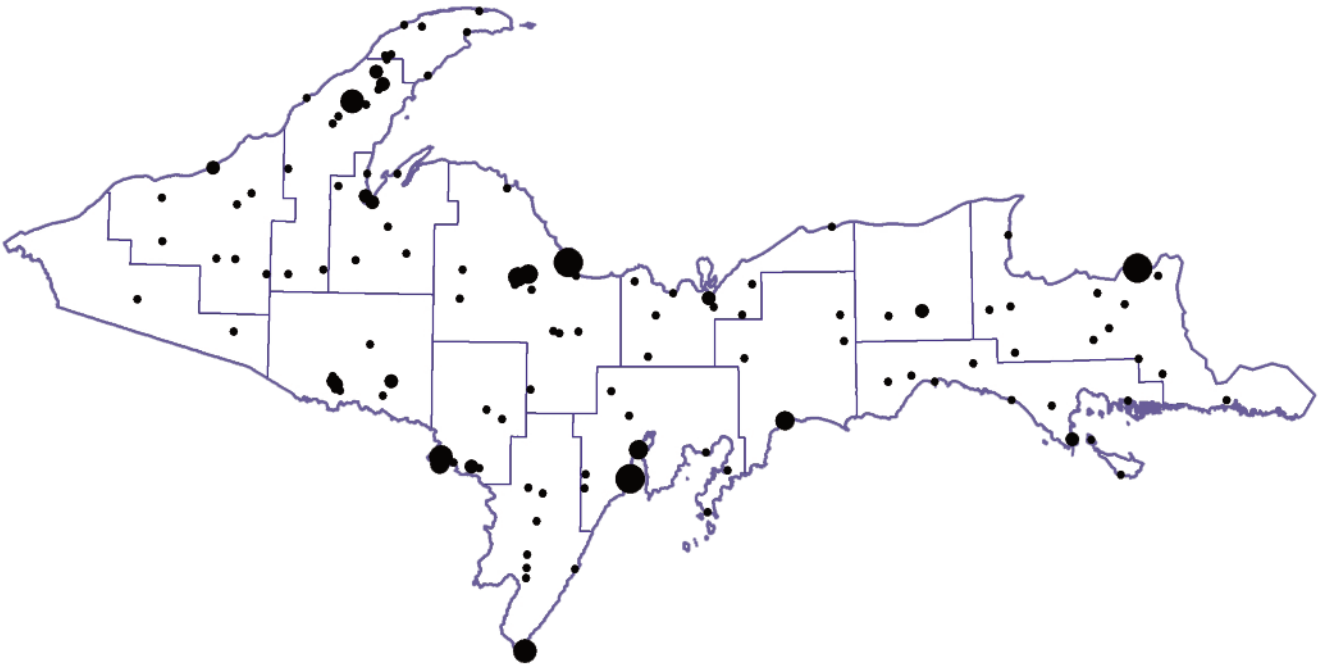
SUPERIOR WATERSHED PARTNERSHIP AND LAND TRUST

Community Wind Power

A GUIDE FOR UPPER PENINSULA COMMUNITIES



Is Wind Power Right for Your Upper Peninsula Community?

Wind power is a simple concept: harvest the wind to produce clean energy. But in practice it is not that simple. There are many factors that need to be considered when an individual, community or a utility company considers developing wind power. Each year more communities are considering wind power because of its many benefits. Wind power doesn't produce any greenhouse gas emissions or contribute to climate change. Wind systems use free fuel. They have low operating costs and can provide consistent revenue for communities. Wind energy can help reduce our reliance on fossil fuel imports and promote energy independence.

This brochure is about community wind power: it will help community wind proponents explore the idea of developing a project that provides all of the benefits of renewable wind energy to their community. It will help you decide if wind power is right for your community. Because the U.S. Department of Energy recently published new wind resource maps for the Midwest, we know that many places in the Upper Peninsula have sufficient average wind speeds to make a community wind project financially viable. But, as we will see, abundant wind is only part of the picture.

See the enclosed flash drive for additional wind power information.

What is Different about Community Wind Power?

"Community wind" is a term we hear quite often these days. The key to community wind is self-sufficiency and environmental sustainability through local ownership and local financial benefit. Rather than providing all profits from a year's successful harvest of the wind to distant stockholders, as is common in a traditional utility power development project, with community wind the profits are shared locally.

