

Original Questions:

1. Compare property values by similar density (i.e. homes per square mile vs. turbines per square mile). [See response to question K3.](#)
2. Provide data/studies on the impact of property values (evaluate based on proximity, view corridor, visual impact, etc.). [See response to question K3.](#)
3. I would like to see a compilation of all the studies done on the effects on property values. There is so much floating around, I don't know what to believe. [See response below.](#)
4. What analysis, if any, has been done to examine the property value and resulting tax reduction for the township? I realize the study Duke cites says there is no adverse impact on property value. But, I understand the housing in that study was not reflective of Benzie County. How will the schools, already in dire economic situations, be impacted? [Project specific; Beyond the scope of this project, but see response to question K3.](#)
5. Would the government be able to condemn property by eminent domain where transmission lines and substations are to be placed? If so, how are properties valued when taken by eminent domain? [See response below.](#)
6. Re: Property Value Issue. The Takings Clause of the 5th Amendment states that serious sustained physical invasions of property requires payment of compensation equal to the difference between market value prior to and after invasion. How does this apply to the wind industry's use of private land and the effect on non-participating property owners and the community in general, in regards to a property value issue, specifically devaluation of property and a township's ability to protect/guarantee property value through its zoning ordinance? Is noise pollution a taking? Consider the scale of the project: encompassing approx. 25 square miles, 4 townships, thousands of property owners, one hundred and twelve 500 ft. tall industrial wind turbines, associated access roads, transmission lines, sub-stations, etc. and the length of the project, a 25 year lease in this case. [See response below.](#)
7. If a wind farm is placed in a mixed use resort/residential/agriculture/natural beauty area, such as this, what is the true potential for real property value loss? [See response to question K3.](#)
8. There are claims that wind farms harm property values in "mixed use" settings, but not in strictly or strongly agricultural settings? Is that what the extant studies say, as far as you can tell? [See response to question K3.](#)
9. Property values are bound to go down, how will this be addressed? Will studies be performed in this area? [See response below.](#)
10. In a decade or more, would having a wind farm (several turbines) nearby be a positive or negative for selling a home and/or piece of property? In other words, if you live next to a wind farm, is that going to negatively or positively affect your ability to get a good price for your home or farm? [See response to question K3.](#)
11. Are there ordinances that have a property value guarantee? Can you reference these community ordinances? Have they been challenged? [See response below.](#)
12. Do homes loose property value if they are located within a one mile radius of an industrial wind energy project with 100+ turbines? [See response to question J2.](#)
13. Will non-participating property value increase if within one mile of an industrial wind energy facility? Can you provide examples? [See response below and response to question J2.](#)
14. The DOE/Lawrence Berkeley Study on Residential Property Values states that wind farms have no impact on residential property values. There have been several examinations of this report. Mr. Albert Wilson (AR Wilson, LLC specializes in environmental financial risk management and impaired value analysis) examined the methodology used in the analysis. He states, "As stated in the title, the primary basis for the conclusions drawn in the report are hedonic analysis of residential real estate sales data. A hedonic analysis in turn is based on the assumption that the coefficients of certain explanatory variables in the regression represent accurately the marginal contribution of those variables to the sale price of the property." He further states, "If the regression does not conform to recognized standards then we have no independent assurance of the accuracy or reliability, as in this case." This study was done for the "Wind Industry." The Wind Industry funded the study and the wind industry got the results

they wanted. One critical flaw in the study is that less than 10% of the properties had any view of the turbines with only 2.1% of the property rated the view greater than minor. 64% of the properties were 3 miles or more from the wind farm and the turbines could not be seen at the properties. This skews the data significantly where little impact on property values is measured. The study was also too short a period. Is the conclusion of the Lawrence Berkeley study that there is not impact on property values from wind farms correct, or are there deficiencies in the study?

**Comment not question.**

15. Keeping in mind the current state of dropping home values in general, is it valid to say that property values increase or decrease after a wind farm is developed? **See response to question K3.**
16. I have a smaller parcel of land I want to build a home on in the future. It is surrounded by adjacent property owners that have signed wind leases. If wind turbines are constructed closer to my property because presently there is no structure on my property, my parcel is now worthless. I or no one else would want to build on my parcel, with wind turbines so close to my parcel. How am I compensated for the loss of a buildable parcel that no one would consider constructing on, with industrial wind turbines so close to it? **See response below.**
17. Some residents argue that the sight of a Wind Farm would lower their property values. Articles that I have read suggest that property values may decrease during the construction phase, but return to normal and increase after the wind turbines are operational. **Comment not question; this study is addressed in the response to question K3.**
18. Are there actual decreased property values of those residences that are non-participating? **See response to question K3.**
19. Can an ordinance include a Property Value Guarantee? If not specifically excluding wind but pertaining to any industrial application? **See response to question K11.**
20. Will the total number of property studies used to determine property values impacts from wind development be disclosed? **Project specific.**

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### **Questions and Responses:**

*These questions may have been re-categorized and reorganized. Some may have been sent to another "theme" area (this will have been explained in red under the "Original Questions" section). In other cases two or more questions will be answered with one response.*

- K3.** I would like to see a compilation of all the studies done on the effects on property values. There is so much floating around, I don't know what to believe.

