Memo

Project:	Aegir wind farm, Lake Michigan	Date: 2010-02-11
Subject:	Impacts of offshore wind farms	Project No.:
To:	Harald Dirdal	
Copy:		
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This purpose of this short memo is to give a brief summary of relevant research and experiences from existing wind farms regarding various issues addressed by Mr. John P. Miller in Garrison Park Association and Mrs. Dianne Baker, citizen of Pentwater.

Noise vs. people

The masking of noise from wind turbines caused by waves breaking on the shoreline has been studied by ÅF-Ingemansson AB and the Royal Institute of Technology in Stockholm. Their findings were presented in the paper "Masking of wind power by sea waves" at the Second international meeting on wind turbine noise, held in Lyon, France in September 2007. The results presented are based on measurements conducted at four different shorelines along the Baltic Sea.

The paper demonstrates that background sound from breaking sea waves (and wind) most likely will contribute to the masking on wind turbine noise, assuming that the frequently used imission limit of 40 dBA is not exceeded (which is the case for the Aegir project, where calculations have shown imission levels <35 dB at the shoreline). However, the masking potential depends on the wave height at the time when the wave breaks. The wave breaking potential can vary between different shore locations, and sea bed depth and inclination are usually important factors in determining wave height when breaking. If the seabed profile at the location in question differs significantly from those measured by Ingemansson, it is advisable to conduct site measurements in order to estimate the relative differences.

Mr. Miller stated that no study yet exists that suggests that the noise level from 200 turbines will not be disturbing to persons onshore. While this may be true, noise prediction models can easily demonstrate the relative difference in noise emission between a large wind farm and a smaller one. The noise spectrum will be almost identical for all turbines in a wind park, so an increase in number of turbines will result in a small and predictable increase in noise level from the wind farm.

It is correct that noise created from a wind farm, or any other type of continuous noise for that matter, may constitute a health risk for the people exposed if the levels are too high. Also, it is recognised as very difficult to perform noise mitigation measures once the wind farm is in operation. It is therefore important to ensure that noise emission limits on the shore are not exceeded, and for the Aegir project this has been achieved by localising the project as far as 4 miles from the shoreline.

The various manufacturers are also continually researching how noise generation can be reduced by improving designs for components of their rotors and turbines, and it is not unreasonable to expect a gradual reduction in noise emissions from the coming generation of wind turbines.

Relevant research / links:

Appelqvist, P., Almgren, M., Bolin, K. & Åbom, M. 2007. *Masking of wind turbine noise by sea waves.* Paper from ÅF-Ingemansson AB and Royal Institute of Technology, Stockholm.

Underwater noise vs. aquatic fauna (more specifically fish)

A lot of effort has been spent to produce good estimates of the underwater sound energy produced from wind turbines. Underwater noise and vibrations generated from offshore wind farms has been a major field of concern among marine scientists. OSPAR published in 2009 a report which gives an overview of the impacts of anthropogenic underwater sound in marine environments. The report stated that sound is important for many marine organisms, and man-made underwater sound becomes a form of pollution when it harms or is likely to harm marine life.

The effect of underwater noise on aquatic life can theoretically be classified to vary from low levels where it can just be detected, up to levels masking communication, levels which induce a response in the particular organism and rising to a level where it can harm the organism.

In a recent PhD Thesis from Sweden Dan Wilhelmsson showed that the foundation structures of the wind turbines act as artificial-reefs, and collected a lot of different fish species. This indicates that fish response to typical underwater noise is acceptable and well within the threshold where fish would flee the area or can be harmed.

In 2007 C. Müller published the results from a scientific laboratory experiment where the response from simulated wind mill noise was tested on two different marine fish species (cod and plaice). The results gave no clear flight response on either of the species.

Furthermore, these two studies showed no negative effects on fish behaviour after exposure to typical noise from a wind turbine.

