



# Report on the Implementation and Cost- Effectiveness of the P.A. 295 Renewable Energy Standard

February 15, 2022

**Dan Scripps, Chair**  
**Tremaine Phillips, Commissioner**  
**Katherine Peretick, Commissioner**



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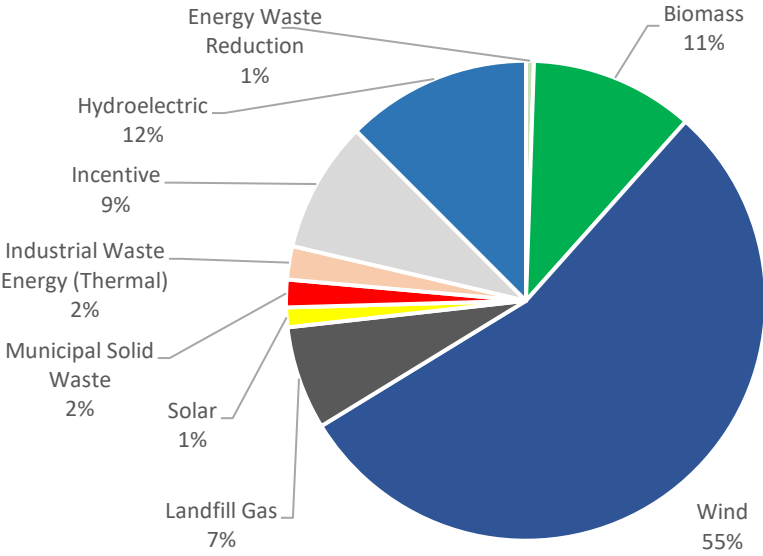
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# Executive Summary

Pursuant to Public Act 295 of 2008, as amended by Public Act 342 of 2016 (Act), the Michigan Public Service Commission (MPSC or Commission) is directed to prepare a report summarizing both the Commission’s activities related to the Act and electric provider’s annual reports.

For 2020, electric providers were required to retire<sup>1</sup> the number of renewable energy credits (RECs)<sup>2</sup> needed to meet a 12.5% renewable energy standard. This quantity of RECs represents an increase from 2015 through 2018 requirements which were equal to approximately 10% of 2014 retail sales. Act 295 has an interim requirement of at least 12.5% for 2019 and 2020 and increases to at least 15% by the end of 2021 which is the final year of statutory renewable energy standard requirements. All<sup>3</sup> of Michigan’s electric providers subject to the renewable energy standard in 2020 met the standard and retired a total of 12,491,756 RECs. **Figure ES-1** shows the different renewable energy technology types used to generate the RECs retired for compliance by all electric providers in 2020.

**Figure ES-1: Compliance REC Breakdown**  
**All Electric Providers – 2020 Compliance RECs**  
**12,491,756 Total RECs**



<sup>1</sup> Renewable energy credits are “retired” when used for compliance.  
<sup>2</sup> The term “renewable energy credit” includes renewable energy credits, Michigan incentive renewable energy credits, and energy waste reduction credits when substituted for renewable energy credits.  
<sup>3</sup> There are currently 65 electric providers subject to the renewable energy standard including: 7 rate-regulated utilities, 10 cooperative utilities, 40 municipal utilities, and 8 alternative electric suppliers.

While electric providers retired enough RECs to achieve the 12.5% renewable energy standard using RECs generated from 2017 to 2020, it is useful to note that based on the number of RECs generated during 2020, Michigan's 2020 renewable energy percentage is equal to 11.9%<sup>4</sup> of retail sales.

By the end of 2022, Michigan is expected to have 3,554 MW of operational renewable energy in response to the renewable energy standard. The weighted average price of renewable energy contracts approved since 2009 continued to decline to \$64.01 per MWh and for 2020 contract approvals is \$47.93 per MWh.

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<sup>4</sup> MIRECS vintage 2020 RECs and 2019 retail sales data were used to calculate the percentage.

## Introduction

Public Act 342 of 2016 (PA 342) became effective on April 20, 2017 and amends Public Act 295 of 2008 (PA 295 or the Act), increasing the renewable energy standard from 10% in 2015 to at least 12.5% in both 2019 and 2020 with a final requirement of at least 15% in 2021. The Act includes a goal of meeting not less than 35% of the state's electric needs through a combination of energy waste reduction and renewable energy by 2025.

The Michigan Public Service Commission (MPSC or Commission) prepares this report annually, by February 15 each year, according to the reporting criteria described in Section 51 (5) of the Act<sup>5</sup>. This report is submitted to the standing committees of the Michigan Senate and House of Representatives with primary responsibility for energy and environmental issues. Section 51 is repealed in its entirety, effective January 1, 2023.

This twelfth and final annual report provides information on the Commission's renewable energy activities related to the Act through calendar year 2021 and summarizes data from electric provider 2020 annual reports.

## Renewable Energy Plans and Commission Approval

The renewable energy standard is applicable to Michigan's rate-regulated electric utilities, cooperative electric utilities, municipal electric utilities, and alternative electric suppliers (AESs). Electric providers filed initial renewable energy plans (REPs) in 2009.<sup>6</sup> The 74 initial REPs described how each electric provider intended to meet the renewable energy standard requirements. Until the passage of PA 342, the Act also directed electric providers to file REPs biennially for Commission review. PA 342 directed the Commission to review each electric provider's REP within one year of the Act's effective date and no longer requires biennial REP filings. On August 23, 2017, the Commission established filing requirements for REPs consistent with the new Act.<sup>7</sup>

All of the REPs filed by Michigan's seven rate-regulated electric providers show the continued achievement of a 15% renewable energy credit<sup>8</sup> (REC) portfolio from 2021 through the end of the 20-year plan period in 2029.

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<sup>5</sup> [Michigan Legislature - Section 460.1051](#)

<sup>6</sup> There are currently 65 electric providers subject to the renewable energy standard including: 7 rate-regulated utilities, 10 cooperative utilities, 40 municipal utilities, and 8 AESs. Fifteen licensed AESs not currently serving customers are not included in this total.

<sup>7</sup> [http://www.michigan.gov/documents/mpsc/U-18409\\_8-23-17\\_598908\\_7.pdf](http://www.michigan.gov/documents/mpsc/U-18409_8-23-17_598908_7.pdf)

<sup>8</sup> The term "renewable energy credit" includes renewable energy credits, Michigan incentive renewable energy credits, and energy waste reduction credits when substituted for renewable energy credits.

A listing of renewable energy case numbers and electric provider names can be found in **Appendix A**. Renewable energy credit requirements and renewable energy plan summaries are shown in **Appendix B** and **Appendix C**, respectively.

## Renewable Energy Cost Reconciliation Cases

Per Section 49(1) of the Act, seven rate-regulated electric providers filed annual renewable energy cost reconciliation cases for 2020. Commission staff examined the pertinent revenues and expenses, determined the electric provider's compliance with its filed REP and assessed whether the provider met its compliance targets. MPSC case numbers for each renewable energy cost reconciliation case for the reporting period can be found in **Appendix A**.<sup>9</sup>

## Summary of Renewable Energy Data Collected

Electric providers are directed by Section 51(1) of PA 295 to file annual reports for each plan year beginning with 2009. The last electric provider annual reports pursuant to the Act will be filed in 2022 for the 2021 compliance year due to the PA 342 repeal of Section 51, effective January 1, 2023. However, it is expected that rate-regulated electric providers will continue to file annual reports as part of their renewable energy cost reconciliation case filings which are required through the end of the 20-year plan period in 2029. Michigan electric provider annual reports for 2009 through 2020 are available on the Commission's website.<sup>10</sup> A summary of selected data from annual reports is shown in **Appendix C**.

## Renewable Energy Credit Requirements – 2020 Compliance

For 2020, electric providers were required to meet an interim compliance standard of 12.5%. The number of RECs required for 2020 compliance is calculated by multiplying the applicable electric provider retail sales figure by the 12.5% compliance percentage. All of Michigan's electric providers subject to the standard in 2020 met the standard and retired<sup>11</sup> a total of 12,491,756 RECs. **Figure 1** shows the different renewable energy technology types used to generate the RECs for compliance by all electric providers in 2019 and 2020 as well as separately for both Consumers Energy's and DTE Electric's 2020 compliance.

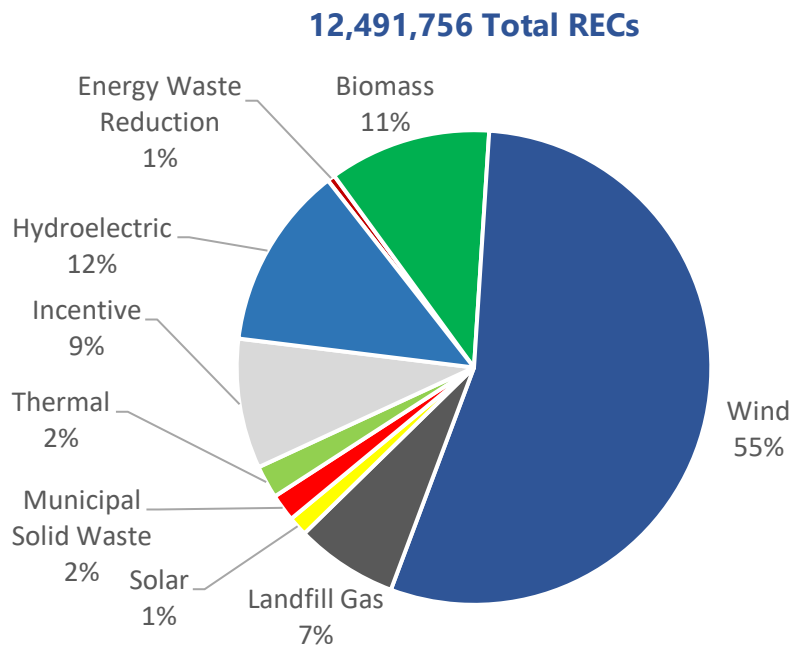
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<sup>9</sup>Link to 2020 electric provider reconciliation filings: [https://www.michigan.gov/mpsc/0,9535,7-395-93308\\_93325\\_93423\\_93502\\_94989-506587--,00.html](https://www.michigan.gov/mpsc/0,9535,7-395-93308_93325_93423_93502_94989-506587--,00.html)

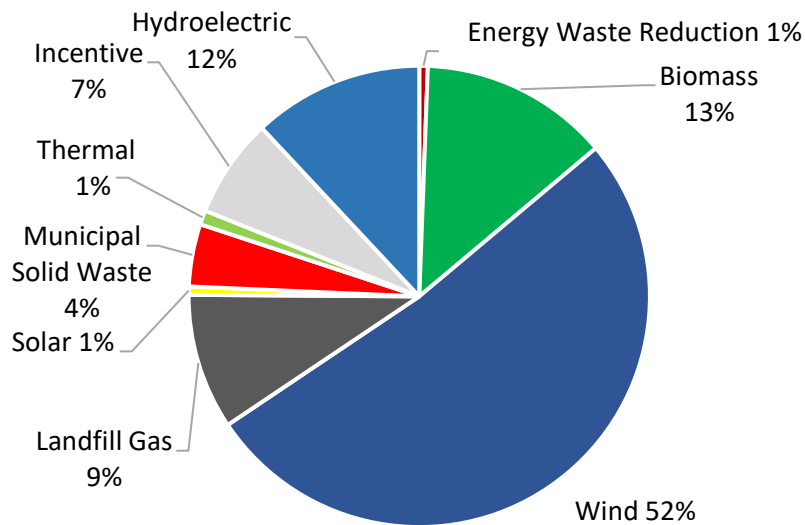
<sup>10</sup> Link to 2020 electric provider annual reports: <https://www.michigan.gov/mpsc/regulatory/electricity/renewable-energy/renewable-energy-filings/2020-renewable-energy-annual-reports>

<sup>11</sup> RECs are "retired" when used for compliance.

**Figure 1: Compliance REC Breakdown  
All Electric Providers- 2020 Compliance RECs**

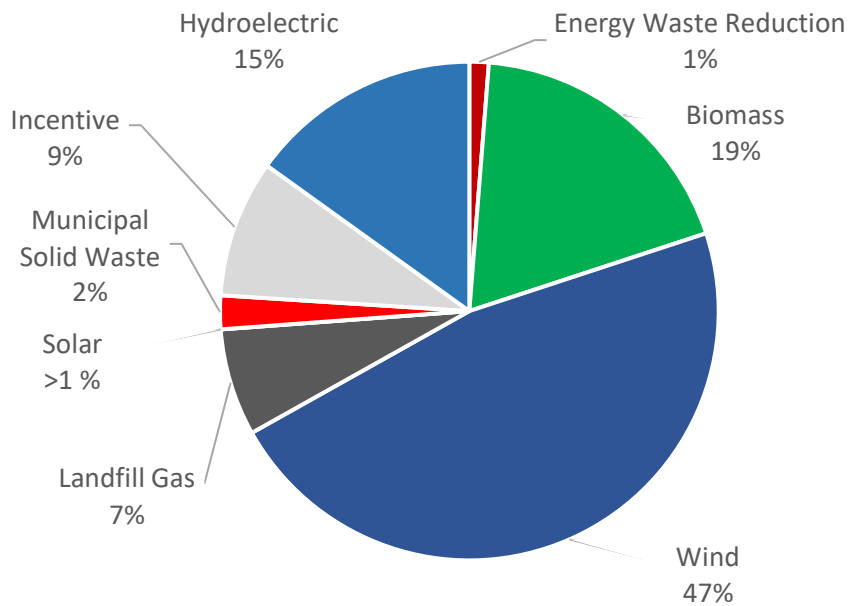


**All Electric Providers – 2019 Compliance RECs  
12,812,152 Total RECs**

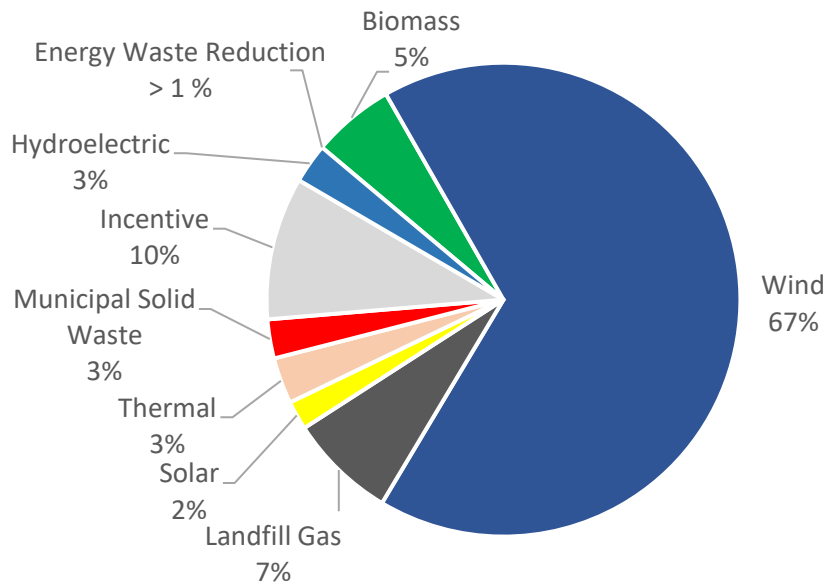




**Consumers Energy - 2020 Compliance**  
**4,168,550 RECs**



**DTE Electric – 2020 Compliance**  
**5,211,845 Total RECs**

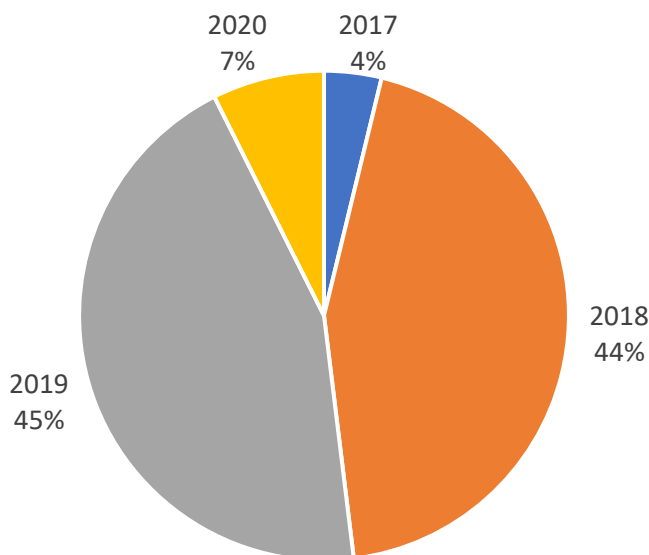


Section 29 of the Act includes provisions for determining whether the location of a renewable energy system is eligible for Michigan’s renewable energy standard. Nearly 96% of the RECs used for 2020 compliance were from renewable energy generated in Michigan. Indiana was the source for 2.6%, Wisconsin nearly 1.13% and a small number of RECs came from renewable energy

generated in Iowa and Minnesota. Michigan’s multi-state utilities and electric providers with out-of-state wholesale suppliers are most likely to use RECs from states other than Michigan.

PA 342 extended the life of a REC representing energy generated during April 2017 and after to five years from the previously effective three-year REC “banking” allowance. **Figure 2** shows a breakdown of RECs retired for compliance by vintage year of generation. RECs used to comply in 2020 were primarily from renewable energy generated in 2018 or 2019.

**Figure 2: 2020 Compliance RECs – Year of Generation**



## Status of Renewable Energy

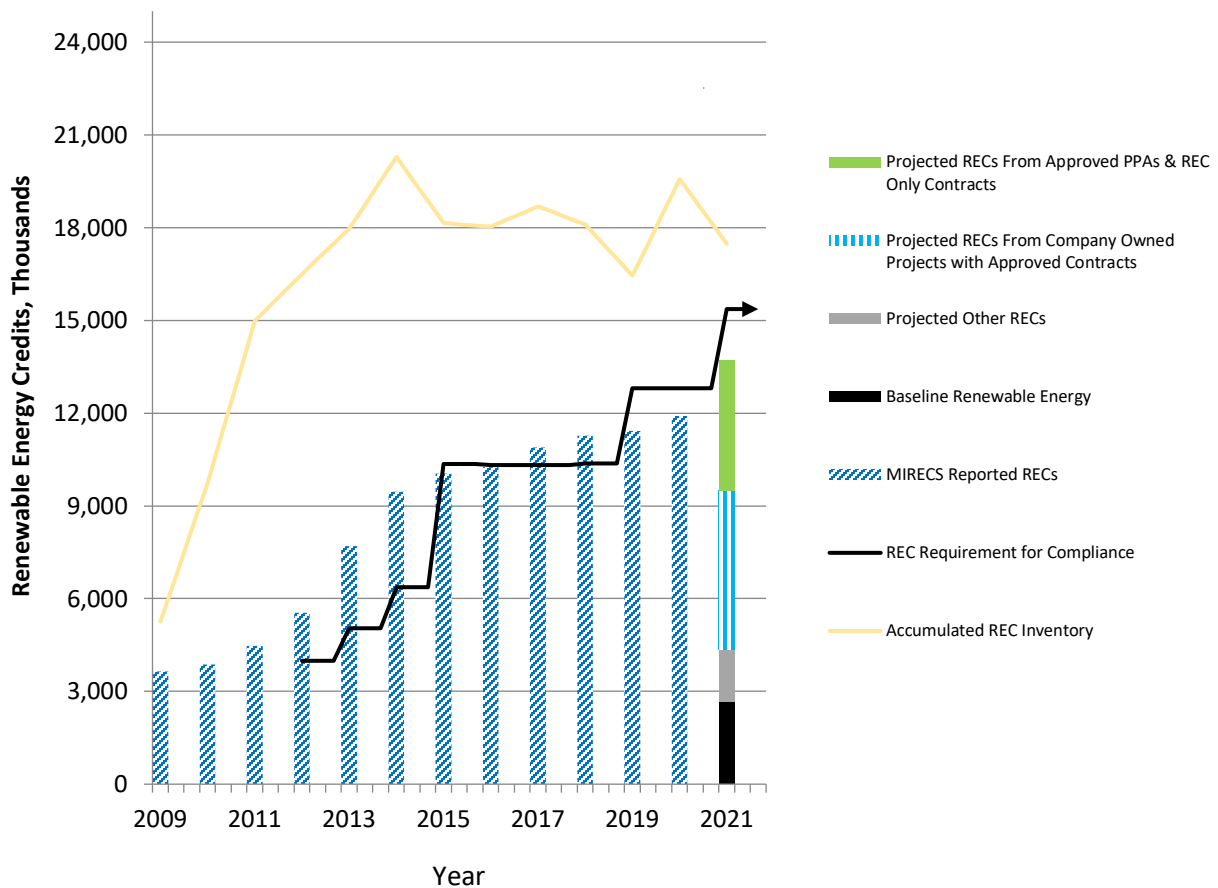
MIRECS data for 2020 shows a total of 11,901,044 vintage 2020 RECs. Dividing the number of 2020 vintage RECs by the 2019 compliance retail sales figure of 99,708,065 MWh as calculated in **Appendix B**, yields an estimate of Michigan’s 2020 renewable energy percentage of 11.9%. Michigan’s renewable energy standard requires electric providers to achieve a renewable energy percentage of 12.5%. All providers achieved the standard by using a combination of 2020 RECs, banked RECs from previous years, and in the case of Consumers Energy and DTE Electric, substituting a limited quantity of energy waste reduction credits for RECs.

