

REPORT ON THE IMPLEMENTATION OF P.A. 295 WIND ENERGY RESOURCE ZONES

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Background

Section 155 of Public Act 295 of 2008 (PA 295 or the Act) requires the Public Service Commission (Commission) to submit an annual report “summarizing the impact of establishing wind energy resource zones, expedited transmission line siting applications, estimates for future wind generation within wind zones, and recommendations for program enhancements or expansion.” The report is to be submitted to the Governor and the Legislature on or before the first Monday of March of each year. This is the first annual report submitted pursuant to Section 155.

PA 295 Wind Zone Process

Part 4 of PA 295 directs the Commission to create an independent Wind Energy Resource Zone (WERZ) Board and identifies the process for the Commission to designate a primary wind zone and perhaps multiple zones. On December 4, 2008, the Commission issued an order in Case No. U-15899, creating the WERZ Board. The WERZ Board consisted of 11 members with various backgrounds who were appointed by the Commission. Acting independently of the Commission, the WERZ Board studied, evaluated, and analyzed the wind energy production potential in the State of Michigan.

Based on the information gathered, the WERZ Board issued its [final report](#) on October 15, 2009. The report included details regarding the study methodology and the assumptions used, as well as details regarding the regions in Michigan with the greatest wind potential. The areas within the state of Michigan found to have the greatest wind energy production potential by the WERZ Board are identified as Region 1, Region 2, Region 3 and Region 4 and are shown in the shaded gray areas in **Figure 1**:¹

¹ http://www.dleg.state.mi.us/mpsc/renewables/windboard/werzb_final_report.pdf, Exhibit 11, p. 23.

Figure 1



The WERZ Board reported details for each of the top four identified regions within the state including an estimate of the minimum and maximum number of wind turbines that could be installed within each region, an estimate of the minimum and maximum potential wind generation capacity for each region and an estimate of the minimum and maximum annual wind energy production potential within each region. These estimates are shown in **Table 1**.²

² http://www.dleg.state.mi.us/mpsc/renewables/windboard/werzb_final_report.pdf, Exhibit 3, p. 5.

Table 1

Estimated Minimum and Maximum Number of Turbines, Capacity, and Annual Energy Production, by Identified Region

Region	Counties	Minimum			Maximum		
		Number of turbines	Capacity (MW)	Annual energy potential (MWh)	Number of turbines	Capacity (MW)	Annual energy potential (MWh)
1	Allegan	166	249	747,938	296	445	1,338,415
2	Antrim Charlevoix	102	153	439,555	183	274	786,572
3	Benzie Leelanau Manistee	435	652	1,991,679	778	1,167	3,564,058
4	Huron Bay Saginaw Sanilac Tuscola	1,578	2,367	6,723,472	2,824	4,236	12,031,477
TOTAL		2,281	3,421	9,902,644	4,081	6,122	17,720,522

SOURCE: Research and findings from Michigan State University Land Policy Institute, 2009, prepared for WERZ Board.
NOTE: These estimates are based on the board's base-case analysis described in the Methodology section and assume a 1.5-megawatt (MW) wind turbine with a hub height of 80 meters. The MW capacity is calculated by multiplying the nameplate capacity of the wind turbine times the number of estimated turbines. The annual energy production in megawatt hours (MWh) is the amount of energy that these turbines are expected to produce over the year, taking into account variability in wind speeds and other factors.

As shown in **Table 1**, the Thumb Region of Michigan (Region 4), consisting of Huron county and parts of Bay, Saginaw, Sanilac and Tuscola counties, was identified in the WERZ Board report to be the region within the state of Michigan having the highest wind potential.

On November 30, 2009, ITC Holdings, through its subsidiaries *ITCTransmission* (ITC) and the Michigan Electric Transmission Company, LLC (METC), along with Wolverine Power Supply Cooperative Inc. (Wolverine) and Indiana Michigan Power (I&M) reported transmission infrastructure upgrades necessary to support the wind energy production potential for each of the four regions.³ A summary of transmission upgrades is provided in *Appendix A*.

³ <http://efile.mpsc.state.mi.us/efile/viewcase.php?casenum=15899>, Document Nos. 25, 26, 27, and 28.

