

PROPERTY VALUE IMPACT STUDY: WIND FARM PROXIMITY

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CohnReznick LLP



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Impact Studies

- Landfills
- Behavioral Health Facilities
- Concert Venues
- Cell Towers



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- Member of the Institute of Real Estate Management (IREM)
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Education

- Syracuse University - BFA

Impact Studies

- Landfills
- Waste Transfer Stations
- Big Box Retail
- Transmission Lines
- Zoning Overlay districts
- Truck Terminals



DOES PROXIMITY TO WIND FARMS IMPACT PROPERTY VALUES?





ACADEMIC STUDIES



PUBLISHED WIND FARM IMPACT STUDIES

Study Title	Author	Date	Methodology	Location	Impact Found
1 Wind turbines, amenities, and disamenities: a study of home value impacts in densely populated Massachusetts	Hoen, et al.	2016	Hedonic Regression Analysis	Massachusetts	No Impact
2 Impact of Industrial Wind Turbines on Residential Property Assessment in Ontario	Moore, et al.	2016	Multiple Regression Analysis	Ontario, Canada	No Impact
3 Brookings County 2015 Property Value Survey	Prevailing Winds	2015	Simple observation of increase/decrease in value of proximate and non-proximate properties (Ag & Res)	Brookings County, SD	No Impact
4 A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States	Hoen, et al.	2013	Spatial-process difference-in-difference hedonic models	27 Counties in U.S. States	No Impact
5 The Effect of Wind Farms on Residential Property Values in Lee County, Illinois	Carter	2011	Hedonic Regression Analysis on proximate and regional sales data	Lee County, IL	No Impact
6 Wind energy facilities and residential properties: the effect of proximity and view on sales prices	Hoen, et al.	2011	Hedonic Regression Analysis	24 existing wind facilities in the United States	No Impact
7 Wind Energy Study - Effect on Real Estate Values	Canning (MAI)	2010	Multiple Regression Analysis, Paired Sale Analysis	Chatham-Kent, Ontario (Canada)	No Impact
8 Wind farm proximity and property values: a pooled hedonic regression analysis of property values in central Illinois	Hinman	2010	Hedonic Regression Analysis with Difference-in-Difference Estimators	McLean County, IL	No Impact
9 The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis	Hoen, et al.	2009	Hedonic Regression analysis & Repeat Sales Models	24 existing wind facilities in the United States	No Impact
10 A Real Estate Study of the Proposed White Oak Wind Energy Center, McLean & Woodford Counties, Illinois	Poletti	2007	Statistical analysis of homes in close proximity and those not proximate	McLean & Woodford Counties, IL	No Impact
11 Impacts of windmill visibility on property values in Madison County, New York	Hoen	2006	Hedonic Regression Analysis	Madison County, NY	No Impact
12 A Study on the Impact of Windmills on Property Values in Tucker County, West Virginia	Goldman	2006	Qualitative interviews	Tucker County, WV	No Impact
13 Market Impact Analysis	MaRous (MAI)	2005	Matched Pair Analysis and Interviews	Bureau County, IL	No Impact
14 The Effect of Wind Development on Local Property Values	Sterzinger	2003	Linear Regression Analysis	7 U.S. States	No Impact

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CR CASE STUDIES



IMPACT STUDY - METHODOLOGY

- We have studied a number of established wind facilities across the U.S.
 - Reviewed published studies
 - Interviewed market participants (real estate assessors and real estate brokers)
 - Prepared paired sales analyses to compare potentially impacted properties located in “**Test Areas**” with unimpacted properties called “**Control Areas**.”
- **Test Areas:** A group of sales located adjacent to Existing Wind Farms.
- **Control Areas:** A group of otherwise similar properties not located adjacent to Existing Wind Farms.
- ***“If a legitimate detrimental condition exists, there will likely be a measurable and consistent difference between the two sets of market data; if not, there will likely be no significant difference between the two sets of data.”***

-From the Appraisal Institute’s textbook, *Real Estate Damages*, page 25





TEST & CONTROL PROPERTY SELECTION CRITERIA

Test Area Sales are:

- In a township or area that contained wind turbines, within close proximity and visibility of a turbine and outside of turbine setbacks, but within two miles of turbines.
- Properties that sold after the construction of the wind farm
- Arm’s length transactions
- Not distressed sales (no foreclosures, short sales, bank-owned sales)
- Not participating land owners. Every effort was made to identify potential participating land owners and were excluded from analysis.