**Response:** The response to this question is intended to address several questions within this thematic area that pertain to the impacts of wind farms on property values. It appears that the question that was at the core of most other questions is "Do wind farms impact property values? If so, under what circumstances and to what degree?" This response provides a summary of available evidence on the effects of wind farms on nearby home property values.

As with many other issues, the impacts of wind turbines on nearby property values are hotly contested. It is difficult to identify studies that have been conducted by a research group from a neutral source of funding. An added complication is that the housing bubble burst in 2007 decreased the values of most homes, not just those near wind turbines. Furthermore, it is possible that wind turbines are built in places with already declining or lower property values, an economic problem called "endogeneity." What is clear is that more economic analysis should be undertaken and published in peer-reviewed journals to better understand this issue, and it is likely that the effects of wind farms on property values varies greatly according to the preferences of the local community as well as land use patterns near the wind farm.

The National Research Council's volume "The Environmental Impacts of Wind-Energy Projects," published in 2007, contains a section on property value studies (That section may be found at [http://books.nap.edu/openbook.php?record\\_id=11935&page=163](http://books.nap.edu/openbook.php?record_id=11935&page=163)). This text presents a list of variables that

could possibly influence the impact that wind turbines have on nearby property values. The contributors to this book summarize: “On the one hand, to the extent that a property is valuable for a purpose incompatible with wind-energy projects, such as to experience life in a remote and relatively untouched area, a view that includes a wind-energy project—especially one with many turbines—may detract from property values. On the other hand, to the extent that the wind-energy project contributes to the prosperity of an area, it may help to bring in amenities and so may enhance property values.”

Since the NRC book was published in 2007, several other studies examining the impacts of wind farms on property values have been conducted. A 2009 study by Ben Hoen, Ryan Wiser, Peter Cappers, Mark Thayer, and Gautam Sethi of the Lawrence Berkeley Lab in California (<http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e.pdf>) analyzed properties near multiple wind farms and found no link between distance from wind farms and property values, but the authors acknowledge that individual properties could still be affected in some cases. This research group released a recent study investigating roughly 7,500 sales of single-family homes surrounding 24 existing wind facilities in the United States. They conclude that neither the view of the wind facilities nor the distance of the home to those facilities is found to have a statistically significant effect on sales prices. See the 2011 article by Hoen et al. in Vol 33 (3) of the Journal of Real Estate Research. This paper is available in the AES document repository in the file “Property Values”. A 2010 study of a large wind farm in Illinois came to a similar conclusion as the Berkeley study group. (<http://indianadg.files.wordpress.com/2010/11/2010-wind-farm-proximity-and-property-values1.pdf>).

For a critique of the 2009 Berkeley study, see the McCann group’s 2009 review at <http://www.bpwtag.ca/mccann-appraisal-llc-review-of-lbnl-wind-farm-property-value280a61.pdf> They critique the hedonic analysis approach taken by Hoen and others. A good example is a report submitted to the Cape and Vineyard Electrical Cooperative in Brewster, Massachusetts, downloadable at <http://www.acousticecology.org/wind/winddocs/property/McCann-Appraisal%20info%20CVEC-2011-01-06.pdf.pdf>

Two more recent studies were conducted in Illinois. Hinman’s 2010 study, “Wind Farm Proximity and Property Values”, looked at the effect of Twin Groves Wind Farm, with 240 turbines, on nearby property values in McLean County, Illinois. The study found that property value impacts vary based on the different stages of wind farm development. When the wind farm was initially announced, property values near the prospective wind farm site sold for less than those located elsewhere. However, during the operational stage of the wind farm project, property values rebounded and soared higher in real terms than they were prior to wind farm approval. The study found that these stages of wind farm development roughly correspond to the different levels of risk as perceived by local residents and potential homebuyers. One of the limitations of this study is that the number of properties actually located within one mile of a wind turbine was small and this limits the number of properties available for sale in the housing market. The report also did not consider property value effects of turbines within 1000ft. The minimum setback used for this project was 1500ft.

