

Website and Video Resources

**[www.wind-watch.org](http://www.wind-watch.org)**

**<http://betterplan.squarespace.com>**

IMPORTANT VIDEO: One town's experience - WINDFALLI Trailer

**<http://www.youtube.com/watch?v=cBYjZG8O6qE>**

This is a good example of what it will look like around us, the terrain is very similar:

**<http://www.youtube.com/watch?v=rkGXoE3RFZ8>**

Awareness : Wind Turbine incidents that have occurred .

Various accidents:

**<http://www.youtube.com/watch?v=ppLh5pGX3qQ>**

**[http://www.youtube.com/watch?v=CG\\_LBSqKSZs](http://www.youtube.com/watch?v=CG_LBSqKSZs)**

The second link is the slow motion of the same video, there are several different angles of this same video on you tube.

**<http://www.youtube.com/watch?v=CqEccgR0q-o>**

**<http://www.youtube.com/watch?v=lvvRHhsQhi8>**

Blade through residence

**<http://www.youtube.com/watch?v=wCphyDD1H4c>**

Fire:

**<http://www.youtube.com/watch?v=rkGXoE3RFZ8&feature=fvw>**

Other things to consider:

Tornados (we just had a tornado in the area this year)

Ice throw in the winter time ( ice builds up on the sail and gets slung off)

Tip speed is 90 to 180mph (think about this when it starts flying apart)

## **PROPERTIES 'VIRTUALLY UNMARKETABLE'**

SOURCE: Casper Journal, [www.casperjournal.com](http://www.casperjournal.com) September 21 2010

by Greg Fladager,

A survey by a local realtor may have confirmed the worst suspicions of Stan Mundy, whose home is closest to Chevron's wind farm northeast of Casper.

Glen Taylor, of Equity Brokers in Casper, did a real estate survey Sept. 10, 2010, and concluded properties directly adjacent to the Chevron Wind Towers are now "virtually unmarketable" at "any realistic price."

In his report, Taylor said no residential properties have sold in his three-road survey area since October 2009, and 10 are presently on the market (five that were listed in the past two years didn't sell).

Taylor wrote, "No reasonable buyer would choose a property close to the wind towers over a property that isn't close to wind towers unless the price is so low that the investment would be a no brainer."

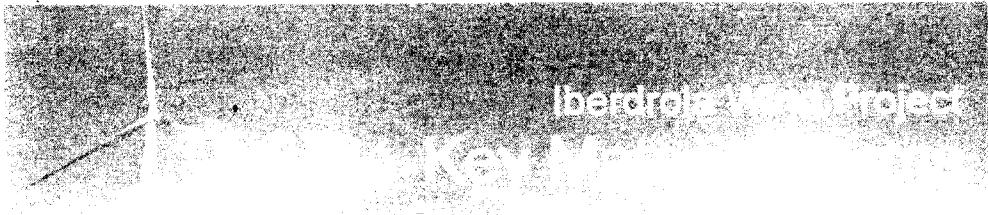
Taylor said in his report that rural property close to town is usually in good demand, and noted he's the agent for one parcel in the area. He has had over 50 inquiries on his listing in about two months, but 40 dropped interest after learning about the location.

"In follow-up with the inquiries, the number one reason for not having genuine interest in this property is because of the proximity of the wind towers," Taylor wrote in his report.

Taylor did the survey at the request of Natrona County State Representative Mike Gilmore. Gilmore is a long-time friend of Mundy's, and had asked Taylor for assistance after hearing about Mundy's property situation.

"Some people are saying Stan's just a nut, and he needs to get over it," Gilmore said about Mundy's dispute with the county. "But his issue had some merit, and I felt he might need a little ammunition ... he's not asking for money or anything from the company, he just didn't want those towers, like 800 feet from his house. He has a legitimate complaint."

Noting that the towers are on Chevron's property, Gilmore said, "... I'm a real private property rights advocate, so much so I fought against the Highway Department's wanting to condemn land for snow fences. But the wind is different. It's unique, it's big, it's this massive structure you've got to look through to see the mountain."



