
Wind Facility Effects On Nearby Property Values: The Emerging “Valley” Landscape

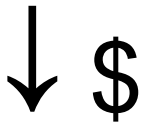
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**AWEA Midwest Summit
Chicago, IL
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Proximity to and Views of Environmental (Dis)Amenities Can Impact Property Values

Highway



Transmission
Lines



Average
Home



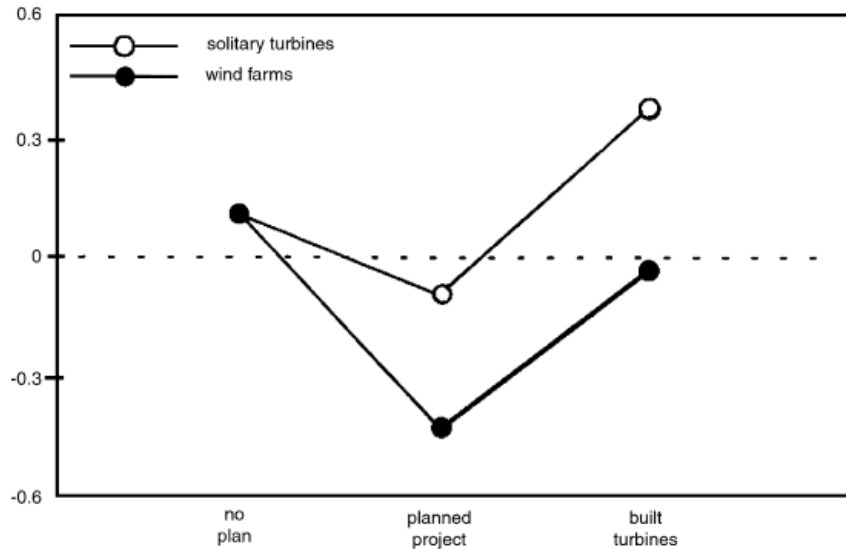
Green
Space



Ocean
Front



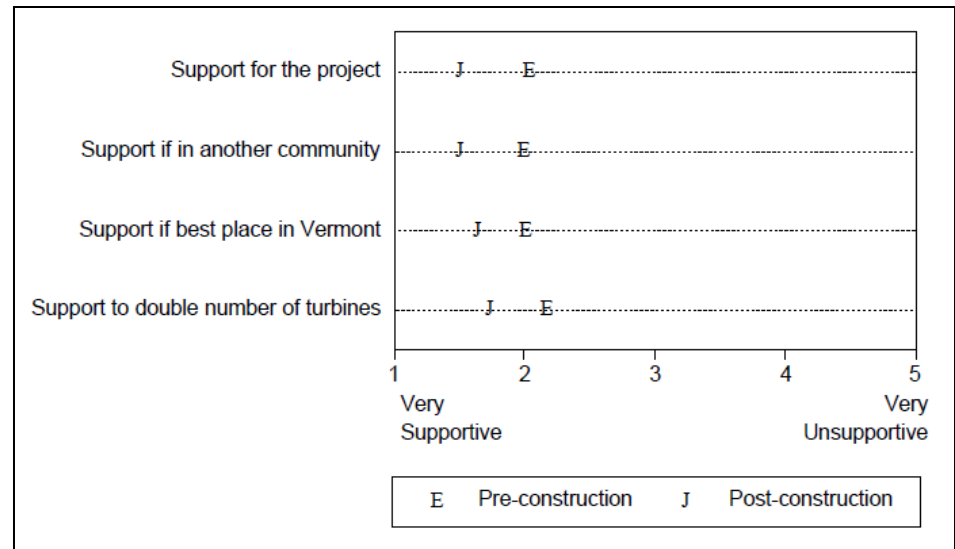
There Is Evidence That A “Valley” Exists Between The Pre-Announcement and Post-Construction Periods



Source: Wolsink, M. (2007) *Wind Power Implementation - The Nature of Public Attitudes*:

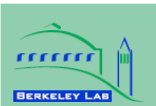
Palmer found levels of support increased after construction

Wolsink found levels of support returned to neutral levels after operation



Source: Palmer, J. (1997) *Public Acceptance Study of the Searsburg Wind Power Project - One Year Post Construction*.

