GRAHAM SUSTAINABILITY INSTITUTE
CENTER FOR EMPOWERING COMMUNITIES
UNIVERSITY OF MICHIGAN

Local Property Tax Impacts of Large-Scale Solar in the Great Lakes Region

Michael Craig, Sarah Mills, Matthew Appel

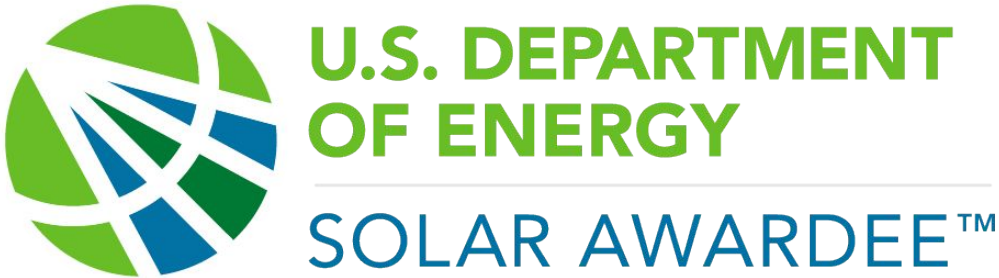
August 12, 2025

Webinar Agenda

- Project background
- State-Specific Tax Policies
- Tax Calculator Introduction
- Q & A (submit questions as we go!)

Recording/slides will be available online

This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Solar Energy Technologies Office Award Number EE00009361. The views expressed herein do not necessarily represent the views of the U.S. Department of Energy, or the United States Government.



The U.S. Department of Energy Solar Energy Technologies Office accelerates the advancement and deployment of solar technology in support of an equitable transition to a decarbonized economy. Learn more at energy.gov/eere/solar.

Our Team

- **Michael Craig**, University of Michigan
- **Hongli Feng**, Iowa State University
- **Gilbert Michaud**, Loyola University Chicago
- **Steven Miller**, Michigan State University Extension
- **Sarah Mills**, University of Michigan
- **Papa Yaw Owusu-Obeng,** University of Michigan

Advisory Board

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- Brian Bourdages, American Farmland Trust
- Andrea Brown, Michigan Association of Planning
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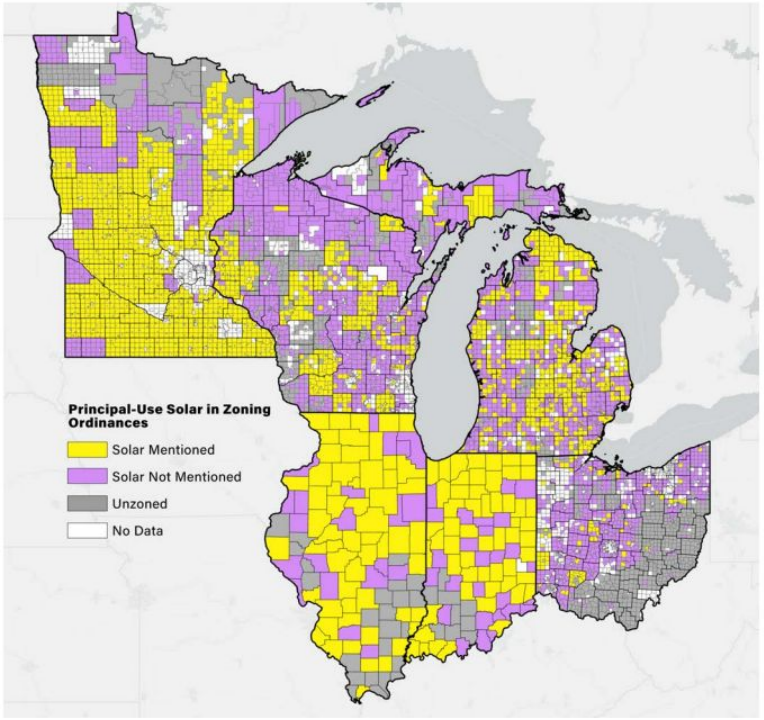
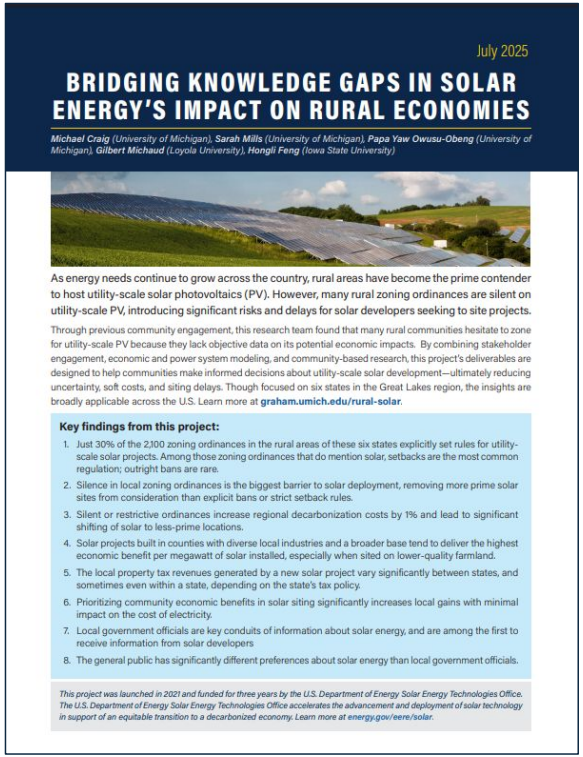
- Julie Staveland, Michigan Department of Environment, Great Lakes, and Energy
- Leah Thill, Michiana Area Council of Governments
- Mike Volpe, Utility Scale Solar Energy Coalition of Ohio
- Kent Whitcomb, MiEnergy Cooperative
- Jessica Wilkinson, The Nature Conservancy