A projection of Michigan’s RECs for 2021 is shown in **Figure 3** along with the annual REC compliance requirement and accumulated RECs. In order to reflect only RECs created each year, accumulated RECs from previous years are not included in the yearly renewable energy totals but are shown separately by the yellow line labeled “Accumulated REC Inventory.” The projected renewable energy includes: i) baseline renewable energy (renewable energy that was operational prior to the passage of PA 295); ii) a projection of other RECs from non-rate regulated providers and contracts that do not require Commission approval under PA 295; iii) an estimate of RECs

from PA 295 approved contracts for company-owned renewable energy projects; and iv) power purchase agreements (PPA) and REC-only contracts.

**Figure 3** shows the number of RECs created in MIRECS each year through 2020 and projects the number of RECs expected to be generated during 2021. The black line represents the level of RECs needed to achieve the renewable energy standard in each year. All providers are expected to achieve the renewable energy standard in 2021 by retiring a mix of 2017 through 2021 vintage RECs. For example, in 2020, the number of vintage 2020 RECs created in MIRECS is 11,901,044, but only 7% or 874,423 of the 12,491,756 compliance RECs retired in 2020 were vintage 2020 RECs. This leaves over 11 million banked 2020 vintage RECs available to supplement the RECs created in 2021 and will enable electric providers to fully achieve the 15% renewable energy standard.

**Figure 3: Michigan REC Projection**

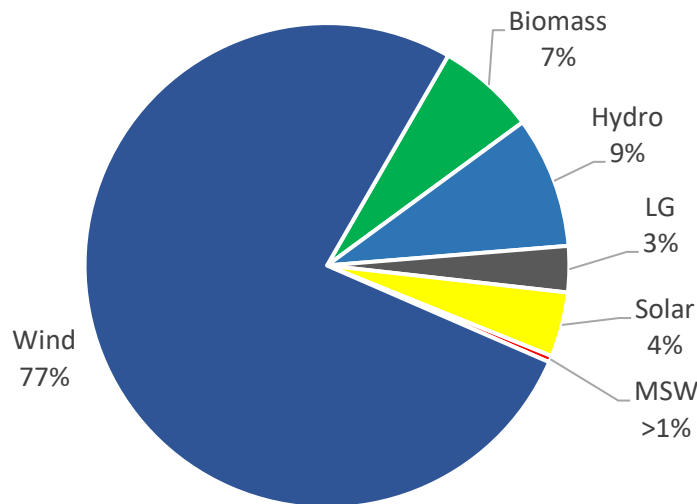


Source: Electric provider annual reports, PA 295 contracts, MIRECS and Commission staff.

**Figure 4** provides a breakdown of the technology type and total nameplate capacity for the approximately 4,200 MW of renewable energy generators in Michigan registered in MIRECS as of the date of this report. This is an increase of 900 MW over last year’s total, which includes some projects from previous years due to the timing of project registrations in MIRECS. Renewable energy generators also exist within Michigan that are not used to meet the REC requirements of the renewable energy standard. These renewable generators may be used for compliance with another state’s renewable energy standard. There are also renewable energy generators currently under development and/or contracted for, which are not yet operational, that are not included within this figure.

While Michigan’s rate-regulated electric providers have renewable energy plans designed to achieve a 15% REC portfolio in 2021 and through the end of the 20-year plan period in 2029, Michigan may experience a REC market with significant quantities of RECs available from renewable energy projects constructed to meet the 15% by 2021 renewable energy standard for the 40 municipal utilities, 10 cooperative utilities, and 8 AESs.

**Figure 4: Renewable Energy Generators in Michigan, by Technology Type  
Approximately 4,200 MW Nameplate Capacity**

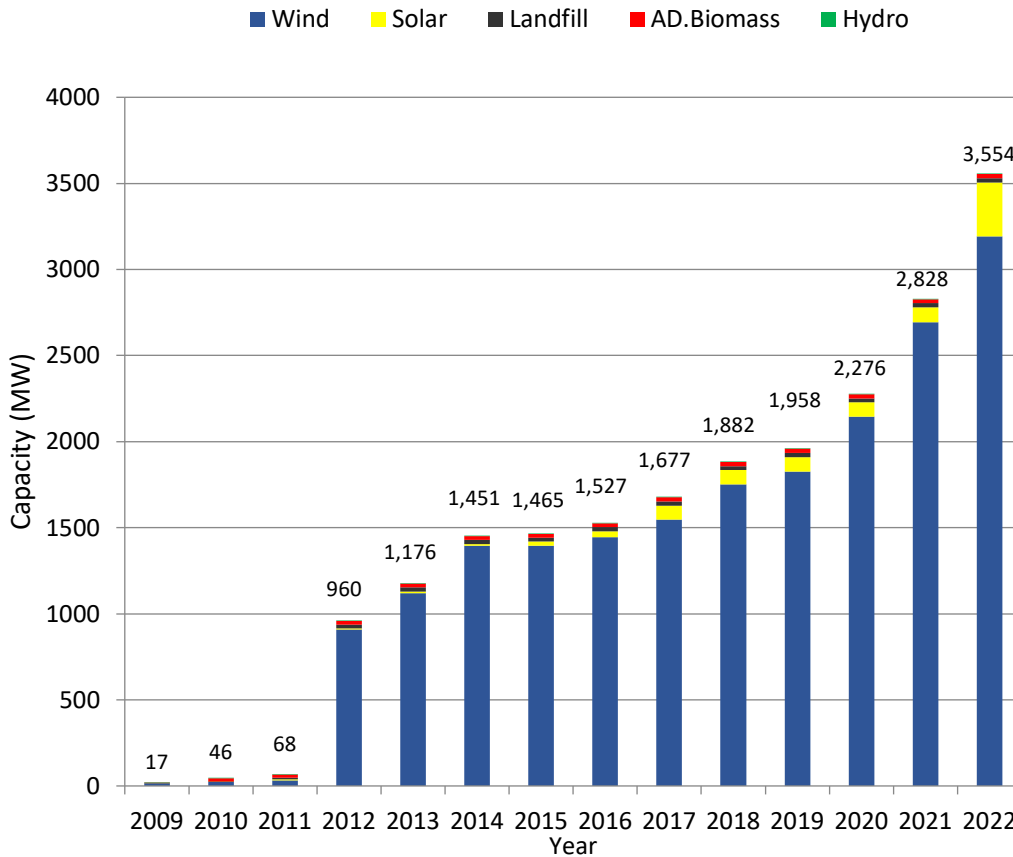


Source: MIRECS Project Registrations

As of January 2022, 94 renewable contracts and amendments have been approved by the Commission pursuant to PA 295. **Figure 5** shows the expected commercial operation dates for renewable energy projects through 2022 based on PA 295 contracts approved by the Commission. DTE shifted the commercial operation dates of the following three projects from 2021 to 2022: Fairbanks Wind Park, Meridian Wind Farm, and Assembly Solar.. This shift caused 376 MW to shift from 2021 to 2022 in **Figure 5**. Renewable projects developed by non-rate-regulated electric

providers, where contracts are not filed for approval with the MPSC, are not reflected in **Figure 5**.<sup>12</sup>

**Figure 5: Cumulative Commission-Approved PA 295 Renewable Energy Capacity by Commercial Operation Date**



During 2020 and 2021, consistent with utility renewable energy plans, five utility-scale wind farms became operational in Michigan:

- Gratiot Farms Wind – 150 MW, Gratiot County, 2020
- Polaris Wind Farm – 168 MW, Gratiot County, 2020
- Crescent Wind – 166 MW, Hillsdale County, 2021
- Isabella I Wind – 197 MW, Isabella County, 2021
- Isabella II Wind – 186 MW, Isabella County, 2021

<sup>12</sup> Nearly all AESs are purchasing unbundled renewable energy credits to meet the renewable energy credit portfolio requirements. The terms and conditions of these purchases are unknown.

Over the next year, three utility-scale wind farms and three utility-scale solar farms are expected to become commercially operational in Michigan:

- Fairbanks Wind Park – 72.45 MW, Delta County (2022)
- Meridian Wind Farm – 224.9 MW, Midland and Saginaw Counties (2022)
- Heartland Farms Wind Farm – 200 MW, Gratiot County (2022)
- Assembly Solar – 79 MW, Shiawassee County (2022)
- River Fork Solar (DTE Electric) – 49 MW, Calhoun County (2022)
- River Fork Solar (Consumers Energy) – 100 MW, Calhoun County (amended to 2022)

These projects will result in 725 MW of new, utility-scale renewable generation for 2022.

## Renewable Energy Growth in Addition to the Renewable Energy Standard

Since its enactment as part of PA 295 of 2008, the renewable energy standard has been the primary driver for renewable energy development in Michigan. However, the interest in clean energy, declines in project costs, and the establishment of a renewable energy infrastructure in the state resulting from the renewable energy standard have contributed to plans for significant quantities of renewable energy in addition to the amount needed to satisfy the renewable energy standard. Additional renewable energy growth is increasingly fueled by voluntary green pricing programs, selection of renewable energy as a key generation source in utility integrated resource plan preferred courses of action, and the Public Utility Regulatory Policies Act of 1978 (PURPA).

## Voluntary Green Pricing (VGP) Programs

Renewable energy supply needed for compliance with the renewable energy standard has largely been constructed with the final projects expected to achieve commercial operation in 2022. A growing number of customers want to go above and beyond the renewable energy standard and turn to their electric provider to provide an opportunity to purchase more renewable energy. Voluntary green pricing programs are becoming a major driver of new renewable energy growth in Michigan. Section 61 of PA 342 requires each electric provider to "...offer its customers the opportunity to participate in a voluntary green pricing program..." These programs provide customers the option to match up to 100% of their electric usage with renewable energy. Electric providers whose rates are regulated by the Commission must receive approval for the programs and the rates paid by participating customers for renewable energy. Subsequent to initial utility voluntary green pricing case filings conducted in 2017 and 2018, the Commission has established a biennial review timeframe for these cases. MPSC case numbers for each electric provider's voluntary green pricing program filings are included in **Appendix A**.

Both Consumers Energy and DTE Electric have requested and received Commission approval to utilize the PA 295 renewable energy plan cost recovery mechanism for voluntary green pricing program renewable energy supply. This cost recovery mechanism has several advantages over traditional utility cost recovery for voluntary green pricing programs.

- Under the renewable energy plan cost recovery mechanism, utility cost recovery begins when the project achieves commercial operation.
- The cost recovery mechanism allows the utility to recover costs according to traditional utility revenue requirement and depreciation accounting methods while the participating customer pays for renewable energy on a levelized cost basis for the life of the project. Under a traditional generation asset cost recovery methodology, the utility revenue requirement is higher than the project’s levelized cost in the first half of the project life and lower in the last half.
- Any unsubscribed energy and RECs may be utilized by the renewable energy plan program for compliance with the renewable energy standard.

Any RECs associated with a customer’s participation in a voluntary green pricing program may not also be used for the electric provider’s renewable energy standard compliance.

Consumers Energy and DTE Electric are experiencing strong customer responses to voluntary renewable energy programs, particularly from commercial and industrial customers. At this time, both electric providers have exhausted the currently available renewable energy supply for their commercial and industrial programs.

The demand for voluntary green pricing program supply is significantly contributing to renewable energy growth for Consumers Energy and DTE Electric. **Table 1** describes the renewable energy supply used by the two electric providers for voluntary green pricing programs.

**Table 1: Voluntary Green Pricing Program Renewable Energy Supply**

| <b>Consumers Energy</b>  | <b>DTE Electric</b>                   |
|--|---------------------------------------|
| <b>Solar Gardens</b>   | <b>MIGreenPower<sup>13</sup></b>      |
| Western Michigan University and Grand Valley State University - 4 MW | Lapeer Solar and O’Shea Solar – 50 MW |
| City of Cadillac - 0.5 MW  | Pinnebog Wind - 50 MW                 |
|  | Isabella I – 197 MW                   |
|  | Isabella II – 186 MW                  |
| <b>Large Customer Renewable Energy Program (LC-REP)</b>              | Fairbanks Wind – 72.45 MW             |
| Crosswinds II - 44 MW  | Freshwater Solar - 200 MW (2022)      |
| Crosswinds III - 76 MW   | Whitetail Solar – 120 MW (2022)       |
|  | Calhoun County Solar – 100 MW (2022)  |

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<sup>13</sup> The settlement agreement approved by the Commission in MPSC Case No. U-20713/U-20851 provides for the Rider 17 and Rider 19 voluntary green pricing programs to be combined in a single MIGreenPower tariff with shared renewable energy supply in 2022. The resource mix serving this program will change in 2022.

## Utility Integrated Resource Plans

As shown in **Figure 11**, Michigan's experience with its renewable energy standard has been that renewable energy costs have declined significantly since the first PA 295 renewable energy supply contracts were approved in 2009. This cost decrease and environmental characteristics are key factors contributing to the selection of renewable energy projects as a supply resource outside of the renewable energy standard.

Public Act 341 of 2016 added a new provision in Section 6t, requiring utilities to file integrated resource plans every five years that look at anticipated customer electricity needs over the next 5, 10, and 15 years, as well as the appropriate mix of resources to serve those needs, including power plants, renewable energy, energy waste reduction, demand response, and customer-owned resources. The first round of integrated resource plans has concluded and renewable energy, particularly solar, was determined to be a key resource in the future supply mix to meet customer electricity needs.

During 2019 and 2020, Consumers Energy issued four requests for proposals for a total of 800 MW of solar energy resulting from its integrated resource plan approved in MPSC Case No. U-20165. **Table 2** summarizes the planned renewable energy additions included in integrated resource plan preferred courses of action for each utility.



**Table 2: Integrated Resource Plans – Preferred Course of Action  
Renewable Energy Additions**

| <b>Utility</b>   | <b>MPSC Case Number</b>            | <b>Renewable Energy Approved for the Initial 3-Years</b> | <b>3-Year Post IRP Filing Period</b> | <b>Renewable Energy in Current Preferred Course of Action throughout IRP Planning Horizon</b>                               |
|--|------------------------------------|--|--------------------------------------|---|
| Alpena Power   | U-20300                            |  | 07/2019-07/2022                      |   |
| Consumers Energy   | U-21090<br><b>Case in Progress</b> | 250 MW   | 6/2022 – 6/2025                      | 4,500 MW of solar by 2030 and 6,000 MW by 2040  |
| DTE Electric   | U-20471                            | 839.4 MW wind, 190 MW solar                              | 04/2020-04/2023                      | 1,667 MW (205 MW solar, 1,462 MW wind) [DTE also includes the following for VGP: 1,391 MW total: 935 MW solar, 456 MW wind] |
| Indiana Michigan*  | U-20591                            | 750 MW wind, 450 MW solar                                | 09/2020-09/2023                      | 3,600 MW wind and solar <sup>14</sup>   |
| Northern States Power Wisconsin Xcel*  | U-20599                            |  | 02/2020-02/2023                      | 5,200 MW (4,000 MW solar, 1,200 MW wind)  |
| Upper Michigan Energy Resource Corporation   | U-21081<br><b>Case in Progress</b> |  | 10/2022 – 10/2025                    | 100 MW solar  |
| Upper Peninsula Power Company  | U-20350                            | 20 MW solar  | 02/2020-02/2023                      | UPPCO is currently pursuing a 22.5 MW PPA and 62.5 MW of company-owned solar through competitive solicitation.              |
| <p>*Data provided for Indiana Michigan Power Company and Northern States Power Wisconsin (Xcel) is representative of the Company's entire multi-state service territory.</p> <p>Renewable energy quantities are subject to change according to actual contracting results and adjustments to the preferred course of action in future IRP cases.</p> |                                    |  |                                      |   |

<sup>14</sup> The Company's Michigan filing was withdrawn in conjunction with a settlement agreement in Case No. U-20591 on September 10, 2020.

Consumers Energy has issued RFPs in 2019 and 2020 that will result in six utility-scale solar installations with commercial operation dates in 2022 and 2023. These projects will result in 695 MW of new solar generation for Michigan based on IRP supply plans. The projects, as approved by the Commission, are:

- Calhoun Solar Energy – 140 MW, Calhoun County, 2022
- Mustang Mile Solar – 150 MW, Lenawee County, 2022
- Heathlands Solar – 30 MW, Manistee County, 2022
- Jackson County Solar – 125 MW, Jackson County, 2023
- Cereal City Solar – 100 MW, Calhoun County, 2023
- Washtenaw Solar – 150 MW, Washtenaw County, 2023

### **PURPA Purchases**

In 1978, Congress passed, and President Carter signed, the Public Utility Regulatory Policies Act, commonly referred to as PURPA. PURPA requires that electric utilities interconnect with qualifying facilities (QF), purchase energy and capacity at the utility's avoided cost, and sell supplemental, backup, maintenance, and interruptible power to the QF on a non-discriminatory basis. Michigan has seen considerable growth in the number of QFs that have projects, or are planning projects, with investor-owned utilities.

### **Progress Toward the 35% by 2025 Goal**

Section 1 of PA 295 establishes a goal of not less than 35% of the state's electric needs should be met through a combination of energy waste reduction and renewable energy by 2025. However, the goal should only be met "...if the investments in energy waste reduction and renewable energy are the most reasonable means of meeting an electric utility's energy and capacity needs relative to other resource options." Renewable energy capacity additions beyond the 15% renewable energy standard and future energy waste reduction levels will be examined in each utility's integrated resource plan filed pursuant to 2016 PA 341.

Progress toward the goal is demonstrated through the following means:

(a) All renewable energy, including renewable energy credits purchased or otherwise acquired with or without the associated renewable energy, and any banked renewable energy credits, that counted toward the renewable energy standard on the effective date of the 2016 amendatory act that added this subsection, as well as renewable energy credits granted as a result of any investments made in renewable energy by the utility or a utility customer after that effective date.

(b) The sum of the annual electricity savings since October 6, 2008, as recognized by the commission through annual reconciliation proceedings, resulting from energy waste reduction measures implemented under an energy optimization plan or energy waste reduction plan.

Michigan has reached 23% and is continuing to progress toward the goal of 35% combined renewable energy and energy waste reduction by 2025.<sup>15</sup>

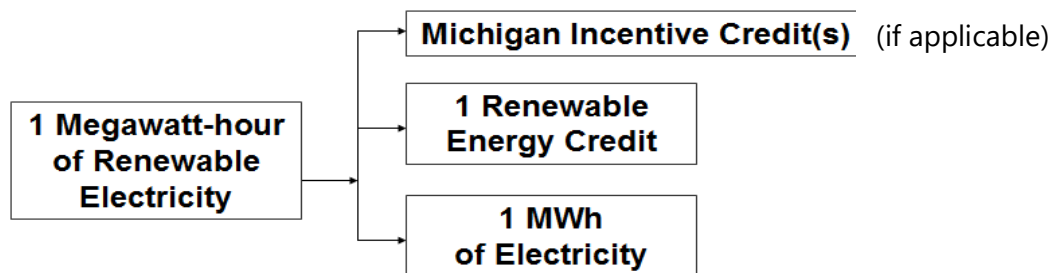
### Impact of Percentage Limits on the Use of Energy Waste Reduction Credits

As allowed by the Act, electric providers included banked energy credits and excess energy waste reduction credits within their renewable energy credit portfolio to achieve the 2020 compliance requirement. As provided under Section 28 of the Act, energy waste reduction credits may be substituted for renewable energy credits on a one-to-one ratio and shall not be used to meet more than 10% of the renewable energy credit standard. For the 2020 compliance requirement, only two electric providers included energy waste reduction credits in their compliance portfolios. Consumers Energy substituted energy waste reduction credits that totaled approximately 1.25% of its renewable energy credit requirement. DTE Electric substituted energy waste reduction credits that totaled less than 1% of its renewable energy credit requirement. The amount of energy waste reduction credits substituted is shown in **Appendix B**.

### Michigan Renewable Energy Certification System (MIRECS)

Compliance with the renewable energy standard is demonstrated through the use of RECs. One REC is created for each megawatt-hour (MWh) of renewable energy generated. Additionally, the Act provides for incentive RECs and the substitution of energy waste reduction credits<sup>16</sup> for RECs. RECs may be sold separately from energy as shown in **Figure 6**.

