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Field Guide to Wind Farms & Their Effect on Property Values

(Updated May 2015)

Wind power is one of the fastest growing sources of electricity generation. While much past growth has taken place in Europe (Denmark derives up to 30% of its electricity from wind), wind power has made inroads domestically. With a total of 61,110 mega watts (MW) in operation at the end of 2013, U.S. wind turbine capacity generated enough electricity to power the equivalent of nearly 15.3 million homes.

As wind farms spread, local opposition to the massive towers (some over 400 ft tall) is appearing and is beginning to impact state regulation. Residents not only oppose the turbines for aesthetic reasons, they also worry how wind farms will impact property values.

This field guide explores the current state of the industry, examines real-estate-related research and its critics, provides wind maps and regulations to give an indication of where future projects might unfold, and gives resources, both critical and supportive, for further study. (A. Siudzinski, Senior Library Information Specialist)

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Windfarms and the Power of the Wind

Top Five States by Cumulative Wind Power Capacity in Mega Watts (MW)—2012:

Texas.....12,214 MW
Iowa.....5,542 MW
California.....5,133 MW
Illinois.....3,568 MW
Minnesota.....3,153 MW

Source: [U. S. Dept. of Energy National Renewable Energy Laboratory](#)

Top Five States by Potential Wind Energy, (thousands of GWh per year):

Texas.....6,528
Kansas.....3,647
Nebraska.....3,540
South Dakota.....3,412
Montana.....3,229

Source: [U.S. Dept. of Energy, Wind Powering America](#)

Background

[2013 Wind Technologies Market Report](#), (U.S. Department of Energy, Aug. 2014). – Annual report that provides a comprehensive overview of trends in the U.S. wind power market, with a particular focus on 2013. The full report, a stand-alone executive summary of the report, a presentation, and some of the data underlying the report can be downloaded.

[Enabling Wind Power Nationwide](#), (Energy.gov, May 18, 2015).

[Rhode Island project may become nation's first offshore wind farm](#), (*Boston Globe*, Mar. 2, 2015).
[Wind Energy Basics](#), (*Bureau of Land Management*, N.D.). How wind turbines work, advantages and disadvantages.
[The Renewables Boom](#), (*Time*, Oct. 11, 2013). Solar, wind – and efficiency herald a broad change in US energy consumption.
[20% Windpower by 2030](#), (*U.S. Department of Energy*, May 2008).—This report looks closely at one scenario for reaching 20% wind energy by 2030 and contrasts it to a scenario of no new U.S. wind power capacity.

Impact on Real Estate Values

[The windy city: Property value impacts of wind turbines in an urban setting](#), (*Energy Economics*, 44 (2014)). - “Broadly, the results suggest that there is no statistical evidence for negative property value impacts of wind turbines. Both the whole sample analysis and the repeat sales analysis indicate that 11 houses within half a mile had essentially no price change”

[Relationship between Wind Turbines and Residential Property Values in Massachusetts](#), (*U of CT/ US Dept. of Energy*, 2014). The study “found no net effects due to the arrival of turbines in the sample’s communities. Weak evidence suggests that the announcement of the wind facilities had a modest adverse impact on home prices, but those effects were no longer apparent after turbine construction and eventual operation commenced. The analysis also showed no unique impact on the rate of home sales near wind turbines.”

[A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States](#), (*U.S. Department of Energy*, Aug. 2013). Building on its earlier 2009 study, the research team collected data from more than 50,000 home sales among 27 counties in nine states. These homes were within 10 miles of 67 different wind facilities, and 1,198 sales were within 1 mile of a turbine—many more than previous studies have collected. “Regardless of model specification, we find no statistical evidence that home values near turbines were affected in the post-construction or post-announcement/pre-construction periods.”

[Values in the Wind: A Hedonic Analysis of Wind Power Facilities](#), (*Land Economics*, Aug. 2012). -2011 draft [available here](#). This paper uses data on 11,331 property transactions over nine years in northern New York State to explore the effects of new wind facilities on property values. They find that nearby wind facilities significantly reduce property values in two of the three counties studied. These results indicate that existing compensation to local homeowners/communities may not be sufficient to prevent a loss of property values.

[Wind Energy Facilities and Residential Properties: The Effect of Proximity and View on Sales Prices](#), (*Journal of Real Estate Research*, 2011). Same authors as the DOE report below. **Q**

[The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis](#), (*U.S. Department of Energy*, Dec. 2009). A three-year 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.” The link is to the press release on the study. A PDF version of the study is available at the bottom of the press release along with a PowerPoint of highlights and contact information. Critics of the study appeared almost immediately, including the [Acoustic Ecology Institute](#), appraisers ([here](#) and [here](#)), as well as from [established opposition groups](#). Study author Ben Hoen presented the following slides at the New England Wind Energy Education Project webinar, 2010: [Impacts on residential property values new wind turbines: An overview of research findings and where to go from here](#) [PowerPoint in PDF]. This presentation shows updated research and conclusions from the Berkeley study that suggest that effects on property values can exist and need to be addressed.