Project Purpose

- Document prevalence & impact of silence in zoning
- Provide information on solar's local economic impact
- Improve knowledge flows to enable communities to make informed zoning decisions



Key Findings + Deliverables



July 2025

BRIDGING KNOWLEDGE GAPS IN SOLAR ENERGY'S IMPACT ON RURAL ECONOMIES

Michael Craig (University of Michigan), Sarah Mills (University of Michigan), Papa Yaw Owusu-Obeng (University of Michigan), Gilbert Michaud (Loyola University), Hongli Feng (Iowa State University)

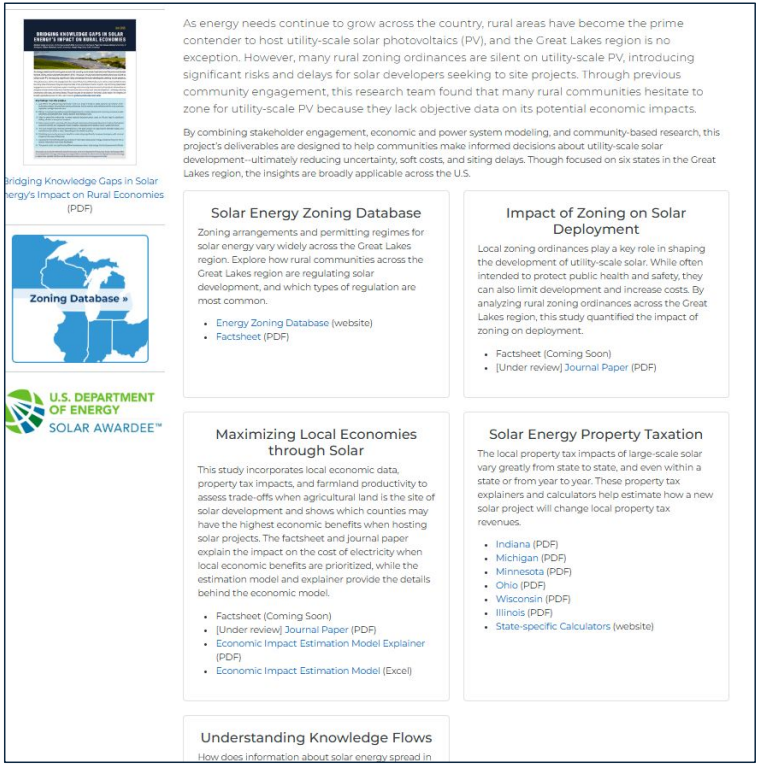
As energy needs continue to grow across the country, rural areas have become the prime contender to host utility-scale solar photovoltaics (PV). However, many rural zoning ordinances are silent on utility-scale PV, introducing significant risks and delays for solar developers seeking to site projects.

Through previous community engagement, this research team found that many rural communities hesitate to zone for utility-scale PV because they lack objective data on its potential economic impacts. By combining stakeholder engagement, economic and power system modeling, and community-based research, this project's deliverables are designed to help communities make informed decisions about utility-scale solar development—ultimately reducing uncertainty, soft costs, and siting delays. Though focused on six states in the Great Lakes region, the insights are broadly applicable across the U.S. Learn more at **graham.umich.edu/rural-solar**.