Relevant research / links:

http://www.ospar.org/documents/dbase/publications/p00441_Noise%20Background%20document.pdf

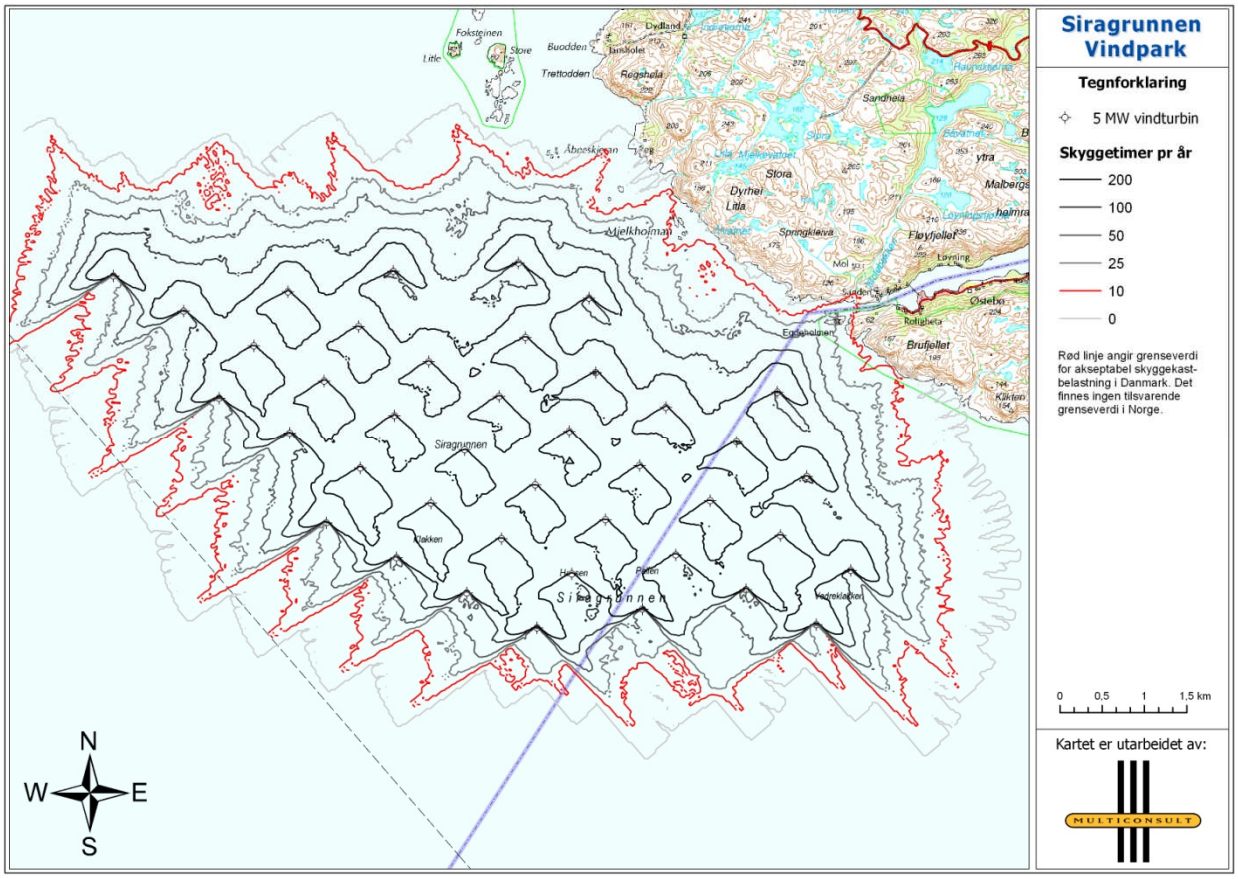
Müller C., 2007.Behavioural reactions of cod (*Gadus morhua*) and plaice (*Pleuronectes platessa*) to sound resembling offshore wind turbine noise. Dissertation zur Erlangung des akademischen Grades Dr. rer. nat. im Fach Biologie. Mathematisch-Naturwissenschaftlichen Fakultät I der Humboldt-Universität zu Berlin

Shadow and flickering

Wind turbines, like other tall structures will cast a shadow on the neighbouring area when the sun is visible. If one lives very close to the wind turbine, it may be annoying if the rotor blades chop the sunlight, causing a flickering (blinking) effect while the rotor is in motion.