Commission Order Declaring Wind Zones

Section 147 of PA 295, MCL 460.1147 states the “Commission shall, through a final order designate the area of this State likely to be most productive of wind energy as the primary wind energy resource zone and may designate additional wind energy resource zones.” In preparing its final order, the Commission was instructed to evaluate projected costs and benefits regarding the long-term production capacity and long-term needs for transmission, along with ensuring the designation of a wind zone does not represent an unreasonable threat to public convenience, health, and safety and any adverse impacts on private property values are minimal. Section 147(3) of PA 295 also instructs the Commission to consider all of the following factors pursuant to the findings of the WERZ Board when determining the location of a wind zone:

- (a) Average annual wind velocity levels in the region.
- (b) Availability of land in the region that may be utilized by wind energy conversion systems.
- (c) Existing wind energy conversion systems in the region.
- (d) Potential for megawatt output of combined wind energy conversion systems in the region.
- (e) Other necessary and appropriate factors as to which findings are required by the commission.

On January 27, 2010, the Commission formally accepted the WERZ Board’s [Final Report](#) and through a [final order](#) designated Region 4 as the primary wind energy resource zone and Region 1 as an additional wind energy resource zone. Table 1 includes the estimates reported by the WERZ Board for wind generation potential from Region 4 and Region 1. The designation of the two regions as wind energy resource zones makes them eligible for expedited transmission siting, as provided for in Part 4 of PA 295.

Summary of the Impact of Establishing Wind Energy Resource Zones

The renewable energy standard under the Act has resulted in approximately 600 MW of renewable energy contracts for new wind projects located in Michigan receiving Commission approval. Approximately 150 MW is located within the primary wind energy resource zone. ITC reported that its transmission system is already operating at its full capacity in the primary wind energy resource zone. As discussed in the **Estimates for Future Wind Generation within Wind Zones** section of this report, there are over 4,000 MW of wind generation projects in the MISO queue in Michigan, and approximately half of those projects are located in the primary wind energy resource zone as designated by the Commission.

In order to accommodate this quantity of wind development in the primary wind energy resource zone, significant transmission upgrades are necessary. The expedited transmission line siting provision in the Act establishes a process to enable the necessary transmission upgrades to serve the primary wind energy resource zone. Indications are that the establishment of wind energy resource zones will have a positive impact on the development of wind in areas of the state with the highest wind potential.

Expedited Transmission Line Siting Applications

Section 149 of PA 295 provides the option for an electric utility, affiliated transmission company, or independent transmission company to submit an application to the Commission for an expedited siting certificate to facilitate the transmission of electricity generated by wind energy conversion systems located in a wind energy resource zone.

Before applying for an expedited siting certificate, the applicant shall notify the Commission 60 days before seeking approval from the applicable regional transmission

organization. The Commission is directed to represent the interests of the State of Michigan at the regional transmission organization.

An application for an expedited siting certificate shall contain the following:

- (a) Evidence that the proposed transmission line received any required approvals from the applicable regional transmission organization.
- (b) The planned date for beginning construction of the proposed line.
- (c) A detailed description of the proposed transmission lines, its route, and its expected configuration and use.
- (d) Information addressing potential effects of the proposed transmission line on public health and safety.
- (e) Information indicating that the proposed transmission line will comply with all applicable state and federal environmental standards, laws, and rules.
- (f) A description and evaluation of 1 or more alternate transmission line routes and a statement of why the proposed route was selected.
- (g) Other information reasonably required by commission rules.

After applying for an expedited siting certificate the applicant shall publish a notice regarding the proposed transmission line in a newspaper of general circulation in the area to be affected and shall send a notice to every affected party on whose property a portion of the proposed transmission line will be constructed. Upon receiving an application for an expedited siting certificate, the Commission will conduct a contested case proceeding. The expedited siting certificate shall be granted by the Commission, within 180 days of the application, if the following requirements are met:

- (a) The proposed transmission line will facilitate transmission of electricity generated by wind energy conversion systems located in a wind energy resource zone.
- (b) The proposed transmission line has received federal approval.
- (c) The proposed transmission line does not represent an unreasonable threat to the public convenience, health, and safety.
- (d) The proposed transmission line will be of appropriate capability to enable the wind potential of the wind energy resource zone to be realized.
- (e) The proposed or alternate route to be authorized by the expedited siting certificate is feasible and reasonable.

To date, one application for an expedited siting certificate has been received by the Commission. On August 30, 2010, ITC submitted its application to build a transmission line to serve the primary wind energy resource zone (Region 4). The proposed transmission line is a 345kV double-circuit configuration approximately 140 miles in length, running through 26 townships, consisting of four new substations and capable of meeting the WERZ Board's estimated wind generation potential for the primary wind energy resource zone.

