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Details:

(FORM UPDATED: 08/11/2010)

**WISCONSIN STATE LEGISLATURE ...
PUBLIC HEARING - COMMITTEE RECORDS**

2009-10

(session year)

Senate

(Assembly, Senate or Joint)

**Committee on ... Commerce, Utilities, Energy, &
Rail (SC-CUER)**

COMMITTEE NOTICES ...

- Committee Reports ... **CR**
- Executive Sessions ... **ES**
- Public Hearings ... **PH**

INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL

- Appointments ... **Appt** (w/Record of Comm. Proceedings)
- Clearinghouse Rules ... **CRule** (w/Record of Comm. Proceedings)
- Hearing Records ... bills and resolutions (w/Record of Comm. Proceedings)
 - (**ab** = Assembly Bill) (**ar** = Assembly Resolution) (**ajr** = Assembly Joint Resolution)
 - (**sb** = Senate Bill) (**sr** = Senate Resolution) (**sjr** = Senate Joint Resolution)
- Miscellaneous ... **Misc**

- ▶ Home
- ▶ Lobbying in Wisconsin
- ▶ Organizations employing lobbyists
- ▶ Lobbyists

Presented by the Wisconsin
Government Accountability Board

as of Monday, May 18, 2009

2009-2010 legislative session
Legislative bills and resolutions

(search for another legislative bill or resolution at the bottom of this page)

Senate Bill 185

regulation of wind energy systems and granting rule-making authority. (FE)

TEXT
sponsors
LBR analysis

STATUS
committee actions and
votes
text of amendments

COST & HOURS
of lobbying efforts
directed at this
proposal

Organization		These organizations have reported lobbying on this proposal:	Place pointer on icon to display comments, click icon to display prior comments		
Profile	Interests		Date Notified	Position	Comments
●	●	Alliant Energy	5/6/2009	↑	
●	●	Associated General Contractors of Wisconsin Inc	5/12/2009	↑	
●	●	ATC Management Inc.	5/13/2009	↑	
●	●	Citizens Utility Board	5/5/2009	↑	
●	●	Clean Wisconsin Inc	5/6/2009	↑	
●	●	Clean, Responsible Energy for Wisconsin's Economy	5/11/2009	↑	
●	●	Coalition For Wisconsin Environmental Stewardship	5/6/2009	↓	
●	●	Construction Business Group	5/12/2009	↑	
●	●	Customers First! Coalition	5/5/2009	↑	
●	●	IBEW Local Union 2150	5/11/2009	↑	💬
●	●	Invenergy Wind LLC	5/8/2009	↑	
●	●	League of Wisconsin Municipalities	5/11/2009	↑	
●	●	League of Women Voters of Wisconsin Education Fund Inc	5/12/2009	↑	💬
●	●	Madison Audubon Society Inc	5/11/2009	↓	💬
●	●	Madison Gas & Electric Company	5/5/2009	↑	
●	●	Midwest Food Processors Association Inc	5/13/2009	↔	
●	●	Municipal Electric Utilities of Wisconsin	5/1/2009	↑	💬
●	●	Operating Engineers Local #139	5/7/2009	↑	
●	●	RENEW Wisconsin	5/5/2009	↑	
●	●	Sierra Club - John Muir Chapter	5/12/2009	↑	💬
●	●	Wind on the Wires	5/5/2009	↑	
●	●				

		Wisconsin Agribusiness Council	5/14/2009	↑	
●	●	Wisconsin Builders Association	5/6/2009	↔	
●	●	Wisconsin Counties Association	5/6/2009	↔	
●	●	Wisconsin Farmers Union	5/15/2009	↑	💬
●	●	Wisconsin Industrial Energy Group Inc	5/11/2009	↑	
●	●	Wisconsin Laborers District Council	5/11/2009	↑	
●	●	Wisconsin League of Conservation Voters (WLCV)	5/7/2009	↑	
●	●	Wisconsin Manufacturers & Commerce	5/5/2009	↑	
●	●	Wisconsin Towns Association	5/6/2009	↓	
●	●	Wisconsin Utilities Association Inc	5/5/2009	↑	
●	●	Wisconsin Wildlife Federation	5/7/2009	↓	💬

Select a legislative proposal and click "go"

House

Proposal Type

Proposal Number (enter proposal number)

Legislative Session

- ▶ Home
- ▶ Lobbying in Wisconsin
- ▶ Organizations employing lobbyists
- ▶ Lobbyists

Presented by the Wisconsin
Government Accountability Board

as of Monday, May 18, 2009

2009-2010 legislative session
Legislative bills and resolutions

(search for another legislative bill or resolution at the bottom of this page)

Assembly Bill 256

regulation of wind energy systems and granting rule-making authority. (FE)

TEXT
sponsors
LBR analysis

STATUS
committee actions and
votes
text of amendments

COST & HOURS
of lobbying efforts
directed at this
proposal

Organization		These organizations have reported lobbying on this proposal:	Place pointer on icon to display comments, click icon to display prior comments		
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●	●	Alliant Energy	5/6/2009	↑	
●	●	ATC Management Inc.	5/13/2009	↑	
●	●	Citizens Utility Board	5/6/2009	↑	
●	●	Clean Wisconsin Inc	5/6/2009	↑	
●	●	Clean, Responsible Energy for Wisconsin's Economy	5/11/2009	↑	
●	●	Coalition For Wisconsin Environmental Stewardship	5/7/2009	↓	
●	●	Construction Business Group	5/12/2009	↑	
●	●	Customers First! Coalition	5/5/2009	↑	
●	●	IBEW Local Union 2150	5/11/2009	↑	
●	●	Invenergy Wind LLC	5/8/2009	↑	
●	●	League of Wisconsin Municipalities	5/11/2009	↔	
●	●	League of Women Voters of Wisconsin Education Fund Inc	5/12/2009	↑	
●	●	Madison Audubon Society Inc	5/11/2009	↓	💬
●	●	Madison Gas & Electric Company	5/6/2009	↑	
●	●	Operating Engineers Local #139	5/7/2009	↑	
●	●	RENEW Wisconsin	5/6/2009	↑	
●	●	Sierra Club - John Muir Chapter	5/12/2009	↑	💬
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●	●	Wisconsin Manufacturers & Commerce	5/6/2009	↑	
●	●	Wisconsin Wildlife Federation	5/7/2009	↓	⊗

Select a legislative proposal and click "go"

House Assembly Senate
Proposal Type Bill Joint Resolution Resolution
Proposal Number (enter proposal number)
Legislative Session



Possible SB 185 (Wind Siting) Amendments

- OK
1. **Health Effects** – PSC rules shall consider health effects of wind systems, including noise and shadow flicker.
 - line 17 2. **Decommissioning** – PSC must develop rules for decommissioning of retired wind systems. Owner of wind system will be responsible for decommissioning. ~~to~~ No
 3. **Payments to Neighbors** – PSC rules will allow local ordinances to require wind developers to make payments to landowners located near wind systems to mitigate impacts of turbines. *not payers*
 4. **Payments for Loss of Property Value** – Require PSC to develop process for landowners located near wind systems to make claims to recover losses in property value due to proximity to wind systems within 5 years of systems becoming operational.

~~to~~
sub 1



Proposed amendment to AB 256/SB 185 submitted by the Wisconsin Wildlife Federation, Wisconsin Audubon Council, and Madison Audubon Society

An amendment requiring that the PSC, after consultation with the DNR, adopt rules establishing setbacks from wind turbines to protect wildlife.





To:

Senate Committee on Commerce, Utilities, Energy, and Rail
Senate Committee on Environment
Assembly Committee on Energy and Utilities
Assembly Committee on Natural Resources
Assembly Committee on Renewable Energy and Rural Affairs

We are proposing a tour of Invenergy's Forward Wind Energy Center on Monday March 30, 2009, for members of the committee listed above, and potentially other interested legislators.

What: Tour - Forward Energy Center
When: Monday March 30, 2009, beginning 1:30 PM
Where: Brownsville Community Center, 871 W. Main Street (State Highway 49), Brownsville, WI

Spanning four townships and straddling two counties, the 86-turbine Forward Energy Center produces electricity for sale to four Wisconsin utilities:

- Alliant Energy
- Madison Gas & Electric
- WPPI Energy
- Wisconsin Public Service.

The expected annual output from the 129 megawatt project will be over 340,000,000 kilowatt-hours, enough energy to serve 30,000 households. The project began commercial operations on March 2008. You can find more information about the project online through Invenergy's website:

http://www.invenergyllc.com/wind_projects.html#Forward

Sincerely,

Wind for Wisconsin

Wind for Wisconsin is a broad coalition of labor, utilities, agricultural interests, customer groups, environmental organizations, manufacturers, and wind developers who support efforts to improve the permitting environment for commercial wind projects in our state. Wind for Wisconsin believes wind energy can be an economic catalyst for our state that fuels business expansion and job creation. (supporter list on page 2)



Press Conference April 30th @ 10 a.m.

AWEA
Clean Wisconsin
Customers First
EcoEnergy LLC
IBEW 2150
MG&E
Michels Wind Energy
MEUW
Operating Engineers #139
RENEW Wisconsin
Wisconsin Agribusiness Council
Wisconsin Industrial Energy Group*
Wisconsin Manufacturers & Commerce
Wisconsin Laborers' District Council
WPPI Energy

Jeff Anthony 414) 967-5950
Ryan Schryver Speak 251-7020 ext. 25
Matt Bromley 286-0784
Curt Bjurlin Speak 815-266-6018
Forrest Ceel Speak 414-218-1168 (cell)
Greg Bollom

Scott Meske 837-2263
Terry McGowan Speak 262) 896-0139 x 333
Michael Vickerman Speak 255-4044
Ferron Havens 877-947-2474
Todd Stuart 608) 441-5740
RJ Pirlot 661-6935
Tom Roach 846-8242 ext. 228
Joint statement with MEUW

*Tentative

Dan Ebert / Scott Meske



Wind Siting Reform Critical

Currently, all wind energy proposals under 100 megawatts (MW) are reviewed at the local level. Though state law prohibits local jurisdictions from restricting wind development unless the regulations serve to protect public health and safety, there are no agreed-upon standards for satisfying that requirement. As a consequence, wind developers often encounter regulatory requirements that delay projects and increase their costs. A number of jurisdictions have adopted ordinances that make it difficult if not impossible for developers to comply with all the restrictions. Over 600 MW of planned wind developments are stalled across Wisconsin, due to midstream changes in regulations and procedures.

Now is the time to remedy this situation before it can cause lasting damage to Wisconsin's ability to attract future wind developments.

The two most significant remedies we seek would:

- Establish, by rule, permitting standards that are uniformly applied by local or state government to all wind energy installations, regardless of size and location;
- Create a procedure for appealing to the Public Service Commission ("PSC") decisions rendered by local jurisdictions on wind energy installations.

The organizations and companies listed below support efforts to improve the permitting environment for commercial wind projects in our state. Under our proposed reforms, all issues relating to public health and safety would be evaluated in a PSC proceeding, and then codified by rule into permitting standards (*e.g.*, setback distances, sound output) which would be uniformly applied by all state and local authorities. The rulemaking would also specify data requirements from developers (*e.g.*, environmental impacts) as well as define their financial obligations (*e.g.*, decommissioning). All commercial wind projects would conform to these standards. Once these standards have been codified, local governments would not be able to impose restrictions on wind energy installations that exceed what is set forth in the new rules.

Another important change we seek is a mechanism for allowing PSC appellate review of local decisions on permitting wind energy projects. We support the establishment of a procedural framework like the appeals process specified under the state's large livestock siting law.



NEED FOR PERMITTING REFORM

Wind is the only renewable energy resource that can scale up to meet the utilities' current renewable energy requirements. We expect that somewhere between 75% and 95% of the energy needed to meet the 10% statewide target will be generated with wind. The single biggest constraint to increasing wind generation in Wisconsin is the permitting environment, which is far more problematic here than in neighboring states.

Permitting reform's specific benefits to wind developers working in Wisconsin are:

- Adherence to rules and procedures that won't change while the project is under development or application is under review;
- Avoidance of permitting and legal expenses that make projects uneconomical; and
- Shortened project development timetables.

Specific benefits to ratepayers, taxpayers, and the environment are:

- Heightened probability of meeting Wisconsin's current renewable energy goal of 10% by 2015 as well as any successor target after that;
- Increased revenues flowing to local governments and landowners, more orders for Wisconsin component manufacturers, and more jobs created in construction, transportation and O&M; and
- Increased opportunities for building community-scale wind installations, such as the six-turbine, 9 MW wind project proposed in the Town of Springfield in Dane County.

