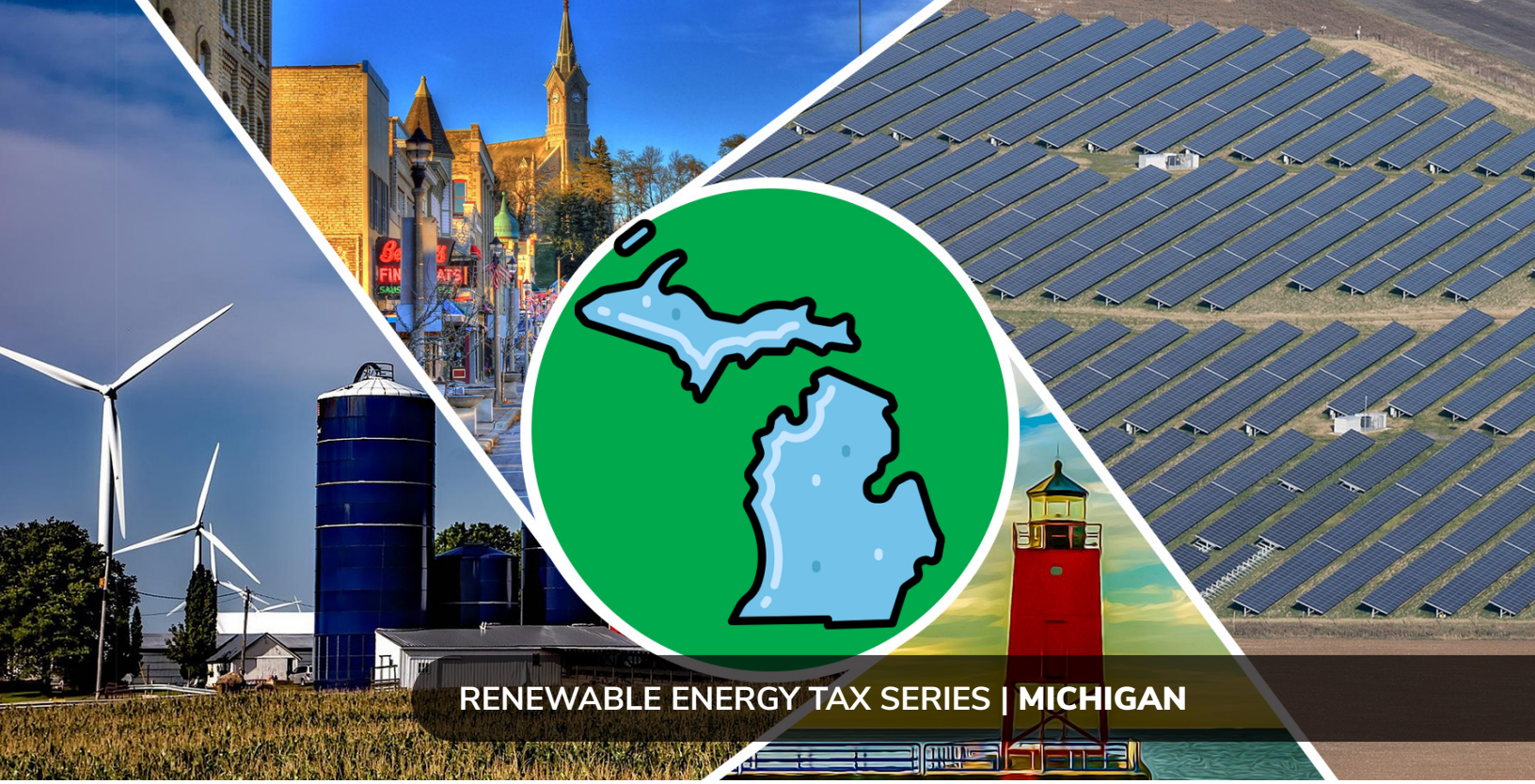



# Local Property Tax Impacts of Large-Scale Wind and Solar Projects

Contact Center for EmPowering Communities, University of Michigan

## 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.

Renewable energy projects are expanding nationwide as governments and industries respond to climate change and advancing technology. This growth is expected to continue for projects of all sizes, especially utility-scale developments that power thousands of homes by feeding electricity directly to the grid. Spanning thousands of acres, these large projects are most often built in rural places and frequently on agricultural land.

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.

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

Contact Center for EmPowering Communities, University of Michigan

## Overview: Wind and Solar Property Taxes in Michigan

Wind and solar projects in Michigan pay **personal property** taxes based on the installed new cost of the renewable energy project. Most of the equipment is taxed as industrial personal property, but some components like electrical substations or new transmission lines are taxed as utility personal property. The land under solar panels is typically reclassified as industrial real property, while land under wind turbines retains its property classification from before the project was built.

- **Valuation:** The State Tax Commission determines which components of a renewable energy project should be taxed and sets valuation multipliers that incorporate both inflation and depreciation.
- **School funding:** Renewable energy developers pay a 18-mill school operating millage and a 6-mill **State Education Tax** on some components of their projects. However, since school operating funding in Michigan is allocated on a per pupil basis, these don't usually result in noticeable changes at the local level. Where voters in a local school district have approved a debt or sinking fund millage, renewable energy developers pay these millages which do directly grow local budgets.