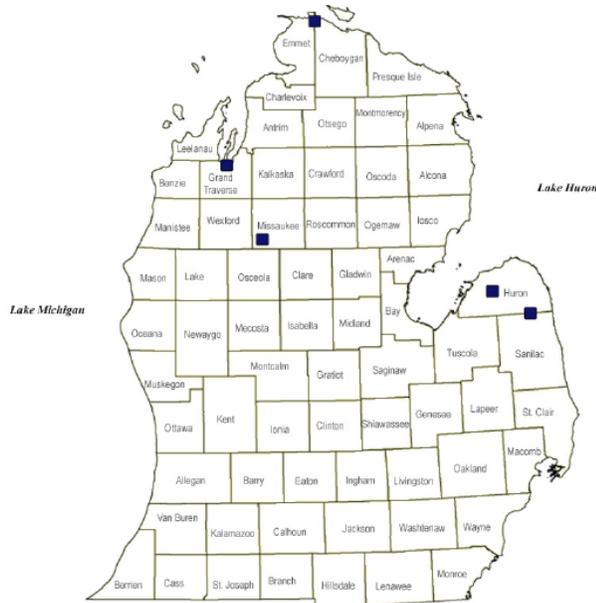
ITC's application for an expedited siting certificate for the proposed transmission line was submitted in [Case No. U-16200](#) and consisted of testimony and exhibits of numerous expert witnesses. The schedule for the contested case was greatly compressed in order for the Commission to meet the 180 day statutory timing requirement to either grant or deny the expedited siting certificate. As part of the contested case hearing process, intervenors representing Michigan utilities, wind generation development, affected landowners, and electric customers also presented testimony. The intervenors raised issues including the amount of future wind development in the primary resource zone, appropriateness of the proposed transmission line, cost of the proposed transmission line, routing of the proposed transmission line, construction of the proposed transmission line, and Michigan's policies for renewable energy and agriculture.

While the Commission found all these issues to be important to the debate and discussion, it determined ITC met all statutory requirements set forth in PA 295. The Commission issued its [order](#) on February 25, 2011, granting an expedited siting certificate in accordance with the timeline required by the Act.

Estimates for Future Wind Generation within Wind Zones

Prior to the enactment of PA 295 in 2008, the State of Michigan had a total of 129.4 MW of installed wind generation at the locations shown below in **Figure 2**:

Figure 2



Following the enactment of PA 295, wind generation development in Michigan started increasing, both inside and outside of the declared wind energy resource zones.

To estimate future wind generation in the wind energy resource zones, the Commission considered the wind energy potential estimated by the WERZ Board for the wind energy resource zones. The Commission also considered barriers to entry for wind generation such as transmission infrastructure limitations, information regarding planned wind generation by Michigan utilities, information regarding wind generation proposals in the Midwest Independent Transmission System Operation (MISO) interconnection queue, and the potential for siting issues.

The WERZ Board included estimates of future wind generation potential in its final report for each of the proposed wind regions and those estimates are included in Table 1. Before arriving at the wind energy potential estimates, the WERZ Board first developed theoretical estimates based upon the number of turbines that would fit within the available space using exclusion criteria for areas not suitable for the placement of wind turbines. In its report, the WERZ Board explains the higher theoretical estimates of wind energy potential were significantly reduced, beyond the application of exclusionary criteria, to arrive at the reported minimum and maximum wind energy potential numbers. **Table 2** shows the WERZ Board’s reductions to the number of wind turbines.

Table 2: WERZ Board’s Reduction to Theoretical Estimates

Region	Counties	WERZ Board Theoretical Number of Turbines	Minimum Number of Turbines (81% Reduction)	Maximum Number of Turbines (66% Reduction)
1	Allegan	872	166	296
2	Antrim Charlevoix	537	102	183
3	Benzie Leelanau Manistee	2,288	435	778
4	Huron Bay Saginaw Sanilac Tuscola	8,306	1,578	2,824

While the WERZ Board reported reasonable estimates of future wind generation, transmission infrastructure limitations have been reported in many areas as an impediment to wind generation development. With a transmission backbone, as proposed by ITC in Case No. U-16200 for the primary wind energy resource zone (Region 4), a roadblock to wind energy development would be removed allowing for significant future wind development in the Thumb.

