arguments. What's different now, though, compared to two or three years ago when this rule was being developed is ^{hurting} for jobs. I very much hope ^{Wisconsin is} this rule will stand, and allow this form of economic development to proceed in Wisconsin.

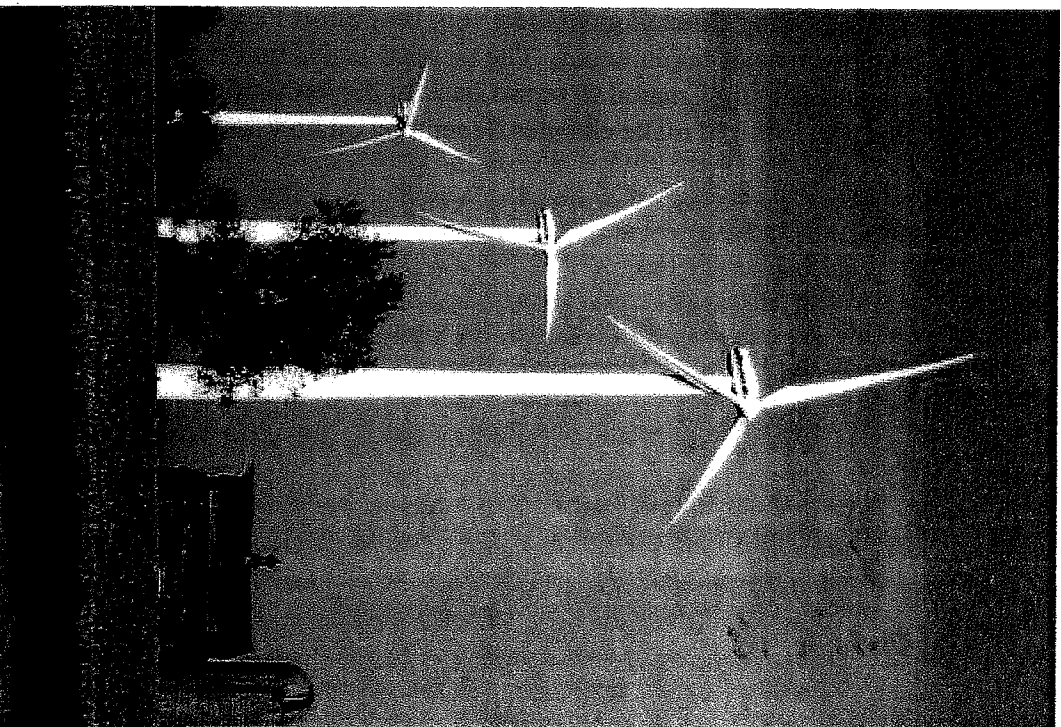


Case Study: Minnesota



107-MW Minnesota wind project

- \$500,000/yr in lease payments to farmers
- \$611,000 in property taxes in 2000 = 13% of total county taxes
- 31 long-term local jobs and \$909,000 in income from O&M (includes multiplier effect)



My name is Megan Falk. I am the daughter of Ann Wirtz. Our family lived in the Forward Wind Project in Dodge County.

We moved to this country home when I was in kindergarten. I had no health problems the entire time I was raised there, until after the wind turbines went up.

I have always been and still remain an honor roll student. I've also been involved in many different sports including basketball, volleyball and soccer. I even played on the Varsity teams as a freshman. Overall I was a very involved and busy individual.

After the wind turbines ~~went up~~ began to spin in 2008 everything changed for me. I started having stomach aches that I had never felt before. The frequency increased as well as the severity of them. Initial trips to my pediatrician eventually left me to be referred to a specialist. By this time I was losing a lot of my strength and weight. My energy level was at an all time low and it became difficult to stick to my busy schedule.

Everyday I was feeling worse and I ^{was} starting to pass blood regularly. Eventually I had a colonoscopy and it was found that I had ulcers all the way through my intestines. At that time I was diagnosed with Crohn's Disease.

Shortly after we found out that Crohn's can be triggered by environmental stress.

But I wasn't the only person in my family affected by the wind turbines. My mom could never sleep once they were there. She was absolutely exhausted all the time. The stress and anxiety for her was overwhelming. Even having friends stay the night left them complaining of headaches each time.

In Sept. of 2009 my family left our home. We moved to the village of Oakfield. We couldn't sell our house and we were desperate to leave.

Since moving my mom has been able to sleep well again. I too have gotten better. Another colonoscopy since leaving has shown my ulcers are gone. It has taken me quite some time to get my strength back.

We are living proof that living close to wind turbines is not healthy. My family has been forced to sacrifice a lot because of this and looking out for our health.

The closest wind turbine was approximately 1350 ft from our home. Because of this we are no longer able to call it our home it is just a house we were forced from as we drive by today.