Solar projects of at least 2 megawatts may be eligible for a payment in lieu of taxes (PILT), which exempts them from industrial personal property taxes, but replaces it with an annual flat rate based on the project's **nameplate capacity**. The PILT is $7,000 per megawatt for most projects, though the PILT must be reduced to $2,000 per megawatt if the property where the solar project is located is state-owned, in an Opportunity Zone, or is located on a brownfield site. The local government has discretion to approve or deny the developer's request for a PILT.

## Example: 100 MW Solar Project in Midland County, Michigan

A 700-acre, 100 MW solar project in Michigan would pay utility personal property, the increased real property tax from reclassifying the land to industrial real property, and would either pay industrial personal property or a $7,000/MW PILT.

**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** | $296,000 | $453,000 | $49,000 | N/A |
| **Geneva Township** | $98,000 | $150,000 | $16,000 | N/A |
| **School Districts and Community College (Combined, Excluding Operating Millage)** | $277,000 | $424,000 | $47,000 | N/A |
| **School Operating Millage** | N/A | N/A | $86,000 | $54,000 |
| **Other Taxing Units (Combined)** | $29,000 | $44,000 | $5,000 | N/A |
| **Total** | **$700,000** | **$1,071,000** | **$203,000** | **$54,000** |

Property tax laws vary by state. While states often use similar terms, their applied definitions can differ from place to place. Below, these shared terms are defined according to Michigan's tax system.

### Property Tax 101

- **Ad valorem:** A tax based on the value of the item being taxed.
- **Assessed value:** A tax based on the value of the item being taxed. Often assessed value is adjusted further to determine taxable value.
- **Depreciation:** The gradual loss of value of a property as it ages or gets used. If a property depreciates by 20%, Taxable Value = Assessed Value x 80%.
- **Millage:** An expression of the tax rate. 20 mills is a rate of $20 per $1,000, or a 2% tax rate.
- **Nameplate capacity:** Maximum amount of electricity in megawatts (MW) that a solar or wind farm could produce under perfect conditions. Sometimes called production capacity or installed capacity.
- **Personal property:** Land, buildings, and fixtures permanently attached to the land.
- **Real property**: Land and permanent improvements to land, such as buildings.
- **Taxable value**: The value of a property used to calculate property taxes, typically not the same as its true cash value.
- **Tax rate**: A percentage at which a property owner is taxed on the value of their property.
- **Taxing unit**: Any government unit that imposes property taxes, such as counties, townships, school districts, and special districts.
- **True cash value**: The fair market value, or price at which property is likely to be sold in the current market.

### Renewable Energy 101

- **Inverter:** Machinery that converts the direct current (DC) electricity generated by solar panels into alternating current (AC) electricity, compatible with the electric grid. Components of an energy system "up to and including the inverter" (which generate and convert energy) are taxed differently than components "after the inverter" (primarily transmission and distribution).

*Adapted from Lincoln Institute of Land Policy Property Tax Glossary.*

# Michigan: Key Concepts

- **Homestead and Non-Homestead Rates:** Principal residences and qualified agricultural property are exempt from school district operating **millages** in Michigan.[1] The property tax rates they pay are called *homestead rates*. All other categories of **real property** pay *non-homestead rates*.
- **School district operating millage:** A millage that school districts use for day-to-day operating expenses like salaries, classroom supplies, utilities, and athletic programs. The vast majority of school districts in Michigan levy an 18-mill operating millage (1.8% tax rate), which is the maximum allowed by state law.[2]
- **State education tax:** A statewide 6-mill levy (0.6% tax rate) levied on most forms of **real** and **personal property**, but not industrial personal property. This revenue goes to the state School Aid Fund, from which it is ultimately redistributed back to local districts. Since revenue from the state education tax does not stay local, it is not factored into our calculators or the example at the end of this brief.[3]
- **State equalized value (SEV):** Refers to a property's **assessed value** as approved by the county and state.[4] Per state law, SEV is set at 50% of **true cash value**. For personal property, SEV is equal to **taxable value**. For real property, SEV is only used to determine taxable value when property ownership is transferred. To prevent taxes on real property from rising too quickly, its **taxable value** is capped so that it increases each year only by the rate of inflation or 5 percent, whichever is less.[5] This cap does not include the cost of new property improvements. When land is sold (such as to a developer for a solar or wind project) in the previous year, the property's **taxable value** is uncapped and is reset to equal its SEV.[6,7]
- **Utility-scale solar and wind:** Solar energy systems that produce electricity for commercial sale with a 2-megawatt **nameplate capacity** or more. No such capacity requirement exists for utility-scale wind energy systems.[8]
- **Valuation multiplier:** The rate at which **true cash value** for **personal property** changes each year for tax purposes. For example, if a property's total original cost in Year 1 is $100,000, and the valuation multiplier for Year 2 of its useful life is 0.90, its **true cash value** in Year 2 is $90,000. The valuation multiplier for wind and solar personal property incorporates the State Tax Commission's estimates of both **depreciation** and inflation, and thus is sometimes greater than 1.0.