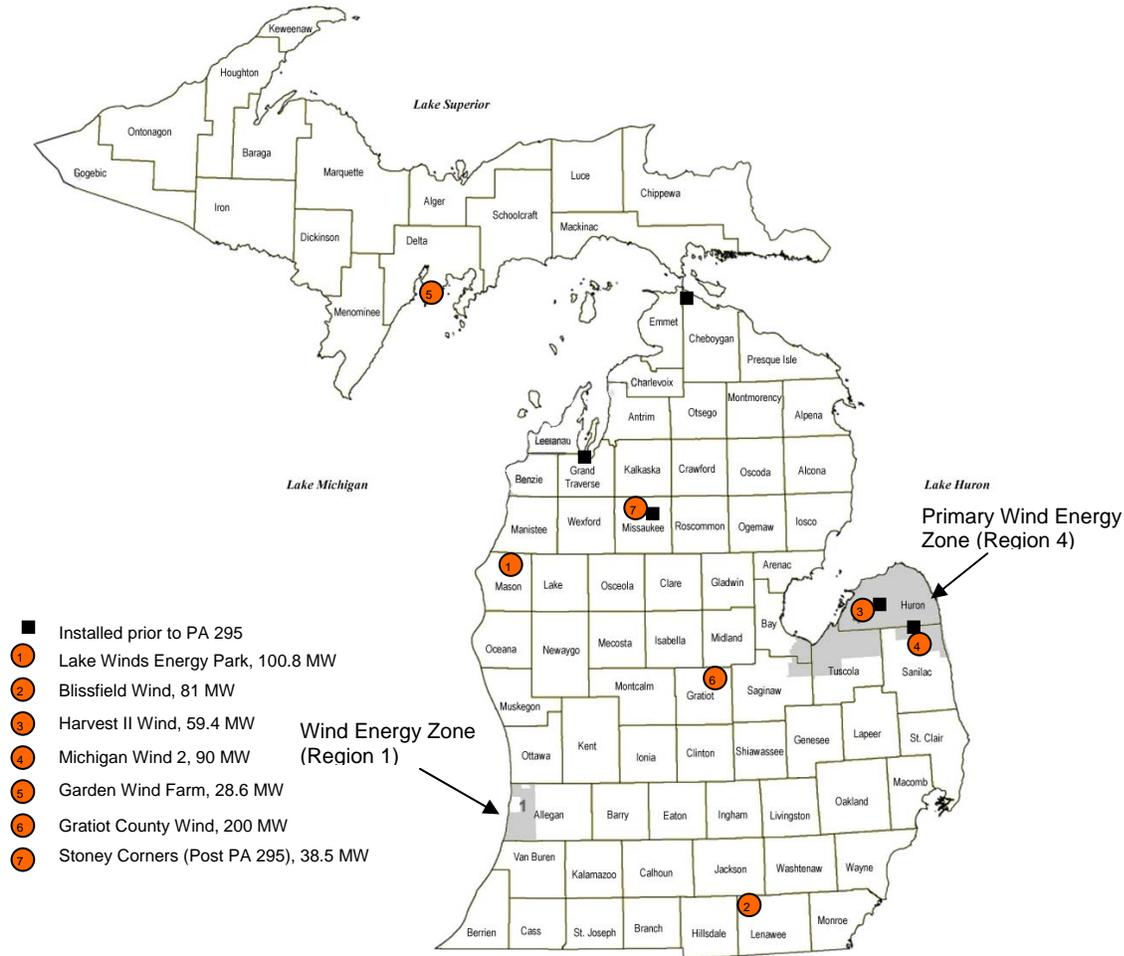
Upgraded transmission infrastructure in the Thumb Region will be critical to enable the wind potential of that Region as reported by the WERZ Board to be realized.

As reported by Michigan transmission companies, Region 1, the additional wind energy resource zone declared by the Commission, has sufficient transmission infrastructure to allow for wind development. Although Region 1 was declared by the Commission to be a wind energy resource zone in its order, and there is capacity within the existing transmission system to allow for local wind generation development, there have not been any wind energy developments in Allegan County.

Pre-PA 295 and Commission-Approved Wind Contracts

Prior to the enactment of PA 295, Michigan had a total of 129.4 MW of wind generation capacity installed. Since the enactment of PA 295, development of wind generation capacity has started to rise. To date, an additional 600 MW of wind generation capacity has been planned and contracted for by Michigan utilities that will be online by 2012. The additional 600 MW of wind capacity that has been contracted for since the enactment of PA 295 represents an increase of wind capacity in Michigan of approximately 460 percent compared to the 129 MW of wind capacity that was installed in Michigan pre-dating PA 295. The total wind generation currently installed in Michigan, along with the additional planned wind generation contracted for under the Act approved by the Commission is 727.7 MW. The locations of wind projects with Commission approved contracts are shown in **Figure 3**:

Figure 3: Pre-PA 295 Wind Installed and Commission-Approved Wind Contracts⁴



Wind Project Interconnection Requests at MISO

Additional wind generation projects have been announced and are under early stages of development as evidenced by activity in the MISO interconnection queue. Some of these projects may also be reflected in the 600 MW of wind contracts approved by the Commission and discussed above. As of January 2011, the total Michigan wind generation that is installed or is in development listed with ‘active’ status in the MISO interconnection queue is 4,377 MW. Figure 4 shows the total MW of wind generation per county that is currently listed as ‘active’

⁴ Representative of data presented to the MPSC on or before 1/21/2011.

interconnection process or withdraw from the queue within the year that they are allowed to be ‘parked.’ Another 397 MW of the total ‘active’ status projects are in the feasibility study stage, which is very early in the interconnection process.

While it appears that a significant portion of the total wind generation in the queue still has several milestones to be reached before being considered firm, there is also a significant portion of MW in the definitive planning phase (DPP). Within the MISO interconnection process, the DPP has been referred to as a ‘fast lane’ to allow certain projects to move forward quickly. Michigan currently has 1,534 MW of wind generation capacity in the DPP. While it is not likely all of the wind generation in the queue will complete the process, it is likely that a significant amount of wind generation in the queue will complete the interconnection process and become operational.

Figure 4 may lend some insight regarding the effect of the declaration of wind energy resource zones on wind energy development. The primary wind energy resource zone in the Thumb is the location for almost half of the wind generation capacity in MISO interconnection queue in the state of Michigan. While it appears that the wind zone process has helped spur wind development in the Thumb Region, there have also been noteworthy amounts of wind generation capacity under development in other areas of the State as well. .

Recommendations for Program Enhancements or Expansion

There is significant development of wind generation in Michigan’s primary wind energy resource zone. The wind energy resource zone program has been successful and is a contributing factor in the development of wind energy where Michigan’s highest wind energy potential exists. The Commission will continue to monitor the impact of establishing wind energy resource zones

and will provide any recommendations identified for program enhancements or expansion in future annual reports.

Appendix A -- Summary of Transmission Upgrades

To support the wind generation potential in each region the following transmission upgrades were identified:

For Region 1, ITC reported that upgrades to the transmission system in their territory would not be required to meet the minimum or maximum wind energy potential identified by the WERZ Board. However, closely situated Indiana Michigan Power reported that the minimum wind energy potential for Region 1 could not be supported without investing in the transmission infrastructure in their territory.

For Region 2, METC reported that several backbone enhancements to the METC transmission system would be required to connect wind generation at the reported minimum and maximum wind capacity levels specified by the WERZ Board. In order to support the minimum wind generation capacity level, infrastructure upgrades would be required for one existing 138 kV METC circuit, existing METC station equipment, and existing Wolverine station equipment. To support the maximum wind generation capacity level, additional equipment replacement on two existing 138 kV METC circuits would be required, and Wolverine would need to upgrade sixteen circuit miles of transmission. The projected cost for these upgrades ranges from \$24.5 million to meet the minimum reported wind energy potential to \$49 million to meet the maximum reported wind energy potential for the region.

In Region 3, METC specified that several backbone transmission system enhancements would be required to interconnect wind generation at the minimum or the maximum wind energy potential reported by the WERZ Board. To enable the minimum wind energy potential, equipment replacement on one existing 138 kV METC circuit, METC station equipment, Wolverine station equipment and 16 circuit miles on the Wolverine system would need to be

upgraded. In addition, to meet the maximum wind energy potential, Wolverine reported that additional station equipment and 80 circuit miles would need to be upgraded. Backbone upgrades required for Region 3 to meet the minimum wind energy potential were estimated to cost \$42 million, while the upgrades required to meet the maximum wind energy potential were estimated to cost \$69 million. In Region 4, ITC reported that its transmission system is already operating at its full capacity. ITC reported that the existing 120 kV backbone running through the Thumb Region would need to be upgraded to six 230 kV circuits or four 345 kV circuits in order to meet the minimum wind energy potential reported by the WERZ Board. The 345 kV proposal would also meet the maximum, and was the least expensive alternative reported by ITC to meet the minimum or maximum wind energy potential of the region at \$510 million. Detroit Edison also reported that many miles of its distribution system in Region 4 may need to be upgraded in order to support additional wind generation. The actual amounts and locations of interconnecting generation in Region 4 would drive those upgrades and the scope of work required for the distribution system will not be known until those amounts and locations of wind generation are certain.