Solar Energy: New threat or opportunity for farmland preservation

Sarah Mills, PhD

Purdue Farm Policy Study Group
December 14, 2021
The Problem
The (Unchanged) Farmland Preservation Toolbox

- TDR
- Use-value taxation
- PDR
- Ag Zoning
- Urban Service Boundary
- Greenbelt
A Farmland Preservation Strategy?
On-farm investment

Investments over 5 years: 2009-2013

<table>
<thead>
<tr>
<th>Category</th>
<th>Home</th>
<th>Outbuildings</th>
<th>Drainage/Irrigation</th>
<th>Equipment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-windfarm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$187k</td>
</tr>
<tr>
<td>Unpaid neighbors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$180k</td>
</tr>
<tr>
<td>Neighbors in pool</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$193k</td>
</tr>
<tr>
<td>Turbines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$449k</td>
</tr>
</tbody>
</table>

Farm Succession

% with 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>

Not without controversy; typically, non-farmers
2018 research on Wind in 4 states

Contention may be a fixed part of the
Bottom Line on Wind

- Wind = economic development
- If goal is to sustain agriculture, wind can fit
- If goal is for substantial residential development or growth of tourism, wind may not be right
Proposed solar energy developments draw opposition over loss of farmland
What we’re not talking about


What we’re not talking about
(but will mention later)

What we are talking about

Two Creeks, WI, 800 acres

Lapeer, MI, 267 acres

Existing Utility-scale Solar
279 MW (342 MW more under construction)

Average size (built): 3.7 MW
Average size (construction): 26 MW

Solar being considered in IN
14,700 MW (MISO) + 26,100 MW (PJM)

Average size:
161/199 MW
~1,000-2,000 acres each

Source: MISO Queue, PJM Queue, 12/10/2021
Not all—but lots—will be built
Proposed solar energy developments draw opposition over loss of farmland

The next money crop for farmers: Solar panels
Both?

“Renewable energy creates opportunities for farmers and landowners to earn new income but also poses threats to farmland and local food systems.”

https://farmland.org/project/farms-under-threat/
What are you trying to preserve?

- Urban boundary
- Rural vista
- Habitat
- Land for growing food
- Farm livelihoods
What are you trying to preserve?

- Urban boundary
- Rural vista
- Habitat
- Land for growing food
- Farm livelihoods
- Land occupied 30+ years
  - Decommissioning standard
- No demands on services
- Contribute to taxes
  - How much varies state to state
What are you trying to preserve?

- Urban boundary
- Rural vista
- Habitat
- Land for growing food
- Farm livelihoods

Source: Anthony Wahl/Janesville Gazette
https://lmtribune.com/agriculture/farming-land-surrounded-by-solar/article_4159269a-b0c0-559e-aad5-fcb561b20fb8.html
What are you trying to preserve?

- Urban boundary
- Rural vista
- Habitat
- Land for growing food
- Farm livelihoods

What are you trying to preserve?

- Urban boundary
- Rural vista
- Habitat
- Land for growing food
- Farm livelihoods

Very niche for foreseeable future
What are you trying to preserve?

- Urban boundary
- Rural vista
- Habitat
- Land for growing food
- Farm livelihoods

- Short-term vs. long-term?
- Do land use requirements limit “reversability”? 

What are you trying to preserve?
What are you trying to preserve?

- Urban boundary
- Rural vista
- Habitat
- Land for growing food
- Farm livelihoods
What are you trying to preserve?

• Urban boundary
• Rural vista
• Habitat
• Land for growing food
• Farm livelihoods

DOE-funded Research (2021-2024)

• How much solar land is leased vs. purchased?
• What are leaseholders doing with revenue?
  – How does lease revenue recirculate in local economy?
• Comparison of solar to ag (inputs, taxes)
MI Farmland Preservation (PA 116) Policy as of June 2019

• Can put agreement on “pause” if...
  – Maintain existing drainage / field tile
  – Plant cover crop including pollinator habitat
  – End-of-life remediation
    + Surety bond/letter of credit

Aim to protect long-term farmability of land; provide farmers/farm communities with new income stream

Solar & Farmland Preservation in other states

• Utility-scale solar, very mixed
  - CA, NY, VT = remove with penalty
  - OH (differential assessment) = remove
  - IA, HI, MD = similar to MI
  - Oregon = permitted

• By comparison, utility-scale wind most often permitted

• On-farm solar, wind generally allowed
NEW RESOURCE
extension.msu.edu/solarzoning

Other Authors
Brad Neumann, AICP, MSU Senior Extension Educator
Mary Reilly, AICP, MSU Extension Educator
Harmony Gmazel, AICP, MSU Extension Educator
M. Charles Gould, MSU Extension Educator – Bioenergy
Wayne Beyea, JD, AICP, Senior Specialist, MSU School of Planning, Design and Construction
Hannah Smith, University of Michigan graduate student
Jason Derry, MSU Urban and Regional Planning student
Emma Gilbert, MSU Urban and Regional Planning student
Our advice to communities on solar and ag

- What does your community mean by farmland preservation?

- Be consistent
  - What else do you allow in ag district?
  - Golf course? Residential development?
Thank you & questions

Sarah Mills, PhD
Senior Project Manager
Graham Sustainability Institute
University of Michigan

sbmills@umich.edu
**Perceptions of Property Taxes**

<table>
<thead>
<tr>
<th>Service</th>
<th>Greatly improved</th>
<th>Somewhat improved</th>
<th>Neither</th>
<th>Somewhat worsened</th>
<th>Greatly worsened</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local schools</td>
<td>9%</td>
<td>24%</td>
<td>64%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Township services</td>
<td>4%</td>
<td>18%</td>
<td>73%</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>County services</td>
<td>3%</td>
<td>15%</td>
<td>77%</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>


Wind developers pay ~$20M in property taxes each year.
% who said Township Services Improved from Wind Development

<table>
<thead>
<tr>
<th>Township</th>
<th>Number of Respondents</th>
<th>% who said Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twp A</td>
<td>5 (turb.)</td>
<td>14%</td>
</tr>
<tr>
<td>Twp B</td>
<td>5</td>
<td>13%</td>
</tr>
<tr>
<td>Twp C</td>
<td>14</td>
<td>19%</td>
</tr>
<tr>
<td>Twp D</td>
<td>15</td>
<td>20%</td>
</tr>
<tr>
<td>Twp E</td>
<td>24</td>
<td>17%</td>
</tr>
<tr>
<td>Twp F</td>
<td>24</td>
<td>60%</td>
</tr>
<tr>
<td>Twp G</td>
<td>41</td>
<td>29%</td>
</tr>
<tr>
<td>Twp H</td>
<td>41</td>
<td>25%</td>
</tr>
<tr>
<td>Twp I</td>
<td>61</td>
<td>25%</td>
</tr>
<tr>
<td>Twp J</td>
<td>88</td>
<td>28%</td>
</tr>
</tbody>
</table>
Perceptions of Property Taxes

- Human nature
- Revenue decline over time
- Changes = Uncertainty