LBNL 2009 Study



ERNEST ORLANDO LAWRENCE
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LBNL-2829E

**The Impact of Wind Power Projects
on Residential Property Values in
the United States:
A Multi-Site Hedonic Analysis**

Ben Hoen, Ryan Wiser, Peter Cappers,
Mark Thayer, and Gautam Sethi

Environmental Energy
Technologies Division

December 2009

Download from <http://eetd.lbl.gov/EA/EMP>

The work described in this report was funded by the Office of Energy
Efficiency and Renewable Energy (Wind & Hydropower Technologies
Program) of the U.S. Department of Energy under Contract No. DE-AC02-
05CH1123.

Summary

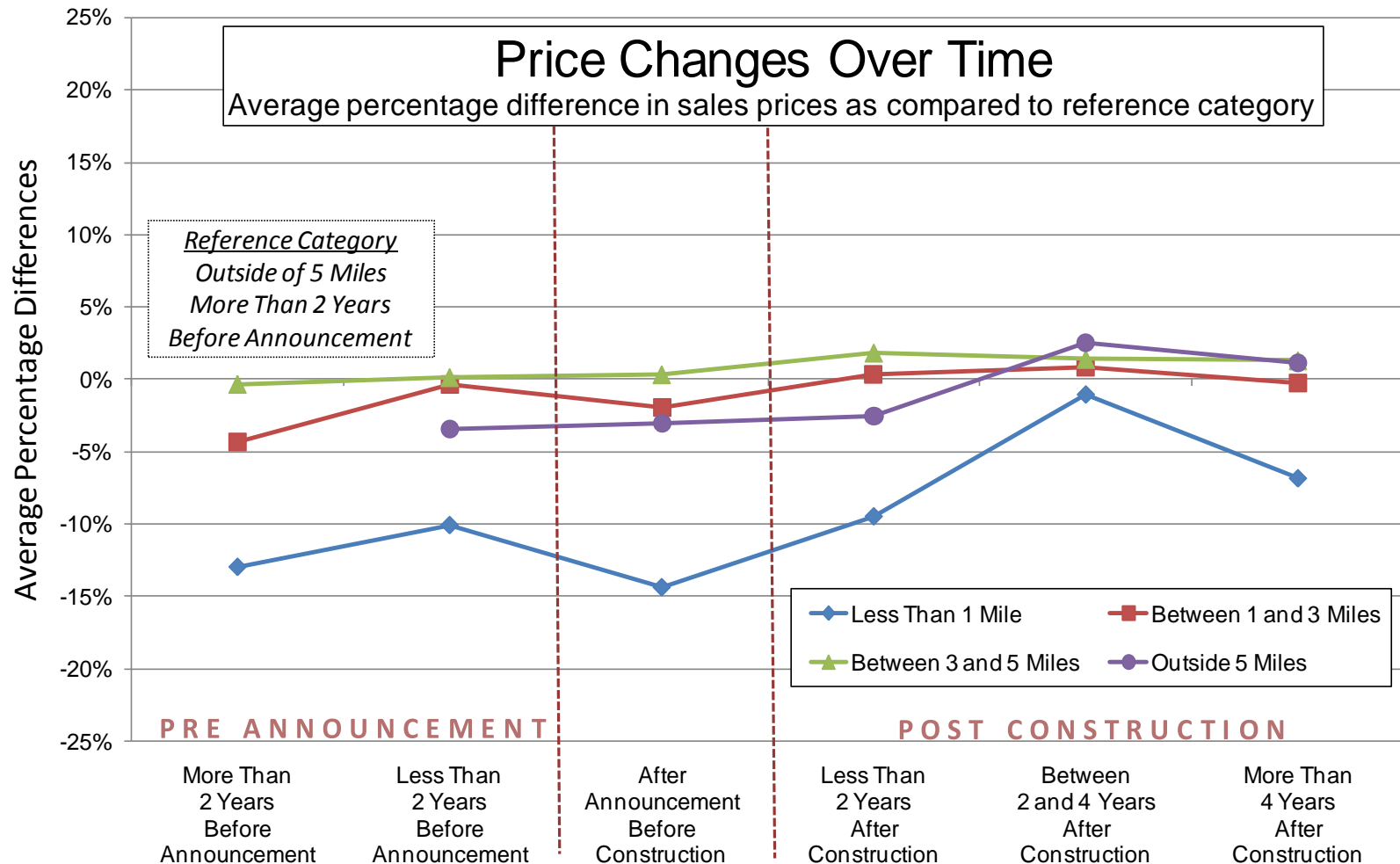
- 7500 sales, 9 states, 24 facilities
- 125 sales post-construction w/in 1 mile
- 98 sales pre-construction w/in 1 mile
- Multiple models, various effects tested

