

Introduction

In support of Governor Whitmer’s administration’s MI Healthy Climate Plan to reduce greenhouse gas emissions by 2050, the Michigan Energy Office (MEO) commissioned a study from The Centrepolis Accelerator to “illuminate the existing assets and gaps Michigan has in its renewable energy policies and its supply and value chains that may impact the further adoption of these clean energy technologies.”

This report focuses on key supply-side assets/gaps and demand-side impediments of Michigan’s commercial and industrial (C&I) wind market. Yet this report also touches on Michigan’s large utility-scale wind market because the supply chain, opportunities and challenges of Michigan’s potential C&I wind market heavily overlap Michigan’s existing utility-scale market. This report ends with recommendations to enhance the adoption of wind energy across both Michigan’s C&I and utility-scale markets.

Methodology

The market research approach was divided into two tasks. First, the team reviewed existing lists of Michigan wind industry suppliers, which had not been updated for 7+ years. Then the project team gathered qualitative insights about Michigan’s C&I wind market primarily through four interviews with leaders of four leading wind energy-involved companies:

- Arbor Wind Ann Arbor
- ONE Energy Findlay, Ohio
- SkySpecs Ann Arbor
- Ventower Industries Monroe

Importantly, while the team’s research team focused on wind power solutions for commercial and industrial markets, it also found significant dependencies on the wind industry’s larger utility-scale market. For example, nearly every wind-related Michigan manufacturer and service company that *could* sell into the C&I wind market already *does* sell into the utility scale market.

Michigan C&I Wind Market – Demand

The demand for renewable energy overall by Michigan’s C&I sectors is modest and growing. For C&I organizations interested in tapping wind power, the primary path in Michigan currently is to purchase wind power through specialized utility renewable energy programs for business. Such programs like DTE’s *MiGreenPower* and Consumers Energy’s *Business Renewable Energy Program* have some wind power in their energy portfolios.

Unfortunately for the wind power industry, Michigan’s utility renewable energy programs for businesses are largely eschewing adding new wind power generation and are instead choosing to add new solar power to their C&I-focused renewable energy portfolios. For example, Ford

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Motor Company and DTE recently announced the purchase of 650 megawatts of capacity of new renewable energy in Michigan, all of which will come from solar power.¹ Similarly, a recent announcement of a 20-year agreement by the State of Michigan to purchase renewable energy from Consumers Energy for state buildings also specifies that the additional power will come from solar power plants.²

For Michigan C&I companies that wish to add wind power as part of their energy mix, additional options include:

- If the company is in the choice market, purchasing wind power from licensed Alternative Electric Suppliers that provide wind power in their mix,
- Purchasing Renewable Energy Credits (RECs) from out-of-state generators, and/or
- Building on-site distributed wind generation.

Currently, the C&I market for distributed wind power generation in Michigan is undeveloped. Nationally, the distributed C&I wind market is very small - but is starting to grow. The nation's largest developer of distributed C&I wind projects is ONE Energy, headquartered in Findlay, OH. ONE Energy deploys utility-scale 1.5 MW wind turbines for industrial customers. ONE Energy builds on-site distributed wind power systems for Fortune 500 firms such as Whirlpool and Lafarge.

The other current manufacturers of smaller distributed wind turbines that service the C&I market include:

- Bergey Windpower (Oklahoma) - 10kW and 15kW models
- Eocycle Technologies (Canada) - 25kW and 100 kW models

According to interviewees, the primary driver for C&I interest in distributed wind is reducing levelized costs of electricity for 20+ years. ONE Energy and ArborWind both target levelized electricity costs of ~6¢/kWh, a rate that is very competitive compared to Michigan's standard C&I electricity rates.

Michigan C&I Wind Market – Supply and Value Chain

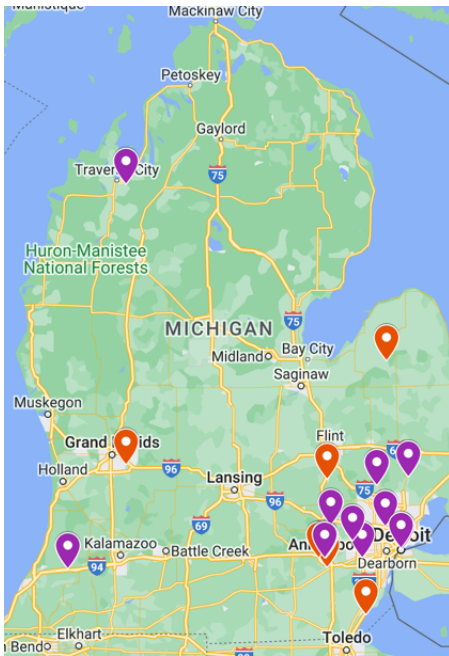
The project team identified 20 Michigan companies that offer services or make systems/components for wind turbines that can be deployed indirectly via C&I utility programs or onsite at C&I facilities.