For more information about this proposal contact Curt Pawlisch (pawlisch@cwpb.com) or Noah Seligman (seligman@cwpb.com)

Wind for Wisconsin is a coalition sponsored by Wind on the Wires and RENEW Wisconsin.



Wind Energy is a Safe, Proven Technology

Scientists conclude that there is no evidence wind turbines have an adverse impact on human health.¹ Wind opponents have circulated deceptive videos and misleading photos in an attempt to scare legislators into inaction.

- Wind energy is safe, secure, and reliable
- Reject the fear campaign from wind opponents
- SB 185/AB 256 would establish a responsible forum for reviewing scientific information regarding wind energy

There are over 120 Gigawatts² of wind turbines installed worldwide, and since 2005, global wind generation capacity has more than doubled. Currently, 76 countries are using commercial wind energy.³

The U.S. military uses wind turbines to reduce fuel costs and the need for fuel shipments in dangerous areas.⁴

Wind turbines provide safe and reliable energy. At present there are well over 10,000 utility-scale wind turbines installed and operating in North America, and tens of thousands of people who live and work in proximity to these wind turbines. Of these individuals, a very small number have claimed that their health has been adversely affected by wind turbines. Surveys of peer-reviewed scientific literature have consistently found no evidence linking wind turbines to human health concerns.

Wind power opponents frequently quote Nina Pierpont to frighten the public and convince decision makers that wind power is dangerous. Her view is not supported by scientists who specialize in acoustics, low frequency sound and related human health impacts. It is important to point out that Dr. Pierpont's writings have not been published in peer-reviewed journals, a fact that raises questions as to the scientific validity of her research.

¹ http://www.canwea.ca/media/release/release_e.php?newsId=37

² 1 Gigawatt = 1 billion watts.

³ http://www.windea.org/home/images/stories/worldwindenergyreport2008_s.pdf

⁴ <http://www.csmonitor.com/2006/0907/p01s04-usmi.html>



The Canadian Wind Energy Association (CanWEA) has compiled a list of articles and publications on the subject from reputable sources in Europe and North America. Below are summaries of these articles:

1. **"Infrasound from Wind Turbines – Fact, Fiction or Deception?"** by Geoff Leventhall in Vol. 34 No.2 (2006) of the peer-reviewed journal Canadian Acoustics. This paper looks at the question of whether or not wind turbines produce infrasound at levels that can impact humans. It directly addresses assertions frequently made by Dr. Nina Pierpont, author of a recent book entitled "Wind Turbine Syndrome". *"In the USA, a high profile objector (Nina Pierpont of Malone NY) placed an advertisement in a local paper, consisting entirely of selected quotations from a previously published technical paper by van den Berg (Van den Berg 2004). However the comment "[i.e. infrasonic]", as shown in Fig 3, was added in the first line of the first quotation in a manner which might mislead naive readers into believing that it was part of the original. The van den Berg paper was based on A-weighted measurements and had no connection with infrasound. So, not only is the advertisement displaying the advertiser's self deception, but this has also been propagated to others who have read it. [...] The comment, [i.e. infrasonic], added into Fig 3 gives incorrect information. Claims of infrasound are irrelevant and possibly harmful, should they lead to unnecessary fears."*
www.wind.appstate.edu/reports/06-06Leventhall-Infras-WT-CanAcoustics2.pdf

2. **"Wind Turbine Facilities Noise Issues"** by Dr. Ramani Ramakrishnan for the Ontario Ministry of the Environment. This study looked into the claims made in the doctoral thesis of G.P. van den Berg, a source frequently cited by Dr. Pierpont. It concluded that: *"The research work undertaken by G. P. van den Berg didn't provide scientific evidence to support the few major hypotheses postulated concerning the wind turbine noise characteristics."*
http://www.ene.gov.on.ca/envision/env_reg/er/documents/2008/Noise%20Report.pdf

3. **"Wind Turbine Acoustic Noise"**, A White Paper by Dr. Anthony Rodgers at the University of Massachusetts at Amherst. This paper looked into the issue of both sound and infrasound (low frequency sound) and concluded *"There is no reliable evidence that infrasound below the perception threshold produces physiological or psychological effects."*
http://www.ceere.org/rerl/publications/whitepapers/Wind_Turbine_Acoustic_Noise_Rev2006.pdf

4. **"Research into Aerodynamic Modulation of Wind Turbine Noise"**, University of Salford, UK, July 2007. This paper looked into claims that it was not infrasound, but "amplitude modulation" (AM) that presented problems. The paper concludes that *"This shows that in terms of the number of people affected, wind farm noise is a small-scale problem"*



compared with other types of noise; for example the number of complaints about industrial noise exceeds those about windfarms by around three orders of magnitude” and that “The low incidence of AM and the low numbers of people adversely affected make it difficult to justify further research funding in preference to other more widespread noise issues.”

[http://usir.salford.ac.uk/1554/1/Salford Uni Report Turbine Sound.pdf](http://usir.salford.ac.uk/1554/1/Salford_ Uni_Report_Turbine_Sound.pdf)

5. **“Electricity generation and health”** in the peer-reviewed journal The Lancet. The paper concludes that *“Forms of renewable energy generation are still in the early phases of their technological development, but most seem to be associated with few adverse effects on health”*
<http://www.ncbi.nlm.nih.gov/pubmed/17876910>

6. **“Health impact of wind turbines”**, prepared by the Municipality of Chatham-Kent Health & Family Services Public Health Unit. This is a comprehensive review of available literature on the subject. This paper concludes and concurs with the original quote from Chatham-Kent’s Acting Medical Officer of Health, Dr. David Colby: *“In summary, as long as the Ministry of Environment Guidelines for location criteria of wind farms are followed, it is my opinion that there will be negligible adverse health impacts on Chatham-Kent citizens. Although opposition to wind farms on aesthetic grounds is a legitimate point of view, opposition to wind farms on the basis of potential adverse health consequences is not justified by the evidence.”* <http://www.chatham-kent.ca/NR/rdonlyres/CA6E8804-D6FF-42A5-B98B-5229FA127875/7046/5a.pdf>

7. **Energy, sustainable development and health**, World Health Organization, June 2004. The study finds that *“Renewable sources, such as photovoltaic and wind energy, are associated with fewer health effects. [...] The increased use of renewable energy, especially wind, solar and photovoltaic energy, will have positive health benefits, some of which have been estimated.”* There is also a table on page 79 showing the relative health effects of nearly all sources of energy, which clearly shows wind as negligible.
<http://www.euro.who.int/document/eehc/ebakdoc08.pdf>



Wind Energy = Strong Editorial Support

SB 185/AB 256 (Wind Siting Reform) has earned the support of editorial boards from across the state. Wind energy growth will create jobs and attract needed investment dollars for local economies. SB 185/AB 256 is a needed regulatory reform that will eliminate costly barriers to renewable energy development.

Wisconsin State Journal, May 16, 2009

"A win for wind power in Wisconsin"

At stake is not only a clean, renewable source of energy, but also the state's economic vitality... Wisconsin can protect the health and safety of residents and encourage wind farm development. The proposed wind farm siting reform is the answer.

Eau Claire Leader-Telegram, April 19, 2009

"State should loosen red tape that restricts wind power"

In the coming weeks, the state Legislature will have a chance to make it easier for clean-energy creating wind turbines to proliferate in Wisconsin... Critics likely will charge that the bill is an attack on local control. However, it still lets local governments make wind-siting decisions, and allows those who disagree with them to appeal to the PSC and the courts.

Sheboygan Press, April 17, 2009

"Have uniform rules for siting wind turbines"

Wisconsin should move ahead with uniform rules and regulations for siting power-generating wind turbines that could be applied statewide... it is quite apparent that the desire to come up with reasonable rules is not universal. Some towns have written siting rules in such a way to ban wind turbine projects entirely.

Tomah Journal, April 2, 2009

"Enact statewide standards for wind turbines"

Renewable energy must replace fossil fuels sometime, and the process may as well start now. Part of the solution is wind energy... Wind power won't reach its full potential until the state establishes uniform standards for siting wind turbines... it's an unavoidable reality that that energy generation must occur somewhere.



The Country Today, January 28, 2009

“Not-in-my-backyard attitude a continuing problem”

Within the past week, stories have crossed our desks about a large dairy project near Rosendale, a Manitowoc County wind farm and a community animal-manure digester project in Dane County. In all three cases, millions of dollars would be invested - during the toughest economic times in about 60 years - to help stimulate the economy. Each of the projects would provide good rural jobs... The economy desperately needs stimulation, and agricultural and rural projects stand ready to meet the challenge. But many of the projects face opposition... The projects that could provide immediate economic stimulation could become bogged down by a plethora of opposition and regulations. If we want to put people back to work and get this country's economy back in gear, some people might have to change their mind-sets

Milwaukee Journal Sentinel, February 26, 2008

“Blowin’ in the wind”

Right now, state law requires state regulators to approve large wind farms but leaves the decision-making on smaller projects to local units of government. While local governments should have a say in siting wind farms - or anything else - in their jurisdiction, giving them the ability to outright ban small projects goes too far. And standards for wind farms should not vary widely from community to community.

Wisconsin State Journal, March 18, 2009

“Don’t blow chance for wind power”

Wisconsin cannot afford to let the statewide interest in harnessing clean, renewable power from the wind be frustrated by local “not in my backyard” campaigns against wind farms... Too often, local governments are cowed by “not in my backyard” worries about the impact of wind turbines -- worries that may be based on misinformation but that local governments lack the expertise to evaluate. The result is impossible-to-meet restrictions that draw small wind farm development to halt.



CAMPAIGN SUPPORTERS

- Addison Wind Energy, LLC
- AgWind Energy Partners
- American Transmission Company
- American Wind Energy Association
- Associated General Contractors of Wisconsin, Inc.
- Babcock & Brown
- Boldt Construction
- Broadwind Energy
- Citizens Utility Board
- Clean Wisconsin
- Construction Business Group
- Customers First Coalition
- Dairyland Power Cooperative
- EcoEnergy, LLC
- Emerging Energies, LLC
- Federal Marine Terminals, Inc.
- Fednav
- Great Lakes Utilities
- Horizon Wind Energy
- Iberdrola Renewables
- IBEW 2150
- IBEW 965
- Invenergy, LLC
- IUOE Local 310
- Lake Michigan Wind and Sun
- League of Women Voters – Wisconsin
- Madison Gas & Electric
- Michels Wind Energy
- Midwest Renewable Energy Association
- Midwest Wind Energy
- Municipal Electric Utilities of WI
- Natural Resources Consulting, Inc.
- Operating Engineers Local #139
- Orion Construction Group
- Orion Energy Systems
- Port of Milwaukee
- Renewegy
- RENEW Wisconsin
- Ritger Law Office
- Seventh Generation Energy Systems
- Sierra Club – John Muir Chapter
- Union of Concerned Scientists
- United Steel Workers
- Uriel Wind, Inc.
- Wausaukee Composites
- Wind Wisconsin
- Wisconsin Agribusiness Council
- Wind Capital Group
- Wind on the Wires
- Wisconsin Commercial Ports Association
- Wisconsin Environment
- Wisconsin Farmers Union
- Wisconsin Farm Bureau Federation
- Wisconsin Industrial Energy Group
- Wisconsin Laborers' District Council
- Wisconsin League of Conservation Voters
- Wisconsin Manufacturers and Commerce
- WPPI Energy
- Wisconsin State Council of Carpenters
- Wisconsin Utilities Association
- Xcel/Northern States Power-Wisconsin

Note: while the endorsing entities support the proposal as summarized herein, their endorsement should not be construed as a blanket endorsement of future legislative or regulatory changes to permitting wind energy systems in Wisconsin.





For Immediate Release: August 28, 2009

Contact:
Todd Stuart
Wisconsin Industrial Energy Group
office: 608-441-5740
cell: 608-320-1669

Contact:
Charlie Higley
Citizens Utility Board
office: 608-251-3322 x. 14
cell: 608-843-6996

Electricity Consumers Sue PSC Regarding Wind Farm *PSC Ignored Law in Approving Half-Billion-Dollar Project*

MADISON – The Wisconsin Industrial Energy Group and the Citizens Utility Board today filed a lawsuit against the Public Service Commission of Wisconsin (PSC) for ignoring state law in approving a wind power project to be built in Minnesota, owned by Madison-based Wisconsin Power & Light Co. (WPL), and paid for by WPL’s Wisconsin customers.

“Electric rates have been rapidly rising so we simply can’t afford less stringent regulatory review of new energy projects,” said WIEG executive director Todd Stuart. “The cost and need of energy infrastructure can’t be ignored, especially right now with the massive job losses in Wisconsin.”

