Do Wind Facilities Affect Local Property Values?

Preliminary Results From A Multi-Site Analysis

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Why Is This Important?

Increasing Siting Success Rate is Crucial!

- As wind development accelerates easing siting and permitting barriers will be crucial
  - An average of 140 new sites per year will be needed to reach 20% by 2030 \(^1\)
- Siting and permitting challenges are a key reason for project delay or failure
  - 30 to 50% of contract failures are attributed to siting and permitting (CEC, 2006; BWEA, 2003 cited by Loring, 2006)
- Strength of the network of those opposed to development is more influential on project success than that of supporters (Loring, 2006)

\(^1\) Using 330,000 MW at 100 MW per site
Aesthetics & Property Values Rank At The Top Of Concerns

US developers rank aesthetics & property values as the #1 and #3 concerns of those in opposition to wind development (Paul, 2006)
Aesthetics & Property Values Are Strongly Linked

This linkage is well studied
Property Value Concerns For Wind Energy Fall Into 3 Categories

1. **Area Stigma**: Concerns over “industrialization” of area leading to decreases in tourism and second home desirability

2. **Scenic Vista Stigma**: Concerns for decreases in quality of scenic vistas from homes

3. **Nuisance & Health Effects**: Potential health/well being concerns of nearby residents

Each of these effects could impact property values
Very Few Quality Wind & Property Studies
A List Of The Most Publicized

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Location</th>
<th>Method</th>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jordal-Jorgensen (1996)</td>
<td>Denmark</td>
<td>Hedonic</td>
<td>Area Stigma</td>
<td>↓ $</td>
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<td>Sterzinger et. al. (2003)</td>
<td>10 US sites</td>
<td>Simple</td>
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<tr>
<td>Poletti (2005)</td>
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<tr>
<td>Sims &amp; Dent (2006)</td>
<td>UK</td>
<td>Hedonic</td>
<td>Area Stigma</td>
<td>↓ $ / nc</td>
</tr>
</tbody>
</table>

Overview
• Most tested for area stigma
• None of the studies, except Hoen (2006), visited homes
• None have been peer reviewed & published
• Sample size is problematic in many of the studies
• Statistical analysis is sometimes not rigorous
LBNL Study Methods

- US focused
- Multiple sites – 4 now, eventually 10 sites
- Field visits to each home
- Transaction values (not assessed values)
- Sample sizes over 350 for each site
- Hedonic Pricing Model – Used to isolate effects
- Test for all 3 effects: area stigma, scenic vista stigma, and nuisance effects
Hedonic Regression Model

Controlling Variables:
- Number of Bedrooms, Number of Bathrooms, Square Feet, Acres, Finished Basement, Age of the Home, Condition of the Home, School District, Census Tract, Scenic Vista, etc.

Variables of Interest:
- View of Turbines, Distance From Turbines, Number of Turbines Visible
Tests For 3 Effects: Area Stigma, Scenic Vista Stigma & Nuisance

1. Area Stigma: Test if distance from the facility has any effect alone after the facility was constructed

2. Scenic Vista Stigma:
   Qualitatively: Using an on-site rating, compare sales of homes with views with those without
   Quantitatively: Using distance and number of turbines visible, compare sales of homes with views with those without

3. Nuisance & Health: Compare sales inside of 2500 ft with and without a view to all others
4 Preliminary Sites – All in Northeast

Madison & Oneida Counties, NY: Madison Wind Farm
• 7 Turbines – 11.5 MW, rolling farmland
• Construction began June 2000
• 464 sales within 7 miles

Madison County, NY: Fenner Wind Farm
• 20 Turbines - 30 MW, rolling farmland
• Construction began Spring 2001
• 694 sales within 5 miles

Wayne County, PA: Waymart Wind Facility
• 43 Turbines – 64.5 MW, ridgeline
• Construction began June 2003
• 553 sales within 7 miles

Somerset County, PA: Multiple Sites
• 34 Turbines – 49.4 MW, rolling farmland & ridgeline
• Construction began December 1999 – August 2003
• 489 sales within 4 miles
To Test for Scenic Vista Stigma
Scenic Vista Itself Needs to be Controlled For

They might pull in two directions

Without separating out scenic vista, measurements of the effects of the turbines might be artificially inflated

$\uparrow$ $\downarrow$ $\uparrow$ $\downarrow$ $\uparrow$ $\downarrow$
5 Rankings for Scenic Vista

Each home was given a scenic vista rating

- Poor
  - Below Average
- Average
  - Above Average
- Premium
4 Qualitative Ratings for View of Turbines dominance

Each home was given a view of turbines dominance rating

- Minor
- Moderate
- Substantial
- Extreme

And quantitative measurements such as numbers of turbines and distance were also collected
Note of Caution

The following graphs, tables, and findings are **PRELIMINARY**, so conclusions based on these results should be considered preliminary as well.
Buyers & Sellers Care about Scenic Vista…

Effect of Scenic Vista on Resale Value

-17% Poor Vista
-6% Below Average Vista
11% Average Vista
12% Above Average Vista

All Significant at the 99% Level
90% Confidence Intervals Shown

Source: LBNL

Model Statistics: \( n = 2195 \), Adjusted \( R^2 \): 0.72, f Stat.: 84, Overall Sig.: 0.000
…but There Is No Statistically Significant Evidence They Care About Views of Turbines

Model Statistics: $n = 2195$, Adjusted $R^2$: 0.72, f Stat.: 84, Overall Sig.: 0.000

and this result holds using quantitative or qualitative measurements
There Is No Statistically Significant Evidence That An Area Stigma Exists

Area Stigma Model Statistics: \( n = 1339, \) Adjusted \( R^2: 0.74, \) f Stat.: 60, Overall Sig.: 0.000
Result – No Effects Found
But More Data Needed to Increase Confidence

<table>
<thead>
<tr>
<th>Effect</th>
<th>Full Sample</th>
<th>2 Years Post Contr</th>
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Model Statistics:

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<th>509</th>
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<tr>
<td>Sig.</td>
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<td>0.00</td>
<td>0.00</td>
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</table>
What Preliminary Conclusions Can Be Drawn From These Results?

Given our sample of 2195 transactions…

- **Area Stigma:** There is no statistical evidence that homes within 4-7 miles of a facility are affected adversely based simply on proximity.

- **Scenic Vista Stigma:** There is no statistical evidence that homes with a view of turbines have different values than homes without.

- **Nuisance:** More data is needed to reliably test this claim but with the 6 more wind farm sites to be added this might change.
Results Are Provisional

With more data to be collected over the coming months from 6 more sites, we’ll have much more to report.

Thank You