## Deeper Dive: Michigan Property Tax Assessment Guidelines

### Solar and Wind Traditional Property Taxes

**Utility-scale solar and wind energy** equipment in Michigan is subject to local property taxation in two categories: *industrial personal property (IPP) and utility personal property (UPP)*.[9] The land under solar panels is typically reclassified as industrial **real property**, while land under wind turbines retains its property classification from before the project was built.

#### Industrial Personal Property (IPP)

**Assessment:** Solar and wind IPP property includes wind turbines, solar panels, attached fixtures and electric equipment, and land improvements like access roads and fencing. Solar IPP also includes all other components "up to and including" the **inverter**.[10] Wind IPP also includes easements,[11] rights-of-way and/or leasehold interests,[12] which are assessed based on the number and capacity of turbines in service.[13]

IPP **taxable value** is calculated by multiplying the cost of all applicable project components by **valuation multipliers** that incorporate inflation and **depreciation**, and then dividing that amount in half to adjust for SEV.[14] The State Tax Commission sets multipliers for different types of property, and is expected to change the multipliers for solar property in upcoming years as project costs decrease.[15]

**Relevant millages:** These taxable IPP values are then taxed at the local IPP rate, which incorporates all local **millages** except the **school district operating millage** and the **state education tax**, from which IPP is exempt.[16]

#### Utility Personal Property (UPP)

**Assessment:** UPP applies to remaining equipment "after the inverter" like electrical substations and transmission lines.[17] The taxable UPP value is calculated by multiplying these project costs by a **valuation multiplier** that incorporates inflation and **depreciation**, and then dividing that amount in half to adjust for SEV. The UPP multiplier decreases more slowly over time than the IPP multiplier.[18]

**Relevant millages:** The UPP value is then taxed at the local UPP rate, which incorporates all local **millages**, including the **school district operating millage** (typically 18 mills, but sometimes less) and the 6-mill **state education tax**.[19]

#### Real property

Construction of wind turbines does not lead to **real property** reclassification, so farmland that hosts wind projects remains classified as agriculture. Agricultural real land pays **homestead rates**, which is exempted from **school operating millages**. The land beneath solar projects is typically reclassified as *industrial real property*, though it is advised to check with local assessors for particular projects.[20] Industrial real property pays **non-homestead rates** which includes **school district operating millages**.

### Solar Projects Payment in Lieu of Taxes (PILT)[21]

As of 2023, local **taxing units** can opt into a **"Payment in Lieu of Taxes" (PILT)** system for solar projects, which exempts projects from traditional personal property taxes and in favor of an annual flat rate based on the project's **nameplate capacity**.

#### Eligible Projects[22]

Eligible projects, called q*ualified solar energy facilities*, must have a **nameplate capacity** of at least 2 megawatts and be located in solar districts. Solar districts are locations that permit qualified solar projects either via a local zoning ordinance or resolution. All land within unzoned jurisdiction (those local governments which have chosen not to regulate land uses through zoning) is also considered a solar district, unless the jurisdiction

establishes a solar district resolution before a project application is submitted.[23] Qualified facilities located in solar districts may apply for PILT certificates for projects not yet in service. The local unit of government, after comparing the **ad valorem** taxation to the PILT, has discretion to approve or deny the request. If approved, the certificate must also be approved by the State Tax Commission.

### Annual Payments

The PILT exempts projects from IPP tax payments for 20 years. Instead, projects pay $7,000/MW of **nameplate capacity** annually for the first 20 years of operations, after which IPP rates are restored. The PILT is reduced by 50% while the project is under construction, and there is no PILT prior to the commencement of construction.

The PILT *must* be reduced to $2,000/MW if the property that is being converted is state-owned, resides in an *Opportunity Zone*,[24] or is located on a *brownfield site*. Opportunity Zones are federally-designated census tracts in low-income communities that have experienced limited business growth.[25] Brownfields are abandoned properties that require environmental cleanup to be redeveloped.[26]

PILT revenues are distributed to local **taxing units** in the same proportion as local **millages** for IPP property.[27]While the *qualified solar facility* includes components up to and including the **inverter,** components "after the inverter" are not included and are still taxed as UPP.

## Discussion of Impacts

### Wind and Solar Traditional Property Tax Impacts

The amount of tax revenue a wind project will generate over its life is largely a function of local **millage** rates and project costs: revenues will be higher where there are higher local millage rates and higher project costs. Solar projects are affected by these same factors, but the total tax revenues also increase if the underlying **real property** changes ownership and/or was formerly agricultural property.

### Solar PILT Impacts

**PILTs** are intended to streamline the taxation process, providing consistent revenue for local governments and a predictable tax bill for developers. Since PILTs in Michigan have a fixed value across the state – whereas traditional **ad valorem** taxes are based on local **millage** rates – the impact of a PILT on total tax payments over time depends on the location. In jurisdictions with high millage rates, the fixed $7,000/MW payments may lead to less tax revenue than ad valorem taxes, while jurisdictions with low millage rates may receive more revenue from a PILT than from traditional taxes. If the project meets any of the requirements that would reduce the PILT to $2,000/MW, local tax impacts are significantly lessened. In Michigan, PILT approvals are up to the discretion of the local government.