## Key Material Terms

Term	Name	Amount	Frequency	Trigger	Notes
Option Term	Initial Option	Greater of \$500 or \$3/acre	Yearly	30 days from the Effective Date of Agreement, and 15 days from the anniversary of Agreement	
	Subsequent Option	Greater of \$1,000 or \$6/acre	Yearly	Fifth anniversary of the Effective Date and 15 days from the anniversary of the Agreement	
	<i>Meteorological</i> Met Tower Installation	\$1,000	Yearly	60 days after the installation of Met Tower	<i>1-2 yrs study</i>
Extended Term	Rent	\$3,000/MW	Yearly	Anniversary of COD	Increases yearly per CPI
	Installation Fee	\$1,000/turbine	One-time	50% upon commencement of construction, 50% upon COD	
	Crop/Timber Damage	Market Value: County average yield*price*1.10	One-time	One time in the growing season in which the damage is done	
Renewal Term	Rent	\$3,000/MW	Yearly	Anniversary of COD	Increases yearly per CPI
Extended Term: No Turbines	Access Roads	\$1.00/LF	One-time	Completion of Road	
	Transmission O/H	\$5.00/LF	One-time	Installation of Line	
	Transmission U/G	\$2.50/LF	One-time	Installation of Line	
	Operation & Maintenance Facility	\$4,000 per acre	One-time	Installation of Facility	
	Electric Substation	\$6,000 per acre	One-time	Installation of Facility	
	1000' from turbine	\$5,000	One-time	Installation of Facility	Not per turbine
	Permanent Met Tower	\$3,000	Yearly	Installation of Facility	

*Environment Test - Bats / Creeks*

## **9/21/10 How to pay Big Wind's big price tag? 'Externalize' the costs, AKA Passing the Buck and then find a back door to more government money**

### **WIND FARM OWNERS TO BENEFIT FROM BONUS DEPRECIATION PROVISION INCLUDED IN SMALL JOBS BILL**

SOURCE North American Windpower, [www.nawindpower.com](http://www.nawindpower.com) September 21, 2010

by Mark Del Franco,

A new provision in the Small Business Jobs Act passed by the Senate last week may mean big things for wind farm owners who place projects into service this year. The \$42 billion bill is expected to create 500,000 jobs, according to a summary of the bill.

The bill would also provide a slew of tax breaks to encourage investment. One such provision is bonus depreciation, which allows wind farm owners to write off more than 50% of the capital costs of building a wind farm in the year the project is commissioned. To take advantage of this tax break, project owners must commission the project before by the end of this year.

Typically, most assets owned by businesses are written off over a period of time prescribed by tax rules. Under existing rules, wind farms are written off over five years. The new bonus depreciation law would make wind farm writeoffs even quicker.

The faster owners can write off capital costs, the more valuable the asset becomes, explains Eli Katz, a partner at New York-based law firm Chadbourne & Parke.

**Note from the BPWI Research Nerd:** The story below outlines a problem that comes with wind development everywhere, including Wisconsin, where wind projects have been approved and permitted by members of local government who stood to gain financially from the project or had family members who would.

## **Records show area officials profit from leases with turbine firms**

SOURCE: Observer-Dispatch, [www.uticaod.com](http://www.uticaod.com)

September 18, 2010

By JENNIFER BOGDAN,

Twelve public officials who sat on county and town boards in Lewis County stand to make a combined \$7.5 million from the region's largest wind-turbine project, government disclosure forms show.

And numerous other officials in Herkimer County stand to profit as well from new projects there, although not to the same extent, records show.

The lease arrangements have raised questions among local residents and good-government experts about potential conflicts of interest as wind-turbine farms are approved.

One person who feels that way is Gordon Yancey of the town of Lowville, who used to have a clear view of the Adirondacks stretching as far as the eye could see from his property on the edge of the Tug Hill plateau.

But in 2006, the sprawling Lewis County landscape became home to the Maple Ridge wind farm – a group of 195 wind turbines towering 400 feet high over the once undeveloped landscape in Lowville, Martinsburg and Harrisburg. Those communities are located along state Route 12 about one hour north of Utica.

Now, Yancey said all he sees are the massive white towers obstructing his view. He blames lease agreements between wind developers and public officials, one of whom is his brother, Edward Yancey, who sat on the Harrisburg Zoning Board of Appeals.

Edward Yancey stands to benefit to the tune of up to \$1 million over the lifetime of the agreement, according to disclosure forms filed with the state by Iberdrola Renewables and Horizon Wind Energy, which co-own the project.

"They made their sweetheart, backdoor deals long before anything was made public," Gordon Yancey said. "Of course, the boards pushed everything through."

Edward Yancey could not be reached.

Disclose or face fine

A 2008 mandate from the state Attorney General's Office requires wind companies to disclose the nature and scope of any municipal officer's financial interest in a wind project or risk facing fines of as much as \$100,000.