Key findings from this project:

1. Just 30% of the 2,100 zoning ordinances in the rural areas of these six states explicitly set rules for utility-scale solar projects. Among those zoning ordinances that do mention solar, setbacks are the most common regulation; outright bans are rare.
2. Silence in local zoning ordinances is the biggest barrier to solar deployment, removing more prime solar sites from consideration than explicit bans or strict setback rules.
3. Silent or restrictive ordinances increase regional decarbonization costs by 1% and lead to significant shifting of solar to less-prime locations.
4. Solar projects built in counties with diverse local industries and a broader base tend to deliver the highest economic benefit per megawatt of solar installed, especially when sited on lower-quality farmland.
5. The local property tax revenues generated by a new solar project vary significantly between states, and sometimes even within a state, depending on the state's tax policy.
6. Prioritizing community economic benefits in solar siting significantly increases local gains with minimal impact on the cost of electricity.
7. Local government officials are key conduits of information about solar energy, and are among the first to receive information from solar developers
8. The general public has significantly different preferences about solar energy than local government officials.

This project was launched in 2021 and funded for three years by the U.S. Department of Energy Solar Energy Technologies Office. The U.S. Department of Energy Solar Energy Technologies Office accelerates the advancement and deployment of solar technology in support of an equitable transition to a decarbonized economy. Learn more at energy.gov/eere/solar.



Bridging Knowledge Gaps in Solar Energy's Impact on Rural Economies (PDF)

U.S. DEPARTMENT OF ENERGY
SOLAR AWARDEE™

As energy needs continue to grow across the country, rural areas have become the prime contender to host utility-scale solar photovoltaics (PV), and the Great Lakes region is no exception. However, many rural zoning ordinances are silent on utility-scale PV, introducing significant risks and delays for solar developers seeking to site projects. Through previous community engagement, this research team found that many rural communities hesitate to zone for utility-scale PV because they lack objective data on its potential economic impacts.

By combining stakeholder engagement, economic and power system modeling, and community-based research, this project's deliverables are designed to help communities make informed decisions about utility-scale solar development--ultimately reducing uncertainty, soft costs, and siting delays. Though focused on six states in the Great Lakes region, the insights are broadly applicable across the U.S.

Solar Energy Zoning Database

Zoning arrangements and permitting regimes for solar energy vary widely across the Great Lakes region. Explore how rural communities across the Great Lakes region are regulating solar development, and which types of regulation are most common.

- Energy Zoning Database (website)
- Factsheet (PDF)

Impact of Zoning on Solar Deployment

Local zoning ordinances play a key role in shaping the development of utility-scale solar. While often intended to protect public health and safety, they can also limit development and increase costs. By analyzing rural zoning ordinances across the Great Lakes region, this study quantified the impact of zoning on deployment.

- Factsheet (Coming Soon)
- [Under review] Journal Paper (PDF)

Maximizing Local Economies through Solar

This study incorporates local economic data, property tax impacts, and farmland productivity to assess trade-offs when agricultural land is the site of solar development and shows which counties may have the highest economic benefits when hosting solar projects. The factsheet and journal paper explain the impact on the cost of electricity when local economic benefits are prioritized, while the estimation model and explainer provide the details behind the economic model.

- Factsheet (Coming Soon)
- [Under review] Journal Paper (PDF)
- Economic Impact Estimation Model Explainer (PDF)
- Economic Impact Estimation Model (Excel)

Solar Energy Property Taxation

The local property tax impacts of large-scale solar vary greatly from state to state, and even within a state or from year to year. These property tax explainers and calculators help estimate how a new solar project will change local property tax revenues.

- Indiana (PDF)
- Michigan (PDF)
- Minnesota (PDF)
- Ohio (PDF)
- Wisconsin (PDF)
- Illinois (PDF)
- State-specific Calculators (website)