**Table 2: Summary of factors that determine the magnitude of local benefits for solar projects**

| Factors | Ad valorem lower than PILT | Ad valorem higher than PILT |
|---|---|---|
| Local millage rates | Low millage rate | High millage rate |
| Project cost | Low per-MW project cost | High per-MW project cost |
| Underlying real property | | Land is state-owned, in an Opportunity Zone, or on a brownfield. |

### School Budget Impacts

Converting agricultural land to renewable energy projects (either via PILT or traditional taxes) slightly changes the amount of local property tax revenue allocated to schools – however, this often does not directly change school operating budgets. This is because the state allocates an annual per-pupil foundation allowance to

subsidize district operating budgets that would not otherwise meet the minimum per-student revenue threshold. Thus, any changes in a school district's local revenue simply changes the size of the state subsidy. There are a few exceptions in which school district budgets can grow from solar project taxes:

- **School districts with *debt or sinking funds:*** In school districts where voters have approved a debt fund or sinking fund **millage**, the **personal property** (both IPP and UPP) from wind or solar development would also increase payments to these funds. These funds are typically used to cover capital expenses like new construction or building improvements.
- ***Out-of-formula districts:*** If a district's local operating revenue exceeds the total state per-pupil allowance, the district keeps any excess local revenue. There were 43 out-of-formula districts in 2023-2024.[28]

The table below breaks down which property tax components pay into school operating funds and the **State Education Tax**, though changes only affect school budgets for out-of-formula districts.

**Table 3. Property Tax Classifications and Applicable Local and School Taxes**

| Project Tax Component ... | Is classified as ... | Pays local taxes to ... | | | |
|---|---|---|---|---|---|
| | | Counties, townships, cities, villages, libraries, intermediate school districts, and other local units | School operating funds (18 mills) | State Education Tax (6 mills) | Voter-approved school debt and sinking fund millages |
| Does the project tax revenue directly grow local budgets? | | Yes | Only out-of-formula districts | No | Yes |
| Equipment that generates and converts energy | Industrial Personal Property (IPP) | ☑ | ☐ | ☐ | ☑ |
| Equipment that transmits and distributes electricity | Utility Personal Property (UPP) | ☑ | ☑ | ☑ | ☑ |
| Land under solar projects | Industrial Real Property | ☑ | ☑ | ☑ | ☑ |
| Agricultural land (including farmland with wind turbines) | Agricultural Real Property | ☑ | ☐ | ☑ | ☑ |
| Eligible solar projects | Optional PILT (replaces IPP taxes) | ☑ | ☐ | ☐ | ☑ |

## Real Property Impacts When Land is Sold and Leased

Most of the time, solar and wind developers enter into leases or long-term easements with landowners who host these projects on their property. Because the land under wind turbines does not get reclassified, there is no change to the **real property** taxes. When agricultural property is leased to a solar developer, the only real property tax revenue comes from the elimination of the land's agricultural exemption from the local **school district operating millage**.[29] However, when land is sold to a wind or solar developer, all local **taxing units** gain new revenue because the real property's **taxable value** is "uncapped" and increases to its **state equalized value (SEV)**.[30] This is due to Michigan's Proposal A which ensures that, unless the property changes ownership, real property taxable value can only increase each year by the rate of inflation or 5 percent, whichever is less,

except for new improvements. As a result, the **taxable value** of many properties in Michigan that have been owned by the same landowner for many years is much below the SEV. When a property is transferred to a developer for a solar or wind project, the SEV becomes the new taxable value, removing the cap and resulting in increased property tax revenues to all local **taxing units.**[31]

### Battery Storage Taxation

On October 22, 2024, the State Tax Commission issued interim guidance regarding the valuation and assessment of battery storage systems.[32] The Commission determined that battery storage systems should be reported as IPP and are subject to a set schedule for **depreciation** that is separate from those of solar and wind systems. This guidance applies to stand-alone battery storage systems; however the implications for solar-plus-storage energy facilities are unclear, as the state's definition of qualified solar energy facilities includes on-site battery storage systems (implying that such systems are components of solar projects). It is advised to check with local assessors for solar-plus-storage projects.

### OBSERVATIONS ON IMPACTS ACROSS STATES

- **Closer neighbors benefit more:** Because projects pay taxes to overlapping **taxing units** (e.g., county, township, and school), those living nearest—who use all these public services—see the greatest economic impact.
- **Less populous areas benefit more:** Since tax benefits are distributed within the project's **taxing units**, counties and townships with fewer residents receive a higher per-person benefit.
- **Tax revenue becomes more concentrated:** A large taxpayer like a wind or solar farm shifts the tax base, increasing reliance on a single source. When the project is decommissioned, local units may struggle to replace the lost revenue.
- **Wind project revenue is more dispersed:** Wind farms retain most farmland, converting only 0.5 to 1 acre per turbine constructed. With turbines spread over many more acres than solar panels, less agricultural tax revenue is lost and benefits are shared across more **taxing units**.