Both the Hoen et al. and Hinman studies note that the lack of negative impact is harder to be clear about at very close ranges (up to a half mile or mile) because the number of sales is too small to establish statistical significance. In the Hoen et al. 2009 data, there is some indication of a modest decrease at close range, and in Hinman’s data, evidence of more variation in prices up close while the average remains relatively unaffected. Again, though, it needs to be stressed that there are not enough sales to make any conclusions with confidence—and that Hoen et al. feel quite sure that the data from close distances is unlikely to represent a real trend. These primary studies indicate that seeing turbines is unlikely to affect property values, but there is less certainty about impacts when turbines are close enough to be clearly audible.

In contrast, a September 2009 study by Appraisal Group One, a condemnation appraisal consultant firm, conducted an opinion survey of realtors in Dodge and Fond Du Lac counties in Wisconsin. They found property values declined 12 to 47 percent from 2006 to 2009, depending on the proximity of turbines within

an existing wind farm region. That study can be found at [www.scribd.com/doc/23858548/Ago-Wind-Turbine-Property-Value-Impact-Study](http://www.scribd.com/doc/23858548/Ago-Wind-Turbine-Property-Value-Impact-Study).

Another recent study is Carter's 2011 "The Effect of Wind Farms on Residential Property Values in Lee County, Illinois" which also utilized a hedonic price model to assess the impacts on 1,298 real estate transactions from 1998 to 2010. The projects in the county include the Lee-Dekalb Wind Center, Mendota Hills and the GSG Wind Farm. The analysis indicates that residential properties located near wind turbines in Lee County have not been impacted by their presence. This study argues that it is tough to reconcile the consistent findings that wind farms do not affect neighboring property values with general public perception to the opposite. While there is evidence to suggest that wind farms do not affect the ease of selling a home, additional exploration of the issue should occur.

In contrast, Heintzelman and Tuttle's 2011 study "Values in the Wind: A hedonic analysis of wind power facilities", which evaluated 11,369 properties in upstate New York over a period of 9 years, found a significant and negative impact from wind turbines. The authors of this study found that properties within one mile of a wind turbine experience a drop in value ranging from 7% to 14%. The results of this study are markedly different from previous studies, which according to the authors is due to the use of methodology that better controls for analysis bias. The authors argue that these results represent a need to compensate nearby non-leasing property owners for a drop in property values. This study can be accessed at [http://clarkson.academia.edu/MartinHeintzelman/Papers/1155349/Values\\_in\\_the\\_Wind\\_A\\_Hedonic\\_Analysis\\_of\\_Wind\\_Power\\_Facilities](http://clarkson.academia.edu/MartinHeintzelman/Papers/1155349/Values_in_the_Wind_A_Hedonic_Analysis_of_Wind_Power_Facilities)

Finally, Chris Luxemburger gathered some interesting information in Ontario; most striking in his findings is that days on market averaged twice as long around wind farms, along with 11% of homes not selling at all near wind farms, as compared to 3% elsewhere. His report can be downloaded at <http://www.acousticecology.org/wind/winddocs/property/luxemburger-Property%20Values,%20time%20on%20market.pdf>

There are no extensive studies of the effect on property values in western Michigan. None of the above studies focus on property value impacts in a resort and tourism based economy. There are also no comprehensive studies of homes abandoned or considered un-marketable after wind farms commenced operation, but there are many isolated examples of both (as well as wind developers buying homes of nearby neighbors who were having problems living in proximity with the turbines).

In conclusion, the studies suggest that there may well be a relatively small number of nearby homes that are very dramatically affected, perhaps by chronic audible noise. These homes may show up in many studies as outlier low sales; when averaged in with others in the area that are less affected, overall prices don't show any marked decline. It remains very unclear what proportion of homes within a half mile may be dramatically devalued by the presence of turbines; it seems likely to be low, but more than negligible.

**K5. Would the government be able to condemn property by eminent domain where transmission lines and substations are to be placed? If so, how are properties valued when taken by eminent domain?**

**Response:** Yes. An authorized governmental unit can condemn property for a "public use," except that the government cannot condemn property for the purpose of transferring it to a private entity for economic development or the enhancement of tax revenues. However, transmission lines and substations related to the generation of wind power would be considered a valid public use. Notably, utilities also have authority to condemn property, or an interest in property, such as an easement for a transmission line.

If their property is condemned, property owners will receive just compensation, which is generally 100% of the fair market value of the property being condemned. If it is their principal residence, they are compensated for 125% of the fair market value. The governmental unit will make a good faith offer based on an appraisal, which the property owner may challenge. If the government and the property owner are

unable to reach an agreement, the government may file an action in court, in which case the court will determine a rate for just compensation for the property.

If something less than the owner's entire interest in the property is condemned, the owner is compensated for the appraised value of only what is condemned. For example, for an easement for a transmission line, a property owner will generally be compensated for the value of the easement, not the entire property, because the property owner will still have use of the property. The value of an easement will vary depending on the extent to which it interferes with the property owner's use of the property.