On June 6, 2008, WPL submitted an application to the PSC for approval to build and own a 200-megawatt wind farm called Bent Tree, to be located in South Central Minnesota, at an estimated cost of \$497 million. WPL’s application requested a “certificate of convenience and necessity” or CPCN, which a utility must obtain from the PSC before the utility can build a new power plant of 100 megawatts or more.

Because the project would be built in another state, on November 6, 2008, the PSC issued an order following a 2-1 vote saying that it would review WPL’s application as one seeking a “certificate of authority” or CA, rather than under the more stringent requirements for obtaining a CPCN. Commissioner Lauren Azar disagreed and voted against reviewing the project under the CA process; she issued a dissenting opinion in which she asserted that Wisconsin law requires utilities to receive a CPCN, regardless of where the project is located. Earlier, in comments filed in July 2008, both WIEG and CUB urged the PSC to use the CPCN process as required by state law.

On July 31, 2009, the PSC issued an order granting WPL a CA for its Bent Tree Wind Farm, even though both WIEG and CUB had submitted legal briefs in May 2009, again pointing out that state law requires utilities to receive a CPCN before constructing a project like Bent Tree.

(more)

In general, a certificate granted under the CPCN process means that the PSC has determined that the project is needed to provide Wisconsin customers with electricity, and that the cost and environmental impacts of the project are reasonable when compared to alternatives.

In filing the lawsuit, WIEG and CUB contend that the PSC ignored Wisconsin law, which states that a utility cannot build a power plant of 100 megawatts or more unless the utility has received a CPCN.

This case is of statewide importance because significantly less review by the PSC is required in granting a CA, and customer groups like CUB and WIEG may have no opportunity to provide testimony and legal opinions regarding a proposed project's appropriateness for providing Wisconsin consumers with electricity at reasonable prices.

"CUB and WIEG are suing the PSC because the agency side-stepped the more thorough CPCN process, which is designed to protect consumers from paying for poorly designed or expensive power plants that can cost hundreds of millions of dollars or more," said Charlie Higley, CUB executive director. "Though CUB believes wind power projects like Bent Tree can play an important role in meeting Wisconsin's electricity needs, the PSC must use the CPCN process to make sure consumer interests are protected."

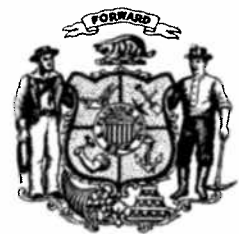
###

The Wisconsin Industrial Energy Group is a nonprofit consumer advocacy trade association that represents most major Wisconsin manufacturing industries including paper, malting, automobile, food processing, chemical, metal casting, and fabricating. WIEG's primary focus is to advocate for reliable and cost effective gas and electric service for Wisconsin energy consumers.

The Citizens Utility Board of Wisconsin is a member-supported nonprofit organization that advocates for reliable and affordable utility service. CUB represents the interests of residential, farm, and small business customers of electric, natural gas, and telecommunication utilities before the Legislature, regulatory agencies, and the courts.



WISCONSIN STATE LEGISLATURE





Dedicated to making sure that wind turbines get sited the *RIGHT WAY*.

Dear Legislator,

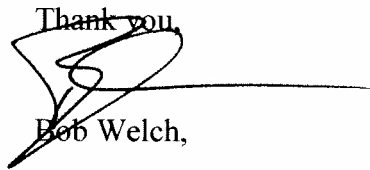
This folder is your copy of the Coalition for Wisconsin Environmental Stewardship (CWEST) Wind Information Packet.

Enclosed, you will find a little information about our organization, *Wind Facts: What The Wind Companies Won't Tell You* and our first *Wind Files* distributions from 2008.

More *Wind Files* will be coming your way during 2009; we hope you find this folder convenient for keeping abreast of issues surrounding wind turbine siting.

If you ever have any questions, concerns or comments about wind energy, don't hesitate to get in touch with us.

Thank you,

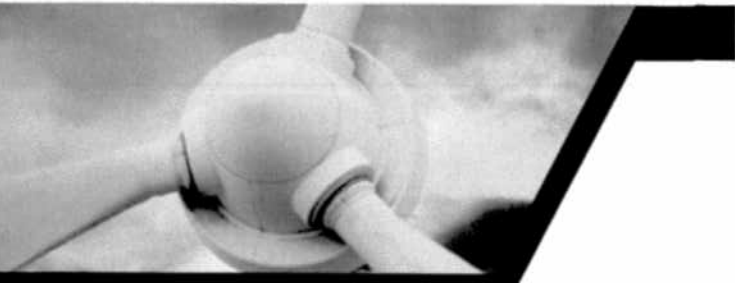


Bob Welch,

Representative for Coalition for Wisconsin Environmental Stewardship

CWEST

Coalition for Wisconsin Environmental Stewardship



Dedicated to making sure that wind turbines get sited the *RIGHT WAY*.

ABOUT US...

The Coalition for Wisconsin Environmental Stewardship (CWEST) is a statewide grassroots organization of people concerned about the responsible placement of wind turbines. Its primary goal is to provide a central source for gathering and disseminating reliable information about industrial wind plant siting, issues relating to the industrial wind turbines and their effects on residents.

A FEW THING ABOUT WIND ENERGY...

While we believe wind energy can become a viable green energy solution, there are a few things you need to know.

Wind turbines can be **40 stories tall** and as close as **1000 feet to your home**. This can result in increased noise levels to near **jet engine volume** and other concerns such as **shadow flicker**.

We believe in proper wind turbine siting to reduce and protect your family from adverse health risks caused by improper distance.

FIND OUT MORE...

For more facts, news and video clips visit our website: www.CWESTonline.org

Contact: Bob Welch | bob@thewelchgroup.org | 608-819-0150

CWEST

Coalition for Wisconsin Environmental Stewardship

Contact us for more information about wind turbines and how proper siting is good for the community and environment.

608-819-0150

contact@westonline.org

www.cwestonline.org



Dedicated to making sure that wind turbines get sited the *RIGHT WAY*.

Wind Facts: What The Wind Companies Won't Tell You

We have been misled. The benefits of industrial wind turbine electrical generation are overstated and environmental/economic costs greatly understated. So what are the problems? Here are some links to get you started on your own research.

Wind farms do not stop the need for reliable generating capacity.

Reliable generating capacity must always be available to "back up" unreliable wind energy. New capacity will have to be added as electricity demand increases whether or not turbines are built. This could mean that you will pay twice — once for expensive wind projects and again for reliable generating capacity.

Large costs for "wind farms" are shifted to ordinary taxpayers and electric customers. Subsidies, tax breaks, R&D funding, state payments to developers, guaranteed markets from mandated "renewable portfolio standards" and mandated purchases of "green electricity" by government agencies, and states requiring utilities to offer "green" electricity at higher prices keep this venture green ... for investors.

Check out: www.abanet.org/enviro/committees/renewableenergy/teleconarchives/121504/feoppt.pdf and www.aweo.org/Schleede.html

"Wind farms" have significant adverse effects on the environment and wildlife.

Turbines kill large numbers of bats and birds and fragment habitat.

Check out: www.cbc.ca/technology/story/2006/09/08/batsturbines.html www.wind-watch.org/documents/category/subjects/impacts/wildlife/ www.protecttheflinthills.org/

Opposition to the "wind rush" is not isolated.

Citizens across the world are rising up in protest to massive turbine developments in their areas.

Check out: www.wind-watch.org www.savespurlensrig.org.uk www.dunionhill-conservation.org.uk www.mlg.org.au/

Turbines present serious health risks.

Besides blade thump and the low-frequency hum, wind turbines present serious health concerns. Nina Pierpont, M.D., board-certified pediatrician licensed in New York, has discovered such problems as elevated blood pressure, increased stress hormones, disturbed sleep and breathing, problems for those with motion sickness and vertigo/strobe problems for those with seizure disorders.

Check out: www.windturbinesyndrome.com

Turbines present other risks.

Ice throw to collapse, they are not good neighbors.

Check out: rawdenbydale.co.uk/turbine-accidents.htm www.wind-watch.org/documents/permitting-setbacks-forwind-turbines-in-california-and-the-blade-throw-hazard/

**For more information or to visit these links go to:
www.CWESonline.org**

1000

The Magic Number?

The Public Service Commission states that living within 1000 feet of a wind turbine is a safe distance for your family. But a turbine company's own operating manual tells a different story.

The PSC's proposed "siting reform" would allow turbines to be sited only 1000 feet from a residence. Most local governments faced with this decision have *sided with the turbine manufacturers* and opted for set backs of 1300 feet or more. Attached is a page from a turbine manufacturer's safety manual. If 1300 feet is the safe distance for a skilled operator, how can 1000 feet be safe for your family?

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



This memo was originally distributed by a Flight For Life Office in the Fond du Lac area. Wind companies have repeatedly indicated that windmill farms pose no hazards to society.

Important Information from FLIGHT FOR LIFE about Windmill Farms

Windmill Farms present Additional Hazards to Air Medical Transport Systems:

- These windmills stand approximately 400 feet high with a wingspan of 270 feet.
- Visibility of them at night or with gray skies is limited.
- They can create vortices equal to the turbulence created by a 747 aircraft.
- The windmill farms are generally grouped into defined "clusters." Only wind mills along the circumference of each cluster are identified with obstruction lights!



- Due to safety considerations, **FLIGHT FOR LIFE** will not land within these clusters because of the risks posed to air medical transport.
- **FLIGHT FOR LIFE** will work with your department to determine a safe landing zone perimeter surrounding each windmill farm cluster within your services' response area.

We would be happy to discuss our operations relating to a windmill farm cluster specific to your department's service area. Please call our **FLIGHT FOR LIFE** - Fond du Lac Base office at (920) 924-0062 and we will arrange a time to meet with you.

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.

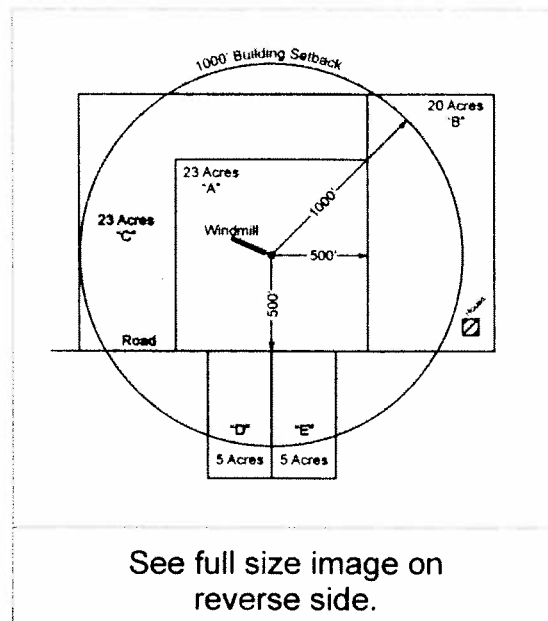
The theoretical environmental benefits of siting industrial wind turbines go to the entire planet. But the costs are overwhelmingly borne by neighboring landowners in terms of plummeting land values, loss of control over their property, and noise effects that can have long term health consequences.