There can be as many profit-sharing methods as there are different groups of landowners or other stakeholders. Some community wind groups are comprised entirely of landowners upon whose property the turbines are constructed while other groups include those who provide an easement or who sign a contractual agreement as effected neighbors. In some cases, construction financing is secured by several members of a local community, while in others the financing is almost entirely in the hands of distant investors. But, in all community wind projects, cash payments are made to local community members when the project succeeds.

Community wind projects are being developed all across North America and the concept is continually being re-defined as new community ownership or profit-sharing models emerge. Establishing a community vision and strategic action plan will help to determine the best model for communities to use their natural resources in such a way as to maximize the benefit to the local economy.

A community owned project can range from a single wind turbine shared by just a few homes to a large wind farm serving hundreds. Regardless of size, all community wind project propos-

als should cause us to stop and think about the true costs of our energy alternatives: what is the cost or impact of our reliance on fossil fuels when we switch on the lights? Are the impacts of constructing wind power fields higher or lower than the long-term impacts of our traditional sources of energy? Every energy choice has a price.

Wind turbines have significant economies of scale. Smaller residential scale turbines cost less overall, but are more expensive per kilowatt of energy producing capacity. Wind turbines under 100 kilowatts cost roughly $3,000 to $5,000 per kilowatt of capacity. That means a 10 kilowatt machine (the size needed to power an average home) might cost $35,000-$50,000. Most of the commercial-scale turbines installed today are 2 MW in size and cost roughly $3.5 Million installed. A general rule is that as system size increases, the cost per installed kW will decrease, improving the economics of the project.

Public Engagement and Outreach

All successful community wind projects begin with a solid plan to educate and engage the local community. The best outreach plans include surveys, news releases, media articles, website updates, public meetings and workshops. In addition to developer-initiated outreach, local laws can require public meetings or more formal public hearings where planning and/or zoning are in place.

Numerous stakeholders will have an interest in wind development and many will be looking for ways to provide input or be part of the planning process. Community wind development is a collaborative process among people of diverse interests.

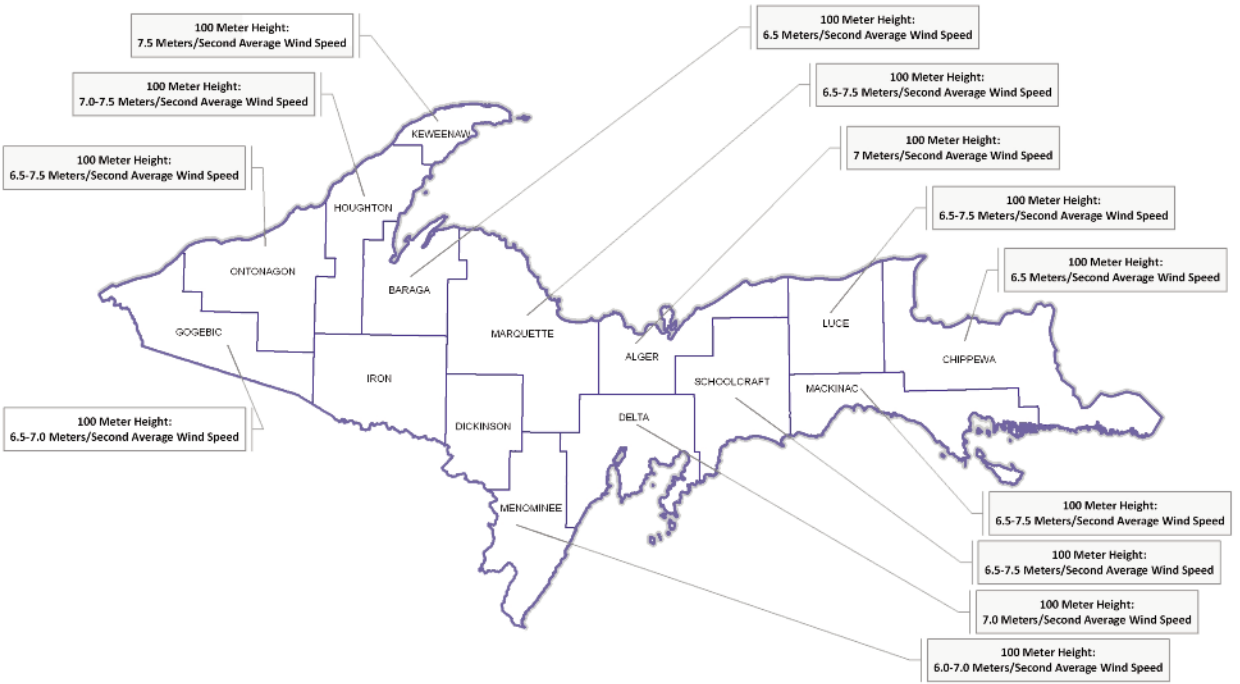
Identifying potential issues early in the planning process leads to better quality planning, better public engagement, and a more successful project. Because some project impacts may occur at substantial distances from the project site, developers should be as comprehensive as possible when preparing public information materials. Visual impact images, for example, are often prepared for landscapes that are several miles from the project site.