No companies have been penalized to date, according to the state Attorney General's Office.

"In order to avoid even the appearance of impropriety, we publically disclose any relationship with a municipal officer or their relative," Iberdrola spokesman Paul Copleman said. (comment: REQUIRED by law, doesn't mean they didn't cut a deal)

Lise Bang-Jensen, senior policy analyst for the Empire Center for New York State Policy, said any move towards increased government transparency is admirable, but making sense of conflicts is more complex than writing them down.

"If you have a role on both sides of a project, that's a clear conflict of interest," Bang-Jensen said. "Putting it on a piece of paper and disclosing it, doesn't make it legal."

## **Now is the time to save the Mountain as we know it.**

### **There is a corporate project in the offing that will change the complexion of Lookout Mountain for the next 25 years.**

**Project:** Iberdrola Renewables, a Spanish company with a US subsidiary, is the worldwide leader in wind power. They are proposing a wind farm of about 120 wind turbines to be erected a small area in Chattooga and Walker Counties on Lookout Mountain. A sales representative is presenting contracts to landowners in this area now, before the word is out.

**Where:** The wind farm would run from north of the Otting Tract on Hwy 157 (east side), then crossing over at the Walker/Chattooga line east of 157 (Allgood Y farm), then turning north about a mile and then northwest, crossing High Road behind what was the Family Grocery, then crossing Flarity Road at the corn fields, and proceeding a mile before turning to northeast toward Camp Adahi.

**Why here:** With a transmission line available in Cloudland, Iberdrola seems to think that wind generation on the ridges and high parts of this mountain is viable. The representative noted that they do not want to go into areas with expensive houses, country clubs, golf courses, etc. as they would have a fight. Conversely they must think that they will have little problem in this area with low density and lower per capita income.

**What is a Wind Farm:** a group of wind turbines that generate electricity. That electricity is transferred through transmission lines which are buried in 3 feet wide and 4 feet deep trenches from the turbines to roads and from there to the large transmission lines in Cloudland.

**What is a wind turbine:** Each turbine is 300 feet high (a typical cell tower is about half that), 16' wide at the base, and with blades 150' long. That makes the diameter about 300' at the top. It weighs 500,000 lbs. It emits about 50 decibels in a "whine" form. It has a red light atop and security lights in the area around the base. Each of these generators should produce 2 mega watts of electricity.

**What is required to construct one:** A road of 50' wide is required for entry of equipment to each site. A three acre cleared space is required for the cranes to put up the turbine. There is a 1000' circular area from the center of the base on which no residential structure can be built (about 72 acres). An easement for service is required for the length of the lease. Weighing 500,000 lbs., the parts are trucked in on county roads and across county bridges. Apparently Iberdrola plans to repair the damaged roads and bridges.

**How much land is required:** They are looking at 80 to 100 acre minimum tracts, but say exceptions might be made. Large tracts in this area could host 10 – 12 towers.

**How long is the lease:** 25 years. It will take about five years for environmental studies, wind studies, formation of county ordinances, etc. before construction begins, but the leases will be signed in the near future. Iberdrola is apparently intending to close the deals before the community as a whole is aware of the project and can organize to fight it.

# NEW WIND FARM REGULATIONS COULD DECREASE PROPERTY VALUES

SOURCE: Wisconsin Real Estate Magazine September 2010 Issue

by Tom Larson

The Wisconsin Public Service Commission (PSC) is proposing new regulations relating to the location of wind turbines and wind farms (a large number of wind turbines located in close proximity to one another) that could have a significant impact on the value of thousands of acres of Wisconsin property.

These regulations will determine, among other things, how far wind turbines can be located from neighboring homes, buildings and property lines. Given that wind turbines can be over 500 feet high and the new state regulations will override all local zoning ordinances, REALTORS® and property owners should pay close attention to these regulations.

## Background

During the 1970s, the United States experienced an energy crisis due to a decrease oil production in the Middle East. To encourage the use of alternative energy sources, Wisconsin enacted a law prohibiting local governments (counties, cities, villages and towns) from placing any restrictions on the installation or use of solar or wind energy systems unless the restriction is necessary to protect public health or safety. For approximately 40 years, this law has not been a significant problem for property owners.