Understanding Knowledge Flows

How does information about solar energy spread in

https://graham.umich.edu/rural-solar

Our approach to property tax calculation

<u>Net</u> benefits

Which units benefit

- Detailed sub-county data

How does it change over time

Our approach to property tax calculation

Net benefits

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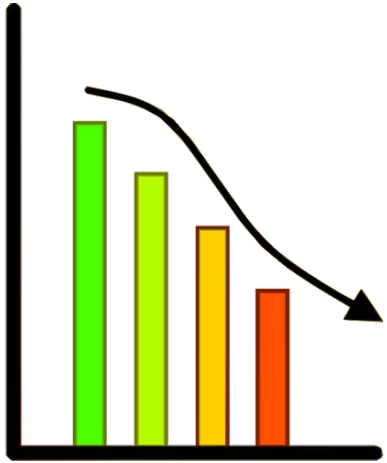
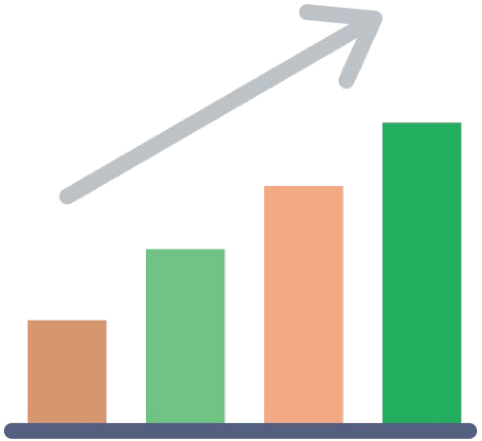
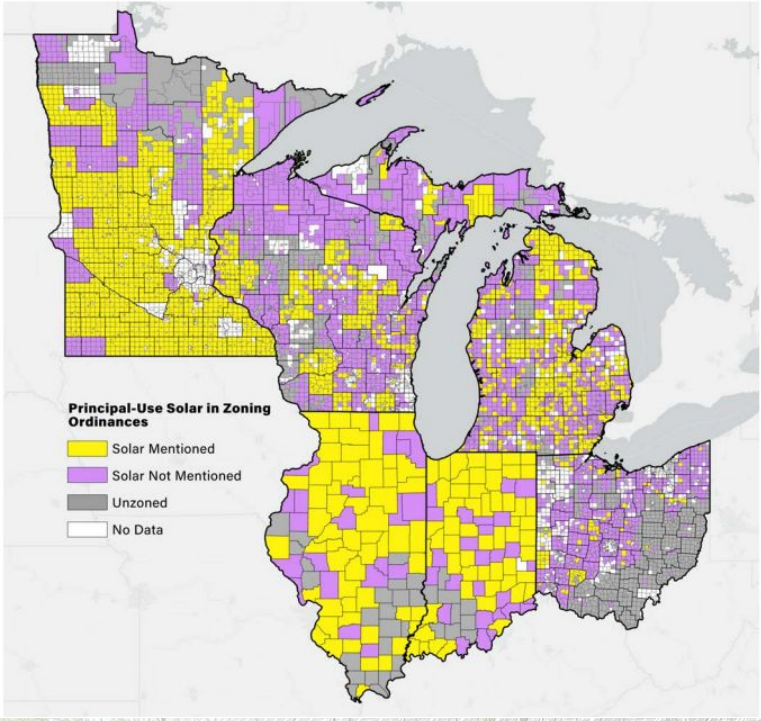




State-by-State Policies and Calculators



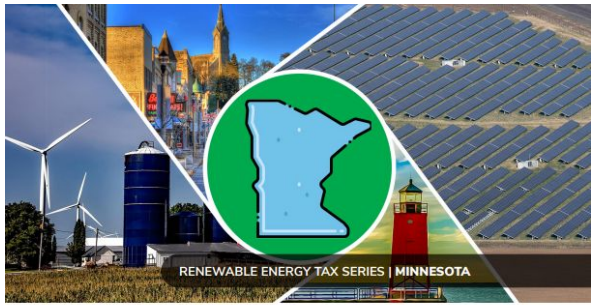
Minnesota

Net land tax + production tax

Ag -> commercial
/industrial/utility

$1.20/MWh

80% county;
20% township



Local Property Tax Impacts of Large-Scale Wind and Solar Projects

About the Series

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Renewable energy projects can boost rural economies and fund community priorities, but assessing their tax impacts is often difficult. This series aims to provide stakeholders with clear, detailed, and accurate information.

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Pete Schultz, advised by Sarah Mills and Hayley Sakwa
Center for Empowering Communities, University of Michigan

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Like other properties, these projects pay taxes to local government units, including towns, schools, libraries, and others. Energy property taxes are usually much higher than farmland taxes, though the size of the difference depends on state tax laws. Large-scale wind and solar projects are typically taxed in one of two ways: ad valorem (based on land and equipment value, taxed at local rates) or as a Payment in Lieu of Taxes or PILOT (often a flat rate tied to the project's electricity production capacity).