Shadow casting is generally not regulated explicitly by planning authorities. In Germany, however, there has been a court case in which the judgement indicated that up to 30 hours of actual shadow flicker per year could be tolerable at a certain neighbour's property. In calculating the 30 hours, the judgement stated that only flicker which occurs during the hours when the property is actually used by people who are awake. In Denmark a corresponding figure of 10 hours/year has been used.

The map below shows the estimated hours of shadow cast for an offshore wind farm in Norway. The distance from the nearest turbine to the coastline is less than 0.55 miles (compared to 4 miles for Aegir). The results of these calculations clearly show that shadow / flickering is not a significant problem if the distance between the wind farm and the coastline / built-up areas is more than 0.55 miles. This clearly indicates that the Aegir project, which is located approximately 4 miles from the shoreline, will not produce shadows / flickering in built-up areas along the shore. Even theoretically shadow cast can only occur for a few minutes during the rising / setting sun on days of very clear visibility. In practice this will be too infrequent to mention as a significant problem.



Relevant research / links:

http://guidedtour.windpower.org/en/tour/env/shadow/shadowc.htm

http://www.wwindea.org/technology/ch02/en/2_1.html

Terrestrial fauna (birds)

The impacts of offshore wind farms on migrating and stationary bird populations have been studied at Nysted (166 MW) and Horns rev (160 MW) in Denmark.

The results from the two Danish wind farms showed that 70-80 % of all migrating seabirds adjusted their flying direction at a distance of 1.5 - 2 km from the wind turbines, thereby passing the wind farm on the outside (Blew et. al. 2006, Fox et. al. 2006). Especially loons (*gavia sp.*), geese (*Anser sp.* and *Branta sp.*) and black scoter (*melanitta nigra*) showed a significant avoidance of the wind farm, while gulls and cormorants did not exhibit such behaviour (Blew et al, 2006). Most birds that flew through the wind farm (20 – 30 %) adjusted either altitude or direction, so that they maintained a safe distance to the rotor blades.

During autumn migration more than 235 000 common eiders (*Somateria mollissima*) are passing the shallow waters where Nysted wind farm is located. A computer model based on extensive experience with migrating birds at Nysted estimated that 0.02 % of all birds (approximately 45 individuals pr season) are likely be killed due to collisions with turbines (Fox et al, 2006).

In addition, at Nysted scientists have used TADS (Thermal Animal Detection System) in order to track the migrating birds. 481 hours of footage was collected with a thermographic /infrared video camera. There were no indications that collisions between birds and wind turbines had occurred (Desholm 2005, 2006). Blew et. al. (2006) also investigated the impacts on birds of prey, but only sparrowhawk (*Accipiter nisus*) were observed in sufficient numbers for statistical analyses. Approximately 30 % of the

migrating sparrowhawks showed no avoidance of the wind farm (they were flying through), but the birds adjusted their altitude or direction and passed the turbines at a safe distance. Not a single bird collision was detected.

According to NWCC (2001) a number of studies of onshore wind farms in the US (California not included) have resulted in an estimate of 1.83 dead birds/turbine/year (all species), while the corresponding figure for birds of prey is 0.006 birds/turbine/year. The total figure for US (including California) is 2.19 birds/turbine/year. The results from Altamont Pass (California) have proved not to be representative for other wind farms in USA. Based on these figures, NWCC has estimated that the 3 500 wind turbines in USA (year 2000) each year killed 6 400 birds. Even though there are some uncertainties associated with these figures, it is obvious that wind turbines do not represent the same threat to birds as transmission lines (135-174 million dead birds pr year in USA), collisions with cars (60-80 million birds), collisions with buildings / windows (100 – 1000 million birds) and cats (approximately 40 million birds killed each year).

Studies at Nysted wind farm also shown that common eiders and long-tailed ducks, the only seabirds except gulls that occur in siginficant numbers in winter and early spring, showed reduced preference for the wind farm during the construction phase (compared to the baseline situation) – while herring gull showed increased preference for the wind farm area. Gulls are probably attracted by boats (Kalhert m.fl. 2004), while the eiders and ducks are affected by noise and disturbance. Both during construction and operation, an offshore wind farm may have some impacts on the quality of the habitat for some species of seabirds.