## Calculation Steps

*This example estimates total tax impacts when a 700-acre, 100 MW solar project is built in Geneva Township, Midland County on leased agricultural land. Example 1 estimates ad valorem property taxes. Example 2 assesses the same project under a PILT. While projects typically span multiple jurisdictions, these examples assume a single taxing district to simplify calculations. Millage rates and valuation multipliers are from 2025. Numbers are rounded.*

## Traditional Property Taxes: 100 MW Solar Project

### Step 1: Find IPP Revenue for Year 1

**A. Calculate total IPP revenue for Year 1.**

- Total project cost: Estimated $1/watt x 100 MW = $100 million
- Cost of IPP components: Estimated 90% of total cost = $90 million
- SEV based on true cash value: $90 million x 50% = $45 million
- Year 1 solar IPP valuation multiplier (Form 5762): 0.98
- Total tax rate for applicable IPP millages: 2.429%

**$45 million x 0.98 x 2.429% = $1,071,000**

**B. Determine distribution between taxing units.**

- Proportional millage rate (Midland County combined): 1.027% / 2.429% = 42%
- Proportional millage rate (Geneva Township combined): 0.341% / 2.429% = 14%
- Proportional millage rate (school districts and community college combined): 0.805% / 2.429% = 33%
- Proportional millage rate (other taxing units combined): 0.1% / 2.429% = 4%

**$1,071,000 x 42% = $450,000 to county**

**$1,071,000 x 14% = $150,000 to township**

**$1,071,000 x 33% = $353,000 to school districts and community college**

**$1,071,000 x 4% = $43,000 to other taxing units**

## Step 2: Find UPP Revenue for Year 1

**A. Calculate total UPP revenue for Year 1.**

- Total project cost: Estimated $1/watt x 100 MW = $100 million
- Cost of UPP components: Estimated 10% of total cost = $10 million
- SEV based on true cash value: $10 million x 50% = $5 million
- Year 1 solar UPP multiplier (Form 3589): 0.96
- Total tax rate for applicable UPP millages: 4.23%

**$5 million x 0.96 x 4.23% = $203,000**

**B. Determine distribution between taxing units.**

- Proportional millage rate (Midland County combined): 1.027% / 4.23% = 24%
- Proportional millage rate (Geneva Township combined): 0.341% / 4.23% = 8%
- Proportional millage rate (school districts and community college combined, excluding operating millage): 0.805% / 4.23% = 19%
- Proportional millage rate (school operating millage): 1.8% / 4.23% = 43%
- Proportional millage rate (other taxing units combined): 0.1% / 4.23% = 2%

**$203,000 x 24% = $49,000 to county**

**$203,000 x 8% = $16,000 to township**

**$203,000 x 19% = $39,000 to school districts and community college, excluding operating millage**

**$203,000 x 43% = $87,000 to school operating millage**

**$203,000 x 2% = $4,000 to other taxing units**

## Step 3: Find New Real Property Revenue for Year 1

**A. Calculate total new real property revenue for Year 1.**

- Taxable value (hypothetical): $3 million
- Total tax rate for previous farmland (homestead rate): 2.429%
- Total tax rate for new industrial real property (non-homestead rate): 4.23%
- Net increase in tax rate: 1.8%

**$3 million x 1.8% = $54,000**

### B. Determine distribution between taxing units.

The net increase in **tax rate** (1.8%) is entirely attributable and equal to the school operating millage, which is paid by industrial real property but not agricultural real property. Therefore, all $54,000 go to the school operating millage.

Importantly, if the land had been purchased rather than leased, the **taxable value** would have been uncapped to the **state equalized value**, creating additional revenues for both the school operating millage and all other millages.

**Traditional Property Tax Year 1 Net Revenue = $1,071,000 + $203,000 + $54,000 = $1.27 million**

## Payment in Lieu of Taxes: 100 MW Solar Project

### Step 1: Find Annual PILT Revenue

### A. Calculate annual PILT revenue.

- Annual standard PILT payment: $7,000/MW
- Capacity of project in MW: 100 MW

**$7,000 x 100 = $700,000**

### B. Determine distribution between taxing units.

- Proportional millage rates for PILT: same as IPP in the traditional property tax calculation

**$700,000 x 42% = $294,000 to county**

**$700,000 x 14% = $98,000 to township**

**$700,000 x 33% = $231,000 to school districts and community college**

**$700,000 x 4% = $28,000 to other taxing units**

### Step 2: Find UPP Revenue for Year 1

This calculation is identical to the calculation in Step 2 of the traditional property tax calculation.

**$5 million x 0.96 x 4.23% = $203,000**

### Step 3: Find New Real Property Revenue for Year 1

This calculation is identical to the calculation in Step 3 of the traditional property tax calculation.