Conclusions

- Lack of consistent evidence of post construction effects based on distance from or view of turbines in all models
- Results indicate effects, if they do exist, are likely to be fairly small and/or sporadic

LBNL 2009 Study

Homes Nearest the Turbines Were Depressed in Value Before Construction and Appreciated the Most After Construction as Compared to Homes Further Away



The reference category consists of transactions of homes situated more than five miles from where the nearest turbine would eventually be located and that occurred more than two years before announcement of the facility

Hoen et al. (2011)

Journal of Real Estate Research paper that built on LBNL Report

Wind Energy Facilities and Residential Properties: The Effect of Proximity and View on Sales Prices

Authors Ben Hoen, Ryan Wiser, Peter Cappers, Mark Thayer, and Gautam Sethi

Abstract This paper received a manuscript prize award for the best research paper on Sustainable Real Estate (sponsored by the NAIOP Research Foundation) presented at the 2010 ARES Annual Meeting.

Increasing numbers of communities are considering wind power developments. One concern within these communities is that proximate property values may be adversely affected, yet there has been little research on the subject. The present research investigates roughly 7,500 sales of single-family homes surrounding 24 existing wind facilities in the United States. Across four different hedonic models, and a variety of robustness tests, the results are consistent: 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, yet further research is warranted.

Wind power development has expanded dramatically in recent years (WEC, 2010) and that expansion is expected to continue (Global Wind Energy Council, 2008; Wiser and Hand, 2010). The U.S. Department of Energy, for example, published a report that analyzed the feasibility of meeting 20% of electricity demand in the United States with wind energy by 2030 (U.S. DOE, 2008).

Approximately 3,000 wind facilities would need to be sited, permitted, and constructed to achieve a 20% wind electricity target in the U.S.¹ Although surveys show that public acceptance is high in general for wind energy (e.g., Firestone and Kempton, 2006), a variety of local concerns exist that can impact the length and outcome of the siting and permitting process. One such concern is related to the views of and proximity to wind facilities and how these might impact surrounding property values. Surveys of local communities considering wind facilities have frequently found that adverse impacts on aesthetics and property values are in the top tier of concerns relative to other matters such as impacts on wildlife habitat and mortality, radar and communications systems, ground