[Green vs. Green: Measuring the Compensation Required to Site Electrical Generation Windmills in a Viewshed](#), (*Appalachian State University*, June 2007). A study finds 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." A version of this paper appeared in the journal [Energy Policy](#) in 2008.

Wind Maps, Regulations

[State Wind Resource Maps](#), (*Wind Powering America*, Aug. 2013)—Links to updated state specific maps detailing wind resources.

[Installed U.S. Wind Capacity](#), (*Wind Powering America*, Mar. 2013)—An animated map showing how capacity has grown over the last 13 years. Current through Year End 2012.

[Catching the breeze at your door](#), (*Wall Street Journal*, Sept. 12, 2010)—Backyard turbines are becoming more popular. Here's what you need to know if you're considering one.

[DSIRE: Database of State Incentives for Renewable's and Efficiency](#), (*NC State University*, 2012)—DSIRE is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency.

Opposition

[Bat decision could impact Midwest wind industry](#), (*Midwest Energy News*, Mar. 31, 2015). - "Wind energy in parts of the Midwest could be impacted if the federal government announces this week that it is listing the Northern long-eared bat as an endangered or threatened species."

[Wind farm fears blow over test tower proposal in Lincoln County](#), (*Sioux Falls Argus Leader*, Feb. 23, 2015).

[Blowback: Wind farms run afoul of neighbors regulators](#), (*Detroit Free Press*, Feb. 24, 2015).

[Homeowners Wind Turbine Ruled Nuisance](#), (*REALTOR.org*, June 26, 2013). Nevada's highest court has considered whether to uphold an injunction preventing the construction of a wind turbine in a residential subdivision.

More and more wind turbine opponents are collecting resources online. Below are a sample:

[Windpowerfacts.info](#) John Droz, Jr. has gathered information on the problems of wind energy on his website.

[Wind Turbine Syndrome](#) Nina Pierpont's research on the physical impact of wind turbines on nearby residents. While some dispute her claims and small sample size, further study is warranted.

[Industrial Wind Action Group](#) Industrial Wind Action is "dedicated to providing information on industrial wind energy to enable communities and government officials to make informed decisions."

[National Wind Watch](#) National Wind Watch™ is a nonprofit organization that promotes awareness of the negative impacts of industrial wind energy development on our environment, economy, and quality of life.

[StopillWind](#) The purpose of Stopillwind is to provide evidence exposing the limitations of wind technology, both as a system for producing energy and because its massive scale too often threatens sensitive ecosystems and vulnerable wildlife while producing numerous nuisances that erode quality of life for nearby residences and, in many locations, destroy historically significant natural views.

Wind Energy Websites

[American Wind Energy Association](#). AWEA is a national trade association representing companies and individuals involved in the wind power industry. It promotes wind energy as a clean source of electricity for consumers around the world. The organization website does a good job addressing opposition to wind farms.

[National Wind Coordinating Collaborative](#), (*RESOLV*). The NWCC brings together government, industry and environmental organizations to try to reach consensus on sustainability developing wind power in the U.S. Subcommittees address environmental, economic, and technical concerns.

[North American Windpower](#). A magazine serving decision-making professionals involved in the North American wind energy generation and distribution business.

[Windpower Monthly](#). A news magazine focused on the international wind energy business.

[Windustry](#). Non-profit organization dedicated to increase wind energy opportunities for rural landowners and communities. Rich collection of resources including industry links, news, state regulations, lease guidelines, and more.

[Yes2Wind](#), (Greenpeace / World Wildlife Fund / Friends of the Earth). UK site sponsored by major environmental organizations to promote wind power in Britain. Includes a wind power FAQ, a myth-buster section, and a wind farm locator (UK only).

eBooks & Other Resources

Books, Videos, Research Reports & More

The resources below are available for loan through Information Central. Up to three books, tapes, CDs and/or DVDs can be borrowed for 30 days from the Library for a nominal fee of \$10. Call Information Central at 800-874-6500 for assistance.

[Wind Power, Revised Edition: Renewable Energy for Home, Farm, and Business](#), (Chicago: Chelsea Green Publishing, 2004).

Field Guides & More

These field guides and other resources in the Virtual Library may also be of interest:

[Field Guide to Solar & Renewable Energy Features & Tax Credits](#)

[Field Guide to Effects of Power Lines on Property Values](#)

[InfoCentral Blog](#)

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