**$3 million x 1.8% = $54,000**

**PILT Tax Year 1 Net Revenue = $700,000 + $203,000 + $54,000 = $957,000**

### Step 4: Determine Total Tax Impacts and Distribution over Project Lifetime

### A. Include supplemental tax revenue tools

- Contact the jurisdiction to find out if economic development agreements, tax abatements, or other considerations apply.

### B. Extend calculations to other taxing units and years

- Use our published calculator for complete multi-year analysis across all units.

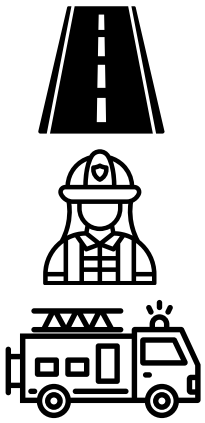
## Step 5: Translate to Possible Uses of Tax Revenue

### A. Use Table 4 to find cost estimates for common expenditures that are funded by local property tax revenue.

**Table 4.** Cost Estimates for Uses of Tax Revenue.

| Expenditures | Estimated Cost |
|---|---|
| **Highway and Bridge Construction** | ~$72,443 per lane-mile (2022)[34] |
| **Roadway Maintenance** | $1,152 per lane-mile (2022)[35] |
| **Firefighters** | ~$71,835 total (salary + benefits)[36] |
| **Fire Trucks or Apparatus** | **Varies:**<br>Regular Fire Truck: $1.8-2.4M[37]<br>Regular Fire Engine: $572,000 |

### B. Calculate benefits based on net tax revenue in Step 4.[33]



| Expenditures | Year 1 Net Tax Revenue (Non-PILT) | Total Possible Benefit in Year 1 |
|---|---|---|
| **Roadway Maintenance** | County: $501,000 | ~435 miles |
| **Firefighters** | Township: $166,000 | ~2.3 full-time firefighter salaries |
| **Fire Trucks** | Township: $166,000 | ~.08 cost of a regular fire truck |

## CALCULATIONS FOR LARGE-SCALE WIND PROJECTS

To calculate the total impacts for a 100 MW wind project, follow the steps above but reduce the farmland acres converted to 33 acres (approximately 1 acre per 3 MW turbine, or 33 turbines for a 100 MW project).

## CALCULATIONS FOR MULTIPLE TAXING DISTRICTS

This example assumes the project is entirely within one taxing district for simplicity. To determine benefits for a project spanning multiple taxing districts, repeat these steps for each portion of the project (either by megawatts or acreage, depending on the step) within each **taxing unit.**


## Acknowledgments

*Grounded in cutting-edge social science and deep community engagement, the Center for EmPowering Communities harnesses the expertise of the University of Michigan to support communities across the urban-rural spectrum as they leverage decarbonization opportunities to advance their goals and enhance their quality of life. 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. It is also supported by funding from the Rural Climate Partnership, a funding collaborative rooted in rural America.*

*Contributors include Matthew Appel, Hayley Sakwa, Paloma Calvin, Vamika Jain, Alisa Sehgal, Alexandra Haddad and Fatimah Bolhassan, advised by Sarah Mills.*


Lighthouse, Michigan. (Wokandapix, Pixabay)