¹ <https://ir.dteenergy.com/news/press-release-details/2022/Ford-Motor-Company-and-DTE-Energy-announce-the-largest-renewable-energy-purchase-from-a-utility-in-U.S.-history/default.aspx>

² <https://renewablesnow.com/news/michigan-agrees-renewables-supply-from-consumers-energy-794753/>

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Manufacturer	City	Type
ArborWind	Ann Arbor	Small Turbine OEM
Creative Foam Corporation	Fenton	Blades
Eaton Corporeation	Grand Rapids	Electronics
Mesen USA BN	Bay City	Electronics
National Pole & Structure	Ypsilanti	Electrical Poles
Ventower Industries	Monroe	Towers
Wacker Chemical Corp.	Ann Arbor	Chemicals/Lubricants
Service Company	City	Type
Aristeo	Wayne	Construction
Atwell Group	Ann Arbor	Engineering
Barton Malow	Ann Arbor	Construction
CGE Energy	Brighton	Installer
Comerica Renewable Energy Group	Detroit	Finance
Energy Sciences	Berkley	Engineering
Four Elements Energy	Lawrence	Installer
Lean and Green Michigan	Detroit	Finance
Metro Consulting Associates	Plymouth	Engineering
Rauhorn Electric	Romeo	Electrical Contractor
SkySpecs	Ann Arbor	Inspection
Wind Secure	Lake Orion	Maintenance
Windmuller	Traverse City	Electrical Contractor

Michigan wind energy-involved suppliers to highlight include:

- Ventower Industries (Monroe, MI).** Ventower is the largest wind tower manufacturer in Midwest. They supply wind turbine towers all over U.S. and even internationally. While the vast majority of their wind towers are for wind turbines at utility-scale wind farms, about 5% (and growing) of its towers are delivered to on-site C&I wind energy projects. Ventower is also ONE Energy’s tower supplier of choice.

Ventower Industries’ supplies are sourced nationally and internationally. Although many of Ventower’s consumables are sourced from Michigan distributors, its steel plates are sourced from suppliers outside of Michigan, as are most equipment and parts installed within the towers.
- Arbor Wind (Ann Arbor, MI).** Arbor Wind has developed a 35kW vertical axis wind turbine that can be ideal for many commercial and agricultural applications. The firm is seeking financing to first test and certify its turbine, and then launch marketing, sales, and production.
- SkySpecs (Ann Arbor, MI).** SkySpecs is the nation’s leading inspector of utility-scale wind turbine blades. SkySpecs’ autonomous drones monitor for emerging issues, help engineers optimize operations, and wind farm owners better manage their assets. The company has blade inspection operations in more than 30 countries.

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Michigan C&I Wind Market – Workforce

The project team identified nine Michigan colleges and universities that have educational programs that suppliers can access for talent. These programs include:

Michigan Colleges & Universities That Offer Wind-Relevant Educational Programs

Delta College www.delta.edu	Green Academics (offer degrees in wind and solar) https://www.delta.edu/sustainability/green-academics.html Solar Photovoltaic Installation Technician Certificate of Achievement https://catalog.deltacollege.edu/preview_program.php?catoid=6&poid=1312
Kellogg Community College www.kellogg.edu	Renewable Energy Certificate http://catalog.kellogg.edu/preview_program.php?catoid=18&poid=1732
Macomb Community College www.macomb.edu/	Renewable Energy Technology Certificate https://www.macomb.edu/resources/viewbook/attachments/CT-Renewable-Energy-Technology.pdf
MIAT College of Technology www.miat.edu	Energy Technology Programs https://miat.edu/programs/energy/
Monroe County Community College www.monroeccc.edu	Renewable Energy Technology https://www.monroeccc.edu/programs/renewable-energy-technology
Mott Community College www.mcc.edu	Introduction to Renewable Energy Tech. Technology https://catalog.mcc.edu/preview_course_nopop.php?catoid=13&coid=56956
Muskegon Community College www.muskegoncc.edu	Wind & Solar Certificate https://www.muskegoncc.edu/degrees-and-certificates/certificate-programs/wind-solar-certificate/
Northwestern Michigan College / Northwestern Technological Institute www.nmc.edu	Renewable Energy Technology - Electrical https://www.nmc.edu/programs/academic-programs/renewable-energy-technology-electrical/index.html
Wayne County Community College www.wcccd.edu	Renewable Energy Technology program https://www.wcccd.edu/academic/pdfs/programs/Renewable%20Energy.pdf

According to interviews, the use of independent operations & maintenance (O&M) service companies is growing as wind turbines age and their OEM warranties and service contracts expire. The result is an emerging wind turbine O&M market that could create many new opportunities for additional wind workforce educating, training and certification initiatives at Michigan schools.