JRER | Vol. 33 | No. 3 - 2011

Summary

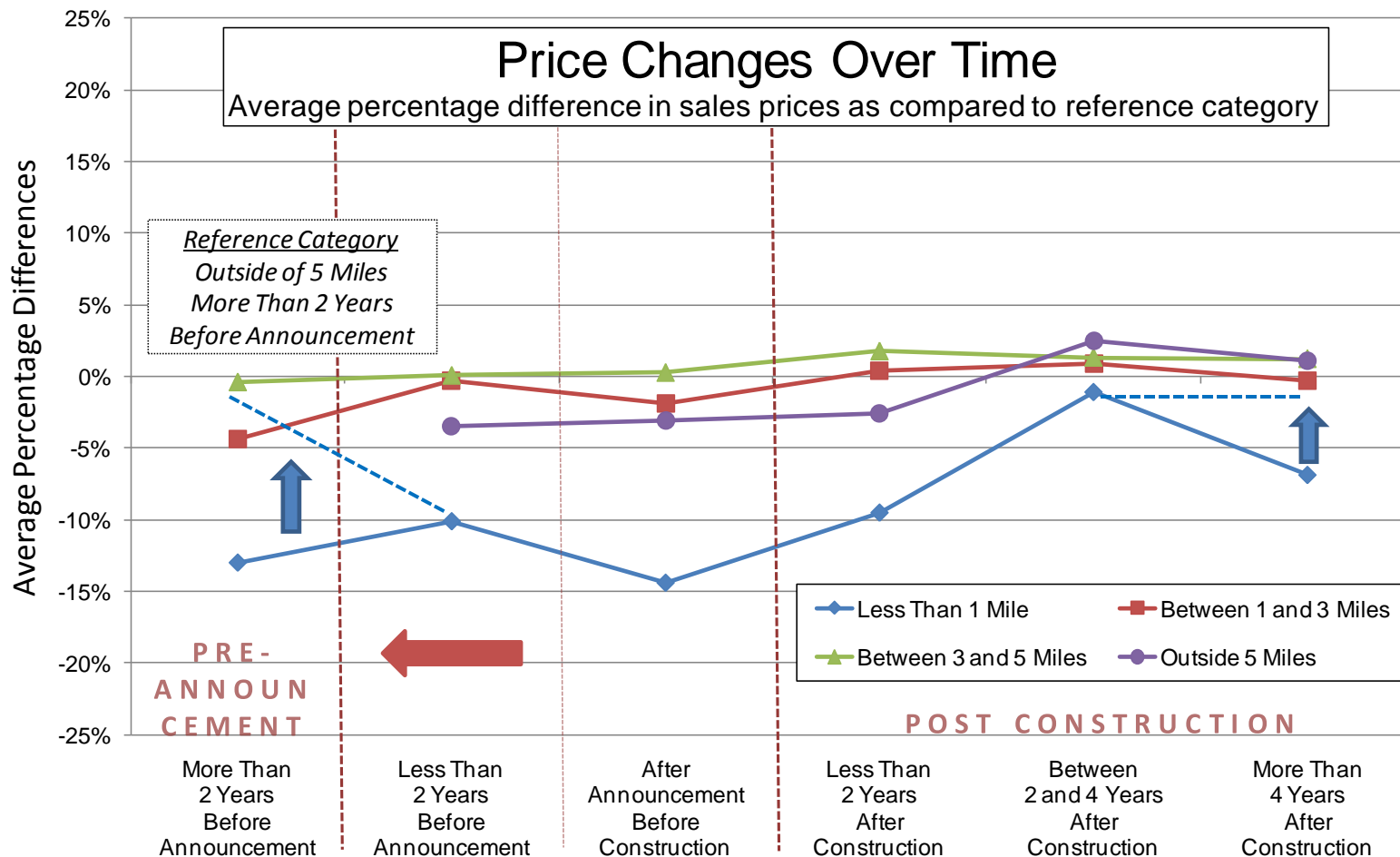
- Same data as LBNL report, but additional analysis (different models)

Conclusions

- Similar lack of evidence of post construction effects based on distance from or view of turbines as in LBNL report
- Some evidence post-announcement pre-construction effects exist that fade after turbines are in operation

Hoehn et al. (2011)

Some Evidence that Prices Are Affected in the Post Announcement Pre Construction Period and then Return to More Normal Levels Following Construction



The reference category consists of transactions of homes situated more than five miles from where the nearest turbine would eventually be located and that occurred more than two years before announcement of the facility

Laposa & Mueller (2010)

Maxwell Ranch Wind Farm, Larimer County, CO

Wind Farm Announcements and Rural Home Prices: Maxwell Ranch and Rural Northern Colorado

Authors Steven P. Laposa and Andrew Mueller

Abstract This study examines the announcement affect of a proposed wind farm development on an 11,000-acre ranch in Northern Colorado on surrounding rural housing prices. This study analyzes 2,910 single-family home transactions in two rural census tracts adjacent to the proposed wind farm prior to, and after the wind farm announcement. The results account for the timing of the announcement in March 2007, which coincided with the beginning of national and regional housing price declines, and still shows insignificant and minimal impacts to surrounding home values and sales, adjusted for the economic recession, after the announcement.

In March 2007, Colorado State University (CSU) announced a proposed wind farm development on an 11,000-acre ranch known as Maxwell Ranch in Northern Colorado. Although the proposal eventually collapsed with the original wind farm developer, at the time of the announcement local homeowners publicly expressed concern about the impact of the wind farm on rural home prices¹ located adjacent to Maxwell Ranch.