Control Area Sales are:

- In a surrounding township or area that did not contain wind turbines, at least 14,725 feet (2.79 miles) from a turbine
- Properties that sold after the construction of the wind farm, and within approximately 18 months of the Test Sale property
- Similar in construction, age, land area, and size to the Test Area Sales
- Arm’s length transactions
- Not distressed sales (no foreclosures, short sales, bank-owned sales)



WIND FARM IMPACT STUDIES

CohnReznick's research has indicated there has been no quantifiable and consistent detrimental impact measured on the Test Area properties, with regard to such market elements as:

- Range of sale prices
- Differences in unit sale prices
- Time on market
- Overall marketability
- Rate of Appreciation
- New Development

The following analysis reflects CohnReznick's study on wind farms located in Illinois.

WIND FARM 1: PILOT HILL WIND FARM, KANKAKEE & IROQUOIS COUNTY, IL

Total Land Size: ±15,000 Acres

Date Project Announced: 2013

Date Project Completed: August 2015

Output: 175 MW AC



WIND FARM 1: PILOT HILL WIND FARM, KANKAKEE & IROQUOIS COUNTY, IL

GROUP 1

CohnReznick Paired Sale Analysis Pilot Hill Wind Farm Group 1		
No. of Sales	Potentially Impacted by Wind Farm	Adjusted Median Price Per SF
Test Area Sales (3)	Adjoining wind farm	\$133.13
Control Area Sales (7)	No: Not adjoining wind farm	\$132.76
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		0.28%



Pilot Hill Wind Farm - Group 1

	Gross Finished Living Area (SF)	Land Size (AC)	Year Built	Beds / Baths
Test Area Sales (Range)	1,675 - 1,900	3.6 - 5.0	1900 - 1974	3 - 4 / 2 - 3.5
Control Area Sales (Range)	1,500 - 2,352	2.0 - 5.17	1940 - 1978	3 - 4 / 2 - 4

WIND FARM 1: PILOT HILL WIND FARM, KANKAKEE & IROQUOIS COUNTY, IL

GROUP 2

CohnReznick Paired Sale Analysis Pilot Hill Wind Farm Group 2		
No. of Sales	Potentially Impacted by Wind Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining wind farm	\$175.00
Control Area Sales (10)	No: Not adjoining wind farm	\$173.98
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		0.59%