**Figure 6: Renewable Energy Credits**



In 2018, the functionality to track energy waste reduction credits was added to MIRECS which allowed energy waste reduction standard compliance to be managed through MIRECS beginning

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<sup>15</sup> See Figure 3 in the MPSC's [Annual Report on the Implementation of PA 295 2019 Utility Energy Waste Reduction Programs, February 15, 2022](#)

<sup>16</sup> At this time, energy waste reduction credits are not transferable from one electric provider to another, meaning that they cannot be sold or otherwise traded.

with the 2017 compliance year. One energy waste reduction credit is created for each MWh of energy saved.<sup>17</sup>

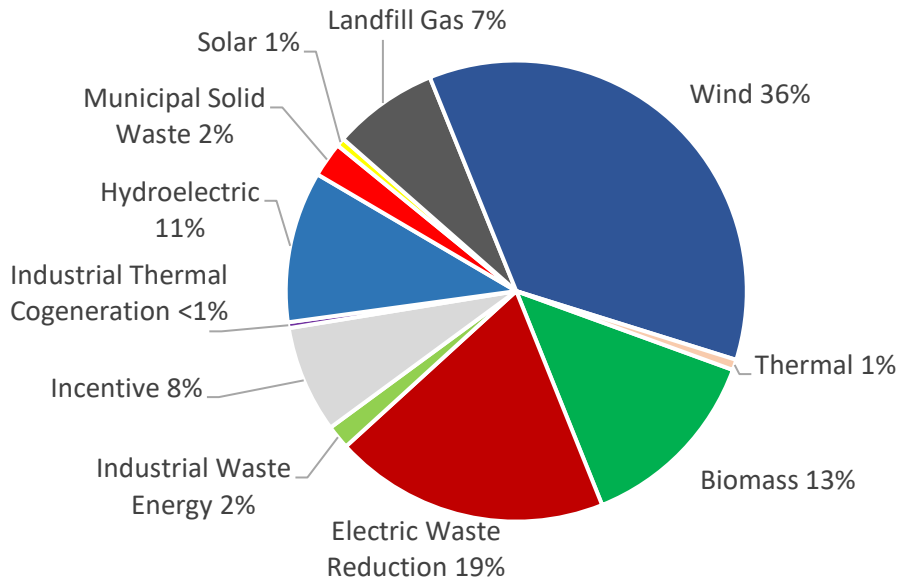
As of January 28, 2022, a total of 145,110,248 energy credits have been created in MIRECS from 2009 through 2021. **Figure 7** shows the categorization of Michigan’s energy credits by technology type with and without energy waste reduction credits. Annual breakouts of energy credits are available in **Appendix D**.

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<sup>17</sup> [Annual Report on the Implementation of PA 295 2019 Energy Waste Reduction Report to the Legislature](#)

**Figure 7: MIRECS 2009-2021 Vintage Energy Credits  
(With Energy Waste Reduction Credits\*)**

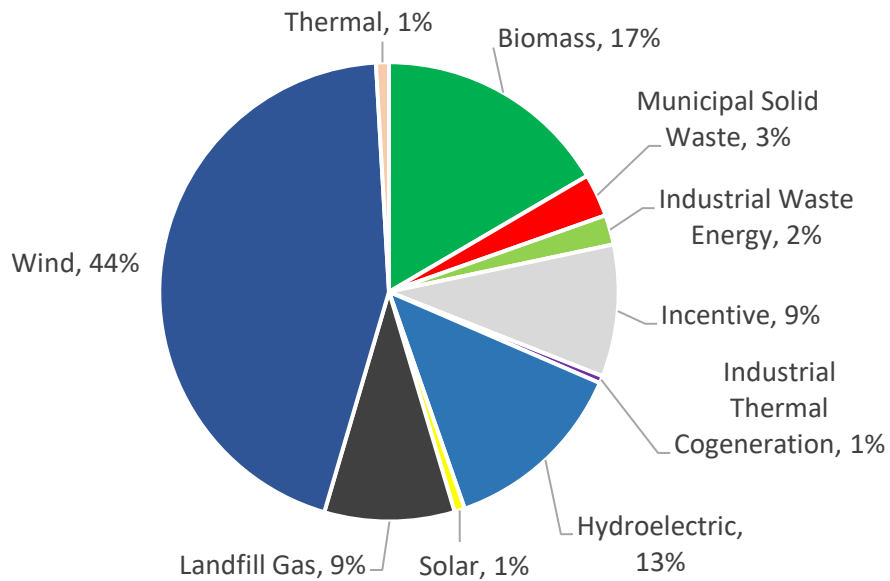
**145,110,248 Total Credits**



\*Energy waste reduction credits prior to 2017 are not included in this number.

**MIRECS 2009-2021 Vintage Energy Credits  
(Without Energy Waste Reduction Credits)**

**117,118,546 Total Credits**



The number of generating units within MIRECS decreased slightly throughout 2021. As of January 2022, there were 306 registered projects (generators) in MIRECS. MIRECS has 152 account holders which include electric service providers, generator owners, and others.

MIRECS is able to fully integrate with other tracking systems such as the Midwest Renewable Energy Tracking System (M-RETS), North American Renewables Registry (NAR) and, to a lesser extent, the North Carolina Renewable Energy Tracking System (NC-RETS) and PJM-Generation Attribute Tracking System (PJM-GATS). Generators registered with other tracking systems have, as of January 2022, registered 64 projects for the purpose of importing energy credits into MIRECS.

## Competition in Areas Served by Multiple Providers

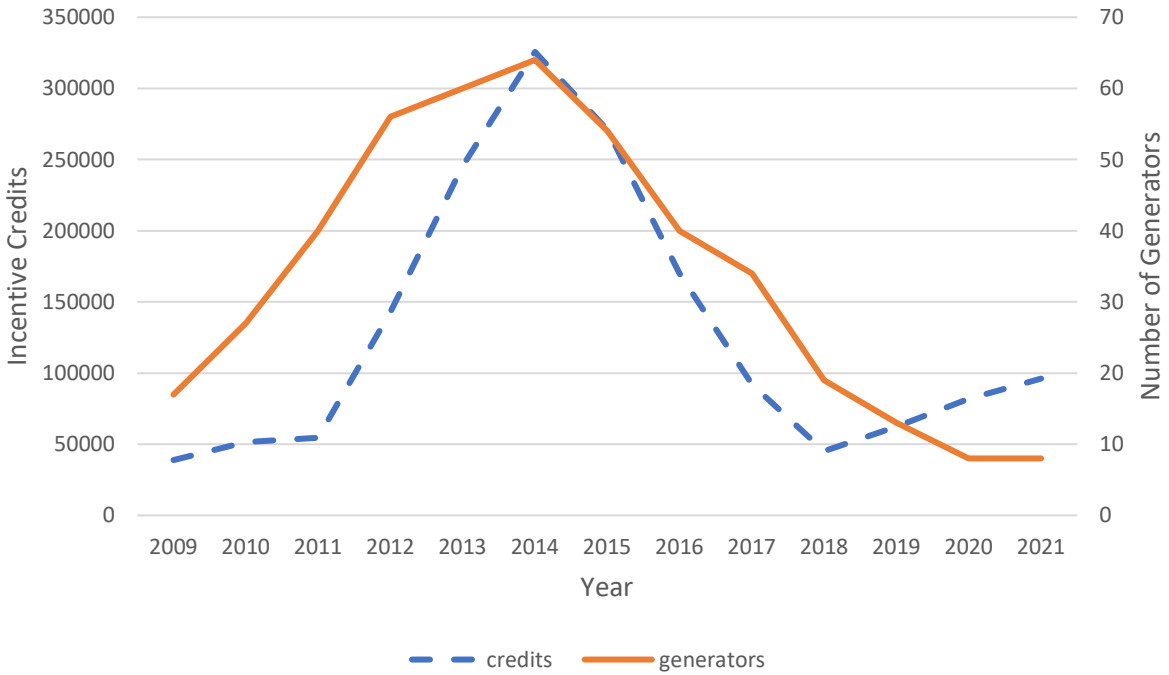
AESs are also required to meet the REC requirement contained in the Act, but not the separate capacity requirement that was applicable to Consumers Energy and DTE Electric as part of the former Section 27. Almost all AESs have indicated in their renewable energy plans and annual reports that they will purchase RECs to meet the renewable energy standard. Customer choice participation levels are at the maximum amount allowed by law and Consumers Energy and DTE Electric currently have customers waiting in the customer choice queue. Although there are no indications that the Act is creating an unfair competitive advantage between utilities and AESs, the two largest utilities and the all-requirements supplier for many of the cooperative utilities in Michigan have driven the expansion of renewable energy associated with complying with the statute.

## Impact of the Renewable Energy Standard on Employment

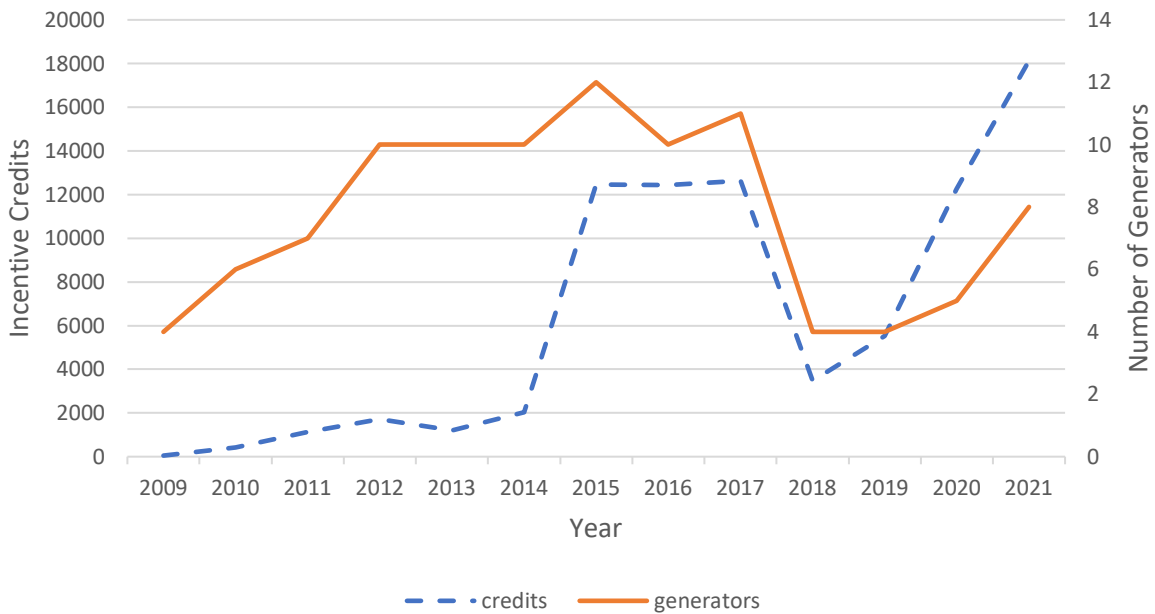
One purpose of PA 295 is to “provide improved air quality and other benefits to energy consumers and citizens of this state.” The clean and renewable energy sector continues to contribute to employment opportunities in Michigan.

Section 39 of PA 295 provides for Michigan Incentive RECs for renewable energy systems meeting certain criteria. For renewable energy systems constructed using a threshold level of Michigan labor, the amount of the incentive is one-tenth of a REC for each MWh generated during the first three years of commercial operation. The incentive for Michigan equipment is calculated in a similar manner. The Michigan specific incentive credits are shown in **Figures 8** and **9** below. The Michigan Equipment Incentive Credits usage has been increasing since 2018.

**Figure 8: Michigan Labor Incentive Credits 2009-2021**



**Figure 9: Michigan Equipment Incentive Credits 2009-2021**



Statewide, there has been significant investment in the renewable energy sector since the passage of PA 295 in 2008. Assuming an installed cost of \$2,000 per kW<sup>18</sup> for renewable energy projects with commercial operation dates through 2018, and \$1,500/kW<sup>19</sup> for projects with commercial operation dates in 2019 through 2021, over \$5.1 billion has been invested to bring approximately 2,828 MW<sup>20</sup> of new renewable energy projects on-line in Michigan.

The *Michigan Energy Cluster Workforce Analysis*, produced by the Michigan Bureau of Labor Market Information and Strategic Initiatives, tracked eight detailed industry sectors as a proxy for employment trends in the *Alternative and Renewable Energy* cluster.<sup>21</sup> The report's authors provided updated data which shows that this set of renewable energy related industries displayed job gains in Michigan from 6,775 jobs in 2005 to 9,380 jobs in the first quarter of 2021.<sup>22</sup> In 2019, the Bureau of Labor Market Information and Strategic Initiatives published a new report on the Michigan Energy Cluster.<sup>23</sup> The Commission will continue to monitor data on the impact of the renewable energy standard on employment in Michigan.

## The Cost of Renewable Energy Compared to the Cost of New Coal Energy

The Commission staff filed a letter in MPSC Case No. U-15800 to provide the required life cycle cost of electricity generated by a new conventional coal plant:

The Commission's temporary order implementing 2008 PA 295, MPSC Case Number U-15800, directed the staff to work with the providers to develop the required life cycle cost of electricity generated by a new conventional coal-fired facility in terms of a guidepost consisting of a levelized busbar rate, in \$/MWh, of an advanced-supercritical pulverized coal plant with a life cycle of 40 years. The Commission directed the staff to submit the number to the Commission by January 30, 2009. The staff worked diligently with the providers to develop the guidepost rate and found that the number is \$133 per MWh.<sup>24</sup>

This guidepost rate was derived from data provided to Consumers Energy as a result of the Company's inquiry into building a new 830 MW coal fired power facility and was adopted by all

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<sup>18</sup> DTE Electric reported an installed cost of \$2,225 to \$2,438 per kW for its Echo Wind Park contract approval application filed on August 10, 2012.

<sup>19</sup> Recently approved renewable projects have installed costs in the range of \$1,500/kW. <https://www.michigan.gov/documents/mpsc/Appendix E- Act 295 Contract Summary 680113 7.pdf>

<sup>20</sup> Reflects the projects developed under Act 295 by MPSC rate-regulated electric providers. This number does not include 67.5 MW of wind generation attributable to contracts filed by Indiana Michigan Power Company as these projects are outside of Michigan or 1.05 MW of hydro and anaerobic digester projects that were commercially operational prior to PA 295.

<sup>21</sup> See 2014 Cluster Workforce Updates – Energy: <http://milmi.org/Research/cluster-workforce-updates-2014>

<sup>22</sup> The report's author provided additional information to MPSC staff showing job data for the first quarter of 2021.

<sup>23</sup> <https://milmi.org/Research/michigan-industry-cluster-workforce-analysis-reports>

<sup>24</sup> Excerpt from Commission staff January 30, 2009 Guidepost Rate Letter, <https://mipsc.force.com/sfc/servlet.shepherd/version/download/068t0000000wNU3AAM>



electric providers. The Commission continues to find that the \$133 per MWh guidepost is reasonable.<sup>25</sup>

The costs of approved PA 295 renewable energy contracts are less than the levelized cost of \$133 per MWh guidepost rate with the exception of 14 MW of total capacity purchased at the beginning of the plan period.

The weighted average of levelized prices in **Table 3** reflect pricing and generation based on one year of each renewable energy project. The weighted average cost of solar for DTE Electric again decreased significantly from \$70.84 per MWh to \$55.90 per MWh. The combined weighted average of all Act 295 and IRP contracts approved since 2009 has decreased to \$64.01 per MWh.

**Table 3: Weighted Average Levelized Renewable Energy Contract Prices  
Contracts Approved 2009 – Present (\$ per MWh)**

| Technology                                      | Wind           | Digester        | Biomass        | Landfill       | Hydro           | Solar          |
|---|----------------|-----------------|----------------|----------------|-----------------|----------------|
| <b>Consumers Energy</b>                         |                |                 |                |                |                 |                |
| <b>Weighted Average</b>                         | \$65.99        | \$134.51        | NA             | \$107.24       | \$121.31        | \$55.23        |
| <b>DTE Electric</b>                             |                |                 |                |                |                 |                |
| <b>Weighted Average</b>                         | \$64.01        | NA              | \$98.94        | \$98.97        | NA              | \$55.90        |
| <b>Combined Weighted Avg.</b>                   | <b>\$64.84</b> | <b>\$134.51</b> | <b>\$98.94</b> | <b>\$99.90</b> | <b>\$121.31</b> | <b>\$55.52</b> |
| <b>Total Combined Weighted Average: \$64.01</b> |                |                 |                |                |                 |                |

## Cost-Effectiveness of the Renewable Energy Standard

Section 51(5)(e) of PA 295 requires an evaluation of the cost-effectiveness of the renewable energy standard. The actual cost of renewable energy contracts submitted to the Commission to date continues to show a downward pricing trend. Including both REP and VGP contracts, Consumers Energy has filed contracts with the Commission totaling approximately 1,372 MW, and DTE Electric totaling approximately 2,549 MW, as shown in **Appendix E**.

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<sup>25</sup> See MCL 460.1051(5)

Consumers Energy and DTE Electric have conducted 54 requests for proposals (RFPs) in total. During 2021, Consumers Energy conducted two RFPs and DTE Electric conducted one RFP. In total, Consumers Energy has conducted 26 RFPs and four requests for qualifications and DTE Electric has conducted 28 RFPs, two pre-qualification events, one solar solicitation of interest, a request for information, and an auction for 2009 and 2010 vintage RECs. Commission staff has reviewed competitive bidding activities through process audits. The purpose and design of the audits was to ensure that the companies followed the processes and procedures outlined in the Commission's December 4, 2008 Temporary Order in MPSC Case No. U-15800, Attachment D<sup>26</sup> and pursuant to the former Section 33 of PA 295. Details about each company's competitive bidding activities are shown in **Appendix F**.

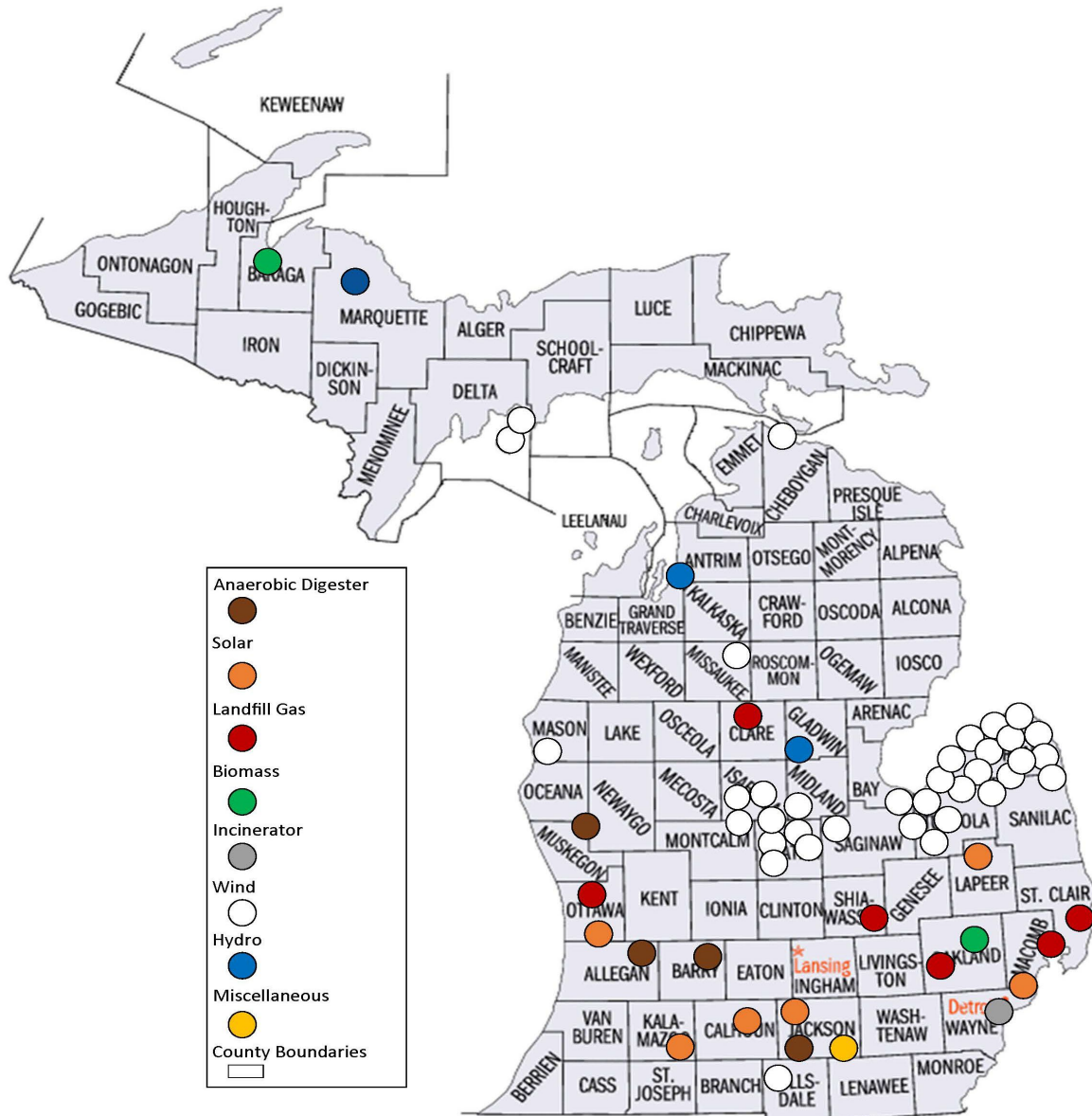
Pursuant to the former Section 37 of the Act and now Section 28, renewable energy power purchase and REC-only agreements entered into by any electric provider whose rates are regulated by the Commission must be submitted to the Commission for approval. **Appendix E** has been expanded to include PURPA and utility IRP contracts in addition to Act 295 renewable energy REP and VGP contracts that have been approved by the MPSC under PA 295 to date.

There has been significant renewable energy development as a result of PA 295. **Figure 10** shows the location of PA 295 renewable energy projects. Since 2009, wind energy has been the primary source of new renewable energy in Michigan, however, the number of PA 295 solar contracts is starting to grow and recent integrated resource plan filings for Consumers Energy and DTE Electric resulted in preferred courses of action with large quantities of solar. As of January 2022, including wind projects developed shortly before PA 295, wind projects developed by non-rate regulated electric providers, and wind projects developed under the PA 295 contract approval and cost recovery mechanisms, there were 3,102 MW (total includes 127 MW of utility scale projects that began operating prior to the Act) of utility-scale wind projects in operation in Michigan as shown on **Appendix G**. Two wind farms totaling 425 MW and eight solar projects totaling 868 MW are expected to begin operating in 2022. This is the first year solar additions are planned to outpace new wind projects.