Although there is broad public support for wind energy in general, changes in our surrounding landscape – changes of any kind – are not always welcome. The mere thought of seeing tall wind turbine towers can be uncomfortable for some people, particularly in rural areas where many landscapes have experienced little change over long periods of time. Survey research done before and after wind field construction shows that, generally speaking, public understanding and experience with wind turbines in the neighborhood lowers barriers and raises acceptance

of the wind alternative.

Ensuring ample opportunity for public engagement improves public understanding of a project. Community wind development partners should maintain a high level of transparency and cultivate relationships in the area. Public involvement needs to begin early in the planning process and continue throughout the life of a project. Engaging an objective and well-trained professional to lead community discussions can help build community support.

Developers and community leaders should make a commitment to educate citizens on local issues to ensure that Upper Peninsula resident's feedback on specific project proposals is well-informed. Project proponents should build in adequate time and resources for multiple outreach events throughout the planning and construction phases of a project and they should arrange follow-up studies to find out how people feel after the project is producing energy.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The Wind Resource Assessment

If your community is seriously considering wind power, one of the first things you need to do is confirm that your chosen site has enough wind for a viable project. This is called the wind resource assessment. The assessment is the most important step in planning a wind project because it is the basis for determining business plan feasibility and is ultimately vital for acquiring financing. It requires the installation of meteorological instruments to gather a minimum of twelve months of wind data near the proposed wind turbine site. Usually, this involves erecting a temporary meteorological tower ("met" tower) that is equipped with wind measurement instruments (anemometers) and other weather recording equipment.

In some situations an existing radio or satellite tower in close proximity to a prospective site can be used for the wind assessment instruments. This can help reduce costs and increase profits for community wind partners. Depending on several factors, a comprehensive one-year wind assessment can range in cost between $5,000 and $25,000.

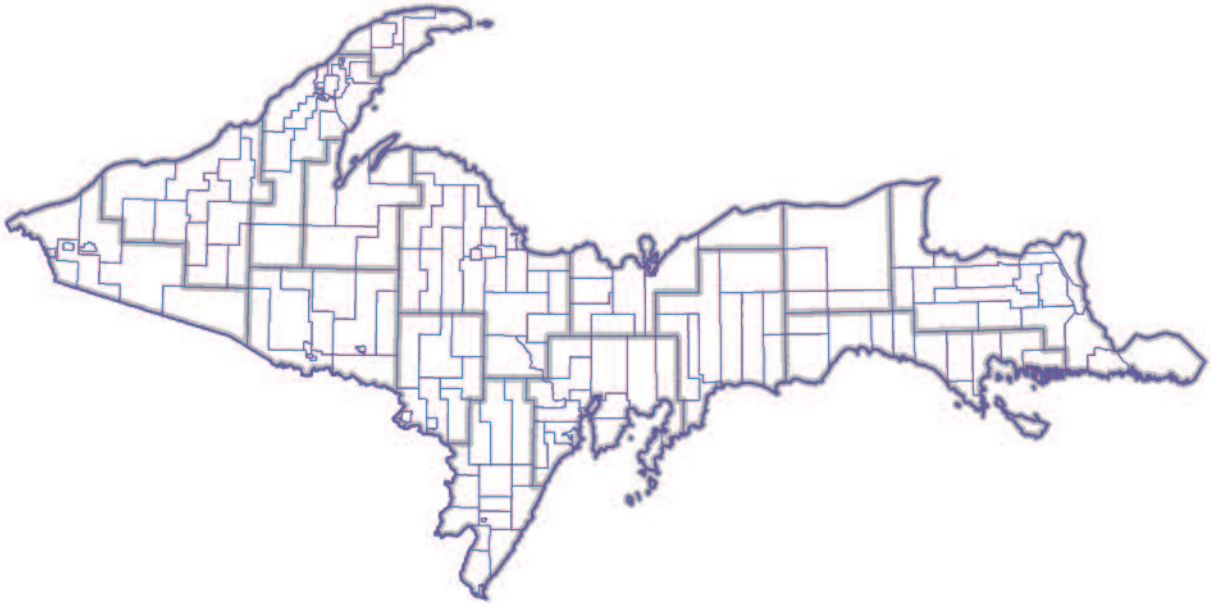
The wind resource in a region is broadly expressed in terms of wind power classes, ranging from class 1 (the lowest) to class 7 (the highest). Generally speaking, areas designated class 3 (Fair; 6.4-7.0 m/s) or greater will contain a number of sites that are suitable for wind development. The Upper Peninsula is blessed with large areas that have wind development potential, but site-specific studies are always needed to determine exactly which sites are best for turbines. All other things being equal, it should be noted that rugged terrain and heavy forest cover may create local wind pattern disturbances that cause wind speeds to vary dramatically within just a short distance. This is one reason why site assessments are so important.

