Lessons Learned from MI’s Windfarms

MMEA Fall Conference
October 5, 2017

Sarah Mills, PhD
Why this research?

- Investigate Gratiot & Huron County claims of farmland preservation
- Understand why such different experiences
2014 Farmland Survey

- All owners of land assessed
- 14 townships
  - 9 with windfarms
  - 5 without
- 1,210 responses
  (72% response rate)
- Funded by Dow Fellowship
2016 Community Survey

- Owners of land assessed ag or residential
- 10 townships with windfarms
- 2,013 responses (53% response rate)
- Funded by C.S. Mott Foundation
Data about the negative impacts

- Views on noise, visual impact, property values roughly 50/50
  - Financial stake = rosier view
  - OR
  - no financial stake = more soured view

**BUT STILL SPLIT OPINIONS**
Noise

Turbines create noise pollution

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>19</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Agree</td>
<td>29</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>Disagree</td>
<td>40</td>
<td>47</td>
<td>38</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>12</td>
<td>18</td>
<td>10</td>
</tr>
</tbody>
</table>

Strongly agree
Agree
Disagree
Strongly disagree
Data about the negative impacts

- Views on noise, visual impact, property values roughly 50/50
  - Financial stake = rosier view
  - OR
  - no financial stake = more soured view

  BUT STILL SPLIT OPINIONS

- Most don’t (72%) see health impacts, but some do

- Majority (70%) don’t think it’s divided the community
  - Even in some pretty contentious projects
Data about the positive impacts

- Most (78%) see job creation with caveat about types of jobs

- Majority (60%+) haven’t seen changes to roads, townships services, county services, or local schools
  - Despite pretty substantial payments
  - Likely because of how money being used: plug holes, do more of same
Tax Benefits

Turbines’ effect on county services

- All: 77, 4, 3, 15
- Paid: 62, 3, 7, 26
- Unpaid: 82, 4, 2, 11

$2.749 Million to county gov’t in Huron County in 2015

Greatly improved
Somewhat improved
Neither
Somewhat worsened
Greatly worsened
Data about the positive impacts

• Most (78%) see job creation with caveat about types of jobs

• Majority (60%+) haven’t seen changes to roads, townships services, county services, or local schools
  o Despite pretty substantial payments
  o Likely because of how money being used: plug holes, do more of same

• Landowner payments linked to substantial increase in on-farm investment (2x neighbors, control) and increase in succession planning
Investments over 5 years: 2009-2013

- Non-windfarm: $187k
- Unpaid neighbors: $180k
- Neighbors in pool: $193k
- Turbines: $449k
Farm Succession

% that have farm succession plan

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-windfarm</td>
<td>57</td>
</tr>
<tr>
<td>Unpaid neighbors</td>
<td>64</td>
</tr>
<tr>
<td>Neighbors in pool</td>
<td>62</td>
</tr>
<tr>
<td>Turbines</td>
<td>80</td>
</tr>
</tbody>
</table>
Overall drivers of attitudes

- Direct compensation
- Type of land owned
  - secondary vs. primary residence
  - farmland / rental property only
- Being within earshot of turbines
- Attitudes about process, wind developer
What Happened with Huron Wind?

- Previous experiences (some good, some bad)
  - Many different wind developers in Huron County
  - Tax table changes a **huge** concern

- Turbine fatigue: “we’ve done our part”

- County voting = lots of heterogeneity
  - Not all farmers/farming families
  - Yeas: 26% - 54%
  - Turnout: 9% - 61%

- Those who cared, voted
What’s the Lesson?