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<sup>26</sup> <https://mi-psc.force.com/s/filing/a00t0000005pa5hAAA/u158000001>

Figure 10: Locations of PA 295 Renewable Energy Projects



Multiple Anaerobic Digester projects participating in Consumers Energy's Experimental Advanced Renewable Program are represented by a brown symbol at Jackson. Multiple Solar projects participating in Consumers Energy's Experimental Advanced Renewable Program are represented by a solar symbol placed at Jackson. Multiple Solar projects participating in DTE's SolarCurrents Program are represented by a solar symbol placed at Detroit. Alpena Power Company purchasing "bulk of RECs" from Consumers Energy represented by a yellow symbol placed at Jackson. DTE purchasing misc. RECs from UPPCo represented by a blue symbol placed at UPPCo's headquarters. Map shows renewable energy projects based on PA 295 contracts filed at the Michigan Public Service Commission.



## Effect of the Renewable Energy Subpart on Electricity Prices

PA 295 provides for the recovery of costs associated with complying with the renewable energy standard. As described in the 2013 report<sup>28</sup> on renewable energy released as part of the *Readying Michigan to Make Good Energy Decisions* information gathering process:

Act 295 renewable energy costs are recovered in two ways: the energy and capacity portion of the renewable energy is recovered pursuant to Sections 47 and 49 of the Act through the Power Supply Cost Recovery (PSCR) mechanism utilizing a transfer price schedule while the remaining or incremental portion of the renewable generation costs is recovered through a surcharge. The incremental cost of compliance represents the cost of renewable energy above and beyond the costs defined by transfer price schedules and recovered through the PSCR process. PSCR recovery is generally reserved for power purchase agreement recovery, fuel purchases and some Environmental Protection Agency regulation compliance costs. Sections 47 and 49 of the Act expanded the use of the PSCR mechanism to include the projected capacity, energy, and maintenance and operation costs, which is now called the transfer price. Transfer price schedules are representative of what a Michigan electric provider would pay had it obtained the energy and capacity (the non-renewable market price component) through a new long term power purchase agreement for traditional fossil fuel electric generation. To best determine the value of the non-renewable component of Act 295 compliant generation, Commission staff determined, for purposes of developing a uniform Transfer Price Schedule, that the levelized cost of a new natural gas combined cycle (NGCC) plant would likely be analogous to the market price mentioned above.<sup>29</sup>

For 2020, the average annual transfer price for DTE Electric was \$64.38 per MWh and the average annual transfer price for Consumers Energy was \$81.19 per MWh. The Act allows providers to recover the incremental costs of compliance with the renewable energy standard requirements through a renewable energy surcharge on customer bills. Commission approval of the renewable energy surcharge is only required for rate-regulated electric providers. Section 45 of the Act limits the retail rate impact (surcharge amount) of the renewable energy standard to the following:

- (a) \$3.00 per month per residential customer meter.
- (b) \$16.58 per month per commercial secondary customer meter.
- (c) \$187.50 per month per commercial primary or industrial customer meter.

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<sup>28</sup> [https://www.michigan.gov/documents/energy/renewable\\_final\\_438952\\_7.pdf](https://www.michigan.gov/documents/energy/renewable_final_438952_7.pdf)

<sup>29</sup> Refer to [Case No. U-15800](#) for more detailed information on the staff Transfer Price Schedule.

At the end of 2020, the only rate-regulated electric provider collecting a renewable energy surcharge on bills was Indiana Michigan Power Company. Additionally, there are three non-rate-regulated electric providers collecting renewable energy surcharges. Surcharge details can be found in **Appendix B**.

## Conclusion

This is the final report pursuant to Act 295. The Commission is pleased to note that all electric providers were able to achieve the renewable energy standard for 2020. The combined efforts of the electric providers, renewable energy project developers, communities hosting renewable energy projects, renewable energy advocates and many others have contributed to the effective implementation of Michigan's renewable energy standard. The renewable energy standard can be credited with the development of over 3,554 MW of new renewable energy projects. The weighted average price of renewable energy contracts approved by the Commission over the 2009 through 2021 time-period is \$64.01 per MWh, which is considerably less than forecasted in the initial 2009 renewable energy plans. Considering only 2020 contract approvals, the weighted average is \$47.93 per MWh.

Act 295 statutory REC requirements end with the 2021 compliance year. However, it is expected that the seven rate-regulated electric providers will continue to maintain at least a 15% REC portfolio. These electric providers are statutorily required to continue filing annual renewable energy cost reconciliation case filings through the end of the 20-year plan period in 2029. Due to the repeal of Section 51 effective January 1, 2023, the Commission will no longer receive renewable energy annual reports from the 40 municipal utilities, 10 cooperative utilities, and 11 AESs.

The Commission will continue tracking progress toward the combined goal of meeting Michigan's electric needs through a combination of 35% energy waste reduction and renewable energy by 2025 based on data filed in annual reports by rate-regulated electric providers.

## Appendix A - Renewable Energy Case Numbers and Electric Providers

|                                      | COMPANY   | Initial RE Plan Case # | Most Recent Plan Case # | 2019 Reconciliation Case #         | 2020 Reconciliation Case # |
|--------------------------------------|---|------------------------|-------------------------|------------------------------------|----------------------------|
| <b>Rate Regulated Utilities</b>      |   |                        |                         |                                    |                            |
| 1                                    | Alpena Power Company                              | U-15804                | U-18230                 | U-20721                            | U-21008                    |
| 2                                    | Consumers Energy Company                          | U-15805                | U-18231                 | U-20722                            | U-21009                    |
| 3                                    | DTE Electric Company                              | U-15806                | U-18232                 | U-20723                            | U-21010                    |
| 4                                    | Indiana Michigan Power Company                    | U-15808                | U-18233                 | U-20724                            | U-21011                    |
| 5                                    | Northern States Power Company-Wisconsin           | U-15809                | U-18234                 | U-20725                            | U-21012                    |
| 6                                    | Upper Peninsula Power Company                     | U-15810                | U-18235                 | U-20726                            | U-21013                    |
| 7                                    | Upper Michigan Energy Resources Corporation       |                        | U-18236                 | U-20727                            | U-21014                    |
|                                      | Wisconsin Public Service Corporation              | U-15811                |                         |                                    |                            |
|                                      | Wisconsin Electric Power Company                  | U-15812                | U-18237                 | U-20489 (15 mo period thru 3/2019) |                            |
| <b>Member Regulated Cooperatives</b> |   |                        |                         | <b>Not Required</b>                |                            |
| 8                                    | Alger Delta Cooperative Electric Association      | U-15813                | U-16589                 |                                    |                            |
| 9                                    | Bayfield Electric Cooperative                     | U-15814                | U-16590                 |                                    |                            |
| 10                                   | Cherryland Electric Cooperative                   | U-15815                | U-16591                 |                                    |                            |
| 11                                   | Cloverland Electric Cooperative/Edison Sault      | U-15816                | U-17799                 |                                    |                            |
| 12                                   | Great Lakes Energy Cooperative (2012)             | U-15817                | U-16593                 |                                    |                            |
| 13                                   | Midwest Energy Cooperative                        | U-15818                | U-16594                 |                                    |                            |
| 14                                   | Ontonagon Co. Rural Electrification Assoc. (2012) | U-15819                | U-16595                 |                                    |                            |
| 15                                   | Presque Isle Electric and Gas Co-op (2012)        | U-15820                | U-16596                 |                                    |                            |
| 16                                   | Thumb Electric Cooperative                        | U-15821                | U-16598                 |                                    |                            |
| 17                                   | Tri-County Electric Cooperative                   | U-15822                | U-17801                 |                                    |                            |
| <b>Municipal Utilities</b>           |   |                        |                         | <b>Not Required</b>                |                            |
| 18                                   | Village of Baraga                                 | U-15848                | U-16599                 |                                    |                            |
| 19                                   | City of Bay City                                  | U-15849                | U-16600                 |                                    |                            |
| 20                                   | City of Charlevoix                                | U-15850                | U-16601                 |                                    |                            |
| 21                                   | Chelsea Department of Electric and Water          | U-15851                | U-16602                 |                                    |                            |
| 22                                   | Village of Clinton                                | U-15852                | U-16603                 |                                    |                            |
| 23                                   | Coldwater Board of Public Utilities               | U-15853                | U-16604                 |                                    |                            |
| 24                                   | Croswell Municipal Light & Power Department       | U-15854                | U-16605                 |                                    |                            |
| 25                                   | City of Crystal Falls                             | U-15855                | U-16606                 |                                    |                            |
| 26                                   | Daggett Electric Department                       | U-15856                | U-16607                 |                                    |                            |
| 27                                   | City of Dowagiac                                  | U-15858                | U-16609                 |                                    |                            |
| 28                                   | City of Eaton Rapids                              | U-15859                | U-16610                 |                                    |                            |
| 29                                   | City of Escanaba                                  | U-15860                | U-16611                 |                                    |                            |
| 30                                   | City of Gladstone                                 | U-15861                | U-16612                 |                                    |                            |
| 31                                   | Grand Haven Board of Light and Power              | U-15862                | U-16613                 |                                    |                            |
| 32                                   | City of Harbor Springs                            | U-15863                | U-16614                 |                                    |                            |
| 33                                   | City of Hart Hydro                                | U-15864                | U-16615                 |                                    |                            |
| 34                                   | Hillsdale Board of Public Utilities               | U-15865                | U-16616                 |                                    |                            |
| 35                                   | Holland Board of Public Works                     | U-15866                | U-16617                 |                                    |                            |
| 36                                   | Village of L'Anse                                 | U-15867                | U-16618                 |                                    |                            |
| 37                                   | Lansing Board of Water & Light                    | U-15868                | U-16619                 |                                    |                            |
| 38                                   | Lowell Light and Power                            | U-15869                | U-16620                 |                                    |                            |
| 39                                   | Marquette Board of Light and Power                | U-15870                | U-16621                 |                                    |                            |
| 40                                   | Marshall Electric Department                      | U-15871                | U-16622                 |                                    |                            |
| 41                                   | Negaunee Department of Public Works               | U-15872                | U-16623                 |                                    |                            |
| 42                                   | Newberry Water and Light Board                    | U-15873                | U-16624                 |                                    |                            |
| 43                                   | Niles Utility Department                          | U-15874                | U-16625                 |                                    |                            |
| 44                                   | City of Norway                                    | U-15875                | U-16626                 |                                    |                            |
| 45                                   | City of Paw Paw                                   | U-15876                | U-16627                 |                                    |                            |
| 46                                   | City of Petoskey                                  | U-15877                | U-16628                 |                                    |                            |
| 47                                   | City of Portland                                  | U-15878                | U-16629                 |                                    |                            |
| 48                                   | City of Sebewaing                                 | U-15879                | U-16630                 |                                    |                            |
| 49                                   | City of South Haven                               | U-15880                | U-16631                 |                                    |                            |
| 50                                   | City of St. Louis                                 | U-15881                | U-16632                 |                                    |                            |
| 51                                   | City of Stephenson                                | U-15882                | U-16633                 |                                    |                            |
| 52                                   | City of Sturgis                                   | U-15883                | U-16634                 |                                    |                            |
| 53                                   | Traverse City Light & Power                       | U-15884                | U-16635                 |                                    |                            |
| 54                                   | Union City Electric Department                    | U-15885                | U-16636                 |                                    |                            |
| 55                                   | City of Wakefield                                 | U-15886                | U-16637                 |                                    |                            |
| 56                                   | Wyandotte Department of Municipal Service         | U-15887                | U-16638                 |                                    |                            |
| 57                                   | Zeeland Board of Public Works                     | U-15888                | U-16639                 |                                    |                            |

## Appendix A - Renewable Energy Case Numbers and Electric Providers

|   | COMPANY  | Initial RE Plan Case #      | Most Recent Plan Case # | 2019 Reconciliation Case # | 2020 Reconciliation Case # |
|---|--|-----------------------------|-------------------------|----------------------------|----------------------------|
| <b>Alternative Electric Suppliers (AES) Serving Customers</b>               |  |                             |                         | <b>Not Required</b>        |                            |
| 58  | Calpine Energy Solutions f/k/a Noble Americas Energy Solutions LLC     | U-15843                     | U-16650                 |                            |                            |
| 59  | CMS ERM Michigan LLC   | U-15826                     | U-16640                 |                            |                            |
| 60  | Constellation NewEnergy Inc  | U-15829                     | U-16642                 |                            |                            |
| 61  | Direct Energy Business LLC   | U-15845                     | U-16643                 |                            |                            |
| 62  | Energy Harbor, LLC f/k/a FirstEnergy Solutions Corp                    | U-15832                     | U-16644                 |                            |                            |
| 63  | Just Energy Inc f/k/a Commerce Energy                                  | U-15828                     | U-16641                 |                            |                            |
| 64  | Spartan Renewable Energy Inc   | U-15844                     | U-16651                 |                            |                            |
| 65  | Wolverine Power Marketing Cooperative Inc                              | U-15847                     | U-16653                 |                            |                            |
| <b>Alternative Electric Suppliers (AES) Not Serving Customers</b>           |  |                             |                         | <b>Not Required</b>        |                            |
| 67  | AEP Energy, Inc  | U-15825                     | U-15825                 |                            |                            |
| 68  | Dillon Power, LLC  | U-17769                     | U-17769                 |                            |                            |
| 69  | Direct Energy Services LLC   | U-15830                     | U-15830                 |                            |                            |
| 70  | EDF Energy Services  | U-18037                     | U-18037                 |                            |                            |
| 71  | Eligo Energy MI, LLC   | U-17885                     | U-17885                 |                            |                            |
| 72  | Energy Int'l Power Marketing d/b/a PowerOne                            | U-15831                     | U-15831                 |                            |                            |
| 73  | Energy Services Providers, Inc. d/b/a Michigan Gas & Electric          | U-17010                     | U-17010                 |                            |                            |
| 74  | Interstate Gas Supply, Inc d/b/a IGS Energy                            | U-17338                     | U-17338                 |                            |                            |
| 75  | Liberty Power Delaware   | U-15834                     | U-15834                 |                            |                            |
| 76  | Libery Power Holdings LLC  | U-15835                     | U-15835                 |                            |                            |
| 77  | MidAmerican Energy Services  | U-17934                     | U-17934                 |                            |                            |
| 78  | Nordic Energy Services, LLC  | U-18066                     | U-18066                 |                            |                            |
| 79  | Plymouth Rock Energy LLC   | U-17549                     | U-17549                 |                            |                            |
| 80  | Texas Retail Energy, LLC   | U-17168                     | U-17168                 |                            |                            |
| 81  | U.P. Power Marketing LLC   | U-16586                     | U-16652                 |                            |                            |
| <b>Alternative Electric Suppliers (AES) Licenses Rescinded</b>              |  |                             |                         | <b>Not Required</b>        |                            |
|   | Constellation Energy Services, Inc. (Formally Integrys)                | License Surrender 11/1/2018 |                         |                            |                            |
|   | Dynegy Energy Services (East), LLC (Formally Duke Energy               | License Rescinded 05/2016   |                         |                            |                            |
|   | Energy.me Midwest, LLC d/b/a energy.me                                 | License Rescinded 04/2016   |                         |                            |                            |
|   | Glacial Energy of Illinois   | License Rescinded 02/2016   |                         |                            |                            |
|   | Lakeshore Energy Services, LLC d/b/a CenterPoint Energy Service Retail | License Rescinded 05/2016   |                         |                            |                            |
|   | MidAmerican Energy Company   | License Rescinded 08/2016   |                         |                            |                            |
|   | Premier Energy Marketing LLC   | License Rescinded 2/26/2018 |                         |                            |                            |
|   | Santanna   | License Rescinded 03/2016   |                         |                            |                            |
|   | Term Power & Gas, LLC d/b/a ENCOA                                      | License Rescinded 11/2014   |                         |                            |                            |
|   |  |                             |                         |                            |                            |
| <b>Rate Regulated Renewable Energy Voluntary Green Pricing Case Numbers</b> |  |                             |                         |                            |                            |
|   | COMPANY  | 2017-2018 Cycle             | 2019-2020 Cycle         | 2021-2022 Cycle            |                            |
| 1   | Alpena Power Company   | U-18350                     | U-18350                 | U-18350                    |                            |
| 2   | Consumers Energy Company   | U-18351                     | U-20649                 |                            |                            |
| 3   | DTE Electric Company   | U-18352                     | U-20713                 | U-21172                    |                            |
| 4   | Indiana Michigan Power Company   | U-18353                     | U-18353                 | U-18353                    |                            |
| 5   | Northern States Power Company-Wisconsin                                | U-18354                     | U-20638                 | U-21173                    |                            |
| 6   | Upper Peninsula Power Company  | U-18355                     | U-20652                 | U-21152                    |                            |
| 7   | Upper Michigan Energy Resources Corporation                            | U-18356                     | U-18356                 | U-18356                    |                            |



## Appendix B - Renewable Energy Credit Requirements and Renewable Energy Plan Summary

| Company                                    | 2019 Compliance Year Sales* | Retail Sales Method** | 2020 REC Requirement | 2020 Excess RECs Retired | 2020 EWR Credit Substitutions | Met the 2020 Standard | Current Residential Surcharge \$/Month |
|--|-----------------------------|-----------------------|----------------------|--------------------------|-------------------------------|-----------------------|--|
| <b>Rate Regulated Utilities</b>            |                             |                       |                      |                          |                               |                       |  |
| Alpena Power                               | 333,474                     | 3Y                    | 43,426               | 0                        | 0                             | Yes                   |  |
| Consumers Energy                           | 32,707,947                  | 3Y                    | 4,168,550            | 0                        | 52,168                        | Yes                   |  |
| DTE Electric                               | 42,072,635                  | W                     | 5,211,845            | 0                        | 14,222                        | Yes                   |  |
| Indiana Michigan                           | 2,523,075                   | W                     | 315,384              | 0                        | 0                             | Yes                   | 3.00                                   |
| NSP-Wisc (Xcel)                            | 139,243                     | 3y                    | 17,375               | 0                        | 0                             | Yes                   |  |
| Upper Michigan Energy Resource Corporation |                             |                       |                      |                          |                               |                       |  |
| UMERC - WPSC Rate Zone                     | 272,513                     | 3Y                    | 33,155               | 0                        | 0                             | Yes                   |  |
| UMERC - WEPCO Rate Zone                    | 344,990                     | 3Y                    | 44,447               | 0                        | 0                             | Yes                   |  |
| Upper Peninsula Power                      | 767,093                     | 3Y                    | 92,754               | 0                        | 0                             | Yes                   |  |

|                                      |           |    |         |   |   |     |  |
|--------------------------------------|-----------|----|---------|---|---|-----|--|
| <b>Member Regulated Cooperatives</b> |           |    |         |   |   |     |  |
| Alger Delta Coop Elec                | 75,981    | 3Y | 9,851   | 0 | 0 | Yes |  |
| Bayfield Elec. Coop                  | 174       | 3Y | 22      | 0 | 0 | Yes |  |
| Cherryland Elec Coop                 | 397,436   | 3Y | 49,620  | 0 | 0 | Yes |  |
| Cloverland Electric Coop             | 716,233   | 3Y | 89,419  | 0 | 0 | Yes |  |
| Great Lakes Energy Coop              | 1,539,061 | 3Y | 185,465 | 0 | 0 | Yes |  |
| Midwest Energy Coop                  | 590,526   | 3Y | 75,317  | 0 | 0 | Yes |  |
| Ontonagon Co. Rural Elec.            | 24,437    | 3Y | 3,044   | 0 | 0 | Yes |  |
| Presque Isle Elec & Coop             | 245,784   | 3Y | 30,423  | 0 | 0 | Yes |  |
| Tri-County Elec. Coop                | 348,706   | 3Y | 43,485  | 0 | 0 | Yes |  |
| Thumb Elec. Coop                     | 172,849   | 3Y | 21,358  | 0 | 0 | Yes |  |