State policymakers determine which tax system applies and how it is implemented, balancing the trade-offs between lower taxes to attract developers and higher taxes to benefit host communities. These policies—from the broad structures to the tiny details—shape the size and distribution of tax payments over a project's 20- to 40-year lifespan. Sometimes units like counties and schools may be affected differently, and some local residents may benefit more than others. Policymakers must also plan for decommissioning to prevent "boom/bust" revenue cycles that can occur when major taxpayers enter and exit. With many of these policies newly established, state and local officials are still learning their applications and impacts.

Minnesota Example

Table 1. Annual net impact and distribution for a 100 MW solar project in Grand Prairie Township, Nobles County.

	New Production Tax Revenue	Net Land Property Tax Revenue	Year 1 total tax impact
County	$185,000	$185,000	**$370,000**
Township	$46,000	$73,000	**$119,000**
School district	$0	$146,000	**$146,000**
Total net tax revenue	**$231,000**	**$404,000**	**$635,000**

Depends upon:

- capacity factor (i.e., sunniness; grid congestion)
- land market value
- local tax rates

Minnesota Calculator

User Entered Inputs			
Project Location Information			
County/Township/School District Name	NOBLES	GRAND PRAIRIE TOWN OF	ELLSWORTH
Use County Average Land Market Value (Value in G2)? (***If no, enter value in $/acre in adjacent cell***)	Yes	$15,000	
Use Estimated County Solar Capacity Factor (Value in G3)? (***If no, enter value in adjacent cell***)	Yes	0.250	
Average Yearly Inflation Rate	3.00%		
Property Classification Information			
Previous Property Classification (*If Agriculture, select if Homestead or Non-homestead in Adjacent Cell*)	Agriculture	Non-homestead	
New Property Classification (*If Agriculture, select if Homestead or Non-homestead in Adjacent Cell*)	Commercial	N/A	
Solar Farm System Information			
System Nameplate Capacity (MW)	100		
Land Area of Project (Acres)	700		

Revenues relatively stable over time

- Small capacity factor decrease
- Land market value increase

Annual *Net* Tax Revenue									
Year	*2025*	*2026*	*2027*	*2028*	*2029*	*2030*	*2031*	*2032*	*2033*
County Real Property	$175,984	$181,264	$186,702	$192,303	$198,072	$204,014	$210,134	$216,438	$222,932
City/Township Real Property	$63,152	$65,047	$66,998	$69,008	$71,078	$73,211	$75,407	$77,669	$79,999
School District Real Property	$138,093	$142,236	$146,503	$150,898	$155,425	$160,088	$164,890	$169,837	$174,932
County Production	$185,310	$185,310	$185,310	$185,310	$185,310	$185,310	$185,310	$185,310	$185,310
City/Township Production	$46,327	$46,327	$46,327	$46,327	$46,327	$46,327	$46,327	$46,327	$46,327
Total County *Net* Revenue	**$361,294**	**$366,574**	**$372,012**	**$377,613**	**$383,382**	**$389,324**	**$395,444**	**$401,748**	**$408,242**
Total City/Township *Net* Revenue	**$109,480**	**$111,374**	**$113,326**	**$115,336**	**$117,406**	**$119,538**	**$121,735**	**$123,997**	**$126,327**
Total School District *Net* Revenue	**$138,093**	**$142,236**	**$146,503**	**$150,898**	**$155,425**	**$160,088**	**$164,890**	**$169,837**	**$174,932**
Total Project *Net* Revenue	**$608,867**	**$620,184**	**$631,840**	**$643,846**	**$656,212**	**$668,950**	**$682,069**	**$695,582**	**$709,500**

Wisconsin

Utility Aid Payment – Ag Property Tax

$5,000/MW

$2,830 county

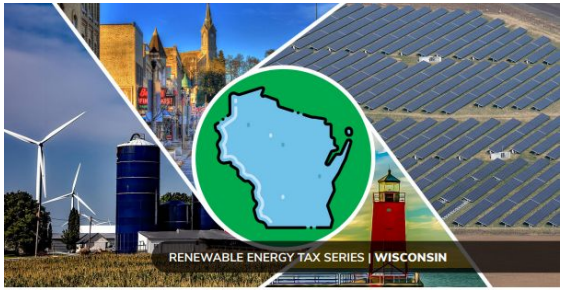
$2,170 town

Based on ag use-value

County

Town

School district



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Caroline Resor and Hayley Sakwa, advised by Sarah Mills
Center for EmPowering Communities, University of Michigan

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Wisconsin Example

Table 1. Annual net impact and distribution for 100 MW solar project in Emerald, Saint Croix County.