In recent years, thousands of large wind turbines have been located in Wisconsin and other states to utilize the energy from winds blowing across the landscape. While these turbines are intended to reduce dependence on fossil-based energy sources, they have generated a lot of controversy and complaints from nearby property owners. Some of the complaints from property owners include the following:

- **Health problems.** After wind turbines have been placed nearby, some residents have complained of insomnia, anxiety, headaches and nausea. They have blamed their health problems on the pulsing noise coming from spinning turbines near their homes.
- **Destruction of natural viewscapes.** Turbines can be over 500 feet tall and can be seen from miles away. (As a comparison, the Wisconsin Capitol is 284 feet tall.) Some feel that these turbines detract from the natural beauty of Wisconsin's farms and rolling landscape.
- **Noise.** Depending on the turbine model and wind speed, wind turbines can create a constant "whooshing" or pulsating noise that can be heard

- case the turbine falls over) and ignores possible health risks to humans and animals and the potential impact of turbines on neighboring property values. Critics suggest that a setback of 2,640 feet is more appropriate.
- **Noise standards are insufficient.** The proposed rules allow wind turbines to create noise up to 45 decibels at night or 50 decibels during the day, as measured from the outside of a neighboring residence.
  - **Shadow flicker limits are inadequate.** The proposed rules allow wind turbines to create a shadow flicker on neighboring residences up to 40 hours per year. If shadow flicker exceeds 20 hours per year, developers must offer mitigation to property owners.

### Why This Is Important for REALTORS®

Without question, the number one reason REALTORS® should care about the proposed wind farm regulations is the impact of wind turbines on property values. Numerous studies have shown that wind turbines can have a negative impact on neighboring property values and sometimes that impact can be significant. According to a survey of REALTORS® working in a wind turbine area, the impact on neighboring vacant land ranges from a 43% decrease if the wind turbine is located very close (within 600 feet) to 29% if the turbine is located in near proximity (½ mile away). With respect to the impact on improved property, the impacts are believed to be similar, but slightly lower (39% and 24%, respectively).

While wind turbines are often seen in more rural settings, these regulations do not prevent wind turbines from being located in more urban or suburban settings. Because these regulations override local zoning ordinances, wind turbines can be located almost anywhere there is adequate wind, including next to residential subdivisions and office parks.

While developing alternative energy sources is important, so too is protecting property values. Without adequate setbacks in place, property values could suffer and property owners could face tremendous uncertainty about whether the neighboring property that is used for open space or farmland today will be used for a wind farm with large wind turbines tomorrow.



# A Problem With Wind Power

Eric Rosenbloom — September 5, 2006

Wind power promises a clean and free source of electricity. It will reduce our dependence on imported fossil fuels and reduce the output of greenhouse gases and other pollution. Many governments are therefore promoting the construction of vast wind “farms,” encouraging private companies with generous subsidies and regulatory support, requiring utilities to buy from them, and setting up markets for the trade of “green credits” in addition to actual energy. The U.S. Department of Energy (DOE) aims to see 5% of our electricity produced by wind turbine in 2010. Energy companies are eagerly investing in wind power, finding the arrangement quite profitable.

A little research, however, reveals that wind power does not in fact live up to the claims made by its advocates (see part I), that its impact on the environment and people’s lives is far from benign (see part II), and that with such a poor record and prospect the money spent on it could be much more effectively directed (see part III).

## I

In 1998, Norway commissioned a study of wind power in Denmark and concluded that it has “serious environmental effects, insufficient production, and high production costs.”

Denmark (population 5.3 million) has over 6,000 turbines that produced electricity equal to 19% of what the country used in 2002. Yet no conventional power plant has been shut down. Because of the intermittency and variability of the wind, conventional power plants must be kept running at full capacity to meet the actual demand for electricity. Most cannot simply be turned on and off as the wind dies and rises, and the quick ramping up and down of those that can be would actually increase their output of pollution and carbon dioxide (CO<sub>2</sub>, the primary “greenhouse” gas). So when the wind is blowing just right for the turbines, the power they generate is usually a surplus and sold to other countries at an extremely discounted price, or the turbines must be shut off.

A writer in *The Utilities Journal* (David J. White, “Danish Wind: Too Good To Be True?,” July 2004) found that 84% of western Denmark’s wind-generated electricity was exported (at a revenue loss) in 2003, i.e., Denmark’s glut of wind towers provided only 3.3% of the nation’s electricity. According to *The Wall Street Journal Europe*, the Copenhagen newspaper *Politiken* reported that wind actually met only 1.7% of Denmark’s total demand in 1999. Besides the amount exported, this low figure may also reflect the actual *net* contribution. The large amount of electricity used by the turbines themselves is typically not accounted for in the usually cited output figures.<sup>1</sup> In *Weekendavisen* (Nov. 4, 2005), Frede Vestergaard reported that Denmark as a whole exported 70.3% of its wind production in 2004.