## Appendix B - Renewable Energy Credit Requirements and Renewable Energy Plan Summary

| Company                                | 2019 Compliance Year Sales* | Retail Sales Method** | 2020 REC Requirement | 2020 Excess RECs Retired | 2020 EWR Credit Substitutions | Met the 2020 Standard | Current Residential Surcharge \$/Month |
|--|-----------------------------|-----------------------|----------------------|--------------------------|-------------------------------|-----------------------|--|
| <b>Municipal Utilities</b>             |                             |                       |                      |                          |                               |                       |  |
| Village of Baraga                      | 19,508                      | 3Y                    | 2,429                | 0                        | 0                             | Yes                   |  |
| City of Bay City                       | 306,720                     | 3Y                    | 38,812               | 0                        | 0                             | Yes                   |  |
| City of Charlevoix                     | 56,658                      | 3Y                    | 7,166                | 0                        | 0                             | Yes                   |  |
| Chelsea Dept. of Electric & Water      | 105,122                     | 3Y                    | 12,406               | 0                        | 0                             | Yes                   |  |
| Village of Clinton                     | 21,932                      | 3Y                    | 2,906                | 0                        | 0                             | Yes                   |  |
| Coldwater Board of Public Utilities    | 509,840                     | 3Y                    | 60,237               | 0                        | 0                             | Yes                   |  |
| Croswell Municipal Light & Power Dept. | 38,710                      | 3Y                    | 4,497                | 153                      | 0                             | Yes                   | 0.11                                   |
| City of Crystal Falls                  | 16,531                      | 3Y                    | 2,028                | 0                        | 0                             | Yes                   |  |
| Daggett Electric Department            | 1,451                       | 3Y                    | 190                  | 0                        | 0                             | Yes                   |  |
| City of Dowagiac                       | 58,640                      | 3Y                    | 7,729                | 0                        | 0                             | Yes                   |  |
| City of Eaton Rapids                   | 92,752                      | 3Y                    | 12,052               | 0                        | 0                             | Yes                   |  |
| City of Escanaba                       | 132,545                     | 3Y                    | 16,804               | 0                        | 0                             | Yes                   |  |
| City of Gladstone                      | 31,411                      | 3Y                    | 3,901                | 0                        | 0                             | Yes                   |  |
| Grand Haven Board of Light & Power     | 294,782                     | 3Y                    | 37,135               | 0                        | 0                             | Yes                   |  |
| City of Harbor Springs                 | 39,746                      | 3Y                    | 4,990                | 0                        | 0                             | Yes                   |  |
| City of Hart                           | 46,692                      | 3Y                    | 5,865                | 0                        | 0                             | Yes                   |  |
| Hillsdale Board of Public Utilities    | 120,973                     | 3Y                    | 15,264               | 0                        | 0                             | Yes                   |  |
| Holland Board of Public Works          | 1,100,492                   | 3Y                    | 137,530              | 0                        | 0                             | Yes                   |  |
| Village of L'anse                      | 12,077                      | 3Y                    | 1,492                | 0                        | 0                             | Yes                   |  |
| Lansing Board of Water & Light         | 2,017,490                   | 3Y                    | 259,768              | 0                        | 0                             | Yes                   |  |
| Lowell Light & Power                   | 77,008                      | 3Y                    | 9,637                | 0                        | 0                             | Yes                   | 3.00                                   |
| Marquette Board of Light & Power       | 277,643                     | 3Y                    | 35,345               | 0                        | 0                             | Yes                   |  |
| Marshall Electric Department           | 104,080                     | 3Y                    | 13,094               | 0                        | 0                             | Yes                   |  |
| Negaunee Dept. of Public Works         | 21,138                      | 3Y                    | 2,653                | 0                        | 0                             | Yes                   |  |
| Newberry Water and Light Board         | 17,170                      | 3Y                    | 2,044                | 0                        | 0                             | Yes                   |  |
| Niles Utilities Department             | 123,404                     | 3Y                    | 15,257               | 0                        | 0                             | Yes                   |  |
| City of Norway                         | 23,181                      | 3y                    | 2,931                | 0                        | 0                             | Yes                   |  |
| Village of Paw Paw                     | 39,048                      | 3Y                    | 4,984                | 0                        | 0                             | Yes                   |  |
| City of Petoskey                       | 97,689                      | 3Y                    | 12,559               | 0                        | 0                             | Yes                   |  |
| City of Portland                       | 34,062                      | 3Y                    | 4,290                | 0                        | 0                             | Yes                   |  |
| City of Sebewaing                      | 41,323                      | 3Y                    | 5,275                | 0                        | 0                             | Yes                   | 0.87                                   |
| City of South Haven                    | 145,572                     | 3Y                    | 17,283               | 0                        | 0                             | Yes                   |  |
| City of St. Louis                      | 39,521                      | 3Y                    | 5,205                | 0                        | 0                             | Yes                   |  |
| City of Stephenson                     | 6,280                       | 3Y                    | 776                  | 0                        | 0                             | Yes                   |  |
| City of Sturgis                        | 211,577                     | 3Y                    | 27,126               | 0                        | 0                             | Yes                   |  |
| Traverse City Light & Power            | 311,489                     | 3Y                    | 40,462               | 0                        | 0                             | Yes                   |  |
| Union City Electric Department         | 15,463                      | 3Y                    | 1,943                | 0                        | 0                             | Yes                   |  |
| City of Wakefield                      | 12,440                      | 3Y                    | 1,557                | 0                        | 0                             | Yes                   |  |
| Wyandotte Dept. of Muncipal Service    | 292,720                     | 3Y                    | 37,111               | 0                        | 0                             | Yes                   |  |

## Appendix B - Renewable Energy Credit Requirements and Renewable Energy Plan Summary

| Company                       | 2019 Compliance<br>Year Sales* | Retail Sales<br>Method** | 2020 REC<br>Requirement | 2020 Excess<br>RECs Retired | 2020 EWR<br>Credit<br>Substitutions | Met the 2020<br>Standard | Current<br>Residential<br>Surcharge<br>\$/Month |
|-------------------------------|--------------------------------|--------------------------|-------------------------|-----------------------------|-------------------------------------|--------------------------|---|
| Zeeland Board of Public Works | 408,957                        | 3Y                       | 50,043                  | 0                           | 0                                   | Yes                      |   |

| Alternative Electric Suppliers                 |                  |    |                  |              |  |     |  |
|--|------------------|----|------------------|--------------|--|-----|--|
| Calpine Energy Solutions, LLC f/k/a Noble      |                  |    |                  |              |  |     |  |
| Americas Energy Solutions                      |                  | W  |                  |              |  | Yes |  |
| CMS ERM Michigan                               |                  | 3Y |                  |              |  | Yes |  |
| Constellation NewEnergy                        |                  | W  |                  |              |  | Yes |  |
| Direct Energy Business                         |                  | W  |                  |              |  | Yes |  |
| Energy Harbor LLC f/k/a First Energy Solutions |                  | W  |                  |              |  | Yes |  |
| Just Energy Inc f/k/a Commerce Energy          |                  | W  |                  |              |  | Yes |  |
| Spartan Renewable Energy                       |                  | 3Y |                  |              |  | Yes |  |
| Wolverine Power Marketing Cooperative          |                  | 3Y |                  |              |  | Yes |  |
| <b>Aggregated Totals</b>                       | <b>9,112,071</b> |    | <b>1,130,975</b> | <b>2,912</b> |  |     |  |

|               |                   |  |                   |              |               |  |  |
|---------------|-------------------|--|-------------------|--------------|---------------|--|--|
| <b>Totals</b> | <b>99,708,065</b> |  | <b>12,488,691</b> | <b>3,065</b> | <b>66,390</b> |  |  |
|---------------|-------------------|--|-------------------|--------------|---------------|--|--|

|  |              |  |                   |                     |
|--|--------------|--|-------------------|---------------------|
| <b>Renewable % Based on Credits retired for<br/>2020</b> | <b>12.6%</b> |  | <b>12,491,756</b> | <b>RECS Retired</b> |
|--|--------------|--|-------------------|---------------------|

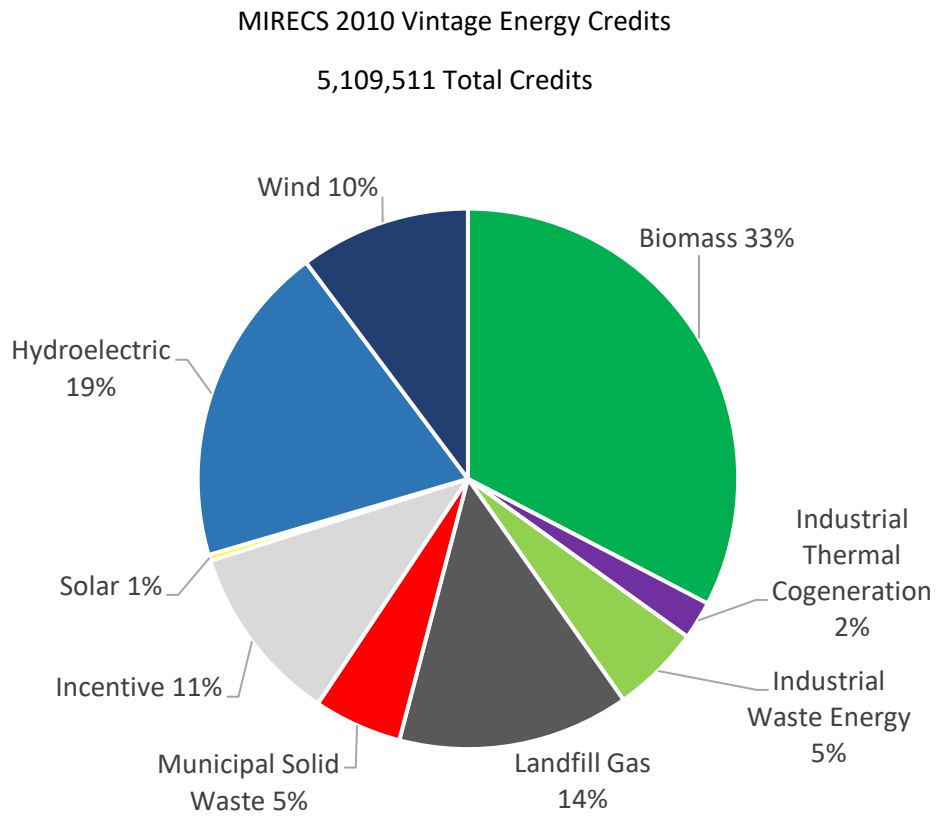
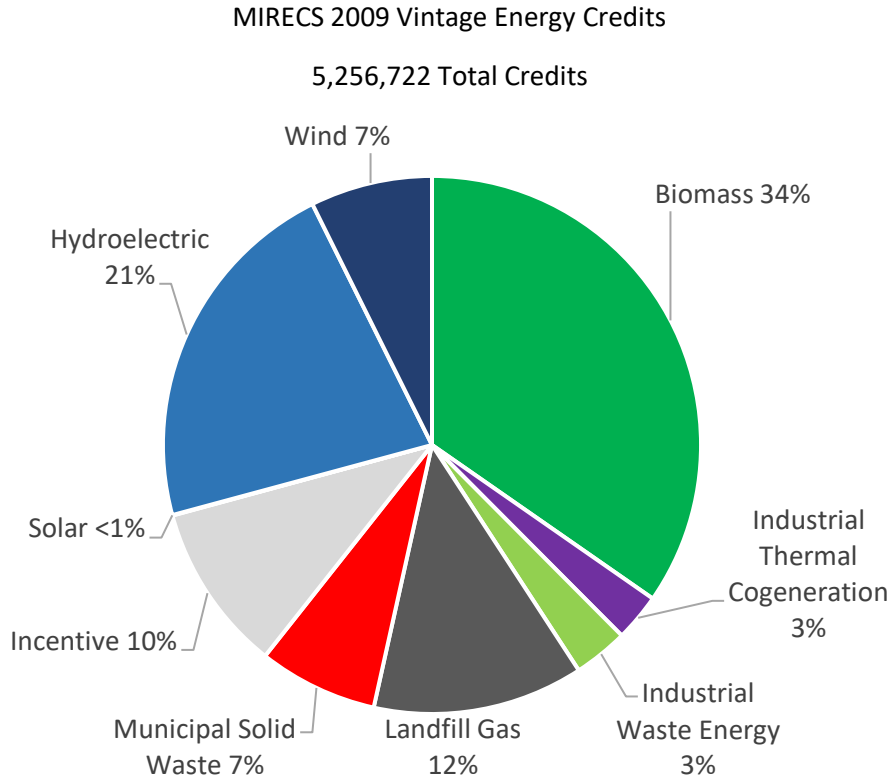
**Appendix C - ELECTRIC PROVIDER RENEWABLE ENERGY ANNUAL REPORT SUMMARY**

**2020 Reporting Year**

| Company Name  | 2020 Generated or Acquired (RECs) | Energy Credits Sold in 2020 (RECs) | 2009-2019 Reported Incremental Cost of Compliance (\$) | 2020 Reported Incremental Cost of Compliance (\$) | Remaining Anticipated Incremental Cost of Compliance (\$) | Total Plan Period Anticipated Incremental Cost of Compliance (Prior Years plus Anticipated) (\$) |
|---|-----------------------------------|------------------------------------|--|---|---|--|
| <b>Rate Regulated Utilities:</b>  |                                   |                                    |  |   |   |  |
| Alpena Power Company  | 10,300                            | 0                                  | 3,074,085  | 53,324  | 0   | 3,127,409  |
| Consumers Energy Company  | 3,232,861                         | 10,300                             | 202,768,171  | 14,200,000  | 18,570,000  | 235,538,171  |
| DTE Electric Company  | 4,697,877                         | 0                                  | 416,592,042  | 33,158,865  | 8,243,640   | 457,994,547  |
| Indiana Michigan Power Company  | 339,818                           | 34,032                             | 15,170,541   | 5,379,970   | 25,074,210  | 45,624,721   |
| Northern States Power Company   | 42,158                            | 0                                  | 0  | 0   | 0   | 0  |
| Upper Peninsula Power Company   | 233,641                           | 26,970                             | 0  | 0   | 0   | 0  |
| Upper Michigan Energy Resource Corporation                              |                                   |                                    |  |   |   |  |
| UMERC - WPSC Rate Zone  | 0                                 | 0                                  | 0  | 0   | 0   | 0  |
| UMERC - WEPCO Rate Zone   | 0                                 | 0                                  | 1,480,779  | 0   | 0   | 1,480,779  |
|   | <b>8,556,655</b>                  | <b>71,302</b>                      | <b>639,085,618</b>                                     | <b>52,792,159</b>                                 | <b>51,887,850</b>   | <b>743,765,627</b>   |
| <b>Member Regulated Cooperatives:</b>                                   |                                   |                                    |  |   |   |  |
| Alger Delta Cooperative Electric Association                            | 10,180                            | 0                                  | 0  | 0   | 0   | 0  |
| Bayfield Electric Cooperative   | 0                                 | 22                                 | 255  | 0   | 0   | 255  |
| Cherryland Electric Cooperative   | 53,232                            | 0                                  | 0  | 0   | 0   | 0  |
| Cloverland Electric Cooperative   | 420,031                           | 79510                              | 0  | 0   | 0   | 0  |
| Great Lakes Energy Cooperative  | 206,253                           | 0                                  | 0  | 0   | 0   | 0  |
| Homeworks Tri-County Electric Cooperative                               | 47,839                            | 0                                  | 0  | 0   | 0   | 0  |
| Midwest Energy Cooperative  | 75,804                            | 0                                  | 0  | 0   | 0   | 0  |
| Ontonagon County Rural Electrification Association                      | 0                                 | 0                                  | 0  | 0   | 0   | 0  |
| Presque Isle Electric and Gas Co-op                                     | 32,512                            | 0                                  | 0  | 0   | 0   | 0  |
| Thumb Electric Cooperative  | 0                                 | 0                                  | 0  | 0   | 0   | 0  |
|   | <b>845,851</b>                    | <b>79,532</b>                      | <b>255</b>   | <b>0</b>  | <b>0</b>  | <b>255</b>   |
| <b>Municipal Utilities:</b>   |                                   |                                    |  |   |   |  |
| City of Bay City  | 43,496                            | 0                                  | 4,336,711  | 0   | 0   | 4,336,711  |
| City of Charlevoix  | 5,942                             | 0                                  | 748,040  | 0   | 0   | 748,040  |
| City of Crystal Falls   | 8,345                             | 0                                  | 0  | 0   | 0   | 0  |
| City of Dowagiac  | 8,059                             | 0                                  | 7,146  | 0   | 0   | 7,146  |
| City of Eaton Rapids  | 4,783                             | 0                                  | 1,125,456  | 0   | 0   | 1,125,456  |
| City of Escanaba  | 1,568                             | 0                                  | 64,771   | 48,211  | 688,838   | 801,820  |
| City of Gladstone   | 3,879                             | 0                                  | 0  | 0   | 0   | 0  |
| City of Harbor Springs  | 5,943                             | 0                                  | 21,190   | 0   | 0   | 21,190   |
| City of Hart Hydro  | 4,884                             | 0                                  | 10,595   | 0   | 0   | 10,595   |
| City of Norway  | 35,756                            | 42,499                             | 0  | 0   | 0   | 0  |
| City of Petoskey  | 11,888                            | 0                                  | 1,020,225  | 0   | 0   | 1,020,225  |
| City of Portland  | 4,128                             | 0                                  | 211,576  | 0   | 0   | 211,576  |
| City of Sebawaing   | 0                                 | 0                                  | 37,098   | 14,591  | 195,368   | 247,057  |
| City of South Haven   | 17,097                            | 0                                  | 7,719  | 0   | 0   | 7,719  |
| City of St. Louis   | 2,602                             | 0                                  | 256,381  | 0   | 0   | 256,381  |
| City of Stephenson  | 462                               | 0                                  | 0  | 0   | 0   | 0  |
| City of Sturgis   | 34,503                            | 0                                  | 12,051   | 0   | 0   | 12,051   |
| City of Wakefield   | 1,815                             | 0                                  | 0  | 0   | 0   | 0  |
| Chelsea Dept of Electric & Water  | 3,564                             | 0                                  | 716,820  | 0   | 0   | 716,820  |
| Coldwater Board of Public Utilities*                                    | 58,817                            | 0                                  | 3,411  | 0   | 0   | 3,411  |
| Crosswell Municipal Light & Power Dept                                  | 8,254                             | 0                                  | 23,803   | 10,619  | 126,334   | 160,756  |
| Daggett Electric Dept   | 87                                | 0                                  | 1,905  | 0   | 0   | 1,905  |
| Grand Haven Board of Light & Power                                      | 30,320                            | 0                                  | 3,051,951  | 0   | 0   | 3,051,951  |
| Hillsdale Board of Public Utilities*                                    | 58,817                            | 0                                  | 1,473  | 0   | 0   | 1,473  |
| Holland Board of Public Works   | 89,213                            | 0                                  | 6,352,628  | 0   | 0   | 6,352,628  |
| Lansing Board of Water & Light  | 360,220                           | 1,224                              | 24,855,521   | 1,883,881   | 3,063,005   | 29,802,407   |
| Lowell Light & Power  | 8,315                             | 0                                  | 2,339,792  | 264,570   | 1,835,976   | 4,440,338  |
| Marquette Board of Light & Power  | 20,051                            | 0                                  | 42,175   | 0   | 0   | 42,175   |
| Marshall Electric Dept*   | 58,817                            | 0                                  | 7,186  | 0   | 0   | 7,186  |
| Negaunee Dept of Public Works   | 2,674                             | 0                                  | 0  | 0   | 0   | 0  |
| Newberry Water & Light Board  | 4,510                             | 0                                  | 2,173,289  | 0   | 0   | 2,173,289  |
| Niles Utility Dept  | 15,557                            | 0                                  | 7,529  | 0   | 0   | 7,529  |
| Traverse City Light & Power   | 26,420                            | 0                                  | 0  | 0   | 0   | 0  |
| Union City Electric Dept*   | 58,817                            | 0                                  | 506  | 0   | 0   | 506  |
| Village of Baraga   | 2,359                             | 0                                  | 0  | 0   | 0   | 0  |
| Village of Clinton*   | 58,817                            | 0                                  | 269  | 0   | 0   | 269  |
| Village of L'Anse   | 1,493                             | 0                                  | 0  | 0   | 0   | 0  |
| Village of Paw Paw  | 5,066                             | 0                                  | 2,505  | 0   | 0   | 2,505  |
| Wyandotte Dept of Municipal Service                                     | 25,528                            | 0                                  | 1,694,896  | 0   | 0   | 1,694,896  |
| Zeeland Board of Public Works   |                                   |                                    | 1,747,046  |   | 0   | 1,747,046  |
|   | <b>1,092,866</b>                  | <b>43,723</b>                      | <b>50,881,664</b>                                      | <b>2,221,872</b>                                  | <b>5,909,521</b>  | <b>59,013,057</b>  |
| <b>Combined Annual Report*</b>  |                                   |                                    |  |   |   |  |
| <b>Alternative Electric Suppliers:</b>                                  |                                   |                                    |  |   |   |  |
| Calpine Energy Solutions, LLC f/k/a Noble Americas Energy Solutions LLC |                                   |                                    |  |   |   |  |
| CMS ERM Michigan LLC  | 25,411                            | 0                                  | 53,000   | 0   | 400,000   | 493,000  |
| Constellation NewEnergy Inc   |                                   |                                    |  |   |   |  |
| Direct Energy Business LLC  |                                   |                                    |  |   |   |  |
| Energy Harbor (Formally FirstEnergy Solutions Corp)                     |                                   |                                    |  |   |   |  |
| Just Energy Solutions Inc. (Foramly Commerce)                           |                                   |                                    |  |   |   |  |
| Spartan Renewable Energy Inc  |                                   |                                    |  |   |   |  |
| Wolverine Power Marketing Cooperative Inc                               |                                   |                                    |  |   |   |  |
|   | <b>1,360,442</b>                  | <b>7,904</b>                       | <b>2,706,200</b>                                       | <b>109,723</b>                                    | <b>508,830</b>  | <b>3,127,930</b>   |
| <b>*Totals:</b>   | <b>11,855,814</b>                 | <b>202,461</b>                     | <b>692,673,737</b>                                     | <b>55,123,754</b>                                 | <b>58,306,201</b>   | <b>805,906,869</b>   |