• Windfarms = economic development proposition
  o Compatible with ag
  o Not with residential growth, tourism

• Indirect economic benefits not felt by average landowner

• Business models that directly pay more landowners keep the peace

• Wind developers, local officials need to act transparently
The CLOSUP Wind Project

Sarah Mills, Project Manager
Phone: (734) 615-5315
Email: sbmills@umich.edu
Web: www.closup.umich.edu/wind
May 2 Referendum vs. Survey

Willingness to host additional turbines in your township

- **Vote (total)**: 63
- **Vote (5twps)**: 55
- **Survey (5twps)**: 27
- **Survey all**: 26

### 5 twps.
- Bingham
- Bloomfield
- McKinley
- Sheridan
- Sigel

- **Strongly support**
- **Somewhat support**
- **Neither**
- **Somewhat oppose**
- **Strongly oppose**
May 2 Referendum vs. Survey

Willingness to host additional turbines in your township

<table>
<thead>
<tr>
<th>Township</th>
<th>Vote (total)</th>
<th>Vote (5 twps)</th>
<th>Survey (5 twps)</th>
<th>Survey all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bingham</td>
<td>63</td>
<td>37</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Bloomfield</td>
<td>55</td>
<td>45</td>
<td>57</td>
<td>55</td>
</tr>
<tr>
<td>McKinley</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheridan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sigel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• 5 twps.
  - Bingham
  - Bloomfield
  - McKinley
  - Sheridan
  - Sigel
Huron County Vote Break-downs

<table>
<thead>
<tr>
<th></th>
<th>With wind</th>
<th>Without wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vote (total)</td>
<td>63</td>
<td>60</td>
</tr>
<tr>
<td>Yes</td>
<td>37</td>
<td>40</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>Turnout 28%</td>
<td>36%</td>
<td></td>
</tr>
<tr>
<td>Turnout 36%</td>
<td>36%</td>
<td></td>
</tr>
</tbody>
</table>
Individual-level Impacts

Turbines create noise pollution

- Noise
- Visual
- Health
- Property value
- Farm income
- Farm succession

![Bar chart showing the percentage of respondents agreeing or disagreeing with the statement about noise pollution.]

- All
  - Strongly agree: 19
  - Agree: 29
  - Disagree: 40
  - Strongly disagree: 12

- Paid
  - Strongly agree: 12
  - Agree: 22
  - Disagree: 47
  - Strongly disagree: 18

- Unpaid
  - Strongly agree: 21
  - Agree: 31
  - Disagree: 38
  - Strongly disagree: 10

20
Individual-level Impacts

Turbines create visual/aesthetic problems

- Noise
- Visual
- Health
- Property value
- Farm income
- Farm succession

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>24</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>Agree</td>
<td>25</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>Disagree</td>
<td>39</td>
<td>46</td>
<td>37</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>12</td>
<td>22</td>
<td>10</td>
</tr>
</tbody>
</table>
Individual-level Impacts

Turbines cause human health problems

- Noise
- Visual
- **Health**
- Property value
- Farm income
- Farm succession

![Bar Chart]

- Strongly agree
- Agree
- Disagree
- Strongly disagree

- All
  - 9 18 49 23

- Paid
  - 8 9 47 37

- Unpaid
  - 10 21 50 19
Individual-level Impacts

Turbines decrease nearby property values

- Noise
- Visual
- Health
- **Property value**
- Farm income
- Farm succession

<table>
<thead>
<tr>
<th></th>
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<th>Unpaid</th>
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</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>24</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>Agree</td>
<td>30</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td>Disagree</td>
<td>36</td>
<td>46</td>
<td>32</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>10</td>
<td>19</td>
<td>7</td>
</tr>
</tbody>
</table>

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### Individual-level Impacts

Investments over 5 years: 2009-2013

- **Noise**
- **Visual**
- **Health**
- **Property value**
- **Farm income**
- **Farm succession**

<table>
<thead>
<tr>
<th>Category</th>
<th>Investment Amount</th>
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<tbody>
<tr>
<td>Non-windfarm</td>
<td><strong>$187k</strong></td>
</tr>
<tr>
<td>Unpaid neighbors</td>
<td><strong>$180k</strong></td>
</tr>
<tr>
<td>Neighbors in pool</td>
<td><strong>$193k</strong></td>
</tr>
<tr>
<td>Turbines</td>
<td><strong>$449k</strong></td>
</tr>
</tbody>
</table>