Denmark is just dependent enough on wind power that when the wind is not blowing right they must im-

port electricity. In 2000 they imported more electricity than they exported. And added to the Danish electric bill are the subsidies that support the private companies building the wind towers. Danish electricity costs for the consumer are the highest in Europe.<sup>2</sup>

The head of Xcel Energy in the U.S., Wayne Brunetti, has said, “We’re a big supporter of wind, but at the time when customers have the greatest needs, it’s typically not available.” Throughout Europe, wind turbines produced on average less than 20% of their theoretical (or *rated*) capacity. Yet both the British and the American Wind Energy Associations (BWEA and AWEA) plan for 30%. The figure in Denmark was 16.8% in 2002 and 19% in 2003 (in February 2003, the output of the more than 6,000 turbines in Denmark was 0!). On-shore turbines in the U.K. produced at 24.1% of their capacity in 2003. The average in Germany for 1998-2003 was 14.7%. In the U.S., usable output (representing wind power’s contribution to consumption, according to the Energy Information Agency) in 2002 was 12.7% of capacity (using the average between the AWEA’s figures for installed capacity at the end of 2001 and 2002). In California, the average is 20%. The Searsburg plant in Vermont averages 23%, declining every year. This percentage is called the *load factor* or *capacity factor*. The rated generating capacity only occurs during 100% ideal conditions, typically a sustained wind speed over 30 mph. As the wind slows, electricity output falls off exponentially.

(1 megawatt (MW, 1 million watts) of power output × 24 hours × 365 days = 8,760 megawatt-hours (MW-h) energy per year; if a 1-MW wind turbine actually produces 1,752 MW-h over a year, owing to the variability of the wind and other factors, its capacity factor is 1,752/8,760 = 0.20, or 20%.)

In high winds, ironically, the turbines must be stopped because they are easily damaged. Build-up of dead bugs has been shown to halve the maximum power generated by a wind turbine, reducing the average power generated by 25% and more. Build-up of salt on off-shore turbine blades similarly has been shown to reduce the power generated by 20%–30%.

Eon Netz, the grid manager for about a third of Germany, discusses the technical problems of connecting large numbers of wind turbines in their 2004 “Wind Report”: Electricity generation from wind fluctuates greatly, requiring additional reserves of “conventional” capacity to compensate; high-demand periods of cold and heat correspond to periods of low wind; only limited forecasting is possible for wind power; wind power needs a corresponding expansion of the high-voltage and extra-high-voltage grid infrastructure; and expansion of wind power makes the grid more unstable.

Despite their being cited as the shining example of what can be accomplished with wind power, the Danish government has cancelled plans for three offshore wind

is only as a supplemental source that has no impact on the base load supply. "By its very nature, it's unreliable," says Jay Morrison, senior regulatory counsel for the National Rural Electric Cooperative Association.

As Country Guardian, a U.K. conservation group, puts it, wind farms constitute an *increase* in energy supply, not a replacement. They do not reduce the costs—environmental, economic, and political—of other means of energy production. If wind towers do not reduce conventional power use, then their manufacture, transport, and construction only increases the use of dirty energy. The presence of "free and green" wind power may even give people license to use *more* energy.

## II.

### Size

Pictures from the energy companies show slim towers rising cleanly from the landscape or hovering faintly in the distant haze, their presence modulated by soft clouds behind them. But a 200- to 300-foot tower supporting a turbine housing the size of a bus and three 100- to 150-foot rotor blades sweeping over an acre of air at more than 100 mph requires, for a start, a large and solid foundation. On a GE 1.5-MW tower, the turbine housing, or *nacelle*, weighs over 56 tons, the blade assembly weighs over 36 tons, and the whole tower assembly totals over 163 tons.