Conclusion: The results of the extensive studies conducted at Nysted and Horns rev show that the risk of collisions between offshore turbines and birds are extremely low compared with many other causes of bird collision. However, offshore wind turbines may negatively affect the quality of bird habitat during construction and operation. Some species may be found in lower densities within the wind farm compared to the baseline situation prior to construction.

Relevant research / links:

Blew, J., Diederichs, A., Grünkorn, T., Hoffman, M. & Nehls, G. 2006. *Investigations of the bird collision risk and the response of harbour porpoises in the offshore wind farms Horns Rev, North Sea, and Nysted, Baltic Sea, in Denmark.* Report from Universiät Hamburg and BioConsult SH, 165pp.

Fox, T., Christensen, T. K., Desholm, M., Kahlert, J. & Petersen, I. K. 2006. *Final Results of the Avian Investigations at the Horn Rev and Nysted Offshore Wind Farms.* National Environment Research Institute, Department of Wildlife Ecology and Biodiversity, Kalø, Denmark.

Desholm, M. 2006. *Wind farm related mortality among avian migrants – a remote sensing study and model analysis.* PhD thesis.

Desholm, M. 2005. *Preliminary investigations of bird-turbine collisions at Nysted offshore wind farm and final quality control of Thermal Animal Detection System (TADS).* Report commissioned by Energi E2. National Environmental Research Institute. Ministry of Environment, Denmark.

Kalhert, J., Petersen, I. K., Fox, A. D., Desholm, M. & Clausager, I. 2004. *Investigations of birds during construction and operation of Nysted offshore wind farm at Rødsand. Annual status report 2003.* Commisioned by Energi E2 A/S. NERI Techincal Report.

NWCC. 2001. Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States; National Wind Coordinating Committee; West, Inc.; August, 2001

Commercial and recreational fishing / boating activities

From fisheries statistics (2006) the total commercial fisheries catch in Lake Michigan was 7,356,234 pounds. The dominating species were Lake Whitefish and Chubs. Gill nets, trap nets, and pound nets are the most common gear used in the region, although trawls and trap nets are still used by some.

An installation of a wind farm in Lake Michigan will occupy some area which could be used for fisheries, either commercial or recreational. The wind turbines are planned to be installed with an internal spacing of approximately 1000 meters. Normally, there are no restrictions on boating activities within offshore wind farms, and there will be space enough for the safe operation of fishing gear such as trap nets and pound nets. Electrical cables between the wind turbines, and from the wind farm to the shoreline, are expected to be buried in the sediments. The use of anchors for the trap nets and pound nets is therefore not expected to be a problem. Depending on the number of nets in a gang, there may not be space enough between turbines for this type of fishery.

Since there will be no restrictions on boating activities within the wind farm, the installation is not expected to affect recreational fishing either.

Relevant research / links:

http://www.st.nmfs.noaa.gov/st1/commercial/landings/gl_query.html

http://www.geo.msu.edu/glra/workshop/02wecoworkshp/PMtalks.htm

Hazard navigation lights

The overall purpose of hazard navigation lights is to make the wind turbines visible for pilots of small and large aircraft, but such lights can disturb the night time landscape view. Such lights can be positioned and angled in order to reduce light emission towards the ground, and the aircraft hazard navigation device can be provided with a cover, which largely prevents the light from being visible from the ground next to the wind turbines.

Relevant research / links:

http://www.wipo.int/pctdb/en/wo.jsp?wo=2003104649

Employment / job opportunities

Job creation is an important benefit from investment in new energy. During the last election, the term “green jobs” was widely quoted. Wind power has over the last past decades generated many jobs for families all over the world, not only in the city centres but also in remote locations and different levels of expertise. In the US you will find that more then 85 000 people are already employed in the industry. According to EWEA, statistics show that 15.1 jobs are created during the manufacturing and construction phase and in the EU and in operations and maintenance approximately 0.4 jobs are created per MW of capacity.

Wind power is a labour intensive form of energy productions, and all wind farms have their own staff maintaining the operations of the turbines. Offshore wind farms in North America are not yet in operation, but experience from Europe clearly indicates that offshore wind generation is more labour intensive then onshore wind generation, and will create more jobs per MW.