![Chart showing investments](chart.png)

Legend:
- Home
- Outbuildings
- Drainage/Irrigation
- Equipment
Individual-level Impacts

- Noise
- Visual
- Health
- Property value
- Farm income
- Farm succession

% that have farm succession plan

- Non-windfarm: 57%
- Unpaid neighbors: 64%
- Neighbors in pool: 62%
- Turbines: 80%
Community-level Impacts

- Job creation
- Roads
- Township services
- County services
- Schools
- Relationships with neighbors

Turbines create jobs

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>21</td>
<td>57</td>
<td>15</td>
</tr>
<tr>
<td>Agree</td>
<td>57</td>
<td>54</td>
<td>6</td>
</tr>
<tr>
<td>Disagree</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>6</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

All Paid Unpaid
Community-level Impacts

- Job creation
- **Roads**
- Township services
- County services
- Schools
- Relationships with neighbors

Turbines’ effect on local roads

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatly improved</td>
<td>7</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Somewhat improved</td>
<td>60</td>
<td>32</td>
<td>67</td>
</tr>
<tr>
<td>Neither</td>
<td>8</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Somewhat worsened</td>
<td>4</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Greatly worsened</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
Community-level Impacts

<table>
<thead>
<tr>
<th>Job creation</th>
<th>Roads</th>
<th>Township services</th>
<th>County services</th>
<th>Relationships with neighbors</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>10</td>
<td>14</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>57</td>
<td>79</td>
<td>79</td>
<td></td>
</tr>
</tbody>
</table>

$2.630 Million to townships in Huron County in 2015

<table>
<thead>
<tr>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
Community-level Impacts

- Job creation
- Roads
- Township services
- County services

Turbines’ effect on county services

- Greatly improved
- Somewhat improved
- Neither
- Somewhat worsened
- Greatly worsened

$2.749 Million to county gov’t in Huron County in 2015

Job creation: 3 All, 7 Paid, 2 Unpaid
Roads: 15 All, 26 Paid, 11 Unpaid
Township services: 77 All, 62 Paid, 82 Unpaid
County services: 4 All, 3 Paid, 4 Unpaid
Relationships with neighbors: 113 All, 7 Paid, 2 Unpaid

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Community-level Impacts

- Job creation
- Roads
- Township services
- County services

$2.083 Million to ISD; $2.074 Million to local schools in Huron County in 2015

Turbines’ effect on local schools

- Greatly improved
- Somewhat improved
- Neither
- Somewhat worsened
- Greatly worsened

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatly improved</td>
<td>9</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Somewhat improved</td>
<td>24</td>
<td>35</td>
<td>21</td>
</tr>
<tr>
<td>Neither</td>
<td>44</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Somewhat worsened</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatly worsened</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Community-level Impacts

#### Turbines’ effect on relationships with neighbors

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatly improved</td>
<td>5</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Somewhat improved</td>
<td>64</td>
<td>18</td>
<td>65</td>
</tr>
<tr>
<td>Neither</td>
<td>19</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Somewhat worsened</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatly worsened</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Job creation
- Roads
- Township services
- County services
- Schools
- Relationships with neighbors
Would they welcome more wind development?

Turbines’ effect on overall quality of life in township

- Quality of life
- Willingness to accept new turbines

![Bar chart showing the effect of turbines on quality of life in All, Paid, and Unpaid turbines.]

- All:
  - Greatly improved: 3
  - Somewhat improved: 13
  - Neither: 55
  - Somewhat worsened: 19
  - Greatly worsened: 10

- Paid:
  - Greatly improved: 7
  - Somewhat improved: 21
  - Neither: 54
  - Somewhat worsened: 10
  - Greatly worsened: 8

- Unpaid:
  - Greatly improved: 2
  - Somewhat improved: 10
  - Neither: 55
  - Somewhat worsened: 22
  - Greatly worsened: 11
Would they welcome more wind development?