Megan Falk

324 Oakview Cr.

Oakfield, WI 53065

(920) 517-8142

megan-falk23@
hotmail.com

Thank you for letting me speak

Jan Elizabeth Ebertz Town of Marshfield
Blue Sky / Green Field

I would like to tell you, a few of many noise issues my family had experienced. My son had to have major surgery, told him to stay over night, had to get up early. Next morning he told me he couldn't sleep. It was like an airplane above the house. Know the sound because he works close to the airport at Appleton, but ^{he} at work to goes away. My granddaughts like to have sleep-overs but can not because of the noise. Have a garden, can only go out on calm days. If windy, only an half an hour, the pressure builds up in my head. It feels like it would explode.

On Sept. 18th. at 3:00 a.m. called The Emergies to report the loud noise that woke me up. Steve Pingo from The Emergies called me back about 9:00, said if they couldn't get it fix today it would be turned off. This turbine is 2,000 ft from my home. Also Ken Kraus reported it, the turbine is on his land. Talked to Town of Marshfield committee about the noise, but was not on the Sept report. Went to ~~Town~~ ^{Town} of Marshfield monthly meeting, to get it put on the Sept report. After 3 mos. of trying, to get back on report, We Emergies told John Bord, Town Chairman, that they have no records of the calls

and are sorry.

So if they have no record of the call why did Steve Pingo call me back to tell me what they are going to do.

Could you please tell me as a committee, what do you make your decision on? If you base them on reports from We Energies, not knowing it not correct, how can you make the right decision?

I would like to know who we can contact if the noise is not reported, also other issues that come up.

Because with lack of sleep, the noise not going away, ^{it} feels like I am at the edge of a cliff and nobody cares.

Sincerely,
Elizabeth Ebertz

1-920-795-4133

Telephone Numbers

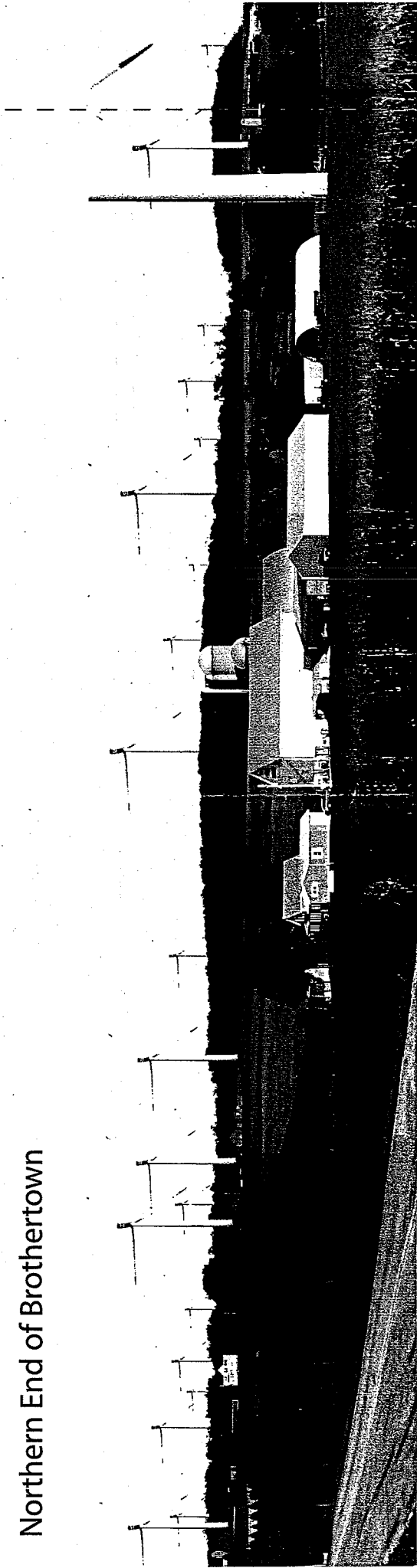
V.E. 1-877-380-0522

Steve Pingo - 1-920-980-3324 (from We Energies)

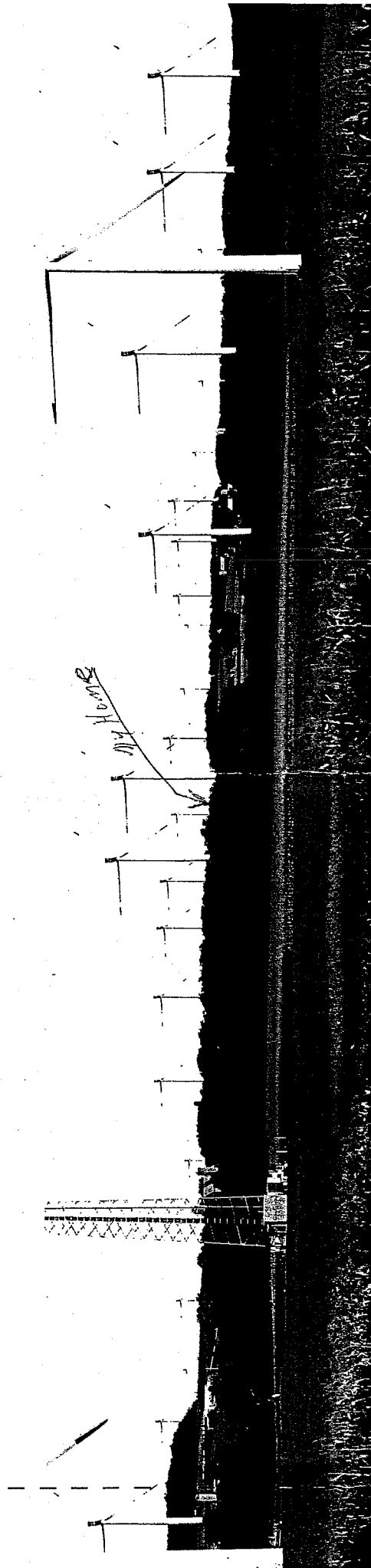
Ken Kraus - 1-920-795-4557 (Side Supervisor Town of Marshfield)