	Total Impact	County	Town	Schools/Other
Annual utility aid payments (uniform statewide)	**$500,000**	$283,000	$217,000	$0
Annual farm property taxes eliminated (varies by locality)	**($2,500)**	($500)	($500)	($1,500)
Annual net impact	**$497,500**	**$282,500**	**$216,500**	**($1,500)**

Additional Year 1 impact from conversion charge (varies by county)	**$191,100**	**$95,550**	**$95,550**	**$0**

Wisconsin Calculator

INPUTS	
Instructions: Tailor the "User Entered Inputs" (blue ink) below to match the project specifications ar information. Any boxes that are greyed out following your entires do no need to be filled for your p	
Wind or Solar	Solar
Project Size (MW)	100
County	Saint Croix
Township/City/Village	Emerald
Solar - Fenceline Acres	700
Wind - Number of Turbines	70
Grade of Ag Land Converted (1, 2, 3 or Pasture=4)	2

Year 1 is outlier

All others the same, but no inflation adjustment

Year	Utility Aid Payments	Conversion Charge	Reduction in local PT	Net Benefit
1	$ 500,000	$ 191,100	($2,501)	$ 688,599
2	$ 500,000		($2,501)	$ 497,499
3	$ 500,000		($2,501)	$ 497,499
4	$ 500,000		($2,501)	$ 497,499
5	$ 500,000		($2,501)	$ 497,499
6	$ 500,000		($2,501)	$ 497,499
7	$ 500,000		($2,501)	$ 497,499
8	$ 500,000		($2,501)	$ 497,499
9	$ 500,000		($2,501)	$ 497,499
10	$ 500,000		($2,501)	$ 497,499
11	$ 500,000		($2,501)	$ 497,499
12	$ 500,000		($2,501)	$ 497,499
13	$ 500,000		($2,501)	$ 497,499
14	$ 500,000		($2,501)	$ 497,499
15	$ 500,000		($2,501)	$ 497,499
16	$ 500,000		($2,501)	$ 497,499
17	$ 500,000		($2,501)	$ 497,499

Illinois

Solar Property Taxes – Previous Farmland Property Taxes

Per-MW ($218k/MW) valuation
Trended for inflation since 2018
Minus depreciation (30% floor)

Valuation based on
soil productivity

Illinois Example

	Tax Rate	Solar Project Tax Payments	Previous Farmland Tax Payments	Net Tax Impacts from Solar Project
County	0.76%	$68,285	$3,289	**$64,996**
Township	0.33%	$29,666	$1,429	**$28,237**
School District	3.50%	$312,631	$15,059	**$297,572**
All other special units	1.43%	$127,606	$6,147	**$121,459**
Year 1 Total	**6.03%**	**$538,187**	**$25,924**	**$512,264**

Depends upon:

- Local tax rate
- Soil productivity of land under solar

Michigan (ad valorem)

- Based on value of components “before the inverter”
- County, town, school district (non-operating millages)

Industrial personal property tax

+

Utility personal property tax

+

Changes in real property tax

- Occur when ag -> industrial, or when ownership changes hands
- County, town, school district (all millages)

- Based on value of components “after the inverter”
- County, town, school district (all millages)

Michigan (PILT)

- $7,000/MW (or $2,000/MW under some conditions)
- County, town, school district (non-operating millages)

Payment in lieu of taxes (PILT)

+

Utility personal property tax

+

Changes in real property tax

- Occur when ag -> industrial, or when ownership changes hands
- County, town, school district (all millages)

- Based on value of components “after the inverter”
- County, town, school district (all millages)

Michigan Example

Table 1: Annual net impact and distribution for 100 MW solar project in Midland County

	One of these options		Plus both of these	
Taxing Unit	PILT	Year 1 Industrial Personal Property Tax	Year 1 Utility Personal Property Tax	Net increase in Real Property Tax
Midland County	$322,000	$468,000	$51,000	N/A
Geneva Township	$105,000	$153,000	$16,000	N/A
School Districts and Community College (Combined, Excluding Operating Millage)	$245,000	$356,000	$39,000	N/A
School Operating Millage	N/A	N/A	$87,000	$54,000
Other Taxing Units (Combined)	$28,000	$40,000	$4,000	N/A
Total	**$700,000**	**$1,017,000**	**$197,000**	**$54,000**