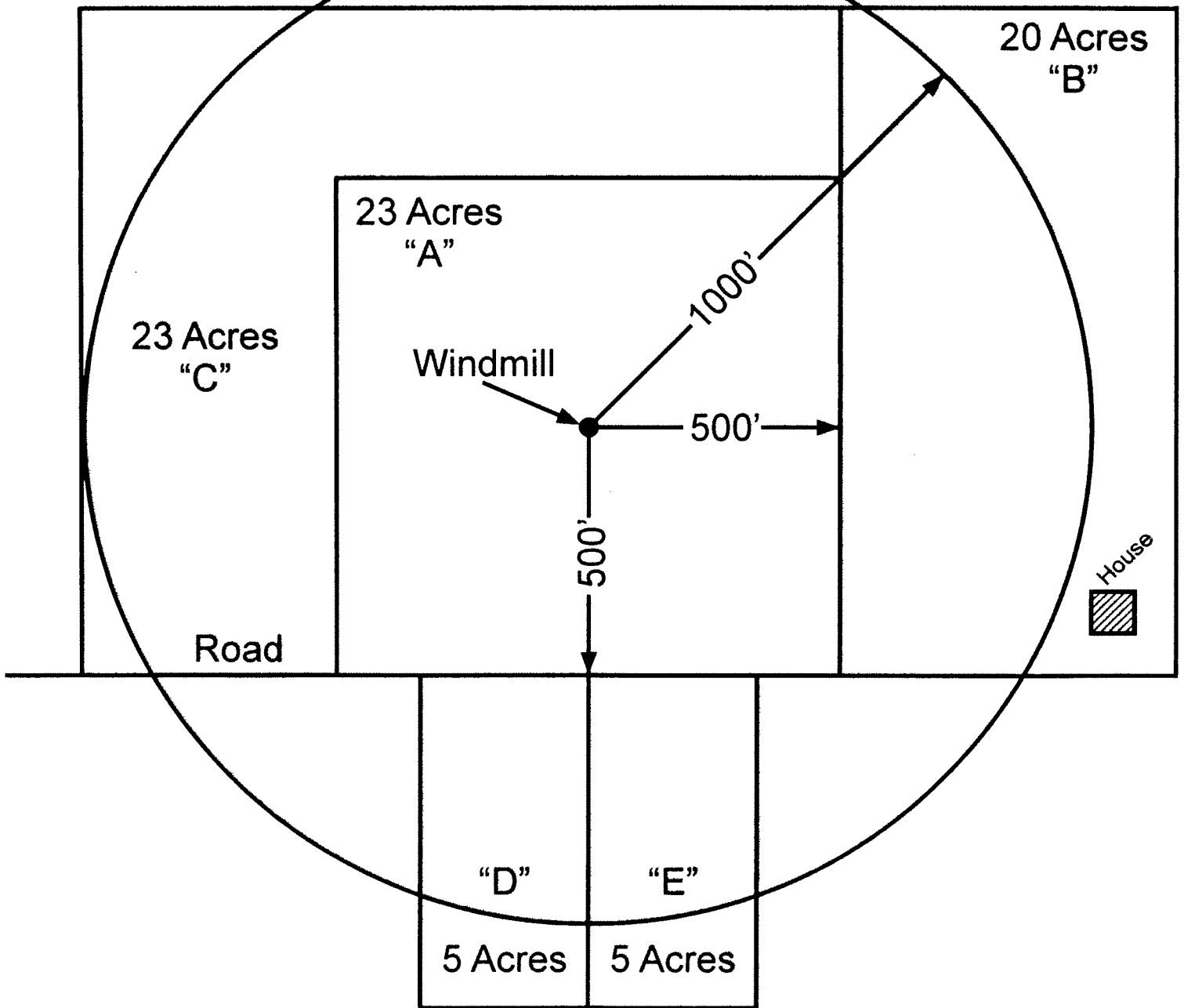
The Wisconsin Legislature can assure that the cost/benefit distribution is done more fairly.

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



IS WISCONSIN WIND THE BEST WAY TO A RENEWABLE FUTURE?

At a recent meeting of the Assembly Renewable Energy Committee, PSC Chairman Eric Callisto made the following remark " ...we need to seek out the best resource from an economic perspective. And right now Wisconsin wind, and I'm focused on terrestrial wind, is not as strong as wind to the West - Iowa, Minnesota, the Dakotas." We agree.

Why does this matter?

Because the legislature soon faces the prospect of trying to reform Wisconsin's wind turbine siting regime. You will be asked to completely override local input and control in favor of a state mandated siting regime written largely by the wind turbine investors.

If Wisconsin wind needed to be utilized to make our renewable portfolio standard (RPS) percentages, then it might be worth the loss of local control.

But in order to understand good wind v. bad wind one needs to know about **capacity factor**.

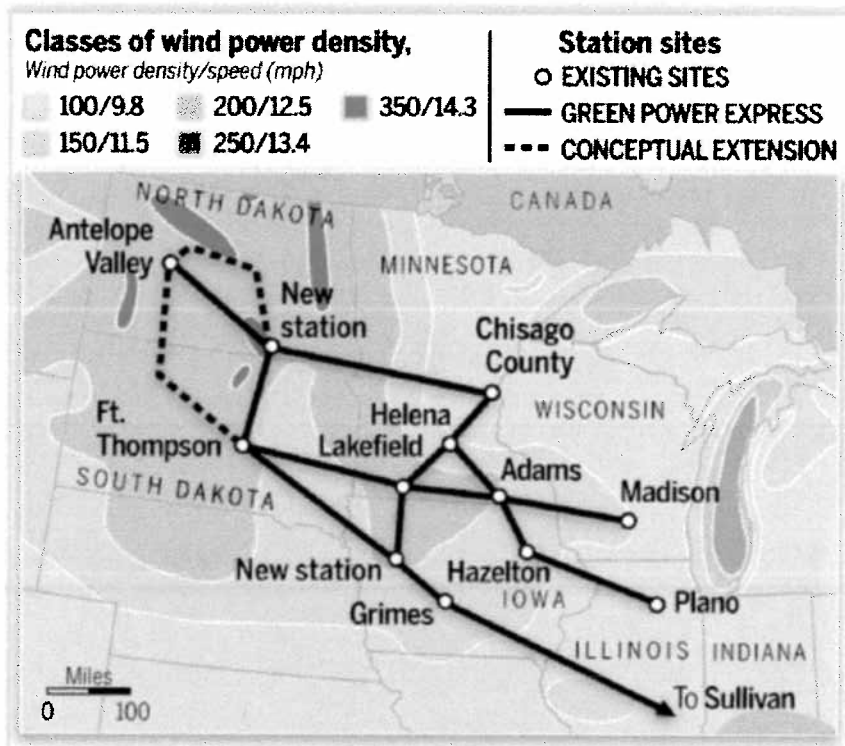
Capacity factor means the percentage of rated capacity that a wind turbine will actually deliver to the grid. More wind equals higher capacity factor. The advantages of a site go down as the capacity factor goes down, both in terms of real economic output and in terms of greenhouse gas savings per turbine.

Out West it is not uncommon to see a capacity factor of 35%. But in Wisconsin we are lucky to see a capacity factor of 25%. The windmills in Montfort are averaging about 21% capacity factor; the turbines in Kewaunee County are at 17%. Source: Department of Energy

Perhaps the best way to meet our growing demand for renewables is not to cram wind turbines into residential neighborhoods in Wisconsin, but to seek out the best available wind resource and bring the electricity here.

Wisconsin's RPS is scheduled to get us to 10% by 2015 - meaning we need an additional 630 MgW. At the estimated \$2 million/MgW of installed wind power here is the math:

Good Wind - 35% capacity factor - total cost to construct - **\$3.6 billion**
 Typical Wisconsin Wind - 25% capacity factor - total cost to construct - **\$5.04 billion**



Source: Green Power Express BOB VEIERSTHALER/rveiersthaler@journalsentinel.com

Sure there is a cost for transmission lines, but wouldn't we need to build those anyway?

Chairman Callisto also said, "Choices we make now are going to impact this country, this state, half a century from now. We've got to make sure we get it right."

We couldn't agree more.

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

Don't be fooled

April 16, 2009

You recently received a bill draft LRB 1048/4, being circulated by Sen. Plale and others. This draft does NOT represent an improvement over last session's attempt to completely eliminate local input with regards to wind siting.

This so-called reform will strip local governments of their ability to manage land use wherever wind developers choose to site their turbines. Land use plans, potential development areas and rural housing communities will all be completely irrelevant to the PSC's plan to put wind turbines any place the developers want them.

Why is the PSC so intent on cramming wind turbines into rural communities? Because they are single-minded in their attempt to meet the standards of Wisconsin's Renewable Portfolio Standards (RPS). This is not a bad thing, but it makes them an unsuitable agency to try to balance the competing interests in this issue.

There is a better way.

Last session the State Senate voted 22-11 to support an amendment which would set up a truly fair process for developing wind siting rules. The PSC cannot be expected to be impartial when they are one of the most driven interests of all!

Also, why can't the state set up a model state standard and still allow local governments to take into account things like unique geography, local comprehensive planning, and population density in the proposed development boundary?

Turbines can provide renewable energy for the state, but they are not free. There are costs to be borne, and they are borne mostly by those living near the windmills. Increased noise levels, decreased property values, shadow flicker, danger from collapsing turbines, and nearly complete interference with phone and TV signals are just some the issues being dealt with by the neighbors of windmills.

Their concerns CAN be dealt with and windmills can still be sited appropriately.

CWEST does not oppose a statewide solution to this problem, but this bill is not an attempt to find a solution, it is an attempt to force windmills into any neighborhood, anywhere, in Wisconsin.

That is not the Wisconsin way.

BusinessWeek

Europe February 10, 2009, 12:47PM EST

Green Energy Not Cutting Europe's Carbon

Wind farms and solar panels are a European success story. But the dirty little secret is that using renewable energy isn't reducing carbon emissions

By Anselm Waldermann

Germany's renewable energy companies are a tremendous success story. Roughly 15 percent of the country's electricity comes from solar, wind or biomass facilities, almost 250,000 jobs have been created and the net worth of the business is €35 billion per year.

But there's a catch: The climate hasn't in fact profited from these developments. As astonishing as it may sound, the new wind turbines and solar cells haven't prohibited the emission of even a single gram of CO₂.

Even more surprising, the European Union's own climate change policies, touted as the most progressive in the world, are to blame. The EU-wide emissions trading system determines the total amount of CO₂ that can be emitted by power companies and industries. And this amount doesn't change – no matter how many wind turbines are erected.

Experts have known about this situation for some time, but it still isn't widely known to the public. Even Germany's government officials mention it only under their breath. No one wants to discuss the political ramifications.

It's a sensitive subject: Germany is recognized worldwide as a leader in all things related to renewable energy. The environmental energy sector doesn't want this image to be tarnished. Under no circumstances does Berlin want the Renewable Energy Law (EEG) – which mandates the prices at which energy companies have to buy green power – to fall into disrepute.

At the same time, big energy companies have an interest in maintaining the status quo. As a result, no one is pushing for change. Everyone involved is remaining silent.

Not an Instrument against Climate Change

In truth, however, even the Green Party has recognized the problem, as evidenced by an e-mail exchange last year between party energy experts and obtained by SPIEGEL ONLINE. One wrote the following message to a colleague: "Dear Daniel, sorry, but the EEG won't do anything for the climate anyway." Ever since the introduction of the emissions trading system, the Renewable Energy Law had become "an instrument of structural change, but not an instrument to combat climate change."

That means: wind turbines and solar energy plants are revolutionizing Germany's mix of power sources, creating jobs and making the country more independent from imports. But they aren't helping in the fight against climate change.

In the worst case scenario, sustainable energy plants might even have a detrimental effect on the climate. As more wind turbines go online, coal plants will be able to reduce their output. This in itself is desirable – but the problem is that the total number of available CO₂ emission certificates remains the same. In other words, there will suddenly be more certificates per kilowatt of coal energy. That means the price per ton of CO₂ emitted will fall.

That is exactly what happened in recent trading. A certificate to emit a ton of CO₂ cost almost nothing. As a result, there was very little incentive for big energy companies to invest in climate friendly technologies.

On the contrary, Germany was able to sell unused certificates across Europe – to coal companies in countries like Poland or Slovakia, for example. Thanks to Germany's wind turbines, these companies were then able to emit more greenhouse gases than originally planned. Given the often lower efficiency of Eastern European power plants, this is anything but environmentally beneficial.

This phenomenon is especially apparent whenever the sustainable energy industry grows more quickly than anticipated – as in recent years when growth in the renewable energy branch quickly rendered the EU Commission's CO₂ plans obsolete.

Continued on reverse

Building Renovations Are Better than Windmills

Experts from the Green Party are taking the problem very seriously: "We are in a veritable crisis situation, and that means we must reconsider and alter things we once took for granted," writes one contributor, adding that it's important to re-examine "whether we have set the right priorities."

Another expert begins his e-mail with a general clarification: "Dear People, I'm not fundamentally against the EEG. I only emphasize this because Manfred has repeatedly and erroneously described me as an opponent of the EEG." But here comes the big "but": "When reduction of CO2 emissions is more cheaply achieved through insulating a building than using a wind turbine, that is where we should concentrate our support." When it comes to climate change, everything else is secondary to reducing CO2 emissions.

Indeed, when it comes to climate change, investments in wind and solar energy are not very efficient. Preventing one ton of CO2 emissions requires a relatively large amount of money. Other measures, especially building renovations, cost much less – and have the same effect.

The e-mail exchange ends with a conciliatory "What do you think?" But it is quickly followed by a bitter PS: "Do the Greens think that this problem (of climate change) will solve itself if we just screw solar panels onto our rooftops?"

Environmental Groups Admit to the Problem

The German Renewable Energy Federation is clearly not thrilled about the debate. The lobbying group's official line is: "By implementing renewable energy, there will be a reduction in 2008 of 120 million tons of CO2." When pressed, however, representatives of the federation will admit that this only applies to Germany. But the reality is that the freely traded CO2 certificates can be sold and used abroad.

Likewise, one federation employee openly said that there is "a certain degree of inconsistency" between the EEG and emissions trading.

But does it really have to be like this? Is it really so impossible to reconcile both of these instruments for protecting the climate?