John Bord - 1-920-753-2100 (Town Chairman Town of Marshfield)

Northern End of Brothertown



Southern End of Brothertown

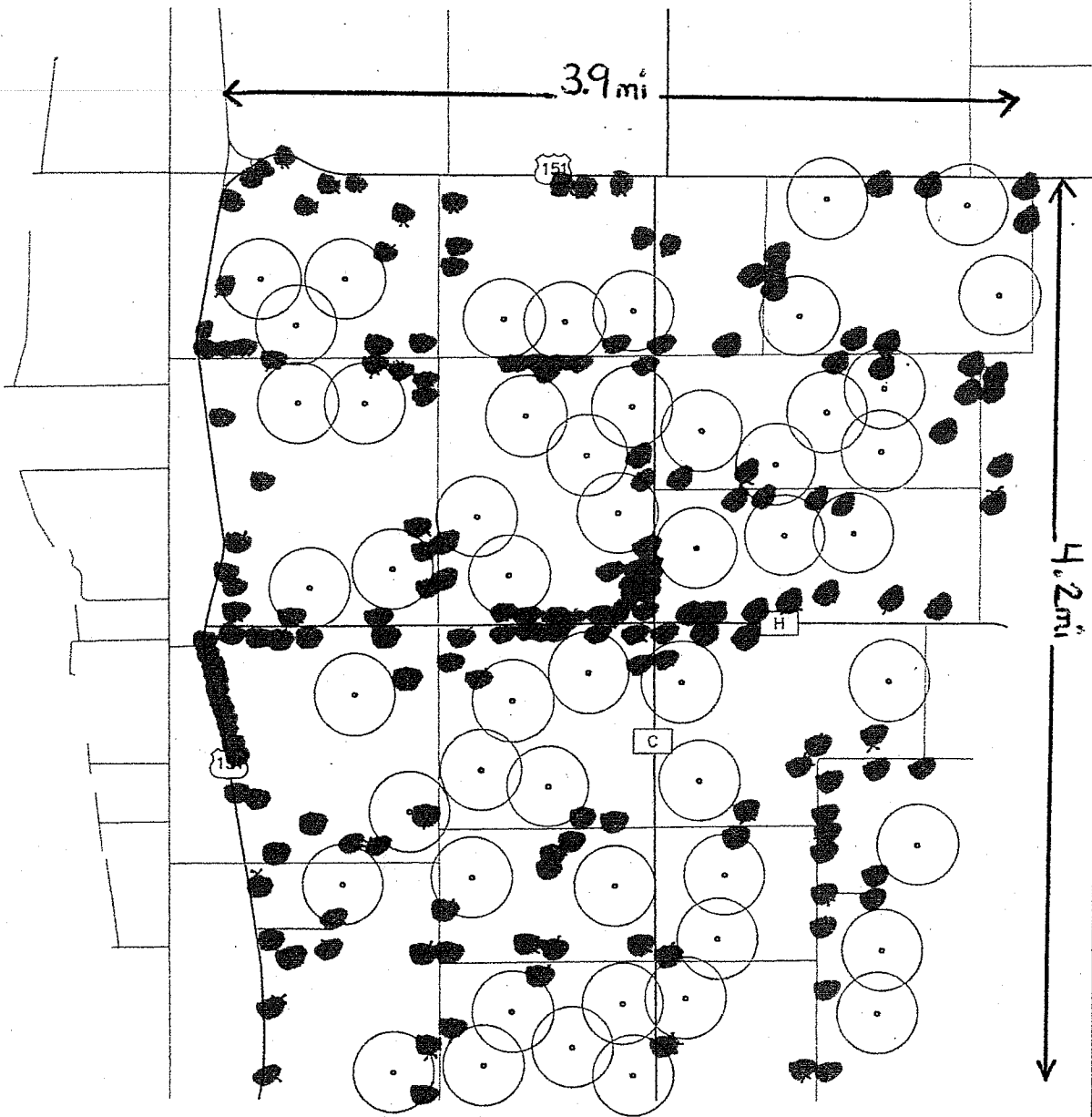


52 turbines
190 residences

Average of 3.7 residences per turbine

How Can This Be Safe?

Proposed Brothertown, WI Industrial Wind Factory Layout
Locations From FAA Website
Circles are 2000 feet in diameter



Disclaimer: to the best of our knowledge these proposed turbines are accurate.
They are mapped according to the latitude and longitude locations from the FAA website.