



“Clean Energy in Michigan” Series, Number 4

Comparing Solar and Wind Proposals Shiawassee County, Michigan

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Q: How do the impacts of two renewable energy projects proposed for the same area—one solar and one wind—compare?

With technological advances, many parts of Michigan are becoming viable for both wind and solar energy projects. While both offer the promise of long-lasting clean energy, these two forms of renewables have different benefits and impacts on the local community. Because some impacts vary depending on the type of landscape and the population density, it can be tricky to do a head-to-head comparison of wind and solar.

	Solar (Assembly Solar)	Wind (Maple Rapids Wind)
Nameplate Capacity	239 MW	120 MW
Project Lifetime	25 years	25-30 years
Land Area	1,200 acres	19,000 acres
# of Landowners Compensated	8	160
Value of Landowner Payments	\$1M-\$1.2M annually	~\$1.04M annually
Total Property Taxes Paid	\$20-25 million, over life of project	\$12 million, over life of project

A unique opportunity arose in Shiawassee County, where within the course of two years, both a wind farm and a solar project were proposed. Ultimately, the county set zoning regulations that allowed the solar project but made the wind farm impossible to construct as proposed. By looking at the projected impacts of both of these project proposals, we can learn more about how the community-level impacts of solar and wind compare.

Nameplate Capacity

The solar project has a nameplate capacity roughly twice that of the wind project. This doesn't necessarily mean that the solar project produces twice as much electricity as the wind project over the course of the year; that depends on a range of factors including the efficiency of the equipment and how sunny/windy it is. (That information was unavailable for both projects.) What it does mean is that at a very sunny (or very



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The Clean Energy in Michigan series provides case studies and fact sheets answering common questions about clean energy projects in Michigan.

Find this document and more about the project online at graham.umich.edu/climate-energy/energy-futures.



Map source: [Wikipedia](#)

windy) time of the day, the solar project would produce twice as much electricity as the wind project.

Land Area

The wind project stretches over much more land than the solar project, in part because solar panels can be placed next to one another while wind turbines must have space between them to operate. Solar projects typically take 5-7 acres per megawatt (MW); for this project, it's 5 acres per MW. Wind projects span larger landscapes (here, over 180 acres per megawatt), but typically only "occupy" 1-2 acres per turbine, with the rest of the land left to be farmed or used as in the past. The access roads and footprint of the turbines for this wind project likely would have covered 60-120 acres.

Landowners Compensated

Just eight landowners hold leases for the solar project. For the wind project, 160 landowners had agreements with the wind developer. Notably, this number exceeds the roughly 60 turbines that were proposed. This is because wind developers

in Michigan often establish agreements with nearby landowners who do not have turbines on their property.

Value of Landowner Payments

For the solar project, each of the landowners involved are paid an average \$125,000 per year, or roughly \$833 per acre per year. These numbers are commensurate with other solar projects in the state, and often reflect a comparable rate if the land were leased to a farmer.

The average landowner payment is significantly smaller in the wind project, at \$6,250 per year. This is both a reflection of there being significantly more landowners involved in wind projects, and also that most of these landowners would not have a turbine on their property and so could continue to farm the land.

Tax Revenue

In Shiawassee, the solar project is projected to pay almost twice as much in taxes as the wind project would have paid—\$20-24 million over the course of the project compared to \$12 million for wind. However, the solar project is twice as big. When you calculate the tax payments based on the size of the project, both projects work out to about \$100,000 per MW in taxes over the life of the project, a good rule-of-thumb when considering what the property tax revenues might be in other communities.