In theoretical terms, of course it's possible. To do so, however, currently existing laws designed to prevent CO2 emissions would have to be reconciled. In real terms, for example, that means that every time a new wind turbine is built, the state would be forced to take certificates off the market. It is only in this way that you can achieve real positive effects on the climate.

Politicians Buckle to Business

There were discussions about such a system under Chancellor Gerhard Schröder, who governed in a coalition with the Green Party. At the time, Minister of the Environment Jürgen Trittin wanted to exclude the amounts of energy covered by the EEG from the calculations used in the carbon-trading scheme. Instead, the industry-friendly regulations currently in effect were pushed through. Major energy corporations, which had claimed as many CO2 certificates as they possibly could, lobbied heavily.

So why has nothing changed? According to experts, one reason has to do with technical problems. In the course of an ongoing trading period, they claim, adjusting the volume of CO2 certificates is no easy task.

Still, an SPD insider provides yet another explanation: "Politicians just have to resign themselves to certain things." As he sees it, if the state went back to the companies and took away the certificates they had been allotted, the result would be an uproar. "What do you think the companies would say to us?" he asks. "As a politician, there are certain storms that you simply can't weather."

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1. Introduction

A turbine connected to the grid implies certain elements of danger if it is handled without exercising proper caution.

For safety reasons, at least two persons have to be present during a work procedure.

The work must be properly carried out in accordance with this manual and other related manuals. This implies, among other things that personnel must be instructed in and familiar with relevant parts of this manual.

Furthermore, personnel must be familiar with the contents of the "Substances and Materials" regulations.

Caution must especially be exerted in situations where measurement and work is done in junction boxes that can be connected to power.

Consequently the following safety regulations must be observed.

2. Stay and Traffic by the Turbine

Do not stay within a radius of 400m (1300ft) from the turbine unless it is necessary. If you have to inspect an operating turbine from the ground, do not stay under the rotor plane but observe the rotor from the front.

Make sure that children do not stay by or play nearby the turbine. If necessary, fence the foundation. The access door to the turbine must be locked in order to prevent unauthorised persons from stopping or damaging the turbine due to mal-operation of the controller.

3. Address and Phone Number of the Turbine

Note the address and the access road of the turbine in case an emergency situation should arise. The address of the turbine can often be found in the service reports in the ring binders next to the ground controller. Find the phone number of the local life-saving service.

16. Precautions in Case of Fire

At any type of fire in or near a turbine, the power to the turbine must always be disconnected at the main high voltage circuit breaker. To disconnect supply, switch off by pushing the red button (marked TRIP F60) on the nacelle controller in the nacelle. In the tower bottom the power supply is switched off by pushing the red button situated on the breaker in the high voltage section. If it is impossible to get to the main circuit breaker, contact the power station for a disconnection of the grid.

In case of a fire during an uncontrolled operation, do under no circumstances approach the turbine. Evacuate and rope off the turbine in a radius of minimum 400m (1300ft). In case of a fire in a non-operating turbine, the fire can be put out by means of a powder extinguisher.

Class II
Item no.: 964106.R00
2007-06-29

Mechanical Operating and Maintenance Manual

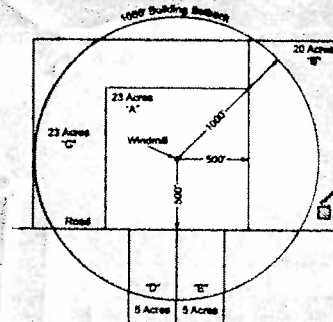
V90 – 3.0 MW, VCRS 60 Hz

Onshore/Offshore (Mk 7)

CWEST

Coalition for Wisconsin Environmental Stewardship

The Windmill Ghetto



Amount of Land is Limited

What is best use? Comprehensive Planning

Example: Calumet County – fastest growing
Expected to grow by 56% by
2035, over 25,000 new people

Public Health Turbine Noise

- In their effort to cram turbines into neighborhoods where they are not appropriate, the PSC has ignored sound science.
- Only peer reviewed study of wind turbine noise health effects done by Nina Pierpont, MD, PhD
- She identifies Wind Turbine Syndrome

Wind Turbine Syndrome

- Symptoms include: sleep disturbance, tinnitus, disturbances to balance, anxiety, memory and concentration loss, and chest tightness
- Caused largely by low frequency noise vibrations

Pierpont Recommendations

- Setback from industrial wind turbines of 2 kilometers (1.2 miles) from residences, hospitals, schools, etc..

"The shorter setbacks currently in use in the USA and elsewhere—1000 to 1500 ft. (305-457 m.)—are a convenience and financial advantage for wind developers and participating landowners. They have no basis in research on safety and health, and they do not make clinical sense."

This matches setbacks for
French Academy of Science – 1500 meters
Germany – 1600 meters
Holland – 1800 meters

Public Safety

- Like cigarette companies, wind developers have now been exposed in their own documents on public safety.

Public Safety

"Do not stay within a radius of 400m (1300ft) from the turbine unless it is necessary."

*Vestas Item no.: 960314.R5
Safety Regulations for
Operators and Technicians
V90 – 3.0MW/V100 – 2.75MW
Page 3 of 32, Rule 2*

stay back 1300 feet

feel free to live and play closer than 1000 feet

The PSC has not proven to be an unbiased observer...

- New Glacier Hills project is designed with 1000' setback to homes
- They are supposed to represent the public, but have refused to engage with community representatives

Rate Payers

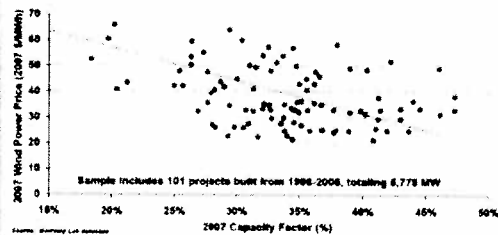
- In our rush to meet the RPS, we have not taken into account the rate payers

Capacity Factors

Capacity Factor (%)	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
100%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

720M
22.3%

Capacity Factors



Billions in savings

- Wisconsin wind is not as strong as wind to the West – Iowa, Minnesota, the Dakotas
- Good Wind: 35% capacity factor
Total cost to construct: \$3.6 billion
- Typical WI Wind: 25% capacity factor
Total cost to construct: \$5.04 billion

This Bill Will Cancel:

- Local wind ordinances
- Local comprehensive planning
- Local economic development plans and extraterritorial zoning
- Existing Potato and Vegetable Grower contracts
- Opportunities for rural wireless broadband
- Offers to purchase on neighborhood homes

This Bill Will Cancel:

- Certificate of Need for projects which are nearly at 100 MgW
- Any consideration of unique plant and animal species or unique landscape attributes
- The property rights of adjoining non-participating landowners
- Health and safety of a lot of rural residents

CWESSt Supports

- A statewide standard for wind siting
- Establishment of an unbiased and science-based committee to come up with said standard

CWESSt Supports

- Consideration of local ordinances with arbitration available for disputes
- Assurance that wind projects will need to show that same need and cost effectiveness as larger projects
- Wind Siting Regulation that protects public health, public safety, and individual property rights.



CWEST

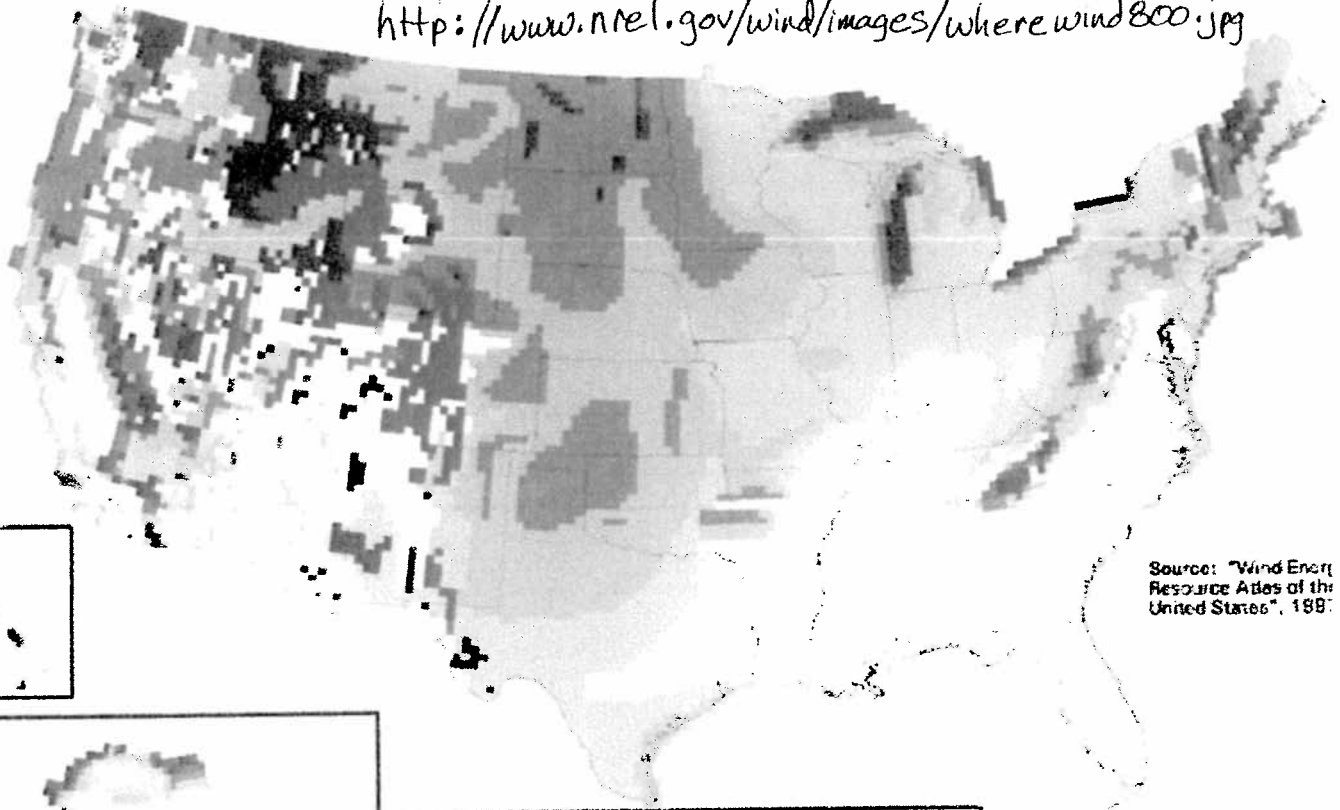
Coalition for Wisconsin Environmental Stewardship

www.CWESOnline.org



United States - Wind Resource Map

http://www.nrel.gov/wind/images/where_wind800.jpg



Source: "Wind Energy Resource Atlas of the United States", 1997

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

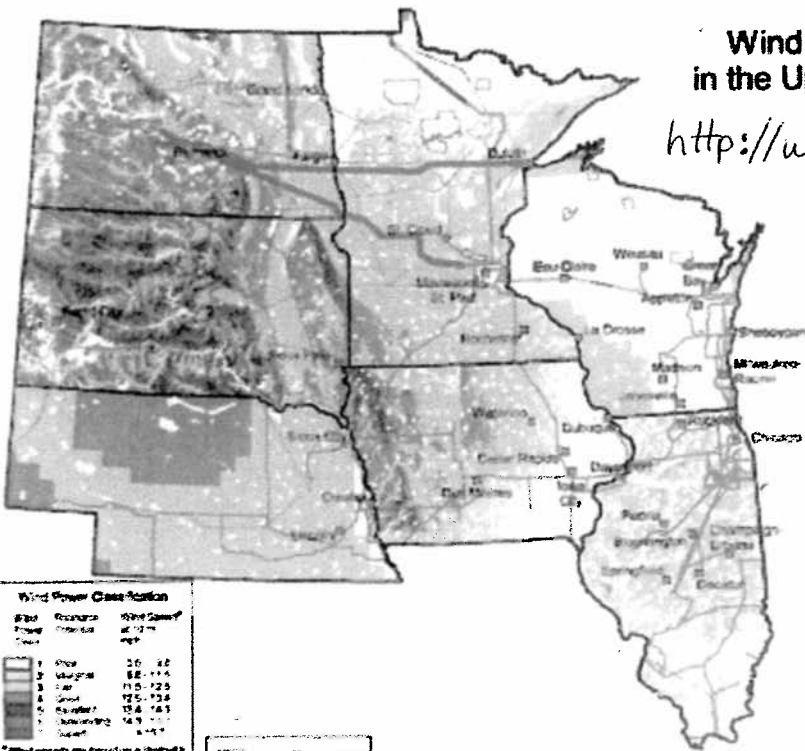
^aWind speeds are based on a Weibull k value of 2.0

U.S. Department of Energy
National Renewable Energy Laboratory



Wind Resources in the Upper Midwest

http://www.nrel.gov/wind/images/wind_resource_char.jpg



Transmission Lines^a
(Voltage in kV)

- Extra 220kV^b
- 220kV - 138kV
- 138kV - 69kV
- 69kV - 33kV
- 33kV - 15kV
- 15kV - 10kV

^aBased on 2000 Census of Population and Housing, U.S. Census Bureau, 2000.