- Quality of life
- Willingness to accept new turbines

### Willingness to host additional turbines in your township

<table>
<thead>
<tr>
<th>Quality of life</th>
<th>Willingness to accept new turbines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly support</td>
<td>Somewhat support</td>
</tr>
<tr>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>23</td>
<td>23</td>
<td>22</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>15</td>
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<td>26</td>
<td>15</td>
<td>30</td>
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<td>20</td>
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<td>23</td>
</tr>
<tr>
<td>18</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>
Example zoning ordinances

- MSU Extension

- Dept. of Energy database
  - Look for similar types of communities
  - Includes places both with/without wind
  - [https://windexchange.energy.gov/policies-incentives](https://windexchange.energy.gov/policies-incentives)

- Shiawassee County Planning
  - Comparison charts on height, noise, setback
  - [https://www.shiawassee.net/Departments/Community-Development/Wind-Energy-Conversion-Systems](https://www.shiawassee.net/Departments/Community-Development/Wind-Energy-Conversion-Systems)

- My website (www.closup.umich.edu/wind)
  - Just the communities which have existing windfarms in Michigan
The ideal zoning ordinance?

Support/oppose additional turbines in township, by zoning setback distance

<table>
<thead>
<tr>
<th>Zoning Setback Distance</th>
<th>Strongly Support</th>
<th>Somewhat Support</th>
<th>Neither</th>
<th>Somewhat Oppose</th>
<th>Strongly Oppose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unzoned township</td>
<td>24</td>
<td>28</td>
<td>27</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>1.5x height</td>
<td>33</td>
<td>27</td>
<td>22</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>1,000'/1,320'</td>
<td>19</td>
<td>18</td>
<td>22</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>1,320'</td>
<td>13</td>
<td>17</td>
<td>26</td>
<td>8</td>
<td>37</td>
</tr>
</tbody>
</table>

Support/oppose additional turbines in township, by zoning setback distance.
What my research suggests on zoning

- Participating vs. non-participating landowners
- Noise, flicker analysis
- Decommission plan/financial assurance
- Have an open & transparent process
The importance of process

Support/oppose additional turbines in township, by agree/disagree opportunity to participate in planning

<table>
<thead>
<tr>
<th></th>
<th>Strongly support</th>
<th>Somewhat support</th>
<th>Neither</th>
<th>Somewhat oppose</th>
<th>Strongly oppose</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>21</td>
<td>58</td>
<td>22</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>26</td>
<td>27</td>
<td>13</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Agree</td>
<td>10</td>
<td>20</td>
<td>24</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>Disagree</td>
<td>7</td>
<td>6</td>
<td>14</td>
<td>63</td>
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</tr>
<tr>
<td>Strongly disagree</td>
<td>14</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“I had ample opportunity to provide input during the wind project planning stage.”
The importance of transparency

Support/oppose additional turbines in township, by agree/disagree wind developer acted transparently

```
<table>
<thead>
<tr>
<th></th>
<th>Strongly support</th>
<th>Somewhat support</th>
<th>Neither</th>
<th>Somewhat oppose</th>
<th>Strongly oppose</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>21</td>
<td>61</td>
<td>26</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>20</td>
<td>16</td>
<td>27</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Agree</td>
<td>14</td>
<td>11</td>
<td>43</td>
<td>14</td>
<td>11</td>
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<tr>
<td>Disagree</td>
<td>5</td>
<td>5</td>
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<tr>
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<td>5</td>
<td>11</td>
<td>72</td>
<td>11</td>
<td>11</td>
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</tbody>
</table>
```

“The wind project developer acted openly and transparently throughout the planning process.”