## Endnotes


1. "What is a Principal Residence Exemption?", Michigan Department of Treasury, Accessed Mar. 9, 2025, https://www.michigan.gov/taxes/property/principal/what-is-a-principal-residence-exemption-pre-2; Michigan Legislature, MCL 211.7ee, Accessed Mar. 9, 2025, https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-211-7ee.
2. Adam Yahya Rayes, "Need Help Decoding School Bond, Sinking Fund or Millage Proposals on Your Ballot? Start Here," Michigan Public Radio (Nov. 1, 2024), https://www.michiganpublic.org/politics-government/2024-11-01/need-help-decoding-school-bond-sinking-fund-or-millage-proposals-on-your-ballot-start-here.
3. "A Closer Look at Your Tax Statement," Pittsfield Charter Township, Accessed Mar. 9, 2025, https://www.pittsfield-mi.gov/850/A-Closer-Look-At-Your-Tax-Statement.
4. Pittsfield Charter Township, "What do the terms assessed value, state equalized value, and taxable value mean," n.d., Accessed Feb. 24, 2025, https://www.pittsfield-mi.gov/FAQ.aspx?QID=77.
5. State of Michigan State Tax Commission, "Guide to Basic Assessing," p. 7, Published May 2018, Accessed Aug. 6, 2025, https://www.michigan.gov/-/media/Project/Websites/treasury/ Assessors/Guide_to_Basic_Assessing_116.pdf?rev=91a77c77c4f944e68e5afa46166445ab: Delhi Charter Township, "My neighbor and I have very similar homes. Why is my tax bill higher than theirs," n.d., Accessed Feb. 24, 2025, https://www.delhitownshipmi.gov/FAQ.aspx?QID=112.
6. Michigan Legislature, "MCL - Section 211.27a," n.d., Accessed Feb. 24, 2025, https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-211-27a.
7. John Fleming, "How to Read Your Assessment Notice," Detroit Free Press, n.d., Accessed Feb. 24, 2025, https://www.michigan.gov/-/media/Project/Websites/taxtrib/Folder1/0310_ASSESS_tax_document.pdf.
8. State of Michigan Department of Treasury, Memorandum from State Tax Commission to Assessors and Equalization Directors, Published Apr. 5, 2022, Accessed Feb. 24, 2025, https://www.michigan.gov/-/media/Project/Websites/treasury/Delta2/A/Updated_Guidance_Regarding_Valuation__Assessment_of_Solar_Electric_Generation_Systems_750801.pdf?rev=8ecefffd8bf34e37bc27b7c2fd0d1046.
9. State of Michigan Department of Treasury, Memorandum from State Tax Commission to Assessors and Equalization Directors, Published May 13, 2008, accessed Feb. 24, 2025, https://www.michigan.gov/treasury/-/media/Project/Websites/treasury/BLGSS/PSD/State-Tax-Commission/STC-Misc/STC_Memo_May13_234159_7.pdf?rev=5fbc2dc9268847c492c71933d11a913e&hash=FF960B217ED7333C972BB7A8029F7B48; State of Michigan Department of Treasury, Memorandum from State Tax Commission to Assessors and Equalization Directors, Published June 11, 2013, Accessed Feb. 24, 2025, https://www.michigan.gov/treasury/-/media/Project/Websites/treasury/BLGSS/PSD/State-Tax-Commission/State-Tax-Commission-Memos-and-Letters/STC20130611MemoSolarPanels_423991_7.pdf?rev=d644c9aa4bf3474990f9a6d15f97ef8a&hash=B50E3F6F7233907D621F677C23251C48; State of Michigan State Tax Commission, "Guide to Basic Assessing," note 6 above, Published May 2018, Accessed Aug. 6, 2025, at p. 56.
10. Michigan Department of Treasury, 2025 Solar Energy System Report, https://www.michigan.gov/treasury/-/media/Project/Websites/treasury/STC/Forms/Form-5762---2025-Solar-Energy-System-Report.pdf?rev=edc9788bf2254da69358b39e0b1937b2&hash=3DB48BF52C9161FA7C47022F58514827
11. Jimerson Birr, "Understanding Easements, Rights-of-Way and Their Effects on Property Value," July 9, 2020, Accessed Feb. 24, 2025, https://www.jimersonfirm.com/blog/2020/07/easements-rights-of-way-building-rights-property-value/.
12. Alexandra Twin, "Leasehold Assets: Types, Examples and FAQ," Investopedia, Updated June 1, 2021, Accessed Feb. 24, 2024, https://www.investopedia.com/terms/l/leasehold.asp.
13. Michigan Department of Treasury, "Wind Energy System Report Form 4565," Updated Dec. 31, 2024, Accessed Feb. 24, 2025, https://www.michigan.gov/taxes/-/media/Project/Websites/treasury/Forms/Misc/4565.pdf?rev=f1e188f9826f4630b2fe8858ac18bb47&hash=3402383DBCBC0438FE4F589C97F66EBE.
14. Michigan Department of Treasury, "Solar Energy System Report Form 5762," Revised Dec. 31, 2024, accessed Feb. 24, 2025, https://www.michigan.gov/treasury/-/media/Project/Websites/treasury/STC/Forms/Form-5762---2025-Solar-Energy-System-Report.pdf?rev=edc9788bf2254da69358b39e0b1937b2&hash=3DB48BF52C9161FA7C47022F58514827.
15. Ad Hoc Solar Committee, "Final Report to the State Tax Commission," note 3 above, Published Sept. 14, 2021, Accessed Feb. 24, 2025
16. Michigan Department of Treasury, "Personal Property Tax Credits," Updated 2025, Accessed Feb. 24, 2025, https://www.michigan.gov/taxes/business-taxes/mbt/details/personal-property-tax-credits.
17. National Grid, "What Is a Substation," Updated Jan. 23, 2024, Accessed Feb. 24, 2025, https://www.nationalgrid.com/stories/energy-explained/what-is-a-substation.
18. Michigan Department of Treasury, "2025 Cable Television and Utility Personal Property Report" (Form 3589), Updated Dec. 31, 2024, Accessed Feb. 24, 2025, https://www.michigan.gov/taxes/-/media/Project/Websites/taxes/Forms/Property-Tax/3589_2025.pdf?rev=9e3aa48814af4e6dbdddc8f2715b092a&hash=F13EEBDF9CC1DC035D634B01DA9EA001.
19. Michigan Legislature, "MCL - Section 211.9m," n.d., accessed Feb. 24, 2025 https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-211-9m.
20. State of Michigan Department of Treasury, Memorandum from State Tax Commission to Assessors and Equalization Directors, p. 1, Published Apr. 5, 2022, Accessed Feb. 24, 2025, https://www.michigan.gov/-/media/Project/Websites/treasury/Delta2/A/Updated_Guidance_Regarding_Valuation__Assessment_of_Solar_Electric_Generation_Systems_750801.pdf?rev=8ecefffd8bf34e37bc27b7c2fd0d1046.
21. Michigan Department of Treasury, "Solar Energy Facility Exemption," Solar Energy Facilities Taxation Act (known as the Solar Energy Exemption), 2023 PA 108, Accessed Feb. 24, 2025, https://www.michigan.gov/taxes/property/exemptions/solar-energy-facility-exemption.
22. State Tax Commission, "Frequently Asked Questions: Solar Energy Facilities Taxation Act (2023 PA 108)," Approved April 2, 2024, Accessed Feb. 24, 2025, https://www.michigan.gov/taxes/-/media/Project/Websites/treasury/STC/2023/Solar-Energy-Facilities-Taxation-Act----Frequently-Asked-Questions.pdf?rev=23bacde6a20d43dd924f3fde42833289&hash=AF8B6D72D8B650A8967AA1B55CC6BF7D.
23. Michigan Legislature Act 108 (2023). https://www.legislature.mi.gov/Laws/MCL?objectName=MCL-ACT-108-OF-2023.