Depends upon:

- whether PILT is $7,000/MW or $2,000/MW
- real property value
- local tax rates

Michigan Calculator

Taxing District	
County	Washtenaw
Township / City Name	Scio
Village	
City?	0
School District	ANN ARBOR PUBLIC SCHOOLS
Unique District (DO NOT EDIT)	*Washtenaw_Scio__0_ANN ARBOR PUBLIC SCHOOLS*

Project Details	
Nameplate capacity of solar project (in megawatts)	100
Original cost of site improvements for **new** solar project **up to and including the inverter**, including: solar modules, racks, tracking, on-site battery storage systems, controls, inverter	$90,000,000.00
Original cost of site improvements for **new** solar project **after the inverter**, including: cables, substations, and other transmission and distribution infrastructure created by the solar project	$10,000,000.00
Expected useful economic life of project	30.0
Average annual inflation rate multiplier	1.03

Non-PILT revenue declines over time, but PILT revenue remains more stable.

Category	Year					
	1	2	3	4	5	6
Total Per Year - All Taxing Units	$1,272,875.94	$961,151.22	$1,194,944.76	$1,441,726.83	$1,376,784.18	$1,389,772.71
Gross IPP Revenue Over Course of Project - All Taxing Units	$14,157,497.70					
Net Present Value of IPP Revenue Over Course of Project - All Taxing Units	$11,578,010.88					
Total Per Year - All Taxing Units	$722,506.20	$722,506.20	$722,506.20	$722,506.20	$722,506.20	$722,506.20
Gross PILT Revenue Over Course of Project Minus Real Property Removed - All Taxing Units	$16,008,747.51					
Net Present Value of PILT Revenue Over Course of Project Minus Real Property Removed - All Taxing Units	$11,829,756.48					

Ohio (non-QEP)

Net changes in real property tax

+

Personal property tax

- Determined by installation costs, depreciation, and adjustments that differ by type of equipment (production, transmission, etc.).
- Paid to county, town, school district.

- For solar projects, land is reclassified as commercial/business (meaning higher taxes), while for wind projects, land usually remains classified as agricultural.
- Paid to county, town, school district.

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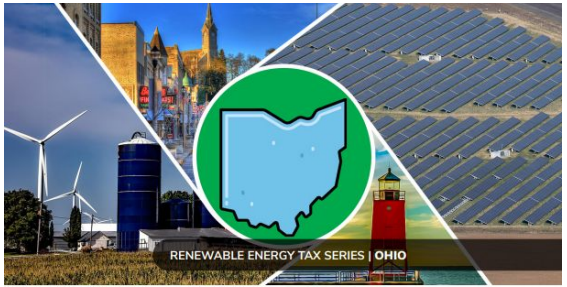
Ohio (QEP)

PILT – Ag Property Tax

- $6,000-9,000/MW
- Exact amount depends on proportion of workers with Ohio residency and whether host counties require additional payments.
- Base payments are distributed as normal to counties, townships, and school districts, while additional payments go into county general fund.

- Based on ag use-value
  - County
  - Town
  - School district



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State policymakers determine which tax system applies and how it is implemented, balancing the trade-offs between lower taxes to attract developers and higher taxes to benefit host communities. These policies—from the broad structures to the tiny details—shape the size and distribution of tax payments over a project's 20- to 40-year lifespan. Sometimes units like counties and schools may be affected differently, and some local residents may benefit more than others. Policymakers must also plan for decommissioning to prevent "boom/bust" revenue cycles that can occur when major taxpayers enter and exit. With many of these policies newly established, state and local officials are still learning their applications and impacts.

Ohio Example

Example: 100 MW Solar Project in Pickaway County, Ohio

A 700-acre, 100 MW solar project in Ohio is taxed either as a QEP or utility property. As a QEP, it would pay $7,000/MW annually, distributed proportionally to local taxing units. As a non-QEP, it would pay taxes on both the equipment and the land. In either case, previous farmland property taxes are removed to calculate net Year 1 tax impacts. Recoupment fees may apply.

Table 1: Annual net impact and distribution for 100 MW QEP solar project vs Non-QEP solar project in Pickaway County, Ohio.