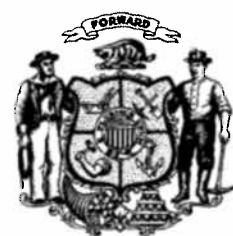
Wind Power Class	Resource Potential	Wind Speed ^a at 50 m mph
2	Marginal	12.5 - 14.3
3	Fair	14.3 - 15.7
4	Good	15.7 - 16.8
5	Excellent	16.8 - 17.9
6	Outstanding	17.9 - 19.7
7	Superb	19.7 - 24.8

^aWind speeds are based on a Weibull k value of 2.0

U.S. Department of Energy
National Renewable Energy Laboratory
17 MAR 2001



WISCONSIN STATE LEGISLATURE



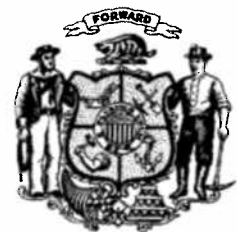
RENEW Wisconsin states:

Wind: Wind emits no air pollution, nor does it produce greenhouse gases, which are the cause of global warming.

Some individuals living within a one-mile radius of large wind farms complain of headaches and sleeping problems, due to noise pollution. Wind turbines are mechanical devices that emit low-frequency sound waves. Large wind farms should be appropriately sited for this reason.



WISCONSIN STATE LEGISLATURE



LIFE in a PS Approved WIND FARM: AFTER ONE YEAR. FOND DU LAC COUNTY WISCONSIN

OK... by Lynda Barry 2009

SO WHAT'S IT LIKE?

YOU USED TO IT YET?

INTERVIEWS WITH RESIDENTS LIVING NEAR 400FT TURBINES

WE'RE SURROUNDED. LAST NIGHT, 2 AM, THEY WOKE ME UP AND I HAD MY EAR PLUGS IN. SOUNDS LIKE A TRAIN COMING THROUGH THE HOUSE. CAN'T SELL MY HOME. REALTOR TOLD ME, 'IF ITS NEAR THAT WIND FARM, I WON'T EVEN LOOK AT IT.'

NO.

WISCONSIN

JOAN L. NEAREST TURBINE: 1000 FEET

IT'S LOUD. WE HAVE HEADACHES AND NAUSEA. WE HAVE RINGING IN THE EARS WE'RE RETIRED ALL THE TIME BECAUSE WE DON'T SLEEP. BUT THEY'RE NOT GOING TO SHUT THEM DOWN.

THEY DON'T CARE.

GERRY MEYER: NEAREST TURBINE 1560 FT

THEY'RE NOT ALWAYS NOISY BUT THERES NIGHTS WHEN WE'RE UP FOUR TO FIVE HOURS FROM THE NOISE, SO THERE WE ARE, UP LISTENING TO THIS ROAR BUT THEY WON'T GIVE YOU A NUMBER YOU CAN CALL TO GET SOME HELP.

RESIDENT SPEAKING AT A 'LISTENING SESSION' WITH SENATOR HOPPER 4/9/09

I'M A CARDIAC NURSE, BUT YOU DON'T HAVE TO BE A ROCKET SCIENTIST TO KNOW NOT GETTING ENOUGH SLEEP LEADS TO HEALTH PROBLEMS. I'M VERY DISTRESSED ABOUT THIS. THEY'RE TOO CLOSE TO HOMES.

THERES NO PEACE NOW.

SANDY VERCAUTEREN: CAN SEE 15 TURBINES FROM HER BEDROOM

YOU CALL THE HEALTH DEPARTMENT. THEY DON'T BELIEVE YOU. THEY SAY, 'WE HAVE NO STUDIES.' I SAID 'WE ARE YOUR STUDIES! WE'RE THE GUNEA PIGS! YOU SHOULD LISTEN TO US.' BUT THEY BLOW YOU OFF. THEY DON'T WANT TO HEAR IT.

BRUCE DALKA: LISTENING SESSION 4/9/09

OUR NEIGHBOR'S KIDS ARE FALLING ASLEEP IN SCHOOL BECAUSE THEY AREN'T SLEEPING AT NIGHT. THEY PUT THEIR HOME UP FOR SALE BUT WHO'S GOING TO BUY IT? A LOT OF HOMES FOR SALE HERE AND THEY JUST SIT THERE.

CHERYL M.: 1560 FT

MY DAUGHTERS AND I GET HEADACHES. I DON'T SLEEP AT ALL. ITS JUST TERRIBLE. LAST NIGHT IT WASN'T JUST THE WHOOSHING AND THE ROAR, IT WAS A HIGH PITCHED WHINE. WE HAVE TO GET OUT OF HERE. ITS NOT GOOD TO LIVE HERE ANYMORE.

ANN WIRTZ: TURBINE 1235 FEET AWAY

AT LEAST WE'RE YOUNG ENOUGH TO START OVER. MY MOM DOESN'T HAVE MUCH MONEY AND NOW SHE HAS TURBINES ALL AROUND HER. I DON'T KNOW WHAT SHES GOING TO DO. I GREW UP HERE AND I LOVED IT HERE... BUT I DON'T ANYMORE. LEAVING THIS HOUSE MAKES ME SICK BUT WE CAN'T STAY ANYMORE.

CAN'T SELL IT. WE TRIED.

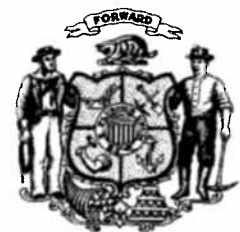
JASON WIRTZ: THE FAMILY HAS NOW DECIDED TO ABANDON THEIR HOME

Contact Information for the people in this comic strip:

- Lynda Barry 13133 W. Dorner Rd Brodhead, WI 53537 (608) 876 4255
- Joan Lagerman --W2178 County Road Q Malone, WI 53049 (920)-979-6224
- Gerry and Cheryl Meyer--W 6249 County Road Y, Brownsville, WI 53006 (920) 583-4355
- Sandy Vercauteren--W6224 W. Byron Rd, Byron, WI 53006 (920) 922-7309
- Bruce Dalka W2340 Ash Rd, Malone, WI 53049 (920) 795-1404
- Ann and Jason Wirtz N11957 Hwy YY Oakfield, WI 53065 (920) 960-5246



WISCONSIN STATE LEGISLATURE

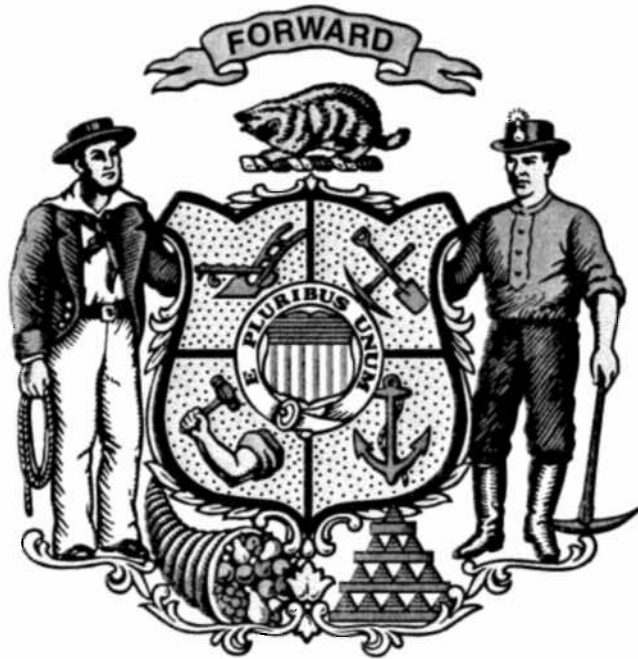


What PSC-Approved Setbacks
from Homes Look Like
Photos from Fond du Lac and
Dodge Counties
2009



"We had a lot of people interested in buying our place until they found out about the wind farm coming in. Then they backed out."

"One realtor we called said she already had a house she was trying to sell in the wind farm and didn't want another one because she knew she couldn't sell it. She told us it be a waste of her marketing dollars. Another realtor asked "Is it near the wind farms?" when we told him it was, he wouldn't even bother to come out and look at it." - Ann and Jason Wirtz-- N11957 Hwy YY Oakfield, WI (920) 960-5246



JANE GEHL W4852 ESCARPMENT TERRACE - SHERWOOD 920-989-865
Martha Woelfel W3949 Hickory Hills Rd. Chilton 920-849-2840
Gerry Karls W4801 Dick Rd, Chilton, ⁵³⁰¹⁴ 920-849-2331





The

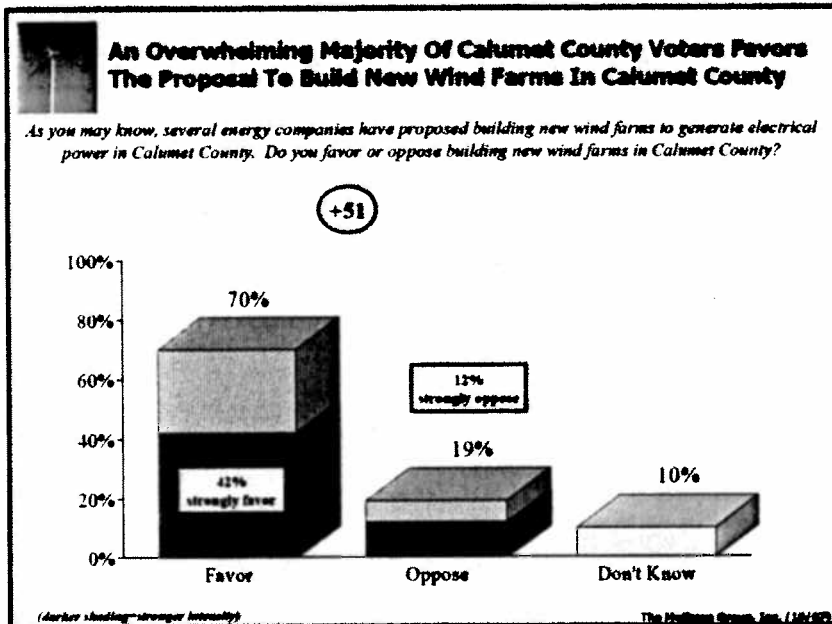
Added to the
LRB's legal
library collection.





TO: EcoEnergy
FROM: The Mellman Group
RE: Wind Farms In Calumet County
DATE: October 18, 2007

The Mellman Group conducted a survey of 400 registered voters in Calumet County, Wisconsin by telephone October 9-11, 2007. The study used a registration-based sample including all registered voters in Calumet County. The margin of error for this survey is +/-4.9% at the 95% level of confidence. The margin of error is larger for subgroups.



Calumet County Voters Overwhelmingly Favor The Proposal To Build Wind Farms In The County

Our recently completed survey shows that Calumet County voters strongly favor building new wind farms in Calumet County to generate electrical power. Seven in 10 voters (70%) support building new wind farms in the county, while only 19% oppose them. Moreover, voters are more than three times more likely to *strongly* support the building of new wind farms (42%) than they are to strongly oppose them (12%). Voters are relatively well-informed about the proposal to build wind farms, with

70% of the county hearing a “great deal” or “some” about the proposal. Among this group, over two-thirds (69%) favor the proposal to build wind farms, while 21% opposes it. Among those who have heard “not too much” or “nothing” about the proposal, support reaches similar levels (73% favor, 17% oppose).

Support for wind farms garners strong support across the ideological spectrum, with large majorities of liberals (81%), moderates (71%) and conservatives (64%) all strongly favoring the proposal. Support is also strong across gender, age and education.

Some cleavages do emerge across geographic groups. The wind farm proposal garners overwhelming support in Appleton/Menasha and Harrison/Shorewood, and nearly two-thirds favor the proposal in the Eastern part of the county. In the Southwest, where most of the proposed wind farms would be located, support is much more evenly divided, although a 41% plurality still favor building wind farms.

