

Original Questions:

1. If there is excess power generation, can the power be placed onto the grid? **See response below.**
2. How does wind energy work on the MISO grid? Presumably when the wind blows wind farms spike electric production to the grid. How is that spike handled by the grid operator? Is the power integrated into the grid and used later when demand is there? Is the power lost if the wind spikes production and grid demand? Is the power lost if the wind spikes production and grid demand remains steady or decreased? Does the extra power fill the pump storage facility in Ludington? **See response below.**
3. What percentage of energy from wind farms will go into the grid? **See response below.**
4. Wouldn't it offer some added acceptance if local residents used the power produced in their back yards rather than ship it away via the grid? **Value judgment.**
5. Does Duke have the necessary infra-structure in place to connect to this grid? How much construction will that entail? Will this entail more forests to be removed? More equipment on roads? More roads to be cut through woods? **Project specific.**
6. What are the current regulations on wind generated power from private property...can it be fed back into the grid with the property owner receiving compensation? **See response below.**
7. Can the community/township only allow grid tied units in certain zoning districts, like industrial areas or agricultural zone for large tracts? **See response below.**

Questions and Responses

These questions may have been recategorized and reorganized. Some may have been sent to another "theme" area (this will have been explained in red under the "Original Questions" section). In other cases two or more questions will be answered with one response.

- Q1.** If there is excess power generation, can the power be placed onto the grid?

Response: Yes, if a wind energy system produces an abundance of energy at a particular time, because the wind is blowing at an appropriate speed and with a low turbulence, the electricity it generates can be placed on the grid and distributed to an area that needs energy.

- Q2.** How does wind energy work on the MISO grid? Presumably when the wind blows wind farms spike electric production to the grid. How is that spike handled by the grid operator? Is the power integrated into the grid and used later when demand is there? Is the power lost if the wind spikes production and grid demand? Is the power lost if the wind spikes production and grid demand remains steady or decreased? Does the extra power fill the pump storage facility in Ludington?

Response: Starting in 2009, the MISO grid integrated its 26 operating centers and began to run out of a single balancing area, decreasing the need for reserve power and allowing spikes in generation to be distributed to areas that need it. This integration complements wind energy well as it allows peaks and lulls in production at one farm to be compensated for at other farms. Additionally, the use of real time markets allows the operating center to distribute energy in an economical way. This allows the grid to run more efficiently, decreasing energy loss and minimizing the need for energy storage.

Q3. What percentage of energy from wind farms will go into the grid?

Response: The response to this question depends upon the scale of the wind project. Some people have residential turbines, which they either use to power their home or sell a portion back to the grid. Utility scale wind farms, on the other hand, transmit 100% of the electricity they generate to the grid.

Q6. What are the current regulations on wind generated power from private property...can it be fed back into the grid with the property owner receiving compensation?

Response: These options are called either feed-in tariffs or net metering. In net metering the electricity meter runs backwards when the homeowner is generating electricity in surplus. This excess energy is sold to the utility and is transmitted back through the transmission lines. With feed-in tariffs, a homeowner has two meters, one measuring consumption and the other generation. This second meter allows different pricing for consumption and generation.

Net metering for wind is available in 29 states at varying rates. For more information about net metering programs by state, see this website for the Department of Energy http://apps3.eere.energy.gov/greenpower/resources/maps/netmetering_map.shtml. The New Rules project provides information about existing net metering regulations in several states, available at <http://www.newrules.org/energy/rules/net-metering/net-metering-selections-other-states>.

A January 2010 report by the National Renewable Energy Lab (NREL) provides a legal analysis for how states could implement feed-in tariffs and still comply with US federal law. See the "Renewable Energy Prices in State-Level Feed-in Tariffs: Federal Law Constraints and Possible Solutions" report at <http://www.nrel.gov/docs/fy10osti/47408.pdf>

In Michigan, net metering for utility scale wind is available to Investor-Owned Utilities. There are net metering and some small feed-in-tariff programs to support some small scale installations. The Consumers Energy net metering site is <http://www.consumersenergy.com/content.aspx?id=1800>

This 2010 paper by the Michigan PSC describes possible feed-in tariff programs: <http://www.itcni.org/uploads/image/MPSC%20Staff%20Discussion%20Paper%20for%20FIT%2007%2027.pdf>

Q7. Can the community/township only allow grid tied units in certain zoning districts, like industrial areas or agricultural zone for large tracts?

Response: Probably. See response to question D1. The township can reasonably limit land uses to certain zoning districts for purposes such as protecting public health, safety, or general welfare, or ensuring compatibility of adjacent land uses. It seems likely that in many instances a township could reasonably determine that utility-scale windmills are a use best suited for industrial or agricultural areas and not compatible with intensive residential or commercial uses. This would include a careful evaluation and possible amendment of the township land use plan and the adoption of an overlay district with either planned development approval for the larger area of wind development or special use permits for the wind turbines, or both.