Project Type	Impacts	Local Units				
		Pickaway County	Circleville City School District	Circleville Township	Special Districts (Combined)	Taxing District Total
Qualified Energy Project (QEP)	QEP Payments	$61,000	$516,000	$64,000	$59,000	**$700,000**
	Previous Farmland Property Taxes	($3,000)	($19,000)	($5,000)	($2,000)	**($29,000)**
	Year 1 Net Impact	**$58,000**	**$497,000**	**$59,000**	**$57,000**	**$671,000**
Non-QEP Utility Property	Land Taxes	$13,000	$91,000	$15,000	$10,000	**$129,000**
	Equipment Taxes	$211,000	$1,772,000	$220,000	$202,000	**$2,405,000**
	Previous Farmland Property Taxes	($3,000)	($19,000)	($5,000)	($2,000)	**($29,000)**
	Year 1 Net Impact	**$221,000**	**$1,844,000**	**$230,000**	**$210,000**	**$2,505,000**

Depends upon:

- PILT rate
- whether it is a wind or solar project
- real property value
- local tax rates

Ohio Calculator

1	User Entered Inputs		
2	*Energy System Information*		
3	Wind or Solar Farm?	Solar	
4	System Nameplate Capacity (MW)	100	
5	Land Area of Project (Acres)	700	
6	Use Assumed Personal Property Valuation of System ($/MW)? (***If no, enter value in adjacent cell***)	Yes	
7	Project Status is Qualified Energy Project (QEP)?(***If yes, enter annual additional payment per MW in adjacent cell***)	Yes	
8	Percentage of Employed Construction Workers from Ohio?	Greater than 75%	

QEP payments remain stable over time both at the unit level and in total.

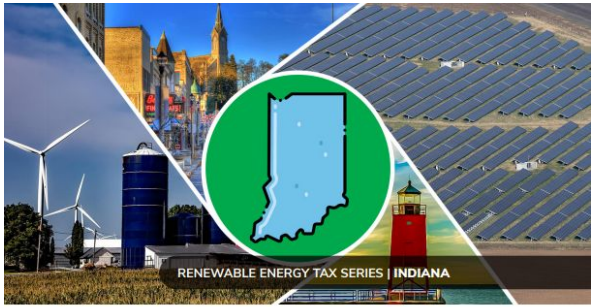
Political Unit	2026	2027	2028	2029	2030
ADAMS COUNTY	$221,389	$221,335	$221,280	$221,223	$221,164
MANCHESTER LSD (ADAMS)	$444,797	$444,699	$444,598	$444,494	$444,387
SPRIGG TWP	$21,806	$21,801	$21,796	$21,790	$21,784
SPRIGG TWP EXC MANCHESTER CORP	$6,698	$6,696	$6,694	$6,692	$6,690
	$694,691	$694,531	$694,367	$694,198	$694,024

Indiana

Major tax overhaul in April/May 2025! (PL 68, 230)

Brief is still online, but check out addendum

Calculator to be updated; don't use!



About the Series

This state-specific series explores one key question: How do property taxes from large-scale wind and solar projects impact local government budgets?

Renewable energy projects can boost rural economies and fund community priorities, but assessing their tax impacts is often difficult. This series aims to provide stakeholders with clear, detailed, and accurate information.

This material is for informational purposes only and is not intended as legal advice.

Local Property Tax Impacts of Large-Scale Wind and Solar Projects

Caroline Resor and Hayley Sakwa, advised by Sarah Mills
Center for EmPowering Communities, University of Michigan

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Indiana Basics

Solar real property
+
Solar personal property
+
Real property improvements
–
Previous ag real property

Determine if exceeds max levy (unit-by-unit)

Calculate new (reduced) county tax rate

Determine what solar developer pays

- Sometimes solar = lower tax rates for all
- Sometimes solar = more tax revenue
- Varies by tax unit!

Indiana Policy Changes

Key Changes (we think)

- No levy growth unless public hearing
- Solar equipment may depreciate more
- Lower assessment for farmland

Expanded resources

- Wind info/calculators in each of these states
- Also: Nebraska & Iowa

RURAL CLIMATE
PARTNERSHIP

- Plan to (pending funding):
  - Keep briefs / calculators up-to-date
  - Translate to public services
  - Help using calculators, answering questions
  - Policy analysis to inform state policy

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- Caroline Leland
- Jade Prange
- Caroline Resor
- Hayley Sakwa
- Pete Schultz
- Dan Spellman

Questions?

- **Type them in!**
- **Email us!**
- **See errors / glitches?**
  - Please let us know!

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Tell us what you think!

Please take the 3-question poll before you sign-out