Environmental Considerations

The site selection process for a wind development should include steps to protect the Upper Peninsula's natural heritage and minimize environmental impacts. Developers of community wind projects need to consider cultural and historical resources, sensitive habitats, vulnerable species, and protecting water quality during construction. Desktop studies should be done for the prospective area before and/or during the year-long on-site wind resource assessment. Desktop studies, when combined with the knowledge of local people, can be used to narrow-down the best sites for more extensive field studies. During the desktop study, federal laws will be consulted to identify habitats and known migration corridors and breeding areas for threatened and endangered species. It may be necessary to study other vulnerable species that have no legal protection but may also be present.

Local citizens, resource agency professionals, and university researchers can provide a wealth of knowledge about natural resources and other environmental factors near prospective wind sites. Quite often, local conservation groups and landowners know where there are locally sensitive resources such as valued landscapes, scenic views (viewsheds), rare plant communities, wildlife habitats, cultural resources and other local concerns that should be included in an environmental assessment. Following the desktop studies of the area, developers should conduct on-site assessments to address all resources of special concern. The desktop and on-site environmental assessment process will be dovetailed with the public outreach process in the most successful community wind projects.

See enclosed flash drive for additional environmental information.



Planning and Zoning

Wind power site development proposal decisions are, by state law, the responsibility of local jurisdictions (counties, cities, townships). Most communities in Michigan have planning and zoning laws to regulate land use development, but some areas of the Upper Peninsula do not. Where local land use plans and zoning codes are in place, community wind developers will find a set of rules and procedures to follow in the interest of public health, safety and welfare. In areas where local laws do not specifically cover the wind development permitting process, community wind developers should nevertheless prepare to illustrate the following, at a minimum, during the community engagement process.

- A map of the project area boundaries.
- The location, height, and dimensions of all existing and proposed structures and fencing.
- The location, grades, and dimensions of all temporary and permanent roads.
- Topography.
- Water bodies, wetlands, and wildlife habitats and corridors.
- Historic and cultural resources.
- Decommissioning plans.

One of the most important siting considerations for wind developers is the property line setback distance. Property line setbacks for structures such as a house, a store or a wind turbine (and for accessory structures such as a barn, garage or storage shed) are often provided for in

local zoning codes and regulations. The origin of setback regulation in English and American land use law lies in public safety, but setbacks also affect a few broader concerns.

With wind power, property line setbacks address two different possible safety issues: equipment failure and ice throw or ice shedding. Setbacks also address public welfare issues of visual and noise disturbance. When determining the setback, developers are also determining the number of wind generators they can install on the site. This affects the economic viability of the project.

Setbacks effect more than safety, profitability, or the economic viability of a project. The setback distance to neighboring property also affects the amount of noise pollution and light strobing or shadow flicker that will be experienced on surrounding land. Setbacks will also affect the overall aesthetic experience of residents and visitors to the area. These are all of concern to community wind developers, who will fortunately find that a number of suggested guidelines or model siting codes are available from around the state and nation.

See enclosed flash drive for more zoning information.

Transmission

Because community wind developments can range in size from just one turbine producing less than 1 megawatt to dozens of turbines generating dozens of megawatts, transmitting the wind field's energy over the electrical grid may or may not be a concern while planning a project. If the energy is for the use of just one or two or three loads (e.g. one school, two county buildings, three businesses) there may be no need to contact the local utility or transmission company. But if the energy production is high-enough to be surplus to the community's local needs: the issues related to grid connection will need exploration. There are financial and engineering issues that can only be resolved through a successfully negotiated business relationship with upstream transmission system companies. A 'net metering' program may already be in place to track and bill the electricity you use from the grid and distinguish that from the electricity you sell back to the grid. There may also be financial incentives that could help make a community wind system more affordable. Your local utility can help you understand your interconnection options.