Source: PA 295 Annual Reports:  
[https://www.michigan.gov/mpsc/0,9535,7-395-93309\\_93439\\_93463\\_93724\\_93726-534198--00.html](https://www.michigan.gov/mpsc/0,9535,7-395-93309_93439_93463_93724_93726-534198--00.html)  
 \*AES totals are aggregated

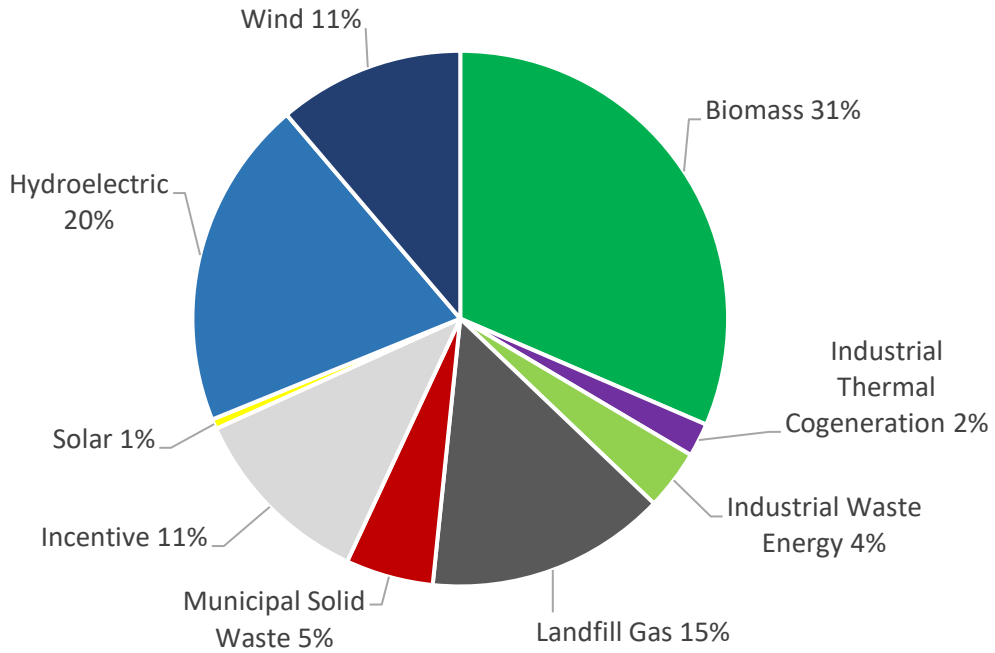
Appendix D- MIRECS Energy Credit Summary



Appendix D- MIRECS Energy Credit Summary

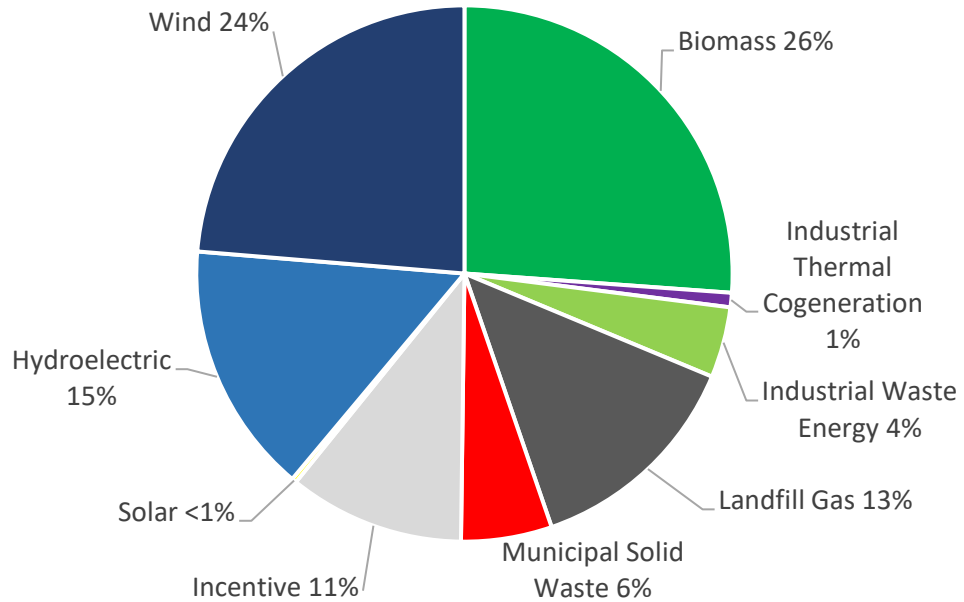
MIRECS 2011 Vintage Energy Credits

5,404,910 Total Credits



MIRECS 2012 Vintage Energy Credits

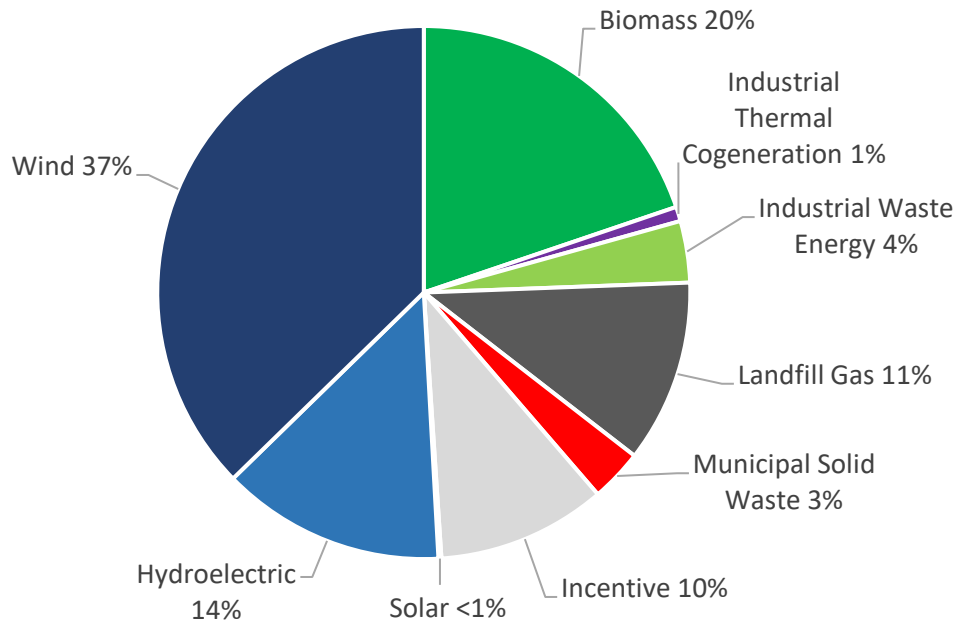
6,642,728 Total Credits



Appendix D- MIRECS Energy Credit Summary

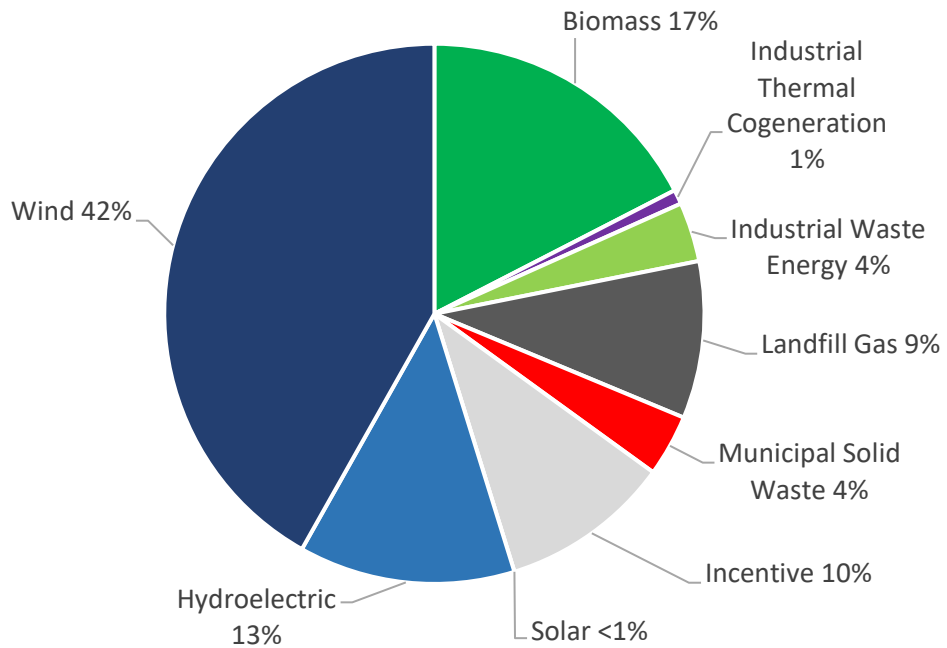
MIRECS 2013 Vintage Energy Credits

8,671,357 Total Credits



MIRECS 2014 Vintage Energy Credits

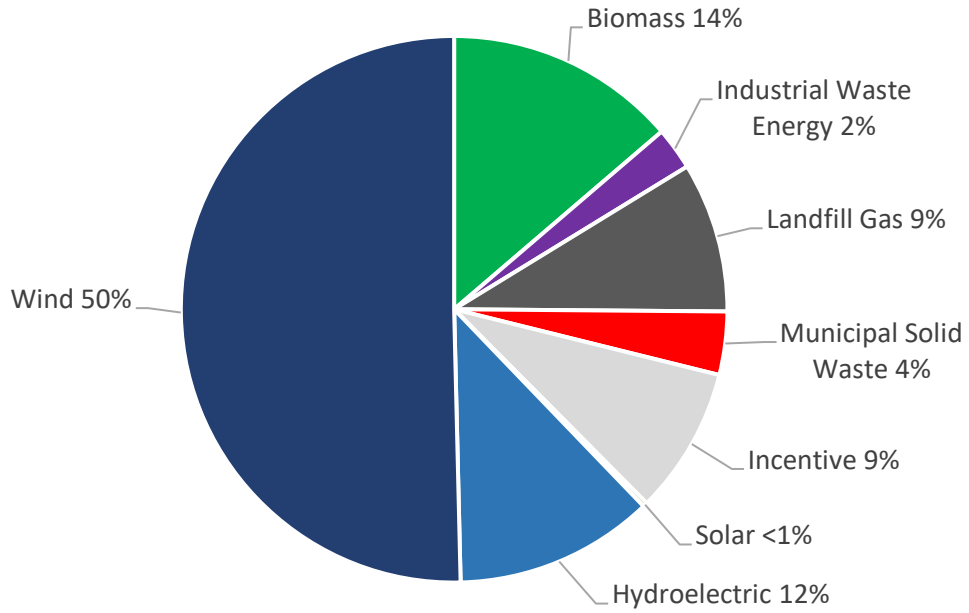
10,133,663 Total Credits



Appendix D- MIRECS Energy Credit Summary

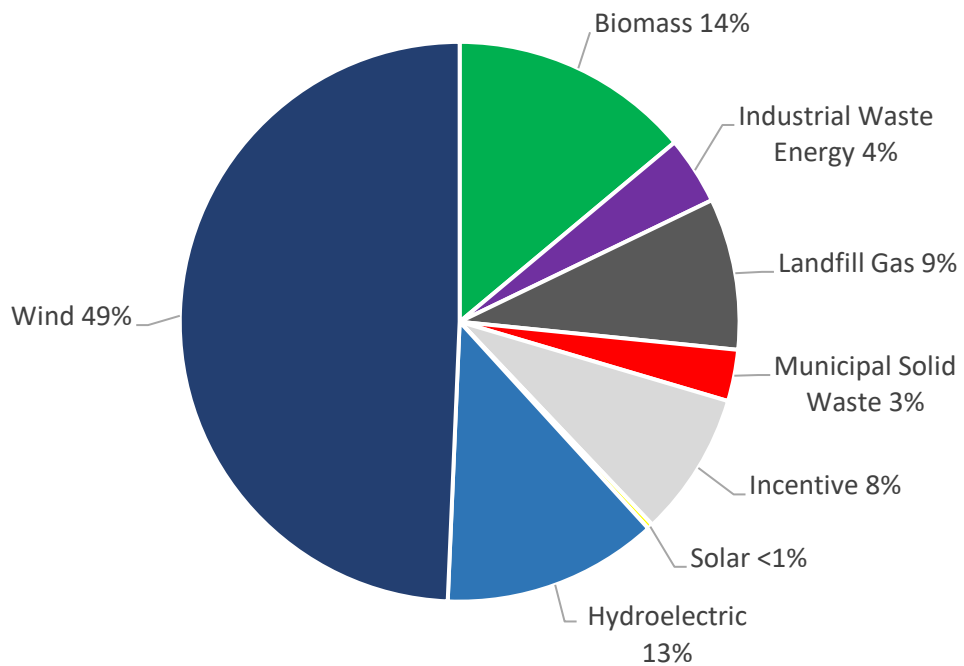
MIRECS 2015 Vintage Energy Credits

10,556,262 Total Credits



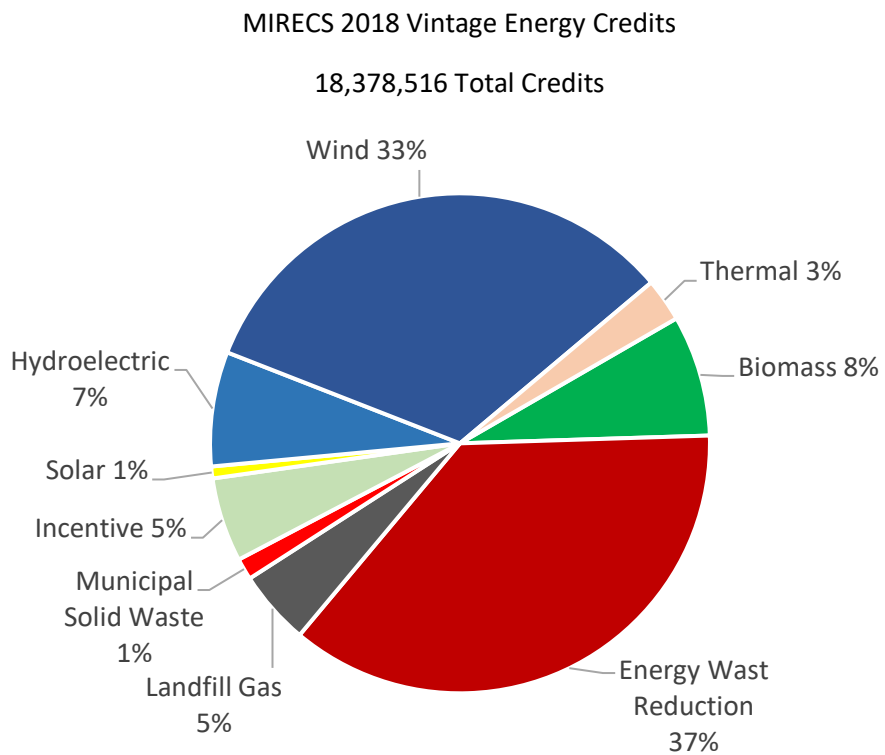
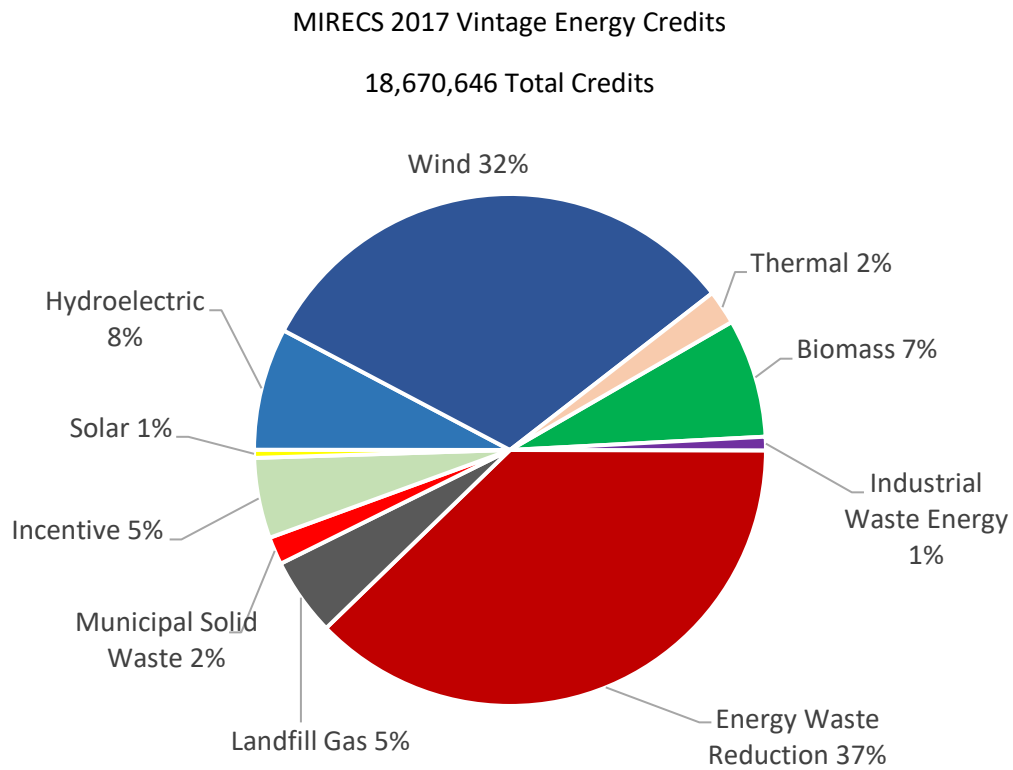
MIRECS 2016 Vintage Energy Credits

10,570,431 Total Credits





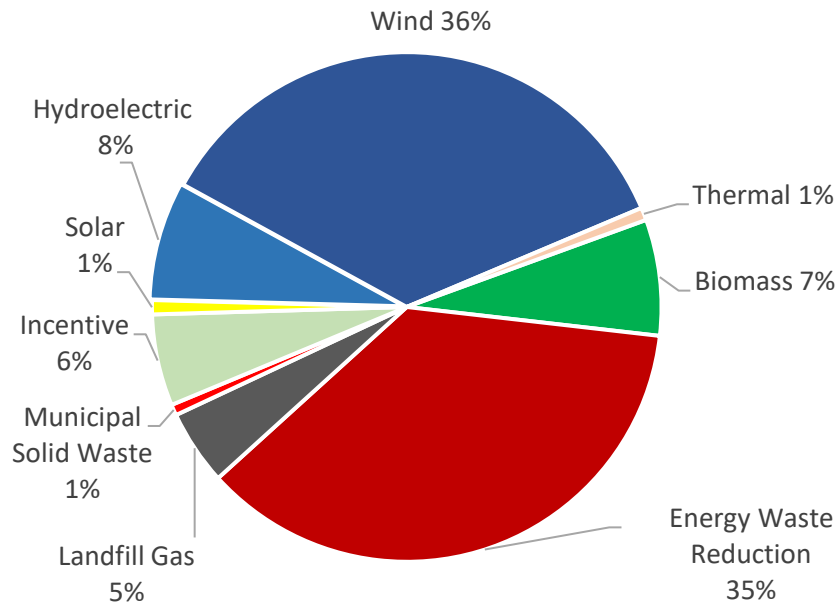
Appendix D- MIRECS Energy Credit Summary