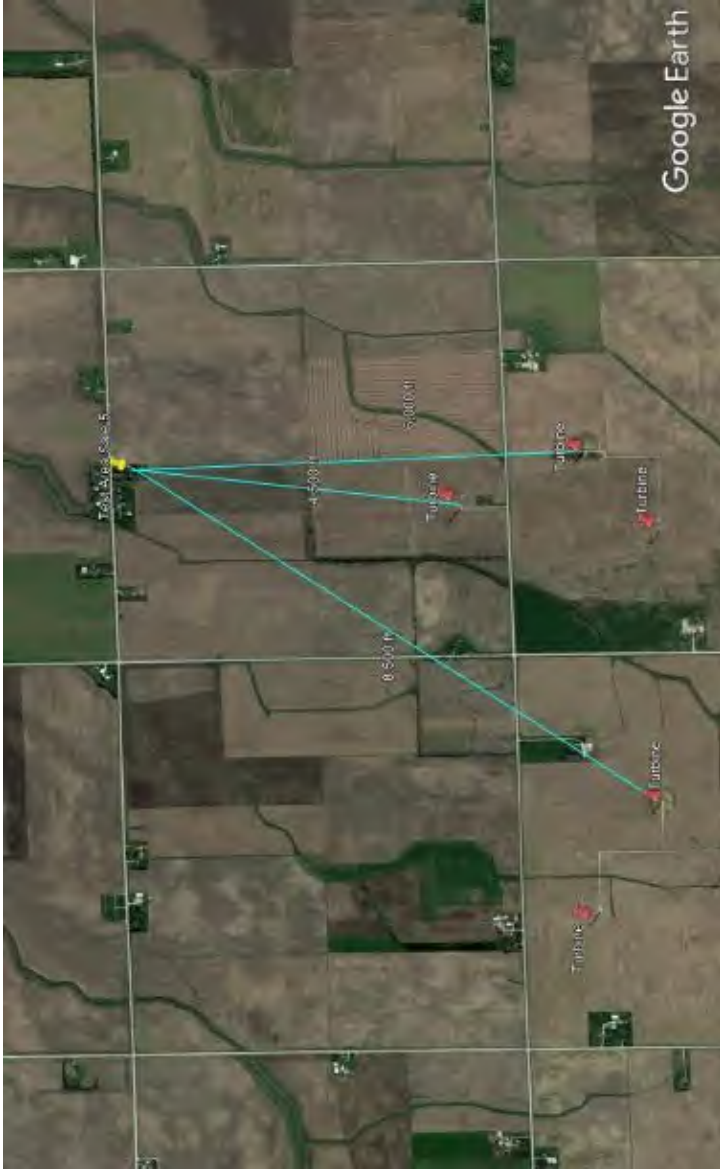
Pilot Hill Wind Farm - Group 2				
	Gross Finished Living Area (SF)	Land Size (AC)	Year Built	Beds / Baths
Test Area Sale	1,800	2.9	1995	3 / 2.5
Control Area Sales (Range)	1,300 - 2,200	2.2 - 5.5	1985 - 2002	3 / 1.5 - 2.5

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WIND FARM 1: PILOT HILL WIND FARM, KANKAKEE & IROQUOIS COUNTY, IL

GROUP 3

CohnReznick Paired Sale Analysis Pilot Hill Wind Farm Group 3		
No. of Sales	Potentially Impacted by Wind Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining wind farm	\$129.06
Control Area Sales (7)	No: Not adjoining wind farm	\$120.73
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		6.90%



Pilot Hill Wind Farm - Group 3				
	Gross Finished Living Area (SF)	Land Size (AC)	Year Built	Beds / Baths
Test Area Sale	1,239	1.0	1959	3 / 1
Control Area Sales (Range)	1,108 - 1,700	1.7 - 3.7	1900 - 1975	3 / 1 - 2