24. Michigan State Housing Development Authority, "Opportunity Zones," n.d., Accessed Feb. 24, 2025, https://www.michigan.gov/mshda/-/media/Project/Websites/mshda/developers/mioz/MSHDAlisttwpscitiesvillageswOZs.pdf?rev=5ce148e7647946b29a041caef1b703c3&hash=0970BD21C1420D60965DDD36F2E49B39.
25. Michigan State Housing Development Authority, "Opportunity Zones," Updated 2025, Accessed Feb. 24, 2025, https://www.michigan.gov/mshda/developers/opportunity-zones.
26. U.S. Environmental Protection Agency, "Brownfield Overview and Definition," n.d., Accessed Feb. 24, 2025, https://19january2017snapshot.epa.gov/brownfields/brownfield-overview-and-definition_.html; Michigan Legislature, "MCL 211.1159(3)(c)," Effective July 27, 2023, Accessed Feb. 24, 2025, https://legislature.mi.gov/Laws/MCL?objectName=mcl-211-1159.
27. Michigan Legislature Act 109 (2023) 211.1159 Section 9 (6). https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-211-1159.
28. Jacqueline Mullen and Noel Benson. Fiscal Brief: Basics Of The Foundation Allowance — FY 2023-24 Update. November 9, 2023. https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-211-1159.
29. See note 7 above.
30. Michigan Department of Treasury, "School Finance Reform in Michigan - Proposal A: A Retrospective," Dec. 2002, Accessed Feb. 24, 2025, https://www.michigan.gov/-/media/Project/Websites/treasury/MISC_8/propa.pdf?rev=4538001449964dd58427eb887ad19bb3.
31. Id.
32. State of Michigan Department of Treasury, Memorandum from State Tax Commission to Assessors and Equalization Directors, Oct. 22, 2024, Accessed Feb. 24, 2025, https://www.michigan.gov/treasury/-/media/Project/Websites/treasury/STC/2024/Memo-3---Battery-Energy-System-Interim-Guidance-Memo.pdf?rev=6d00ca2de1004d80af2bdacc6d081a2e&hash=3D5C1F497482B6483AB8EAE5D31FC60E
33. Bungaran, Y. (n.d.). Firefighter. In The Noun Project. Retrieved from https://thenounproject.com/search/icons/?q=firefighter; Hermawan. (n.d.). Road. In The Noun Project. Retrieved from https://thenounproject.com/search/icons/?q=road; Hikami, E. (n.d.). Fire Truck. In The Noun Project. Retrieved from https://thenounproject.com/search/icons/?q=firetruck
34. Baruch Feigenbaum, Truong Bui, Jay Derr, Thuy Nguyen, and Nicholas Montano, "28th Annual Highway Report," Reason Foundation, March 2025. https://a8d50b36.delivery.rocketcdn.me/wp-content/uploads/28th-annual-highway-report.pdf.
35. Baruch Feigenbaum, Truong Bui, Jay Derr, Thuy Nguyen, and Nicholas Montano, "28th Annual Highway Report," Reason Foundation, March 2025. https://a8d50b36.delivery.rocketcdn.me/wp-content/uploads/28th-annual-highway-report.pdf.
36. United States Bureau of Labor Statistics, "May 2023 State Occupational Employment and Wage Estimates: Michigan," May 2023. https://www.bls.gov/oes/2023/may/oes_wi.htm; United States Bureau of Labor Statistics, "EMPLOYER COSTS FOR EMPLOYEE COMPENSATION – JUNE 2025," September 12 2025, https://www.bls.gov/news.release/pdf/ecec.pdf.
37. United States Bureau of Labor Statistics, "May 2023 State Occupational Employment and Wage Estimates: Michigan," May 2023. https://www.bls.gov/oes/2023/may/oes_wi.htm; United States Bureau of Labor Statistics, "EMPLOYER COSTS FOR EMPLOYEE COMPENSATION – JUNE 2025," September 12 2025, https://www.bls.gov/news.release/pdf/ecec.pdf.

GRAHAM SUSTAINABILITY INSTITUTE
CENTER FOR EMPOWERING COMMUNITIES
UNIVERSITY OF MICHIGAN