Appendix D- MIRECS Energy Credit Summary

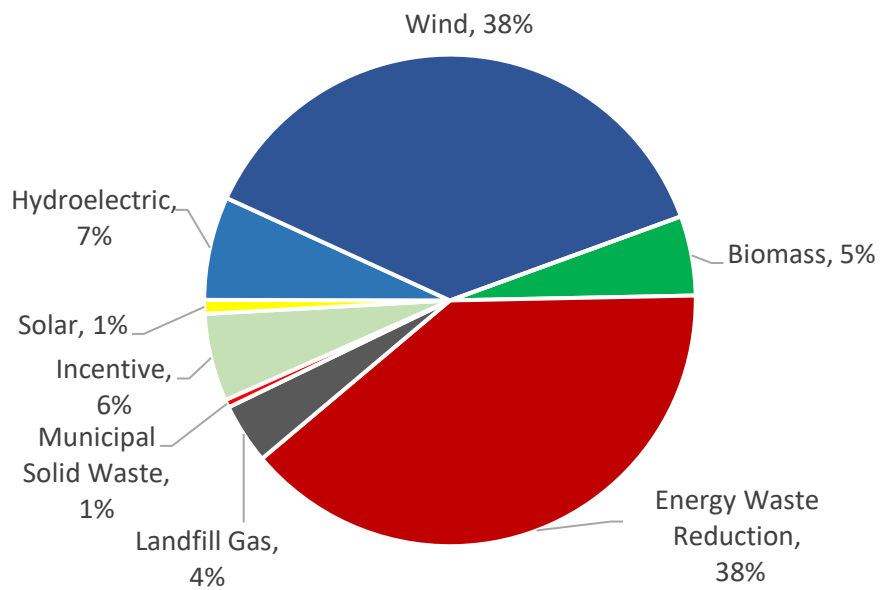
MIRECS 2019 Vintage Energy Credits

17,986,916 Total Credits



MIRECS 2020 Vintage Energy Credits

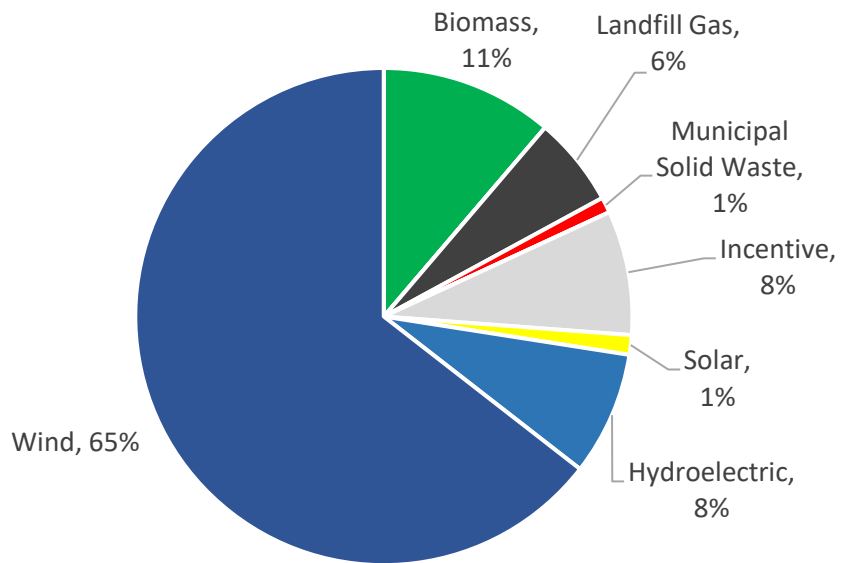
19,568,990 Total Credits



Appendix D- MIRECS Energy Credit Summary

MIRECS 2021 Vintage Energy Credits

8,115,004 Total Credits\*



\*Not all data, including EWR credits, has been reported for 2021

| IRP - Integrated Resource Plan, PURPA - Public Utility Regulatory Policies Act, REP - Act 295 Renewable Energy Plan/15% Renewable Portfolio Standard, VGP-Voluntary Green Pricing Program |           |             |               |              |  |               |                       |                      |   |                           |
|---|-----------|-------------|---------------|--------------|--|---------------|-----------------------|----------------------|---|---------------------------|
| Seller<br>(Link goes to application requesting contract approval and includes the contract.)  | County    | Quantity MW | Contract Type | Price        | Price Description                        | Term          | Renewable Energy Type | Request for Proposal | Commission Approval<br>(Date links to Order)            | Commercial Operation Date |
| <b>Consumers Energy</b>   |           |             |               |              |  |               |                       |                      |   |                           |
| <a href="#">MAP Plant</a>   | Kent      | 0.375       | PURPA         | see contract | LMP energy rates, PRA capacity rates     | 10 years      | Solar                 |                      | <a href="#">1/20/2022</a>                               | 12/16/2019                |
| <a href="#">Washtenaw Solar</a>   | Washtenaw | 150         | IRP           | \$54.46/MWh  | Average Cost                             | Company Owned | Solar                 | 2020 RFP             | <a href="#">11/18/2021</a>                              | 12/31/2023                |
| <a href="#">Cereal City Solar</a>   | Calhoun   | 100         | IRP           | \$51.38/MWh  | Average Cost                             | 25 years      | Solar                 | 2020 RFP             | <a href="#">11/18/2021</a>                              | 5/31/2023                 |
| <a href="#">Jackson County Solar</a>  | Jackson   | 125         | IRP           | \$50.81/MWh  | Average Cost                             | 20 years      | Solar                 | 2020 RFP             | <a href="#">11/18/2021</a>                              | 12/31/2023                |
| <a href="#">SCHS Solar</a>  | Kent      | 0.55        | PURPA         | see contract | LMP energy rates, PRA capacity rates     | 10 years      | Solar                 |                      | <a href="#">11/18/2021</a>                              | 10/1/2021                 |
| <a href="#">DSC Corp Center Solar Plant</a>   | Bay       | 0.0313      | PURPA         | see contract | Full avoided cost                        | 10 years      | Solar                 |                      | <a href="#">11/4/2021</a>                               | 9/4/2021                  |
| <a href="#">Heathlands Solar</a>  | Manistee  | 30          | IRP           | \$41.72/MWh  | Average Cost                             | 20 years      | Solar                 | 2020 RFP             | <a href="#">9/9/2021</a>                                | 12/31/2022                |
| <a href="#">Mustang Mile</a>  | Lenawee   | 150         | IRP           | \$66.51/MWh  | Average Cost                             | Company Owned | Solar                 | 2019 RFP             | <a href="#">4/8/2021</a>                                | 12/31/2022                |
| <a href="#">Calhoun Solar Energy</a>  | Calhoun   | 140         | IRP           | \$57.73/MWh  | Average Cost                             | 25 years      | Solar                 | 2019 RFP             | <a href="#">4/8/2021</a>                                | 5/31/2022                 |
| <a href="#">Heartland Farms Wind Project</a>  | Gratiot   | 200         | REP           | \$56/MWh     | LCOE                                     | Company owned | Wind                  | 2018 RFP             | <a href="#">3/19/2021</a>                               | 12/31/2022                |
| <a href="#">MCV Plant</a>   | Midland   | 1,240       | PURPA         | see contract |  | 10 years      | Cogeneration          |                      | <a href="#">3/4/2021</a>                                | 3/4/2021                  |
| <a href="#">Good Fruit Storage, LLC</a>   | Ottawa    | 0.179       | PURPA         | see contract | LMP energy rates, PRA capacity rates     | 10 years      | Solar                 | Amendment            | <a href="#">2/18/2021</a><br><a href="#">12/6/2019</a>  | 9/30/2020                 |
| <a href="#">Byron Center Plant</a>  | Kent      | 3           | PURPA         | see contract |  | 20 years      | Landfill Gas          |                      | <a href="#">2/4/2021</a>                                | 6/1/2019                  |
| <a href="#">Coopersville Plant</a>  | Ottawa    | 6.1         | PURPA         | see contract |  | 20 years      | Landfill Gas          |                      | <a href="#">2/4/2021</a>                                | 6/1/2019                  |
| <a href="#">Grand Blanc Plant</a>   | Genesee   | 3.8         | PURPA         | see contract |  | 20 years      | Landfill Gas          |                      | <a href="#">2/4/2021</a>                                | 6/1/2019                  |
| <a href="#">Pinconning Plant</a>  | Bay       | 3           | PURPA         | see contract |  | 20 years      | Landfill Gas          |                      | <a href="#">2/4/2021</a>                                | 6/1/2019                  |
| <a href="#">Lake City Solar</a>   | Missaukee | 2           | PURPA         | see contract | Full avoided cost                        | 20 years      | Solar                 | Amendment            | <a href="#">10/29/2020</a><br><a href="#">12/6/2019</a> | 9/30/2021                 |
| <a href="#">Morev Road Solar</a>  | Missaukee | 2           | PURPA         | see contract | Full avoided cost                        | 20 years      | Solar                 | Amendment            | <a href="#">10/29/2020</a><br><a href="#">12/6/2019</a> | 9/30/2021                 |
| <a href="#">Surrey Road Solar</a>   | Clare     | 2           | PURPA         | see contract | Full avoided cost                        | 20 years      | Solar                 | Amendment            | <a href="#">10/29/2020</a><br><a href="#">12/6/2019</a> | 9/30/2022                 |
| <a href="#">Durban Solar, LLC</a>   | Branch    | 12          | PURPA         | see contract | Avoided energy rates, PRA capacity rates | 20 years      | Solar                 |                      | <a href="#">7/23/2020</a>                               | 5/8/2022                  |
| <a href="#">Esmarelda Solar, LLC</a>  | Mason     | 8           | PURPA         | see contract | Avoided energy rates, PRA capacity rates | 20 years      | Solar                 |                      | <a href="#">7/23/2020</a>                               | 11/1/2021                 |
| <a href="#">Shady Solar, LLC</a>  | Calhoun   | 10          | PURPA         | see contract | Avoided energy rates, PRA capacity rates | 20 years      | Solar                 |                      | <a href="#">7/23/2020</a>                               | 12/15/2021                |
| <a href="#">Cascade Hydro Plant</a>   | Kent      | 1.4         | PURPA         | see contract |  | 20 years      | Hydroelectric         |                      | <a href="#">7/23/2020</a>                               | 1/1/2019                  |
| <a href="#">Fallasburg Hydro Plant</a>  | Kent      | 0.85        | PURPA         | see contract |  | 20 years      | Hydroelectric         |                      | <a href="#">7/23/2020</a>                               | 6/1/2019                  |
| <a href="#">Alverno Hydro Plant</a>   | Cheboygan | 1.2         | PURPA         | see contract |  | 20 years      | Hydroelectric         |                      | <a href="#">7/23/2020</a>                               | 6/1/2019                  |
| <a href="#">City of Beaverton Hydro Plant</a>   | Gladwin   | 0.5         | PURPA         | see contract |  | 20 years      | Hydroelectric         |                      | <a href="#">7/23/2020</a>                               | 6/1/2019                  |
| <a href="#">Elk Rapids Hydro Plant</a>  | Antrim    | 0.7         | PURPA         | see contract |  | 20 years      | Hydroelectric         |                      | <a href="#">7/23/2020</a>                               | 10/13/2019                |
| <a href="#">Mass Burn Incinerator Plant</a>   | Kent      | 18.2        | PURPA         | see contract |  | 20 years      | Incinerator           |                      | <a href="#">7/23/2020</a>                               | 6/1/2019                  |
| <a href="#">Kleber Hydro Plant</a>  | Cheboygan | 1.2         | PURPA         | see contract |  | 20 years      | Hydroelectric         |                      | <a href="#">7/23/2020</a>                               | 1/1/2020                  |
| <a href="#">Tower Hydro Plant</a>   | Cheboygan | 0.56        | PURPA         | see contract |  | 20 years      | Hydroelectric         |                      | <a href="#">7/23/2020</a>                               | 1/1/2020                  |

## Appendix E- Act 295 Contract Summary

|  |                |        |       |              |   |          |               |           |  |            |
|--|----------------|--------|-------|--------------|---|----------|---------------|-----------|--|------------|
| <a href="#">Bellevue Gothic Mill Plant</a>         | Eaton          | 0.045  | PURPA | see contract |   | 20 years | Hydroelectric |           | <a href="#">7/23/2020</a>                              | 6/1/2019   |
| <a href="#">White's Bridge Hydro Plant</a>         | Ionia          | 0.817  | PURPA | see contract |   | 20 years | Hydroelectric |           | <a href="#">7/23/2020</a>                              | 6/1/2019   |
| <a href="#">Geddes 2 Solar, LLC</a>                | Saginaw        | 2      | PURPA | see contract | Full avoided cost                           | 20 years | Solar         | Amendment | <a href="#">7/9/2020</a><br><a href="#">12/6/2019</a>  | 10/15/2020 |
| <a href="#">Bullhead Solar, LLC</a>                | Hillsdale      | 2      | PURPA | see contract | Full avoided cost                           | 20 years | Solar         | Amendment | <a href="#">7/9/2020</a><br><a href="#">12/6/2019</a>  | 10/15/2020 |
| <a href="#">Geddes 1 Solar, LLC</a>                | Saginaw        | 2      | PURPA | see contract | Full avoided cost                           | 20 years | Solar         | Amendment | <a href="#">7/9/2020</a><br><a href="#">12/6/2019</a>  | 10/15/2020 |
| <a href="#">Arthur Solar Farm, LLC Plant</a>       | Midland        | 1.827  | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 1/1/2021   |
| <a href="#">Golden Solar Farm, LLC Plant</a>       | Livingston     | 1.828  | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 1/1/2021   |
| <a href="#">Robert Swift Solar Farm, LLC Plant</a> | Branch         | 1.828  | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 1/1/2021   |
| <a href="#">Byrne Solar, LLC</a>                   | Genesee        | 5      | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 7/15/2021  |
| <a href="#">Aluminum Solar, LLC</a>                | Calhoun        | 8      | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 9/1/2021   |
| <a href="#">TART Solar, LLC</a>                    | Grand Traverse | 8.49   | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         | Amendment | <a href="#">6/23/2021</a><br><a href="#">4/15/2020</a> | 7/1/2022   |
| <a href="#">Albion Solar, LLC</a>                  | Calhoun        | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 9/15/2021  |
| <a href="#">Bamboo Solar, LLC</a>                  | Jackson        | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/15/2021 |
| <a href="#">Burns Park Solar, LLC</a>              | Genesee        | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/15/2021 |
| <a href="#">Congo Solar, LLC</a>                   | Alcona         | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/15/2021 |
| <a href="#">Johnsfield Solar, LLC</a>              | Midland        | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 8/15/2021  |
| <a href="#">Lightfoot Solar, LLC</a>               | Oscada         | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/15/2021 |
| <a href="#">Rosco Solar, LLC</a>                   | Genesee        | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 9/1/2021   |
| <a href="#">Surbrook Solar, LLC</a>                | Jackson        | 10     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/15/2021 |
| <a href="#">Allegheny, LLC</a>                     | Saginaw        | 10.699 | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/1/2021  |
| <a href="#">Hogan Solar, LLC</a>                   | Livingston     | 12     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 8/15/2021  |
| <a href="#">Swede Solar, LLC</a>                   | Alcona         | 12     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/15/2021 |
| <a href="#">Blue Elk Solar VII, LLC</a>            | Genesee        | 12.331 | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 5/5/2023   |
| <a href="#">Blue Elk Solar I, LLC</a>              | Lenawee        | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 5/5/2023   |
| <a href="#">Blue Elk Solar III, LLC</a>            | Lenawee        | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 5/5/2023   |
| <a href="#">Blue Elk Solar IV, LLC</a>             | Lenawee        | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 5/5/2023   |
| <a href="#">Beaverton Solar, LLC</a>               | Clare          | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 8/1/2022   |
| <a href="#">Cloudbreak Solar, LLC</a>              | Arenac         | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 9/15/2021  |
| <a href="#">Lyons Road Solar Farm, LLC</a>         | Shiawassee     | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 9/1/2021   |
| <a href="#">Shipsterns Solar, LLC</a>              | Calhoun        | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 5/15/2022  |
| <a href="#">Topanga Solar, LLC</a>                 | Arenac         | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 10/1/2021  |
| <a href="#">Willford Solar, LLC</a>                | Gladwin        | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 9/1/2021   |
| <a href="#">Greenstone Solar, LLC</a>              | Branch         | 20     | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years | Solar         |           | <a href="#">4/15/2020</a>                              | 5/5/2023   |

Appendix E- Act 295 Contract Summary

|  |             |       |       |              |   |               |               |           |                            |                            |
|--|-------------|-------|-------|--------------|---|---------------|---------------|-----------|----------------------------|----------------------------|
| <a href="#">Midcontinent Solar, LLC</a>  | Shiawassee  | 20    | PURPA | see contract | Avoided energy rates,<br>PRA capacity rates | 20 years      | Solar         |           | <a href="#">4/15/2020</a>  | 5/5/2023                   |
| <a href="#">Cement City Solar, LLC</a>   | Jackson     | 20    | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         | Amendment | <a href="#">1/20/2022</a>  | 7/1/2022                   |
|  |             |       |       |              |   |               |               |           | <a href="#">12/19/2019</a> |                            |
| <a href="#">Letts Creek Solar, LLC</a>   | Jackson     | 15    | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         | Amendment | <a href="#">1/20/2022</a>  | 8/1/2022                   |
|  |             |       |       |              |   |               |               |           | <a href="#">12/19/2019</a> |                            |
| <a href="#">Pullman Solar, LLC</a>   | Allegan     | 20    | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         | Amendment | <a href="#">1/20/2022</a>  | 7/1/2022                   |
|  |             |       |       |              |   |               |               |           | <a href="#">12/19/2019</a> |                            |
| <a href="#">Thorn Lake Solar, LLC</a>  | Washtenaw   | 20    | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         | Amendment | <a href="#">1/20/2022</a>  | 9/15/2024                  |
|  |             |       |       |              |   |               |               |           | <a href="#">12/19/2019</a> |                            |
| <a href="#">Temperance Solar, LLC</a>  | Monroe      | 20    | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 11/30/2020                 |
| <a href="#">Bingham Solar, LLC</a>   | Clinton     | 20    | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 11/30/2020                 |
| <a href="#">Macbeth Solar, LLC</a>   | Muskegon    | 20    | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 12/24/2021                 |
| <a href="#">Woodley Solar, LLC</a>   | Branch      | 0.821 | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 12/8/2020                  |
| <a href="#">Stoneheart Solar, LLC</a>  | Saginaw     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 12/8/2020                  |
| <a href="#">Interchange Solar, LLC</a>   | Genesee     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/18/2020                  |
| <a href="#">Coldwater Solar, LLC</a>   | Genesee     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/3/2020                   |
| <a href="#">Captain Solar, LLC</a>   | Genesee     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/3/2020                   |
| <a href="#">Angola Solar, LLC</a>  | Branch      | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/18/2020                  |
| <a href="#">13 Mile Solar, LLC</a>   | Calhoun     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/18/2020                  |
| <a href="#">May Shannon Solar, LLC</a>   | Genesee     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/3/2020                   |
| <a href="#">Jack Francis Solar, LLC</a>  | Genesee     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/3/2020                   |
| <a href="#">Hendershot Solar, LLC</a>  | Lenawee     | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/18/2020                  |
| <a href="#">Hazel Solar, LLC</a>   | Montcalm    | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 8/18/2020                  |
| <a href="#">Workman Road Solar</a>   | Missaukee   | 2     | PURPA | see contract | Full avoided cost                           | 20 years      | Solar         |           | <a href="#">12/6/2019</a>  | 9/30/2020                  |
| <a href="#">Mackinaw City Plant</a>  | Emmet       | 1.8   | PURPA | see contract |   | 2 years       | Wind          | Amendment | <a href="#">9/9/2021</a>   | 6/1/2019                   |
|  |             |       |       |              |   |               |               |           | <a href="#">11/14/2019</a> |                            |
| <a href="#">Belding Plant</a>  | Ionia       | 0.3   | PURPA | see contract |   | 20 years      | Hydroelectric |           | <a href="#">11/14/2019</a> | 1/1/2019                   |
| <a href="#">Crescent Wind</a>  | Hillsdale   | 166   | REP   | \$48/MWh     | LCOE  | Company Owned | Wind          | 6/1/2018  | <a href="#">10/7/2019</a>  | 2/15/2021                  |
|  |             |       |       |              |   |               |               |           | <a href="#">12/6/2019</a>  |                            |
| <a href="#">River Fork Solar</a>   | Calhoun     | 100   | REP   | \$44.16/MWh  | LCOE  | 20 years      | Solar         | Amendment | <a href="#">10/29/20</a>   | 3/31/2022<br>- 11/30/2022  |
|  |             |       |       |              |   |               |               | 6/1/2018  | <a href="#">9/26/2019</a>  | 5/31/2021                  |
| <a href="#">Rathbun Plant</a>  | Saginaw     | 1.6   | PURPA | see contract |   | 20 years      | Landfill Gas  |           | <a href="#">9/26/2019</a>  | 9/26/2019                  |
| <a href="#">LaBarge Hydro Plant</a>  | Kent        | 0.8   | PURPA | see contract |   | 20 years      | Hydroelectric |           | <a href="#">9/26/2019</a>  | 9/26/2019                  |
| <a href="#">Hillman</a>  | Montmorency | 16.3  | PURPA | see contract |   | 3 years       | Biomass       |           | <a href="#">7/2/2019</a>   | 7/2/2019                   |
| <a href="#">Lincoln Plant</a>  | Alcona      | 18    | PURPA | see contract |   | 8 years       | Biomass       |           | <a href="#">4/18/2019</a>  | 4/18/2019                  |
| <a href="#">McBain Plant</a>   | Missaukee   | 18    | PURPA | see contract |   | 8 years       | Biomass       |           | <a href="#">4/18/2019</a>  | 4/18/2019                  |
| <a href="#">Gratiot Farms Trade Wind Energy</a>                                    | Gratiot     | 150   | REP   | \$46/MWh     | LCOE  | Company Owned | Wind          | 7/1/2017  | <a href="#">2/7/2019</a>   | 12/1/2020                  |
| <a href="#">Ada Hydroplant</a>   | Kent        | 1.4   | PURPA | see contract |   | 5 years       | Hydroelectric |           | <a href="#">7/31/2017</a>  | 7/31/2017                  |
| <a href="#">Cross Winds II</a>   | Tuscola     | 44    | VGP   | \$45/MWh     | LCOE  | Company Owned | Wind          | 10/2/2012 | <a href="#">12/20/2016</a> | 12/31/2017                 |
| <a href="#">Cross Winds III</a>  | Tuscola     | 76    | VGP   | \$46/MWh     | LCOE  | Company Owned | Wind          | 12/1/2016 | <a href="#">3/10/2017</a>  | 12/31/2019                 |
| <a href="#">General Electric White Construction, Inc. General Electric Company</a> |             |       |       |              |   |               |               |           |                            |                            |
| <a href="#">Solar Gardens Suniva, Inc.</a>   | Various     | 10    | VGP   | \$160.00/MWh | LCOE  | Company Owned | Solar         |           | <a href="#">3/29/2016</a>  | Starting with<br>4/18/2016 |
|  |             |       |       |              |   |               |               | 7/31/2015 |                            |                            |