- K6. Re: Property Value Issue. The Takings Clause of the 5th Amendment states that serious sustained physical invasions of property requires payment of compensation equal to the difference between market value prior to and after invasion. How does this apply to the wind industry's use of private land and the effect on non-participating property owners and the community in general, in regards to a property value issue, specifically devaluation of property and a township's ability to protect/guarantee property value through its zoning ordinance? Is noise pollution a taking? Consider the scale of the project: encompassing approx. 25 square miles, 4 townships, thousands of property owners, one hundred and twelve 500 ft. tall industrial wind turbines, associated access roads, transmission lines, sub-stations, etc. and the length of the project, a 25 year lease in this case.

**Response:** The Fifth Amendment of the United States Constitution and Art. 10, Sec. 2 of the Michigan Constitution most likely do not apply to this situation because the Taking Clauses only apply to actions of the government and land that is appropriated or "taken" for a "public use." In other words, it is not possible for one private landowner's private use of their property to amount to a "taking" of a neighbor's property in violation of the Constitutions.

Instead, the neighboring private landowner's remedies are limited to pursuing a private lawsuit in court, such as pleading a "nuisance" claim that the wind turbine unreasonably interferes with the neighbor's enjoyment of his or her property. The fact that a township permits wind turbines under a zoning ordinance would not be relevant; that is to say, the failure to prohibit a private land use does not amount to a taking of properties affected by that land use, even if the land use rises to the level of nuisance. But, on the other hand, the fact that a windmill owner is in compliance with a local zoning ordinance also would not protect the owner from a nuisance suit.

The only way in which the Taking Clauses might apply would be if the government took action by passing a law, stating that a wind turbine could never be treated as a nuisance, depriving a landowner who has been harmed of their legal property rights to redress a nuisance, or if the government, itself, constructed the windmill like any landowner.

- K9. Property values are bound to go down, how will this be addressed? Will studies be performed in this area?

**Response:** Property values of nearby homes will not necessarily decrease due to the presence of wind turbines. See question K3. We are not aware of property values studies being performed in Manistee and Benzie Counties.

- K11. Are there ordinances that have a property value guarantee? Can you reference these community ordinances? Have they been challenged?

**Response:** Property value guarantees are not a common element of wind energy ordinances. However, in Denmark property owners who lose more than 1 percent in value of their property as a result of the installation of a wind turbine are ensured full compensation for their loss. In this case, if you own the property you have the option to voluntarily enter into an agreement with the wind energy company to compensate you for the loss of the value of the property as part of your initial agreement to lease your land.

Information about this case is available at [http://www.ens.dk/en-US/Info/Legislation/Energy\\_Supply/Documents/Promotion%20of%20Renewable%20Energy%20Act%20-%20extract.pdf](http://www.ens.dk/en-US/Info/Legislation/Energy_Supply/Documents/Promotion%20of%20Renewable%20Energy%20Act%20-%20extract.pdf)

The Town of Hammond, New York passed a Wind Energy Facilities law that requires the applicant to submit for review a “Property Value Analysis” that is prepared by a licensed appraiser. The analysis is reviewed and approved by the Variance and Project Oversight Board. This analysis is used to determine the potential impact of values on properties. The law also requires a Residential Property Value Guarantee Agreement that attempts to deal with the issue of protecting the value of real property within a 2 mile radius of a Wind Energy System project. This law was enacted in 2011 and has not been tested in a court of law. For more information about this law, see [http://www.townofhammondny.com/uploads/documents/Hammond\\_Wind\\_Law-Proposed\\_Revisions\\_021311\\_\(2\).pdf](http://www.townofhammondny.com/uploads/documents/Hammond_Wind_Law-Proposed_Revisions_021311_(2).pdf)

In addition, in 2009 DeKalb County, Illinois a property owner entered into a property value guarantee agreement. The agreement is fashioned after a template developed by attorneys working for the State of Illinois. This is available at <http://renewableenergy.illinoisstate.edu/wind/conferences/speaker%20presentations/022410%20Siting%20Zoning%20Taxing%20Conf/PM%200230%20A%20Ruth%20Anne%20Tobias.pdf>

K16. I have a smaller parcel of land I want to build a home on in the future. It is surrounded by adjacent property owners that have signed wind leases. If wind turbines are constructed closer to my property because presently there is no structure on my property, my parcel is now worthless. I or no one else would want to build on my parcel, with wind turbines so close to my parcel. How am I compensated for the loss of a buildable parcel that no one would consider constructing on, with industrial wind turbines so close to it?

**Response:** See the response to question K6. Assuming the turbines are operated in compliance with all applicable laws, then the neighbor’s remedy would be a private lawsuit against the wind turbine owners or operators.