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SUMMARY OF TESTED DATA

CohnReznick Impact Study Analysis Conclusions							
Wind Farm #	Wind Farm	Adjoining Test Sale Properties	Adjoining Property Sale (Test Area) Median Price per SF	Control Area Sales Median Price per SF	% Difference	Avg Linear Feet from Turbine to House	Impact Found
1	Pilot Hill Wind Farm	Group 1 (3)	\$133.13	\$132.76	0.28%	1,533	No Impact
		Group 2 (1)	\$175.00	\$173.98	0.59%	1,900	No Impact
		Group 3 (1)	\$129.06	\$120.73	6.90%	4,500	No Impact
2	Kelly Creek Wind Project	Group 1 (1)	\$86.79	\$86.99	-0.24%	1,400	No Impact
		Group 2 (1)	\$123.29	\$118.15	4.35%	2,200	No Impact
3	Camp Grove Wind Farm	Group 1 (1)	\$49.67	\$49.04	1.28%	2,105	No Impact
		Group 2 (1)	\$83.43	\$79.71	4.67%	2,650	No Impact
4	Lee-DeKalb Wind Energy Center	Group 1 (2)	\$99.41	\$97.68	1.77%	2,283	No Impact
		Group 2 (1)	\$97.62	\$95.65	2.06%	1,600	No Impact
		Group 3 (1)	\$73.66	\$72.32	1.85%	2,425	No Impact
		Group 4 (1)	\$124.71	\$124.29	-0.34%	2,225	No Impact
5	Adair Wind Farm	Group 1 (1)	\$135.77	\$134.18	1.19%	1,300	No Impact
		Group 2 (1)	\$169.03	\$145.27	16.36%	1,375	No Impact
		Group 3 (1)	\$95.17	\$96.07	-0.93%	1,450	No Impact
6	Eclipse Wind Farm	Group 1 (2)	\$109.54	\$98.70	10.98%	1,260	No Impact
		Group 2 (1)	\$86.77	\$88.66	-2.13%	4,800	No Impact
7	White Oak Wind Energy Center	Group 1 (1)	\$121.71	\$118.93	2.34%	1,870	No Impact
		Group 2 (5)	\$93.20	\$86.10	8.25%	3,080	No Impact
		Group 3 (5)	\$106.28	\$102.60	3.59%	3,730	No Impact
		Group 4 (1)	\$117.88	\$118.31	-0.36%	2,930	No Impact
8	Top Crop Wind Farm	Group 1 (2)	\$92.47	\$90.47	2.21%	1,830	No Impact
		Group 2 (1)	\$132.78	\$121.09	9.65%	4,475	No Impact
9	Rail Splitter Wind Farm	Group 1 (1)	\$74.22	\$75.49	-1.68%	2,500	No Impact
		Group 2 (1)	\$109.12	\$103.21	5.73%	1,650	No Impact
10	Bright Stalk Wind Farm	Group 1 (1)	\$99.73	\$100.36	-0.63%	3,260	No Impact
Median Variance in Sales Prices for Test to Control Areas							
38 Adjoining Test Area Sales studied and compared to 223 Control Area Sales					-1.85%		

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MARKET PARTICIPANT INTERVIEWS



MARKET COMMENTARY

Renee Johnson, Stark County Illinois Tax Assessor:

- **“Could not see a difference in home prices between current values and before wind farm was built.”**
- No complaints from residents after construction
- New homes constructed in 2012 and in 2018 next to existing wind turbines

Bridget Nodurft, Chief Deputy of the Supervisor of Assessments Office in DeKalb County, Illinois:

- Reported **“being near the turbines did not cause harm to values.”**

Wendy Ryerson, Chief County Assessment Officer in Lee County, Illinois (Mendota Hills wind farm):

- Reported **“has not noticed any difference in values of homes that are near wind turbines.”**

Shelly Renken, Supervisor of Assessments in Livingston County, IL (Minonk wind farm and Streator Cayuga Ridge South):

- Reported that the potential impact on home values are always a concern of some people.
- **“But there's no documentation that shows that's happening, that values have gone down or up as a result of being near a wind farm.”**

Tracey Vinavich, Assessor in Henry County, IL:

- “There have been no changes in values because of the wind farms that have been developed.”

Christine Andersen, Coordinator in Assessor's office in Bureau County, IL:

- **“[They] have never received any complaints about potential changes in home values, before or after any of the wind farms were built.”**



CONCLUSIONS



CONCLUSION

Based upon our examination, research, and analyses of the existing wind farm uses, including multiple peer-reviewed studies from other experts, we have concluded that **no consistent negative impact has occurred to adjacent property values that could be attributed to proximity to the adjacent wind farm**, based on:

- Data analyzed in the Pilot Hill Wind Farm
- Data analyzed in the Kelly Creek Wind Project
- Data analyzed in the Camp Grove Wind Farm
- Data analyzed in the Lee-DeKalb Wind Energy Center
- Data analyzed in Iowa, Wisconsin, Colorado, New York and Washington
- Annual Appreciation Rate
- Published Studies on National Data (14 studies)
- Published Studies on Illinois Data (5 studies)
- Surveys of Real Estate Assessors