CSU acquired the Maxwell Ranch property, located in Larimer County in Northern Colorado, in the 1970s and subsequently used the property for agricultural research. CSU's strategy to cultivate a 'green university' encouraged the Colorado State University Research Foundation (CSURF) to investigate its diverse portfolio of land and ranch holdings as possible alternative energy locations, suitable for education and research. Maxwell Ranch is located in a rural, semi-mountainous corridor estimated to have 'excellent' wind farm capacity based on numerous studies including the U.S. Department of Energy's National Renewable Energy Laboratory. The original wind farm developer of the CSU Green Power Project at Maxwell Ranch received regulation approvals to move forward with the project on October 20, 2008 by the Larimer County Commissioners. By November 2009, the project was in an undetermined state due to lease defaults by the wind farm developer. In June 2010, CSU reached an agreement with a new wind farm developer and the project is currently proceeding through the development process.

General studies on wind farms and home prices build on the literature based on home valuation impacts due to externalities like high voltage transmission lines and underground storage tanks, which illustrates a broader view of sustainability and real estate by addressing the externality effects of the growing alternative

JOSRE | Vol. 2 | No. 1 - 2010

Summary

- 2,910 rural-residential transactions
- 2 Development periods tested:
 - pre-announcement
 - post-announcement
- Multiple models, development period effects tested

Conclusions

- Lack of evidence of post-announcement effects exist

Hinman (2010)

Twin Groves Wind Farm, McClean County, IL

Hinman, J.L. (2010)

Wind Farm Proximity and Property Values

WIND FARM PROXIMITY AND PROPERTY VALUES: A POOLED HEDONIC REGRESSION ANALYSIS OF PROPERTY VALUES IN CENTRAL ILLINOIS

Jennifer L. Hinman

In partial fulfillment of the requirements for the degree of

Master of Science in Applied Economics

Electricity, Natural Gas, and Telecommunications Economics Regulatory Sequence

Illinois State University
Department of Economics
Campus Box 4200
Normal, Illinois 61790-4200
May 2010

Abstract

The objectives of this study are to examine whether proximity to the 240-turbine, Twin Groves wind farm (Phases I and II) in eastern McLean County, Illinois, has impacted nearby residential property values and whether any impact on nearby property values remains constant over different stages of wind farm development with the different stages corresponding to different levels of risk as perceived by nearby property owners. This study uses 3,851 residential property transactions from January 1, 2001 through December 1, 2009 from McLean and Ford Counties, Illinois. This is the first wind farm proximity and property value study to adopt pooled hedonic regression analysis with difference-in-differences estimators. This methodology significantly improves upon many of the methodologies found in the wind farm proximity and property value literature. This study finds some evidence that supports wind farm anticipation stigma theory and the results strongly reject the existence of wind farm area stigma theory.

Summary

- 3,851 residential transactions
- 3 Development periods tested:
 - pre-announcement
 - post-announcement yet pre-operation
 - post-operation
- Multiple models, distance and development period effects tested

Conclusions

- Strong evidence that post-announcement pre-operation effects exist
- Effects range from -6% to -12%
- Lack of evidence of post-operation effects exist

Heintzelman & Tuttle (2011)

Lewis, Lincoln and Franklin Counties, NY

Values in the Wind: A Hedonic Analysis of Wind
Power Facilities*

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May 23, 2011

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*Martin D. Heintzelman is Assistant Professor, Clarkson University School of Business. Carrie M. Tuttle is a Ph.D. Candidate in Environmental Science and Engineering at Clarkson University, as well as Director of Engineering, Development Authority of the North Country. We would like to thank Michael R. Moore, Noelwah Netusil, and seminar participants at Binghamton University as well as the 2010 Thousand Islands Energy Research Forum and the 2010 Heartland Economics Conference for useful thoughts and feedback. The views expressed in this paper are those of the author(s) and do not necessarily represent those of the Development Authority of the North Country. In addition, the research described in this paper has not been funded entirely or in part by the Development Authority of the North Country, nor is it subject to peer review by the Authority. No official Authority endorsement should be inferred. All errors are our own.