In Europe, where many offshore wind farms are already in operation or under development, you will easily find local job generation. The Norwegian company Statoil is currently developing a 315 MW wind site by the coast of Norfolk, UK. When the wind farm comes into operation about 63 people will be directly employed at this site.

Relevant research / links:

http://www.awea.org/pubs/factsheets/Market_Update_Factsheet.pdf

http://www.ewea.org/fileadmin/ewea_documents/documents/publications/factsheets/EWEA_FS-employment.pdf

http://www.statoil.com/no/TechnologyInnovation/NewEnergy/Renewablepowerproduction/offshore/sheringhamshoel/Pages/default.aspx

Wind power versus coal, gas and nuclear power / CO_2-emissions

Coal generates more than 50 percent of United States' electricity, and is the single biggest air polluter in the country. Coal pollutes in all aspects of the value chain, from coal mining, transport, storage, emissions to air, water and ground, cooling water impacts right through to disposal of ash and chemicals after generation. Although less severe than coal in terms of greenhouse gas emissions, a similar picture can be drawn for energy production based on gas, oil, oils shales and nuclear fuel.

Informed advocates of renewable energy have good arguments and many analyses which demonstrate that new renewable energy added to the grid will have a positive impact in reducing the carbon footprint of the nation, and new wind farm projects should not be viewed in a regional perspective but rather in a national context. It is not the case that standby generation is required for every MW of new wind power added to the grid, and certainly not the case where such standby generation plant already exists such as for the Ludington pump storage plant right adjacent to the proposed Aegir wind farm. New wind energy will replace the most expensive form of energy already being produced on the grid system, and thereby reduce the carbon footprint, irrespective of what the future demand for power will rise or fall.

Wind is a sustainable source of energy compared to non-renewable sources like coal, oil and gas, and during operation there are no emissions of green house gases. A Danish study from the late 90'ties concluded that the energy consumption during production, construction, maintanence and removal/demolition equals the amount of energy produced in only three months of operation. Assuming 20 years of operation, each turbine will produce more than 80 times the energy consumed.

***Table 1**. CO2-emissions for various power production technologies / energy sources. Kg CO_2-equivalents pr MWh.*

	Coal	Gas	Solar PV	Nuclear	Wind	Hydro
			kg CO_2/MW$_e$h			
ExternE [1]	815	362	53	20	7	-
UK SDC [2]	891	356	-	16	-	-
U. of Wisconsin [3]	974	469	39	15	14	-
CRIEPI, Japan [4]	990	653(a)	59	21	37	18
Paul Scherrer Inst. [5]	949(b)	485	79	8	14	3
UK Energy Review [6]	755	385	-	11–22	11–37	-
IAEA [7]	968(c)	440(c)	100(c)	9–21	9–36	4–23
Vattenfall AB [8]	980	450	50	6	6	3
British Energy [9]	900	400	-	5	-	-

The units are kilograms of CO_2–equivalent emitted per megawatt-hour of electricity generated.
The figures refer to total emissions for the whole life cycle of the generating plant.
Notes:
(a) The figures for gas refer to combined cycle where available, the CRIEPI figure is for thermal.
(b) The PSI data are the "minimum" value data-set from the PSI report.
(c) Figures for best 1990s technology.

1. ExternE National Implementation Germany, W. Krewitt *et al.*, Externalities of Energy European Commission Research Project, Nov. 1997
2. The Role of Nuclear Power In a Low Carbon Economy, SDC Position Paper, UK Sustainable Development Commission, Mar. 2006
3. Life-Cycle Assessment of Electricity Generation Systems and Applications for Climate Change Policy Analysis, P.J. Meier, Ph.D. thesis, University of Wisconsin, Aug. 2002
4. Energy Technology Life Cycle Analysis that Takes CO2 Emission Reduction Into Consideration, Central Research Institute of Electric Power Industry, Japan, Annual Research Report, 1995
5. Greenhouse Gas Emissions From Energy Systems: Comparison and Overview, R. Dones *et al.*, Paul Scherrer Institut Annual Report 2003, Annex IV
6. UK Govt. Energy Review: The Energy Challenge, 2006, Chapter 5, Electricity Generation
7. Greenhouse Gas Emissions Of Electricity Generation Chains: Assessing the Difference, J.V. Spadaro *et al.*, IAEA Bulletin 42/2/2000
8. Environmental Product Declaration of Electricity from Torness Nuclear Power Station, British Energy, May 2005
9. Vattenfall's Life Cycle Studies of Electricity, Vattenfall AB, Oct. 1999

Tourism

The possible impacts of wind farms on tourism have been widely debated for many years. So far, most tourism studies of the effect of wind farms have shown that the impacts have been insignificant, and in some cases even positive.