FPL (Florida Power & Light) Energy says, "a typical turbine site takes about a 42 × 42-foot-square graveled area." Each tower (and a site needs at least 15–20 towers to make investment in the required transmission infrastructure worthwhile) requires a huge hole filled with tons of steel rebar-reinforced concrete (e.g., 1,250 tons in each foundation at the facility in Lamar, Colo.). According to Country Guardian, the hole is large enough to fit three double-decker buses. At the 89-turbine Top of Iowa facility, the foundation of each 323-foot assembly is a 7-foot-deep 42-foot-diameter octagon filled with 25,713 pounds of reinforced steel and 181 cubic yards of concrete. The foundations at the Wild Horse project in Washington are 30 feet deep. At Buffalo Mountain in Tennessee, too, each foundation is at least 30 feet deep and may contain more than 3,500 cubic yards of concrete (production of which is a major source of CO<sub>2</sub>). On Cefn Croes in Wales the developer built a complete concrete factory on the site, which is not unusual, as well as opened quarries to provide rock for new roads—neither of which activities were part of the original planning application.<sup>7</sup>

On many such mountain ridges as well as other locations, it would be necessary to blast into the bedrock, as Enxco's New England representative, John Zimmerman, has confirmed, possibly disrupting the water sources for wells downhill. At the Waymart plant in Pennsylvania, the foundations extend 30–40 feet into the bedrock. At Romney Marsh in southern England, foundation pillars will be sunk 110 feet. For each 6-foot-deep foundation at

the Crescent Ridge facility in Illinois, another 24 feet was dug out and filled with sand. Construction at a site on the Slieve Aughty range in Ireland in October 2003 caused a 2.5-mile-long bog slide.

(Building on peat bogs is recognized as a serious disruption of an important carbon sink; the Royal Society for the Protection of Birds opposes wind development on the Scottish island of Lewis because the turbines would take 25 years to theoretically save the amount of carbon that their construction will release from the peat (not to mention the threat to birds—see below). Clearing forests for facilities on mountain ridges is an analogous situation. Such mountaintop clearing has serious runoff implications as well as documented at the Meyersdale plant in Pennsylvania.)

FPL Energy also says, "although construction is temporary [a few months], it will require heavy equipment, including bulldozers, graders, trenching machines, concrete trucks, flatbed trucks, and large cranes." Getting all the equipment, as well as the huge tower sections and rotor blades, into an undeveloped area requires the construction of wide straight strong roads. Many existing roads, particularly in hilly areas, are inadequate. For the Buffalo Mountain project, curves were widened, switchbacks were eliminated, and portions were repaved. The weight of the material has damaged existing roads. Many an ancient hedgerow in England has been sacrificed for access to project sites.

The destructive impact that such construction would have, for example, on a wild mountain top, is obvious. Erosion, disruption of water flow, and destruction of wild habitat and plant life would continue with the presence of access roads, power lines, transformers, and the tower sites themselves. For better wind efficiency, each tower requires trees to be cleared. Vegetation would be kept down with herbicides, further poisoning the soil and water. Each tower should be at least 5–10 times the rotor diameter from neighboring towers and trees for optimal performance. For a tower with 35-meter rotors, that is 1,200–2,400 feet, a quarter to half of a mile. A site on a forested ridge would require clearing 50–100 acres per tower to operate optimally (although only 4–6 acres of clearance per tower, the towers spaced every 500–1,000 feet, is typical, making them almost useless when the wind is not a perfect crosswind). The Danish grid operator Eltra has found that a turbine can decrease the production of another turbine 5 kilometers (3.1 miles) away. The proposed 45-square-mile facility on the Scottish island of Lewis represents 50 acres for each megawatt of rated capacity. FPL Energy says it requires 40 acres per installed megawatt, and the U.S. Environmental Protection Agency (EPA) says 60 acres is likely. Facilities worldwide generally use 30–70 acres per megawatt, i.e., about 120–280 acres for every megawatt of likely average output (25% capacity factor).

GE boasts that the span of their rotor blades is larger than the wingspan of a Boeing 747 jumbo jet. The typical

turns to catch the wind.<sup>11</sup> Enxco's John Zimmerman admitted at a meeting in Lowell, Vt., "Wind turbines don't make good neighbors."

The penetrating low-frequency aspect to the noise, a thudding vibration, much like the throbbing bass of a neighboring disco, travels much farther than the usually measured "audible" noise. It may be why horses who are completely calm around traffic and heavy construction are known to become very upset when they approach wind turbines.<sup>12</sup> Many people have complained that it causes anxiety and nausea. The only way to reduce it is to reduce the efficiency of the electricity production, i.e., reduce the illusion of profitability. It can't be done.

Advocates, when not denying the noise outright, suggest that the wind itself masks any noise the turbine assembly makes. Rustling leaves, however, are a very different sound than the thumping of a wind facility. And in developers' output projections, they point out that the wind is very much more steady and stronger up at the top of the towers, so even that rustling down on the ground is not always there when the turbines are turning. This is often the case at night and always the case in winter. In Oregon, wind developers complained they could not comply with regulations limiting the increase of noise in rural and wild areas. In May 2004, the state weakened the noise regulations so installation of wind facilities could go ahead.