% Favor/Oppose Building New Wind Farms		
	Favor	Oppose
Men	73%	19%
Women	67%	20%
Liberal	81%	13%
Moderate	71%	12%
Conservative	64%	27%
18-39	66%	22%
40-59	73%	18%
60+	70%	19%
HS or Less	70%	16%
Some College	76%	17%
College Grad+	67%	24%
Appleton/Menasha	90%	5%
Harrison/Shorewood	78%	16%
Southwest	41%	36%
East	64%	25%
Near proposed site	45%	38%
Not near proposed site	79%	13%

Looked at another way, voters who live in towns, villages or cities near the proposed wind farm sites (about 26% of the county’s population) are more likely to oppose the building of new wind farms, but their opposition is far from monolithic – indeed, even in those areas most likely to be affected by wind farm construction, a 45% plurality favors building them while 38% opposes their construction.

After Hearing Arguments On Both Sides Of The Issue, Calumet County Voters Continue to Overwhelmingly Favor The Construction Of Wind Farms

Support for the proposed wind farms remains strong after voters hear arguments on both sides of the issue (argument wording is on chart at right). After hearing supporter and opposition arguments modeled on those actually being made by both sides of this issue, 70% favor the construction of new wind farms, while 22% are opposed. This suggests that there is a large degree of stability in terms of opinion on this issue. Indeed, opinion changes very little regardless of the level of information that voters had going into the survey. Very few of those who had heard “a great deal” or “some” (-1 favor, +3 oppose) about the proposal changed their minds. Likewise, opinion remained largely consistent among those who had heard “not too much” or “nothing at all” about the proposed wind farms (+0 favor, +1 oppose). Moreover, a narrow plurality of those who live near proposed wind farm sites continue to favor their construction (45% favor, 43% oppose), while voters in the rest of the county continue to favor them by a large margin (78% favor, 15% oppose).

After Hearing Arguments On Both Sides Of The Law, A Sizable Majority Continues To Support The Construction Of Wind Farms In Calumet County

Now I'm going to read you some arguments people have given for and against the proposal to build new wind farms in Calumet County:

- Supporters of the proposal to build wind farms in Calumet Co. say that wind energy is a clean, renewable energy source that reduces our dependence on fossil fuels and helps prevent global warming. At the same time, wind farms will create jobs, help family farmers and require energy companies to make payments to local governments totaling millions of \$ over several years, which will help the county reduce taxes & fund important services. To protect property owners, turbines will be located at least 1,000 feet away from residences, be positioned to produce minimal noise & light flicker, & follow zoning requirements to protect groundwater. Calumet Co. should not pass up this opportunity to take real action in the fight to protect our environment.
- Opponents of the proposal to build new wind farms in Calumet Co. say that they should not be built because it is unfair to those who live near the wind farms. They say that wind farms are extremely noisy & generate an annoying light flicker, which together can cause headaches & other health problems. The construction of wind turbines could also affect Calumet Co.'s groundwater & could limit future development on land surrounding the turbines. Furthermore, opponents say that industrial wind turbines, which can be up to 400 feet tall, are an eyesore that people should not be forced to look at in their back yard. Nearby residents should not be forced to endure noise & lower property values caused by wind farms.

Do you favor or oppose building new wind farms in Calumet County?

Response	Percentage	Strong Intensity
Favor	70%	43%
Oppose	22%	15%
DK	8%	-

(darker shading = stronger intensity) +48

The Mellman Group, Inc. (10/07)

Support For Wind Farms Is Likely Grounded In The Positive Feeling Calumet County Voters Have Toward Using Renewable Fuels To Generate Electrical Power

Calumet County voters have a much more positive view of renewable energy sources, like wind and solar, than they do of natural gas, coal or nuclear energy. We asked voters to evaluate 5 different energy sources, placing each on a 0-10 scale where 0 denoted it was one of the worst methods to generate electrical power and 10 meant it was one of the best methods. The chart at left shows the mean (average) rating voters gave to each energy source. Renewable energy sources, like solar power (7.78) and wind-turbines (6.84) were viewed significantly more positively than natural gas-fired power plants (5.64), nuclear power plants (5.07) and coal-fired power plants (3.68). Thus, strong support for wind farms in Calumet County is likely grounded in the positive feeling voters have toward renewable energy sources.

Solar Power Is Perceived As The Best Way To Generate Electrical Power, Followed By Wind-Powered Turbines

Now I am going to read to you several different methods for generating electrical power. After I read each, using a 0 to 10 scale where 0 means it is one of the worst methods for generating electrical power & 10 means it is one of the best methods, please tell me how good or bad each method is as a way to generate electrical power. Five is neutral. You can pick any number between 0 & 10. If you are not sure, please say so and we will move on.

Energy Source	Mean Rating	% of Voters
Solar Power	7.78	51%
Wind-Powered Turbines	6.84	37%
Natural Gas-Fired Power Plants	5.64	15%
Nuclear Power Plants	5.07	11%
Coal Fired Power Plants	3.68	2%

Ranked by means % 9-10

The Mellman Group, Inc. (10/07)

Memorandum

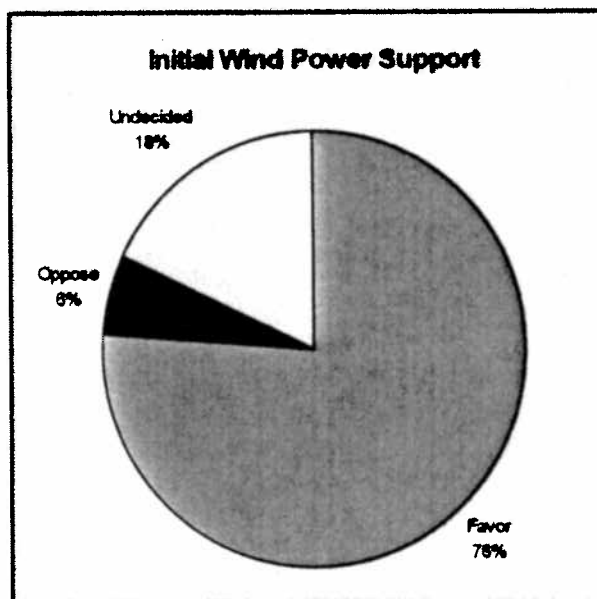
To: Interested Parties
From: EcoEnergy
Date: April 29, 2008
Subject: Evansville Area Public Opinion Survey on Wind Power

The following memo details the results of a public opinion survey of 349 registered voters in the Evansville Water and Light (EWL) service area conducted by Forward Strategies by telephone from April 14-16, 2008. The margin of error for this survey is 4.63%.

Initially, Voters in the Evansville Water and Light Service Area Overwhelmingly Favor the Use of Wind Power in the Area

The results of the recent survey show overwhelming levels of support for the proposed wind energy project in the EWL service area. Before positive or negative statements were read to respondents about wind power, nearly 8 in 10 voters (76%) support the use of wind power to generate electricity in the area, with less than 1 in 10 opposing (6%).

The results are very similar when broken down by gender, with slightly stronger support amongst men. Eighty-percent of male respondents indicated they support wind power while a paltry 4% said they oppose it, 16% were undecided. Seventy-three percent of women surveyed said they support wind power, with 7% opposing and 19% undecided.



The level of support remains strong when the results are broken down regionally.

In the Town of Union, supporters of the proposed wind project heavily outweigh opponents 72% to 8%, with 20% undecided.

Within the City of Evansville supporters also outnumber opponents 78% to 4%, with 18% undecided.

Finally, voters residing in the EWL service area, but outside the Town of Union or the City of Evansville also strongly favor the use of wind power with 76% in favor, 8% opposed, and 17% undecided.

After Hearing Arguments on Both Sides of the Issue, Voters in the Evansville Water and Light Service Area Still Overwhelmingly Favor the Use of Wind Power in the Area

Support for the proposed wind project in the area remains very strong after respondents were read one statement in support of and one statement in opposition to wind power. It is important to note that opponent arguments were offered even if they may have no basis in fact. These are, however, the most common arguments used by opponents of wind development. The statements read as follows:

Supporters of the proposal to build wind turbines say that wind energy is a clean, renewable energy source that reduces our dependence on fossil fuels and helps prevent global warming. At the same time, wind projects will create jobs, help family farmers and provide payments to local governments, which will help fund important services. Supporters of wind turbines say that property owners will be protected. They say that turbines will be located at least 1000 feet away from residences, be positioned to produce minimal noise and light flicker, and receive all required local and state permits.

Opponents of proposals to construct wind turbines say that they should not be built because it is unfair to those who live near the turbines. They say wind farms are extremely noisy and generate annoying light flicker, which together can cause headaches and other health problems. The construction of wind turbines could also limit the future development on land surrounding the turbines. They say that nearby residents will have to endure noise and lower property values caused by wind farms. Furthermore, opponents say that industrial wind turbines, which can stand up to 400 feet tall, are an eyesore that people should not be forced to look at in their back yard.

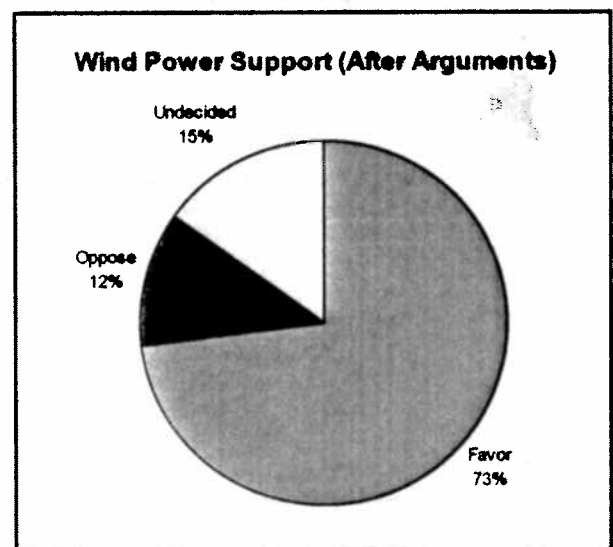
After the statements were read, support remained overwhelmingly strong with 73% of voters in the EWL service area in favor of using wind power to generate electricity in the area, with 12% opposed and 15% undecided.

Once again, similar numbers are seen when the results are broken down by gender. Seventy-eight percent of men support the use of wind power, with 11% opposing and another 11% undecided. Women had comparable results with 69% supporting, 13% opposing and 18% undecided on the use of wind power.

The results by region are similarly favorable to wind power after the arguments for and against the proposed project were read.

Support in the Town of Union remained strong with 66% supporting wind power, 16% opposing and 18% undecided.

In the City of Evansville supporters outnumber opponents 74% to 9% with 17% undecided. Those residing in the service area but not in either of these municipalities support the use of wind power by an overwhelming 77% to 14% rate with 9% undecided.





May 2007

REPORT
IN BRIEF

Environmental Impacts of Wind-Energy Projects

As wind energy development continues to expand, federal, state and local agencies should adopt a consistent approach to evaluating the planning, regulation, and location of wind-energy projects. This National Research Council report proposes a framework that can help in evaluating tradeoffs between the benefits of new wind-energy projects and risks of adverse environmental impacts before projects begin.

There has been rapid growth in the construction of wind-powered electricity generating facilities over the past 25 years in the United States. As the nation considers options for future energy development, environmental questions have emerged as important considerations. Wind-energy facilities emit no atmospheric pollutants and are driven by a renewable source, addressing multiple environmental concerns such as air quality and climate change. But the expansion of such facilities can carry adverse environmental impacts.

Wind energy provided about 1% of U.S. electricity in 2006 (Figure 1 shows distribution of installed capacity). An often-mentioned advantage of using wind-energy facilities is the reduction of thermal and atmospheric pollution associated with fossil fuel-based energy facilities. According to current projections for use of wind energy in 2020, use of the technology could reduce the energy sector's emissions of carbon dioxide by about 4.5% in 2020. However, more steps need to be taken to assess potentially

negative impacts—including threats to wildlife and sightlines—and evaluate tradeoffs between benefits and possible adverse environmental impacts.

The National Research Council was asked by Congress to review the positive and negative environmental impacts of wind-energy development, including effects on landscapes, views, wildlife, habitats, air pollution, and greenhouse gases.

Federal Agencies Lack Experience Because Decisions Made Locally

Wind-energy projects exist in 36 states. California has had them since the early 1980s. Most wind turbines are approved through local zoning boards and state authorities. But most state governments, the Federal Energy Regulatory Commission, the Department of the Interior, and the Environmental Protection Agency do not have extensive experience with anticipating, reviewing, and assessing their impacts. The development of a more extensive knowledge base

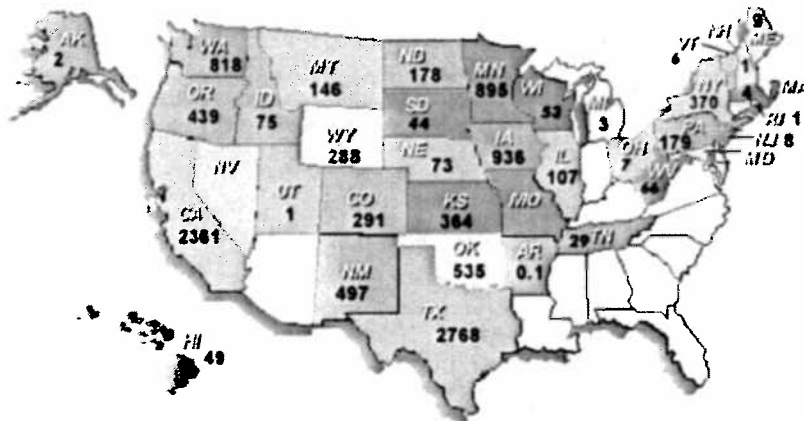


Figure 1. Total installed U.S. wind-energy capacity in megawatts: 11,603 megawatts as of Dec 31, 2006. Source: American Wind Energy Association 2007.