A study conducted by MORI Scotland (2002) showed that the development of wind farms in Argyll had very little impact on numbers of tourists in this region. 91 % of the tourists responded that the wind farm projects had no impact on their plans or wishes for future trips to Argyll. In some areas, like Kentish Flats (UK), Esperance (Australia) and Smøla (Norway), wind farms have become popular attractions leading to an increase in tourist numbers. Neither Friesland (Germany) nor Denmark, two regions/countries with high numbers of wind turbines, have witnessed any decrease in numbers of tourists in recent years. This popularity is likely to be a temporary effect as the general public become more accustomed to wind farms and more people have participated in such site visits. This would imply that the first wind farm projects in a particular state/ country may reap potential benefits in tourism, while subsequent projects may experience a declining or negative effect as curiosity for the new technology wanes.

In Denmark, there are 6,000 wind turbines (2004) in an area approximately 1/6 of the size of state of Michigan, and wind farms there are sometimes used for marketing tourism. This is particularly targeted towards the German market, where the public is known to have a high level of interest in both environmental issues and new technology.

Surveys in the UK show that for 94 % of visitors to North Cornwall, the presence of wind farms has had no adverse impact on the likelihood of them visiting North Cornwall again. The majority of the remaining 6 % said that the presence of wind farms would actually encourage them to revisit. Such public interest has led to a steady increase in the use of serviced accommodation in the area of the Delabole Wind Farm.

The survey done by the tourism organization "Visit Scotland" (2002) showed that more tourists were positive than negative to wind farms. The conclusion in this survey was that existing wind farms in Scotland have had insignificant impacts on tourism (so far).

Two surveys in Norway (Mork & Melby, 1995 and Vestlandsforskning, 2009) have shown that most tourists prefer fewer and larger wind farms instead of many smaller farms with the same total capacity. The rationale behind this is that the cumulative impacts on the natural and human environment are less for the first alternative compared to the last. These surveys also showed that most tourists are not very concerned about the development of a limited number of large wind farms; it is the cumulative impacts of wind farm development spread along the entire coastline that worries the majority of local inhabitants.

Relevant research / links:

Hilligweg, G. og Kull, S., 2004: Windkraftanlagen und Tourismus: Zwei unvereinbare Welten oder eine lokale Chance? Ergebnisse einer Touristenbefragung im Nordseebad Varel-Dangast. Fachhochschule

Oldenburg/Ostfriesland/Wilhelmshaven, Fachbereich Wirtschaft am Standort Wilhelmshaven

Melby, M & Mork, K. 2005. Environmental Impact Asessment for Havsul I-IV. Multiconsult AS and Miljøfaglig Utredning AS. Oslo, Norway.

MORI, Scotland 2002. Tourist Attitudes towards Wind Farms. Research Study Conducted for Scottisch Renewables Forum & the British Wind Energy Association.

The Scottish Government Publications, 2008. The Economic Impacts of Wind Farms on Scottish Tourism. http:/www.scotland.gov.uk/Publications/2008/03/07113554/0

VisitScotland, 2002. Investigation into the potential impact of wind farms on tourism in Scotland. Final Report.

Wind farms vs. property prices

Berkeley Lab Study Finds No Widespread Impact of Wind Power Projects on Surrounding Residential Property Values in the U.S., (*U.S. Department of Energy*, Dec. 2009). *A three years study by the U.S.*

Department of Energy's Lawrence Berkeley National Laboratory concludes "neither the view of wind energy facilities nor the distance of the home to those facilities was found to have any consistent, measurable, and significant effect on the selling prices of nearby homes. No matter how we looked at the data, the same result kept coming back - no evidence of widespread impacts."