The European Union (E.U.) published the results of a 5-year investigation into wind power, finding noise complaints to be valid and that noise levels could not be predicted before developing a site. The AWEA acknowledges that a turbine is quite audible 800 feet away. The National (U.S.) Wind Coordinating Committee (NWCC) states, "wind turbines are highly visible structures that often are located in conspicuous settings ... they also generate noise that can be disturbing to nearby residents." The NWCC recommends that wind turbines be installed no closer than half a mile from any dwelling. German marketer Retexo-RISP specifies that turbines not be placed within 2 kilometers (1.24 miles) of any dwelling.

Communities in Germany, Wales, and Ireland claim that even 3,000 feet away the noise is significant. Individuals from Australia to the U.K. say they have to close their windows and turn on the air conditioner when the wind turbines are active. The noise of a wind plant in Ireland was measured in 2002 at 60 decibels 1 km (3,280 feet) upwind. The subaural low-frequency noise was above 70 dB (which is 10 times as loud on the logarithmic decibel scale). A German study in 2003 found significant noise levels 1 mile away from a 2-year-old wind farm of 17 1.8-MW turbines, especially at night. In mountainous areas the sound echos over larger distances. A neighbor of the 20-turbine Meyersdale facility in southwest Pennsylvania found the noise level at his house, about a half mile away, to average 75 dB(A) over a 48-hour period, well above the level that the EPA says prevents sleep. In Vermont, the director of Energy Efficiency for the Depart-

ment of Public Service, Rob Ide, has said that the noise from the 11 550-kilowatt Searsburg turbines is significant a mile away. Residents 1.5 and even 3 miles downwind in otherwise quiet rural areas suffer significant noise pollution. A criminal suit has been allowed to go forward in Ireland against the owner and operator of a wind plant for noise violations of their environmental law. Also in Ireland, a developer has been forced to compensate a homeowner for loss of property value, and many people have had their tax valuation reduced. In the Lake District of northwest England, a group has sued the owner and operator of the Askam wind plant, claiming it is ruining their lives.

In January 2004, a couple was awarded 20% of the value of their home from the previous owners who did not tell them the Askam wind plant was about to be constructed 1,800 feet away: "because of damage to visual amenity, noise pollution, and the irritating flickering caused by the sun going down behind the moving blades." The towers of this plant are only 40 meters (130 feet) high, with the rotors extending a further 24 meters (75 feet). Steve Molloy of West Coast Energy responded that loss of value of a property, although unfortunate, was not a material planning consideration and did not undermine the industry's argument that the benefits of sustainable energy outweighed the objections.<sup>13</sup>

Don Peterson, senior director of Madison Gas & Electric, which operates 31 wind towers in Kewaunee County, Wisconsin, similarly dismisses complaints, saying that most people, but not all, will get used to the sound of the machines. "Like any noise, if you don't like it, your brain is going to focus on it," he comfortingly told the *Beloit Daily News*. Especially in relatively undeveloped areas, there can be no question that the unnatural noise from a wind facility will be prominent. Just a 10-dB increase over existing levels (a typical limit for such projects) represents the subjective perception of a doubling of noise level.

It has been reported that one of the farmers who leases land for the wind towers had to buy the neighbors' property because of the problems (not just noise but also flicker and lights at night). Wisconsin Public Service, operator of another 14 turbines in Kewaunee County, in 2001 offered to buy six neighboring properties; two owners accepted, but two others filed a lawsuit in January 2004.<sup>14</sup> On January 6, 2004, the *Western Morning News* of Devon published three articles about noise problems, particularly the health effects of low-frequency noise, from wind turbines. Another interesting report, which notes that the Nazis used low-frequency noise for torture, was published in the January 25 *Telegraph*.<sup>15</sup>

### Jobs, Taxes, and Property Values

Despite the energy industry's claim that wind farms create jobs ("revitalize struggling rural communities," says Enxco), the fact is that, after the few months of construction—much of it handled by imported labor from

thing even Denmark, with wind producing as much as 20% of their electricity, is not able to do. According to solar energy consultant and retailer Real Goods, if every household in the U.S. replaced one incandescent bulb with a compact fluorescent bulb, one nuclear power plant could be closed. John Etherington claims that switching the most-used bulb in every house of the U.K. would save as much as the entire output of all existing and proposed on-shore wind plants in that country.