THE NATIONAL ACADEMIES
Members to the Nation in Science, Engineering, and Medicine

is needed so state and federal agencies can evaluate these impacts in order to better carry out their mandate to protect species and to weigh tradeoffs between the technology's environmental benefits and impacts.

The report urges federal and state agencies to take the environmental impacts of wind-energy more seriously as part of planning, locating, and regulating these facilities. This is because some bird and bat collisions with spinning blades and towers—especially along migration corridors—may begin to threaten local populations of some species if wind facilities rapidly expand over the next 20 years. The report notes that bat populations in the nation's Mid-Atlantic and several other regions of the country may be particularly at risk.

Effects of Wind-Energy Projects on Wildlife

Development of wind power is on an upswing, particularly in the past seven years (see Figure 2). Out of a total of perhaps 1 billion birds killed annually as a result of human structures, vehicles and activities, somewhere between 20,000 and 37,000 died in 2003 as a result of collisions with wind-energy facilities.

However, the crucial issue is whether these impacts affect whole populations of certain species. At the current level of U.S. installed wind capacity, the report found no evidence of significant impacts on bird populations. One possible exception is certain birds of prey in California whose threatened status may be aggravated by collisions with older wind-energy technology at one area in the state. In light of the lack of follow-up studies of environmental impacts of these facilities, more careful tracking of bird and bat populations, behavior, migration corridors, and other factors that may affect their risk of collisions with turbines is warranted, especially for threatened or endangered species.

To provide a systematic approach to wind energy and its effects, the report's evaluation guide (*see next page*) recommends using systematic pre- and post-construction studies to explore potential wildlife and other impacts and improve how such facilities are built, located, and operated.

Potential Impacts of Wind-Energy Projects on Property Values

Perceptions of wind-energy projects, like other potentially controversial developments, vary depending on the characteristics of the surrounding community. Residents living near proposed facilities may resist having their views and sightlines altered. The potential nuisance created by flickering shadows resulting from spinning blades has been raised in other countries with wind-energy facilities but has not been a significant issue to date in the United States.

Several research studies failed to detect an

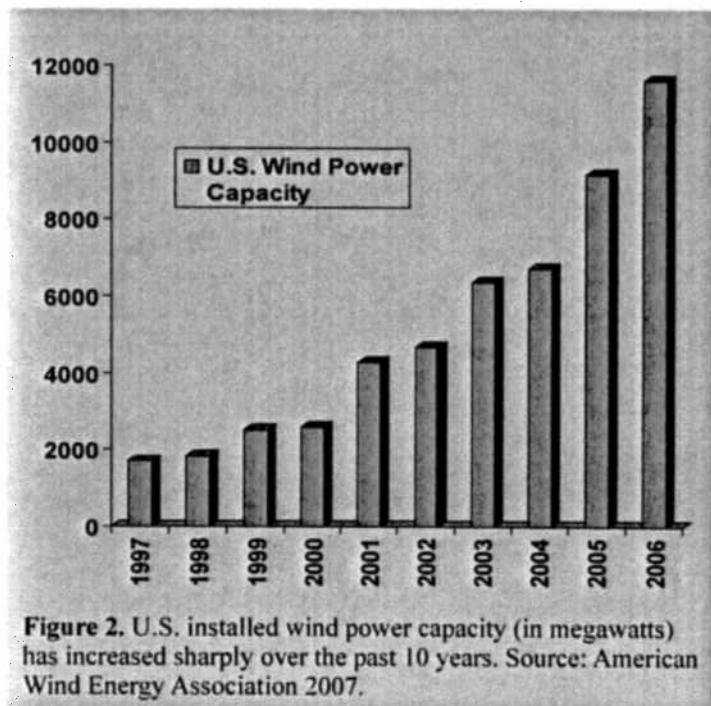
average effect of wind-energy facilities on property values within a ten-mile radius of the sites. Despite the difficulty of reaching reliable conclusions about property value impacts, it is possible to identify some of the key factors involved. Aesthetic impacts could be important, especially when a property is valuable for a purpose incompatible with wind-energy projects, such as to experience life in a remote and relatively untouched area. In this scenario a view that includes a wind-energy project may detract from

property values. On the other hand, to the extent that a wind-energy project contributes to the prosperity of an area, it may help to bring in amenities and, therefore, may enhance property values. In addition, landowners can be paid about \$3,000 per year per turbine on their property.

Because the construction of wind installations in the United States is a relatively recent phenomenon, the long-term effects of wind-energy projects on property values are difficult to assess, according to the report. While property values may be initially affected by a wind-energy project, the effect may diminish as the project becomes an accepted part of the landscape.

Consideration of Other Ecological Impacts

Although research and monitoring studies are not extensive, a review of existing studies indicates that adverse effects of wind-energy facilities on ecosystems



Guide for Evaluating Wind-Energy Projects

Some elements to consider in policy, planning, and public relations

1. Have mechanisms been established to provide necessary information to interested and affected parties, and to seek meaningful input from them as wind-energy projects are planned and implemented? Are developers required to provide early notification of their intent to develop wind energy?
2. Are procedures—including policies and regulations—in place for evaluating the impacts of wind-energy projects that cross jurisdictional boundaries?
3. Is guidance available to developers, regulators, and the public about what kinds of information are needed for review, what degrees of adverse and beneficial effects of proposed wind-energy developments should be considered critical in evaluating a proposed project, and how competing costs and benefits of a proposed project should be weighed with regard to that proposal only, or by comparison with likely alternatives?
4. Are regional planning documents available that provide guidance on the quality of wind resources, capacity of transmission options, potential markets, major areas of concern, and tradeoffs that should be considered?

Legal and Regulatory Considerations

1. Are wind-energy guidelines and regulations issued by different federal agencies compatible, are those guidelines and regulations aligned with other federal regulating rules and regulations, and do the guidelines and regulations follow acceptable scientific principles when establishing data requirements?
2. Does the review process include steps that explicitly address the cumulative impacts of wind-energy projects over space and time; that is, by reviewing each new project in the context of other existing and planned projects in the region?

Evaluation of Impacts

1. Are the biological, aesthetic, cultural, and socioeconomic attributes of the region sufficiently well known to allow an accurate assessment of the environmental impacts of the wind-energy project, and to distinguish among the potential sites considered during the site selection process? Are there species, habitats, recreational areas, or cultural sites of special interest or concern that will be affected by the project? Are there key gaps in the needed information that should be addressed with further research before a project is approved or to guide the operation of an approved project?

Environmental Impacts

1. What environmental mitigation measures will be taken and how will their effectiveness be measured? Are there any legal requirements for such measures (e.g., habitat conservation plans)? Are any listed species at risk from the proposed facility?
2. How and by whom will the environmental impacts be evaluated once the project is in operation? If these evaluations indicate needed changes in the operation of the facility, how will such a decision be made and how will their implementation be assured?
3. What pre-siting studies for site selection and pre-construction studies for impact assessment and mitigation planning are required?
4. What post-construction studies, with appropriate controls, are required to evaluate impacts, modify mitigation if needed, and improve future planning?

Impacts on Human Health and Well-Being

1. Have pre-construction noise surveys been conducted to determine the background noise levels? Will technical assessments of the operational noise levels be conducted? Is there an established process to resolve complaints from the operation of the turbines?
2. Is there a process in place to address complaints of shadow flicker and does the operator use the best software programs to minimize any flicker?

Aesthetic Impacts

1. Has the project planning involved professional assessment of potential visual impacts, using established techniques such as those recommended by the U.S. Forest Service or U.S. Bureau of Land Management?
2. How have the public and the locally affected inhabitants been involved in evaluating the potential aesthetic and visual impacts?

Cultural Impacts

1. Has there been expert consideration of the possible impacts of the project on recreational opportunities and on historical, sacred, and archeological sites?

Economic and Fiscal Impacts

1. Have the direct economic impacts of the project been accurately evaluated, including the types and pay scales of the jobs produced during the construction and operational phases, the taxes that will be produced, and costs to the public?
2. Has there been a careful explication of the indirect economic costs and benefits, including opportunity costs and the distribution of monetary and non-monetary benefits and costs?
3. Are the guarantees and mitigation measures designed to fit the project and address the interests of the community members and the local jurisdictions?

Electromagnetic Interference

1. Has the developer assessed the possibility of radio, television, and radar interference?

Cumulative Effects

1. How will cumulative effects be assessed, and what will be included in that assessment (i.e., the effects only of other wind-energy installations, or of all other electricity generators, or of all other anthropogenic impacts on the area)? Have the spatial and temporal scales of the cumulative-effects assessment been specified?

have occurred. The construction and maintenance required to install wind turbines and roads alters ecosystems through the clearing of vegetation, soil disruption, and the potential for erosion and noise. These changes can lead to habitat loss and fragmentation for forest-dependent species. This impact is particularly important in the Mid-Atlantic Highlands, because wind-energy projects there have all been constructed or proposed in forested areas.

Plants and animals throughout an ecosystem respond differently to changes in forests, and although no deaths of animals listed under the Endangered Species Act have been recorded to date, agencies should evaluate this possibility. This knowledge should be weighed using the evaluation guide (see previous page) outlined in the report to minimize ecological impacts and inform decisions on planning, siting, and operation.

Comparative Research on Environmental Impacts is Crucial

As policymakers weigh strategies for future energy development, an ability to compare the environmental impacts and benefits of various options will improve the information base for decisions. But a lack of side-by-side information on the environmental costs and benefits of wind-energy development compared with other types of energy facilities makes it difficult to project impacts on wildlife and ecosystems for the different energy options policymakers and developers are considering.

To address this lack of information, the report's evaluation guide will help assess the environmental effects of wind-

energy projects before they are built and after installation. Such information will facilitate comparisons with other energy options. The guide contains a matrix, which is not pictured, for coordinating the review of wind-energy projects across federal, regional/state and local governments. It addresses a range of issues including legal, regulatory, health, environmental, aesthetic, cultural, and economic impacts.

Objective, systematic methods of assessing aesthetic impacts, including visual impacts, are available, such as some methods used by the U.S. Fish & Wildlife Service. They can and should be adapted to use for wind-energy projects.

The Guide for Evaluation of Wind-Energy

Projects emphasizes the need to create opportunities for public input by incorporating participation by those whose well-being may be affected by siting decisions so these impacts can be minimized or avoided. The guide should be routinely used to help organize regulatory reviews and encourage public input. As a result, the public, policymakers, energy developers, state and federal agencies, and other interested groups will have a richer information base for decision-making.

In addition, government agencies could use this guide to develop methods for addressing tradeoffs between the benefits, costs, and environmental impacts of wind-energy facilities in comparison with other energy options, which are seldom evaluated this comprehensively. This will help inform future choices about which types of energy development should be pursued to meet the nation's growing needs.



Committee on Environmental Impacts of Wind-Energy Projects: Paul Risser (Chair), University of Oklahoma; Ingrid Burke, University of Colorado; Christopher Clark, Cornell University; Mary English, University of Tennessee; Sidney Gauthreaux, Jr., Clemson University; Sherri Goodman, Center for Naval Analyses; John Hayes, University of Florida; Arpad Horvath, University of California, Berkeley; Thomas Kunz, Boston University; Lance Manuel, University of Texas, Austin; Erik Lundtang Petersen, Risø National Laboratory, Denmark; Dale Strickland, Western EcoSystems Technology, Inc.; Jean Vissering, Jean Vissering Landscape Architecture; James Roderick Webb, University of Virginia; and Robert Whitmore, West Virginia University

This report brief was prepared by the National Research Council based on the committee's report. For more information or copies, contact the Board on Environmental Studies and Toxicology at (202) 334-3060 or visit <http://nationalacademies.org/best>. Copies of *Environmental Impacts of Wind-Energy Projects* are available from the National Academies Press, 500 Fifth Street, NW, Washington, D.C. 20001; (800) 624-6242; www.nap.edu.

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