Green vs. Green: Measuring the Compensation Required to Site Electrical Generation Windmills in a Viewshed, (Appalachian State University, June 2007) *A study find that "individuals who perceive wind energy as a clean source of power require less compensation. Those who retire to the mountains or individuals who have ancestors from Watauga County require more compensation to accept windmills in their view-shed. The annual compensation necessary is estimated to be about $23 per household. In the aggregate, citizens need to be compensated by about $500,000 a year to allow wind electrical generation turbines in Watauga County."*

Impact of windmill visibility on property values in Madison County, New York, (*Bard Center for Environmental Policy*, Bard College, Apr. 2006). *Master's thesis. The paper finds no measurable affect on property values on 280 arms-length single family home transactions around an upstate New York windfarm. Also provides a good review of previous studies.*

An economic analysis of a wind farm in Nantucket Sound, (*Beacon Hill Institute*, May 2004). *The authors use a survey methodology to poll tourists, residents and real estate agents as to the effect of a proposed windfarm in Massachusetts. Homeowners expect the project to decrease their home values by an average of 4.0%. A minority of real estate agents concurred.*

The effect of wind development on local property values, (*Renewable Energy Policy Project*, May 2003). *One of the main sources in support of wind farming, this study was one of the first detailed looks at the relationship between wind farming and property values. The study finds that wind farms have no impact on property values. However, opponents discount the report due to some statistical issues (problems with the study are outlined on pgs. 16-17 of the Bard College paper above). Still widely cited.*

Final Report of the Wind Turbine Moratorium Study Committee, (*Lincoln Township, WI*, Feb. 2000). *Lincoln Township in western Wisconsin undertook a study of local windfarms to gage their impact on the community. Excerpts of this report are often cited by wind farm opponents to bolster their case. However, the actual report states "the siting of the windmills has not had any significant negative impact on property values near them."*

Relevant research / links:

http://newscenter.lbl.gov/press-releases/2009/12/02/wind-power-property-values/

http://econ.appstate.edu/RePEc/pdf/wp0712.pdf

http://www.windaction.org/?module=uploads&func=download&fileId=811

http://www.beaconhill.org/BHIStudies/Windmills2004/WindFarmArmyCorps.pdf

http://www.awea.org/pubs/documents/000211_Lincoln_Township-Full_Moratorium_Report.pdf

Economic feasibility

The question of the economic feasibility of various power production technologies boils down to macro-economics and political subsidies. Many economists argue that it is the polluting use of fossil fuels which has been effectively subsidized for generations through applying no penalties, i.e. zero cost

for polluting emissions. Fossil fuels will continue to be subsidized until the whole economic cost to society of such pollution (clean-up costs, health costs, climate gas reduction costs etc.) is built into the price of further use of such fossil fuels. Pollution–free renewable energy sources are the only ones where “subsidies” have so far been quantified in monetary terms. Wind energy is no exception. US Wind energy projects receive a tax credit for each kilowatt-hour generated, over the first ten years of the project. This credit reduces the tax liability of a wind farm, and can be considered as a subsidy, but public money does not flow to the wind farm owner.

Clean, renewable, domestic wind energy produces no emissions, requires no fuel and the cost is fixed and predictable over time.

Wind energy costs are now in a range that is competitive with power from new conventional power plants. The up-front, capital cost of wind energy is more expensive than that of some traditional power technologies such as natural gas. However, the cost of fuel is zero, and the cost of operations and maintenance over the lifetime of the wind farm is now competitive with that of other energy sources.

What makes this Aegir Lake Michigan wind project even more favourable is the Ludington Pumped Storage Power Plant. This plant is located near the northern edge of the proposed wind farm. The Aegir Project could provide off-peak power to the plant—fill its reservoir via renewable energy generation—while the plant could continue to generate and sell its power during peak consumption hours. Aegir could, in effect, recharge this giant “battery” and combine two renewable energy sources to deliver reliable and predictable base load energy. This combination of random wind energy regulated by a pump storage plant nearby is ideal for matching power demand variations, and exists only in very few places elsewhere in the US.

Also, the 345 kV transmission lines on shore provide a substantial backbone to transmit power to major load centers.

Relevant research / links:

http://www.awea.org/pubs/factsheets/050629_Myths_vs_Facts_Fact_Sheet.pdf