The BWEA itself says that the cost of saving energy is less than half the cost of producing it. According to the California Power Authority (ignoring the subsidies that lower the market price of wind-generated electricity) conservation costs exactly the same per KW-h as wind power. John Zimmerman admitted at a February 2003 meeting in Kirby, Vermont, that we "could do much more for our energy balance by just tightening our belts a little."

As described in part I, wind farms do not bring about any reduction in the use of conventional power plants. Requiring the upgrading of power plants to be more efficient and cleaner would actually do something rather than simply support the image of "green" power that energy companies profit from while in fact doing nothing to reduce pollution or fuel imports. An April 2000 E.U. report found that, using existing technology, increased efficiency could decrease energy consumption by more than 18% by 2020. The U.N.-sponsored Intergovernmental Panel on Climate Change has stated that simple voluntary energy-efficiency improvements in buildings will reduce world energy use 10%–15% by 2020. They state that, with technology already in use, efficiency improvements in buildings, manufacturing, and transport can reduce world carbon emissions more than 50% by 2020.

In the U.S., 61.5% of the energy used is "lost," i.e., only 38.5% of the energy consumed is actually extracted.<sup>20</sup> In transmission alone, 7.34% of the electricity generated is lost. There is obviously much that can be improved in what we already have and will continue to live with for quite some time.

Electricity represents only 39% of energy use in the U.S. (in Vermont, 20%; and only 1% of Vermont's greenhouse gas emissions is from electricity generation). Pollution from fossil fuels also comes from transportation (cars, trucks, aircraft, and ships) and heating. Despite the manic installation of wind facilities in the U.K., their CO<sub>2</sub> emissions rose in 2002 and 2003. At a May 27, 2004, conference in Copenhagen, the head of development from the Danish energy company Elsam stated, "Increased development of wind turbines does not reduce Danish CO<sub>2</sub> emissions." Demanding better gas mileage in cars, including pickup trucks and SUVs, promoting rail for both freight and travel, and supporting the use of biodiesel (for example, from hemp) would make a huge impact on pollution and dependence on foreign oil, whereas wind power makes none. Some hybrid gas-electric cars (the ones that don't just add the electric motor just for a

"green" acceleration boost) already use 60% less gasoline than average conventional new cars in the U.S.

Wind-power advocates often propose that wind turbines can be used to manufacture hydrogen for fuel cells. This may be an admirable plan (although *Windpower Monthly* dismisses it for several reasons in a May 2003 article) but is so far in the future that it only serves to underscore the fact that there is no good reason for current construction. And it must be remembered that as wind turbines are unable to produce significant amounts of electricity they would likewise be unable to produce significant amounts of hydrogen. On top of that, a 2004 study by the Institute for Lifecycle Environmental Assessment determined that hydrogen returns only 47% of the energy put into it, compared with pumped hydro returning 75% and lithium ion batteries up to 85%.

On a small scale, where a turbine directly supplies the users and the fluctuating production can be stored, wind can contribute to a home, school, factory, office building, or even small village's electricity. But this simply does not work on a large scale to supply the grid. Even the small benefits claimed by their promoters are far outstripped by the huge negative impacts.

We are reminded that there are trade-offs necessary to living in a technologically advanced industrial society, that fossil fuels will run out, that global warming must be slowed, and that the procurement and transport of fossil and nuclear fuels is environmentally, politically, and socially destructive. Sooner or later the realities of this modern life will have to reach into our own back yards, the commons must be developed for our economic survival, and it would be elitist in the extreme to believe we deserve better. So wilderness areas are sacrificed, rural communities are bribed into becoming live-in (but ineffective) power plants, our governments boast that they are looking beyond fossil fuels (while doing nothing to actually reduce their use), and our electric bills go up to support "investment in a greener future." And at the other end of this trade-off, multinational energy companies reap greater profits and fossil and nuclear fuel use continues to grow.

Many alternative sources of energy, as well as dramatic improvements in the use of current sources, are in development. But wind turbines exist, so they are presented by their manufacturers and managers as *the* solution. Every effort is made to maintain the illusion that they are in fact a solution when a few simple questions reveal they are not.

## Notes

1. Actual information about energy consumption by the turbines themselves is difficult to discover. Their output to the grid is measured at a substation, but the meters do not "run backwards." Some information can be seen in the Greenpeace-sponsored "Yes2Wind" forum at <http://www.yes2wind.co.uk/forums/showthread.php?&threadid=69>.