Summary

- 11,331 residential transactions
- 1 development periods tested:
 - post-announcement
- Multiple models, distance effects tested

Conclusions

- Some evidence that post-announcement yet pre-operation effects exist
- Effects can range from -6% to -16%
- Lack of evidence of post-operation effects exist



Heintzelman & Tuttle (2011)

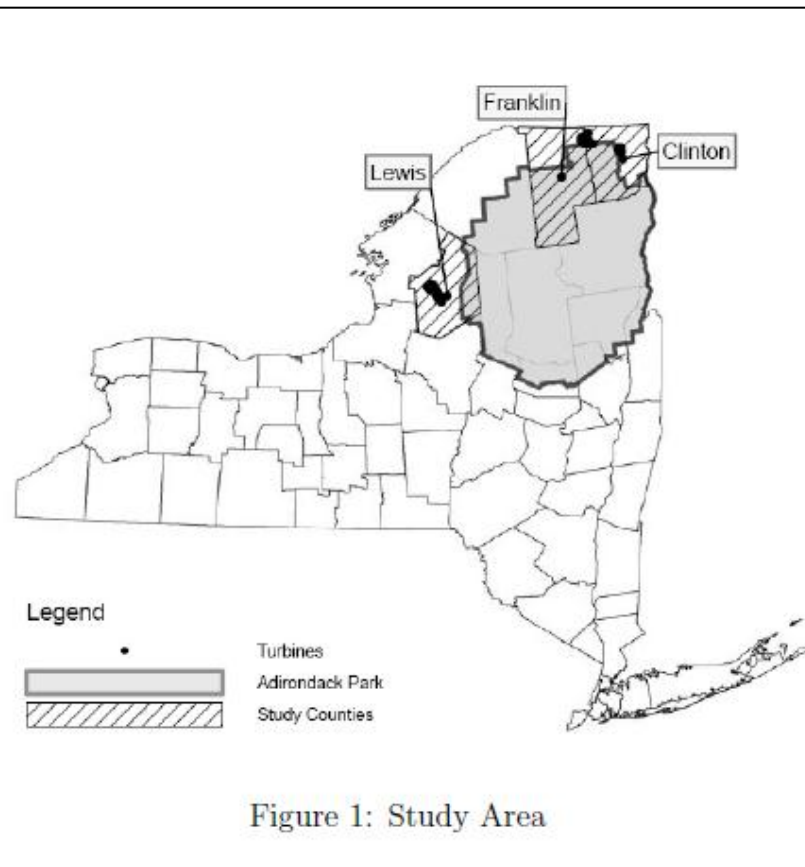
Lewis, Lincoln and Franklin Counties, NY

Summary

- 11,331 residential transactions
- 1 development periods tested:
 - post-announcement
- Multiple models, distance effects tested

Conclusions

- Some evidence that post-announcement yet pre-operation effects exist
- Effects can range from -6% to -16%
- Lack of evidence of post-operation effects exist



Carter (2011)

Lee County, IL

The Effect of Wind Farms on
Residential Property Values
in Lee County, Illinois

Jason Carter
Illinois State University
Spring 2011

Summary

- 1,298 residential transactions
- 2 development periods tested:
 - pre-construction
 - post-construction
- Multiple difference-in-difference models tested

Conclusion

- Lack of evidence of post-operation adverse effects



Conclusion

A “Valley” Does Seem To Exist

- Support for wind facilities is lowest after announcement but prior to construction and then returns to more normal levels after operation
- Analogously, risks of property value impacts are highest when they cannot be accurately quantified in the period prior to construction/operation
- Adverse sales price impacts are evident in the period after announcement but prior to construction in some studies
- There is evidence that both support for and sales prices near turbines improve to more neutral levels after the facility begins operation
- And more to the point, conclusive evidence of persistent post-construction effects from wind facilities have not been discovered despite a number of studies using a variety of sophisticated statistical techniques



There Are Gaps in the Literature

Proposed Future Work

- Correlates to “Valley” Effect: Development process, transparency, local involvement, etc.
- Are all impacts being priced into homes? i.e., Is the noise worse than expected for buyers?
- Effects very near turbines (e.g., within ½ mile)
- Influences of negative or positive press on home values, i.e. press as a driver to selling prices



Thank You!



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