Michigan C&I Wind Market – Growth Drivers and Impediments

According to interviews, the primary growth drivers for C&I wind, especially on-site distributed systems, are:

- The fact that Michigan has many locations with attractive wind classification profiles, and
- Michigan has relatively high grid C&I electricity costs, which continue to rise.

Major impediments that slow Michigan C&I wind adoption, however, include:

- Grass-roots resistance in many Michigan communities, which has forced cancellation of several utility-scale wind farms, and
- Michigan’s Tall Structures Act (Act 259), which provides local airports significant discretion to approve wind turbine locations

Additional impediments that hurt the return-on-investment for C&I companies that want to deploy wind energy at their sites include:

- The 1.5 MW turbines used by ONE Energy, the country’s leading developer of C&I wind solutions, are too large to qualify for Michigan’s 150kW distribution generation program. Thus, all excess wind power produced and sold to the grid can be sold only at local marginal pricing (LMP) levels, typically 2-4¢/kWh. In addition, required interconnection studies and grid upgrades can be expensive and time consuming.
- Michigan lacks consistent statewide zoning requirements for siting wind turbines, which can render on-site deployment of large wind turbines subject to local community concerns, even when the turbines are on private company property. As one of the interviewees said, “No zoning was made to handle 450 ft. structures.”

Michigan C&I Wind Market – Recommendations

Recommendations to the State from interviewees to increase C&I wind adoption in Michigan fall into four categories: 1) advocacy and promotion, 2) distributed C&I wind deployment facilitation, 3) interconnection and siting best practices, and 4) RD&D funding for small-to-medium sized C&I wind technologies.

- Advocate and promote C&I wind energy. EGLE can clearly and strongly advocate for and promote wind energy to enhance its value and reduce stigma and misconceptions.
- Facilitate deployment of distributed wind at large C&I facilities. The potential for distributed wind deployment at C&I entities with large land holdings could be substantial. Identify candidates for distributed C&I wind projects and encourage them to consider the business case for on-site wind. MEDC can assist by integrating the potential for C&I wind into large-scale business attraction efforts. Encourage ONE Energy and companies in Michigan to consider distributed C&I wind projects in Michigan.
- Adopt interconnection and siting best practices for C&I scale projects. Encourage Michigan’s utilities to use best interconnection practices to reduce study costs and wait-times. Similarly, better inform Michigan communities about wind energy and encourage local communities to adopt siting and permitting best practices.
- Provide research, development, and deployment (RD&D) funding. “Small wind” systems require 3rd party testing and certifications for market acceptance. These certifications are expensive and time consuming. Accelerate C&I small wind development in Michigan

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by providing grants/funding to reduce or offset costs for testing, certification and other research and deployment. This will both accelerate C&I wind adoption and increase wind energy research in Michigan.

Impediments to more wind power in Michigan in general, including more C&I wind are complex, but not unique to wind. Douglas Jester, a partner at 5 Lakes Energy (Lansing, Michigan), observed that decades ago Michigan's emerging oil and gas industry in Michigan was similarly constrained in its growth by embroiling siting controversies. Three key tools used together to successfully mitigate the controversies and enable the growth of oil & gas drilling to in Michigan to proceed were:

- State pre-emption of local siting control over oil and gas operations,
- Establishment of a shared pool understanding of oil and gas as a common resource held as mineral rights by multiple owners, and
- Establishment of a state-authorized unitization methods for determining oil and gas drilling boundaries, and formula for compensating parties that impacted mineral rights.

With this history in mind, Mr. Jester offers that an analogous approach that could mitigate wind energy siting controversies for both C&I and utility-scale wind projects and enable the wind industry to regain its footing and grow in Michigan. Specifically, he suggests a three-part integrated approach:

- Utilities offer an attractive and stable “feed-in tariff” or “outflow rate” for power delivered to the grid for C&I wind projects up to a certain size, say up to 20 MW.
- EGLE/state develops and offers model C&I wind project zoning guidance for localities that distinguishes small C&I wind projects from much larger utility-scale wind farms, and
- Work with Michigan legislators and regulators to establish (1) a common method to determine the boundaries of a “wind pool,”³ and (2) a single compensation formula for directly affected parties.

Developing such an integrated approach would be a cutting-edge solution for Michigan, and indeed the country. It could also enable wind power to re-emerge as a key cost-effective decarbonization strategy for C&I entities, and indeed all parties that want more wind power.

³ A wind pool could include impacts of wind turbine wakes that could negatively affect the economics of wind turbines set in adjacent properties, and/or negatively perceived viewsheds.