The power lines you connect to must be big enough to handle the added generation of your system. You should start talking to your local electric distribution company early on in the planning process. They will help you decide if and when you need to contact the American Transmission Company (ATC) serving the Upper Peninsula.

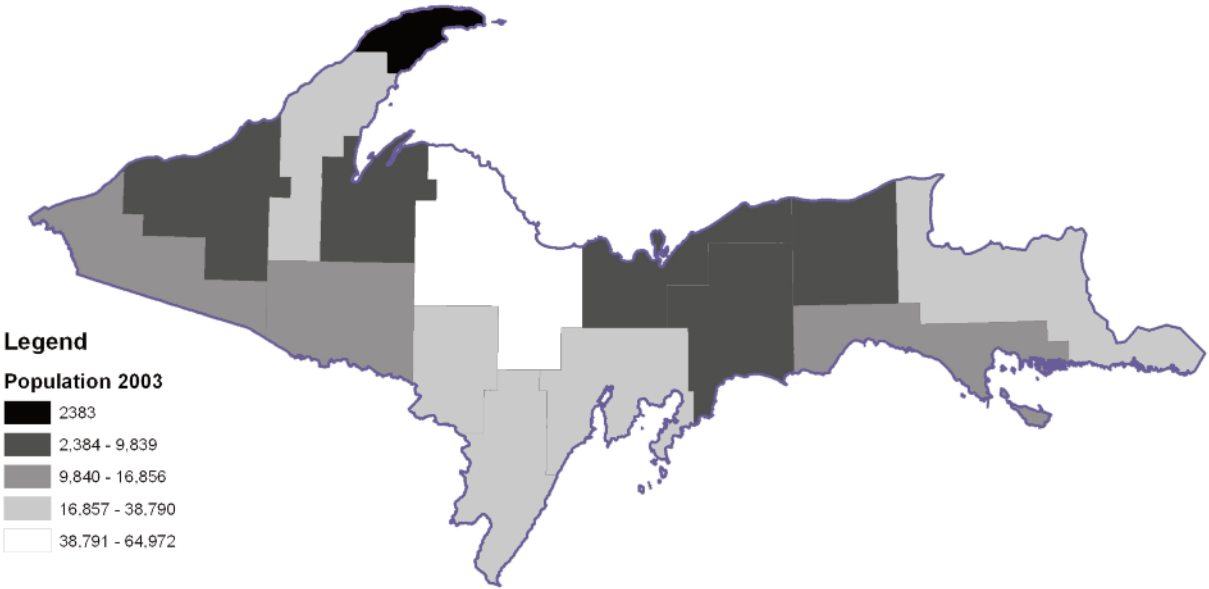
Funding a Community Wind Project

Cost components for community wind projects include wind resource assessment and site analysis expenses; the price and freight of the turbine and tower; construction expenses; permitting and interconnection studies; utility system upgrades, transformers, metering equipment; insurance; maintenance; legal and consultation fees. Others factors that will impact your project economics include your financing costs, the size of your project, and taxes.

Funding for community based wind power projects can come from a variety of sources. Some of the more common steps in securing funding for a community wind project include:

- Research related government loan and grant options.
- Identify tax incentives and eligibility requirements.
- Develop cash flow and projected income statements.
- Negotiate agreements with potential equity investors.
- Develop a power purchase agreement, if applicable.
- Consider a contract to sell renewable energy credits, if applicable.

A variety of profit-sharing models should be explored including public/private partnerships with for-profit investors that could benefit from federal tax incentives that the community might not be eligible for and provide capital to cover construction costs. For example, initially the community would own only one percent of the turbine, with investments making up the other 99 percent. This ownership ratio would stay in place for the first 10 years of operation while the investors collect tax credits, after which time, the ownership would flip, giving the community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16,857 - 38,790
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90 percent and investors 10 percent of the project. Conversely, without a for-profit corporation in the equation, there is no stipulation that the project make money for investors, only that it meets the community goals of creating meaningful savings for utility customers and reducing the community's dependence on imported sources of energy.

Public engagement, planning, zoning and funding are just a few of the things a community needs to address when considering wind power. The attached flash drive contains additional in-depth information regarding wind power development. For additional information please contact the Superior Watershed Partnership at 906-228-6095 or www.superiorwatersheds.org.

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Financial assistance for this project was provided, in part, by the Michigan Coastal Management Program, Michigan Department of Environment Quality (DEQ), through a grant from the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce.

The statements, findings, conclusions, and recommendations in this document are those of the Superior Watershed Partnership and do not necessarily reflect the views of the DEQ and the NOAA.