Appendix E- Act 295 Contract Summary

|  |                     |        |     |  |                  |                |           |                                     |   |            |
|--|---------------------|--------|-----|--|------------------|----------------|-----------|-------------------------------------|---|------------|
| <a href="#">SMA Solar Technology America, LLC</a><br><a href="#">J. Ranck Electric, Inc.</a><br><a href="#">Mounting Systems Inc.</a>                                    |                     |        |     |  |                  |                |           | 8/7/2015<br>8/24/2015<br>8/7/2015   |   |            |
| <a href="#">Experimental Advanced Renewable Program Phases 26-35</a>   | Various             | 2.2    | REP | \$0.199-\$0.243/kWh  | Tariffed Program | Up to 15 years | Solar     | Unsolicited                         | <a href="#">2/11/2016</a>   | Varies     |
| <a href="#">Geronimo Huron Wind, LLC (Apple Blossom)</a>   | Huron               | 100    | REP | Less than \$45/MWh   | LCOE             | Up to 15 years | Wind      | Unsolicited                         | <a href="#">11/19/2015</a>  | 2017       |
| <a href="#">Experimental Advanced Renewable Program Anaerobic Digester</a>   | Various             | 2.6    | REP | \$86/MWh or \$76.39/MWh-106.39/MWh                                 | Tariffed Program | 20 years       | Anaerobic | Unsolicited                         | <a href="#">4/23/2015</a>   | Varies     |
| <a href="#">Experimental Advanced Renewable Program Phases 16-21</a>   | Various             | 1.4    | REP | \$0.199-\$0.243  | Tariffed Program | Up to 15 Years | Solar     | Unsolicited                         | <a href="#">4/23/2015</a>   | Varies     |
| <a href="#">Experimental Advanced Renewable Program Phases 10-15</a>   | Various             | 1.2    | REP | Non-Residential \$0.199-0.209/kWh<br>Residential \$0.243-0.249/kWh | Tariffed Program | Up to 15 Years | Solar     | Unsolicited                         | <a href="#">5/2/2014</a>  | Varies     |
| Cross Winds<br><a href="#">Barton Malow Company</a><br><a href="#">General Electric Company</a><br><a href="#">ABB Transformers</a>                                      | Tuscola             | 111    | REP | \$59.00/MWh  | LCOE             | Company Owned  | Wind      | 4/25/2013<br>10/2/2012<br>2/27/2013 | <a href="#">9/10/2013</a><br><a href="#">6/28/2013</a><br><a href="#">9/10/2013</a> | 12/31/2014 |
| <a href="#">Blissfield Wind (Beebe Wind)</a>   | Gratiot             |        | REP | Unchanged  |                  | 20 Years       | Wind      | Amendment                           | <a href="#">1/26/2012</a>   | 12/31/2012 |
| <a href="#">Heritage Garden Wind Farm I</a>  | Delta               | 20     | REP | Unchanged  |                  | 20 Years       | Wind      | Amendment                           | <a href="#">1/26/2012</a>   | 12/31/2012 |
| <a href="#">Heritage Stoney Corners Wind Farm II</a>   | Missaukee & Osceola |        | REP | Unchanged  |                  | 20 Years       | Wind      | Amendment                           | <a href="#">1/26/2012</a>   | 1/1/2012   |
| <a href="#">Heritage Stoney Corners Wind Farm I (Phase 3)</a>  | Missaukee & Osceola | 8.35   | REP | \$106.20/MWh   | LCOE             | 20 Years       | Wind      | Result of Amendment                 | <a href="#">1/26/2012</a>   | 1/1/2012   |
| <a href="#">Experimental Advanced Renewable Program</a>  | Various             | 0.9877 | REP | Commercial \$0.375/KWh<br>Residential \$0.525/KWh                  | Tariffed Program | 12 Years       | Solar     | Unsolicited                         | <a href="#">5/10/2011</a>   | Varies     |
| Lake Winds Energy Park<br>Vestas-American Wind Technology<br>White Construction, Inc.<br><a href="#">U-15805 edocket files # 251-256</a><br>GE Prolec Transformers, Inc. | Mason               | 100.8  | REP | \$110.00/MWh   | LCOE             | Company Owned  | Wind      | 1/15/2010<br>7/23/2010<br>7/27/2009 | <a href="#">12/2/2010</a>   | 12/31/2012 |
| <a href="#">Heritage Garden Wind Farm I</a>  | Delta               | 0      | REP | \$106.20/MWh   | LCOE             | 20 Years       | Wind      | Unsolicited                         | <a href="#">11/19/2010</a>  | 1/1/2012   |
| <a href="#">Heritage Stoney Corners Wind Farm II</a>   | Missaukee & Osceola | 12.3   | REP | \$98.50/MWh  | LCOE             | 20 Years       | Wind      | Unsolicited                         | <a href="#">11/19/2010</a>  | 1/1/2012   |
| <a href="#">Experimental Advanced Renewable Program</a>  | Various             | 1      | REP | Commercial \$0.45/KWh<br>Residential \$0.65/KWh                    | Tariffed Program | 12 Years       | Solar     | Unsolicited                         | <a href="#">12/21/2010</a>  | 5/1/2010   |

|   |            |      |     |              |      |           |              |             |                            |            |
|---|------------|------|-----|--------------|------|-----------|--------------|-------------|----------------------------|------------|
| Scenic View Dairy**   | Allegan    | 0.35 | REP | \$83.07/MWh  | LCOE | 63 Months | Anaerobic    | Unsolicited | <a href="#">10/26/2010</a> | 7/29/2010  |
| <a href="#">Blissfield Wind (Now Beebe Wind)</a>                        | Gratiot    | 81   | REP | \$100.88/MWh | LCOE | 20 Years  | Wind         | 5/7/2009    | <a href="#">7/27/2010</a>  | 12/31/2012 |
| <a href="#">Harvest II Wind</a>   | Huron      | 59.4 | REP | \$98.38/MWh  | LCOE | 20 Years  | Wind         | 5/7/2009    | <a href="#">7/27/2010</a>  | 12/31/2012 |
| <a href="#">Michigan Wind 2</a>   | Sanilac    | 90   | REP | \$94.00/MWh  | LCOE | 20 Years  | Wind         | 5/7/2009    | <a href="#">7/27/2010</a>  | 6/30/2012  |
| <a href="#">WM Renewable Energy - Pine Tree Acres</a>                   | Macomb     | 12.8 | REP | \$98.75/MWh  | LCOE | 20 Years  | Landfill Gas | 5/7/2009    | <a href="#">7/27/2010</a>  | 6/30/2012  |
| <a href="#">WM Renewable Energy - Northern Oaks Landfill</a>            | Clare      | 1.6  | REP | \$122.39/MWh | LCOE | 20 Years  | Landfill Gas | 1/29/2009   | <a href="#">10/13/2009</a> | 11/11/2010 |
| <a href="#">NANR – Lennon</a>   | Shiawassee | 1.6  | REP | \$137.27/MWh | LCOE | 20 Years  | Landfill Gas | 1/29/2009   | <a href="#">10/13/2009</a> | 12/31/2010 |
| <a href="#">Elk Rapids Hydro Electric** 1</a>                           | Antrim     | 0.7  | REP | \$121.31/MWh | LCOE | 10 Years  | Hydro        | 1/29/2009   | <a href="#">10/13/2009</a> | 7/11/2009  |
| <a href="#">Zeeland**</a>   | Ottawa     | 1.6  | REP | \$122.20/MWh | LCOE | 7 Years   | Landfill Gas | 1/29/2009   | <a href="#">10/13/2009</a> | 7/11/2009  |
| <a href="#">Freemont Community Digester</a>                             | Newaygo    | 3.1  | REP | \$139.35/MWh | LCOE | 20 Years  | Anaerobic    | 1/29/2009   | <a href="#">10/13/2009</a> | 11/11/2012 |
| Scenic View Dairy**<br><a href="#">Part 1</a><br><a href="#">Part 2</a> | Allegan    | 0.82 | REP | \$138.17/MWh | LCOE | 7 Years   | Anaerobic    | 1/29/2009   | <a href="#">10/13/2009</a> | 7/11/2009  |
| <a href="#">Michigan Wind 1 Amendment</a>                               | Huron      | 12   | REP |              |      | 7 years   | Wind         | Amendment   | <a href="#">2/4/2021</a>   |            |
| <a href="#">Michigan Wind 1</a>   |            |      |     |              |      | 10 years  |              | 3/14/2005   | <a href="#">10/18/2005</a> |            |

|                         |       |    |          |   |
|-------------------------|-------|----|----------|---|
| Consumers Energy Totals | 3,982 | MW | Combined |   |
|                         | 695   | MW | IRP      |   |
|                         | 1,914 | MW | PURPA    | (Limited to contract approvals after January 1, 2019) |
|                         | 1,242 | MW | REP      |   |
|                         | 130   | MW | VGP      |   |

### Renewable Energy Contract Summary

Prepared by Michigan Public Service Commission Staff

IRP - Integrated Resource Plan, PURPA - Public Utility Regulatory Policies Act, REP - Act 295 Renewable Energy Plan/15% Renewable Portfolio Standard, VGP-Voluntary Green Pricing Program

| Seller<br>(Link goes to application requesting contract approval and includes the contract.) | County     | Quantity MW | Contract Type | Price          | Price Description | Term                     | Renewable Energy Type | Request for Proposal | Commission Approval (Date links to Order) | Commercial Operation Date |
|--|------------|-------------|---------------|----------------|-------------------|--------------------------|-----------------------|----------------------|---|---------------------------|
| <b>DTE Electric</b>  |            |             |               |                |                   |                          |                       |                      |   |                           |
| <a href="#">Freshwater Solar</a>   | Montcalm   | 200         | VGP           | \$48-51/MWh    | LCOE              | Company-owned            | Solar                 | 2019                 | <a href="#">6/9/2021</a>                  | 12/31/2022                |
| <a href="#">Whitetail Solar</a>  | Washtenaw  | 120         | VGP           | \$51-54/MWh    | LCOE              | Company-owned            | Solar                 | 2019                 | <a href="#">6/9/2021</a>                  | 12/31/2022                |
| <a href="#">Calhoun County Solar</a>   | Calhoun    | 100         | VGP           | \$52.46/MWh    | LCOE              | 25 years                 | Solar                 | 2019                 | <a href="#">6/9/2021</a>                  | 12/31/2022                |
| <a href="#">Meridian Wind Farm</a>   | Saginaw    | 224.9       | REP           | \$46-49/MWh    | LCOE              | Company-owned            | Wind                  | 9/1/2019             | <a href="#">7/9/2020</a>                  | Year 2022                 |
| <a href="#">Assembly Solar</a>   | Shiawassee | 79          | REP           | \$47-50/MWh    | LCOE              | 25 Years                 | Solar                 | 9/1/2019             | <a href="#">7/9/2020</a>                  | Year 2022                 |
| <a href="#">Riverfork Solar</a>  | Calhoun    | 49          | REP           | \$49-52/MWh    | LCOE              | 25 Years                 | Solar                 | 9/1/2019             | <a href="#">7/9/2020</a>                  | 12/31/2022                |
| <a href="#">Isabella I Wind Farm</a>   | Isabella   | 197         | VGP           | \$43.20/MWh*** | LCOE              | Company Owned            | Wind                  | 5/29/2018            | <a href="#">7/18/2019</a>                 | 6/1/2021                  |
| <a href="#">Isabella II Wind Farm</a>  | Isabella   | 186         | VGP           | \$43.20/MWh*** | LCOE              | Company Owned            | Wind                  | 5/29/2018            | <a href="#">7/18/2019</a>                 | 6/1/2021                  |
| <a href="#">Fairbanks Wind Park</a>  | Delta      | 72.45       | VGP           | \$53.78/MWh*** | LCOE              | Company Owned            | Wind                  | 5/59/2018            | <a href="#">7/18/2019</a>                 | 1/7/2022                  |
| <a href="#">Polaris Wind Park</a>  | Gratiot    | 168         | REP           | \$47.18/MWh*** | LCOE              | Company Owned "Polaris " | Wind                  | 6/19/2017            | <a href="#">4/12/2018</a>                 | 4/23/2020                 |



Appendix E- Act 295 Contract Summary

|  |                            |                              |               |  |                  |  |             |                          |                            |               |
|--|----------------------------|------------------------------|---------------|--|------------------|--|-------------|--------------------------|----------------------------|---------------|
| <a href="#">Pine River Wind Energy, LLC</a>  | Gratiot & Isabella         | 161.3                        | REP           | \$59.67/MWh***                                     | LCOE             | Company Owned<br>"Pine River"          | Wind        | 5/20/2016                | <a href="#">12/20/2016</a> | 12/31/2018    |
| <a href="#">Innovatus (DTE Solar)</a>  | Wayne<br>Lapeer<br>Lapeer  | 2                            | VGP           | \$90/MWh   | LCOE             | Company Owned                          | Solar       | 6/24/2015                | <a href="#">12/11/2015</a> | 10/31/2016    |
| O'Shea Solar   |                            |                              | Company Owned |  |                  | Solar                                  | Amendment   | <a href="#">6/9/2021</a> | 8/2/2017                   |               |
| Turrill Solar  |                            |                              | Company Owned |  |                  | Solar                                  | Amendment   | <a href="#">6/9/2021</a> | 5/9/2017                   |               |
| Demille Solar  |                            |                              | "Lapeer"      |  |                  | Solar                                  | Amendment   | <a href="#">6/9/2021</a> | 5/2/2017                   |               |
| <a href="#">Pinnebog Wind</a>  | Huron                      | 50                           | VGP           | \$54.75/MWh  | LCOE             | Company Owned                          | Wind        | 2/17/2014<br>6/20/2014   | <a href="#">12/11/2015</a> | 12/9/2016     |
| <a href="#">General Electric Company</a><br><a href="#">Aristeo Construction Company</a>   |                            |                              |               |  |                  |  |             |                          |                            |               |
| <a href="#">Rudolf Libbe, Inc</a>  | Wayne                      | 0.75                         | REP           | \$3,741/kW   | Average cost     | Company Owned                          | Solar       | 9/28/2012                | <a href="#">7/8/2014</a>   | 4/1/2015      |
| <a href="#">Inovateus Solar, LLC.</a><br><a href="#">(SolarCurrents)</a>   | Wayne                      | 0.504                        | REP           |  |                  |  |             |                          |                            |               |
| <a href="#">Big Turtle Wind Farm, LLC</a>  | Huron                      | 20                           | REP           | \$53/MWh   | LCOE             | 20 Years                               | Wind        | Unsolicited              | <a href="#">9/24/2013</a>  | Expected 2014 |
| <a href="#">Pheasant Run Wind, LLC</a>   | Huron                      | 74.8                         | REP           | Up to<br>\$49.25/MWh                               | LCOE             | 20 Years                               | Wind        | Unsolicited              | <a href="#">5/17/2013</a>  | 12/31/2014    |
| <a href="#">Pheasant Run Wind II, LLC</a>  | Huron                      | 74.8                         | REP           | Up to<br>\$49.25/MWh                               | LCOE             | Company Owned<br>"Brookfield"          | Wind        | Unsolicited              | <a href="#">5/17/2013</a>  | 12/31/2014    |
| <a href="#">SolarCurrents Phase II</a>   | Various                    | 2                            | REP           | \$0.13/W<br>\$0.02/kWh<br>\$0.20/W<br>\$0.03/kWh   | Tariffed Program | Through 8/31/2029                      | Solar       | Unsolicited              | <a href="#">11/16/2012</a> | Varies        |
| <a href="#">Tuscola Wind II, LLC</a>   | Tuscola & Bay              | 100                          | REP           | \$49.25/MWh***                                     | LCOE             | 20 Years                               | Wind        | 5/3/2012                 | <a href="#">10/31/2012</a> | 12/31/2013    |
| <a href="#">Echo Wind</a>  | Huron                      | 110                          | REP           | \$52.50/MWh  | Staff estimate   | Company Owned                          | Wind        | 10/12/2011               | <a href="#">9/11/2012</a>  | 12/31/2013    |
| <a href="#">General Electric Company</a><br><a href="#">Barton Malow Company</a>   |                            |                              |               |  |                  |  |             | 4/17/2012                |                            |               |
| <a href="#">Michigan Waste Energy, Inc.</a>  | Wayne                      | Up to<br>65,000<br>RECs/Year | REP           | \$7.00/REC   | REC pricing      | 13 Years                               | Incinerator | Unsolicited              | <a href="#">12/6/2011</a>  | 1991          |
| <a href="#">SolarCurrents</a>  | Various                    | 12                           | REP           | Up to \$48<br>Million<br>Up to \$24<br>Million     | Tariffed Program | Company Owned                          | Solar       | 2/28/2011                | <a href="#">11/10/2011</a> | 12/31/2015    |
| <a href="#">Nova Consultants, Inc.</a>   |                            |                              |               |  |                  |  |             |                          |                            |               |
| <a href="#">McNaughton-McKay Electric<br/>Company</a><br><a href="#">Inovateus Solar, LLC</a><br><a href="#">(SolarCurrents)</a> |                            |                              |               |  |                  |  |             | 3/24/2011                |                            |               |
| <a href="#">Thumb Wind (McKinley,<br/>Minden, and Sigel)</a>   | Huron & Sanilac            | 110.4                        | REP           | \$61-\$64/MWh                                      | LCOE             | Company Owned                          | Wind        | 3/9/2011                 | <a href="#">9/13/2011</a>  | 12/31/2012    |
| <a href="#">General Electric Company</a><br><a href="#">Barton Malow Company</a>   |                            |                              |               |  |                  |  |             | 5/6/2011                 |                            |               |
| <a href="#">Tuscola Bay Wind, LLC</a>  | Tuscola, Bay, &<br>Saginaw | 120                          | REP           | Up to<br>\$60.90/MWh                               | LCOE             | 20 Years                               | Wind        | 11/18/2010               | <a href="#">8/25/2011</a>  | 10/31/2012    |
| <a href="#">L'Anse Warden Electric Company</a>   | Baraga                     | 110,374<br>RECs              | REP           | \$11.98<br>(Average of 4<br>REC/ACEC<br>Contracts) | REC pricing      | Amendment<br>Acquiring Vintage<br>RECs | Biomass     | 8/18/2009                | <a href="#">8/25/2011</a>  | 7/1/2010      |
| <a href="#">Gratiot County Wind</a>  | Gratiot                    | 12.8                         | REP           | Unchanged<br>from original<br>contract             |                  | Company Owned                          | Wind        | Amendment                | <a href="#">5/10/2011</a>  | 12/31/2012    |

Appendix E- Act 295 Contract Summary

|  |                     |   |     |                                  |                |               |          |             |                            |            |
|--|---------------------|---|-----|----------------------------------|----------------|---------------|----------|-------------|----------------------------|------------|
| <a href="#">Nova Consultants (SolarCurrents)</a>                     | Various             |   | RE  | Unchanged from original contract |                | Company Owned | Solar    | Extension   | <a href="#">12/21/2010</a> | 12/31/2011 |
| <a href="#">Blue Water Renewables - Smiths Creek Landfill</a>        | St. Clair           | 3.2   | REP | \$99.00/MWh                      | LCOE           | 20 Years      | Landfill | Unsolicited | <a href="#">1/20/2011</a>  | 12/31/2011 |
| <a href="#">Gratiot County Wind</a>                                  | Gratiot             | 110.4   | REP | \$94.43/MWh<br>Up to \$94.45/MWh | LCOE           | 20 Years      | Wind     | 8/18/2009   | <a href="#">9/14/2010</a>  | 5/1/2012   |
|  |                     | 89.6  | REP |                                  | Staff estimate | Company Owned | Wind     |             |                            | 3/31/2012  |
| <a href="#">WM Renewable Energy - Eagle Valley Landfill</a>          | Oakland             | 3.2   | REP | Combined average of              | LCOE           | 20 years      | Landfill | 8/18/2009   | <a href="#">8/10/2010</a>  | 6/1/2011   |
| <a href="#">L'Anse Warden Electric Company</a>                       | Baraga              | 17  | REP | \$98.94/MWh                      |                | 20 years      | Biomass  | 8/18/2009   | <a href="#">8/10/2010</a>  | 7/1/2010   |
| <a href="#">Boyce Hydro**</a>  | Various             | Firm 210,000 RECs w/additional 112,000 RECs dependent on generation | REP | \$7.75/ REC                      | REC pricing    | 7 Years       | Hydro    | 12/23/2009  | <a href="#">4/27/2010</a>  | 3/16/2010  |
| <a href="#">Nova Consultants (SolarCurrents)</a>                     | Various             | 3   | REP | Up to \$18 Million               |                | Company Owned | Solar    | 11/23/2009  | <a href="#">3/2/2010</a>   | 12/31/2010 |
| <a href="#">Heritage Sustainable Energy Stoney Corners Wind Farm</a> | Missaukee & Osceola | 12.2  | REP | Unchanged from original contract |                | 20 Years      | Wind     | Unsolicited | <a href="#">12/1/2009</a>  | 1/1/2011   |
| <a href="#">UPPCO**</a>  | Various             | Firm 500,000 RECs   | REP | Combined average price           | REC pricing    | 7 Years       | Hydro    | 12/23/2009  | <a href="#">12/1/2009</a>  | 10/1/2009  |
| <a href="#">Sterling Planet**</a>                                    | Various             | Firm 2,500,000 RECs   | REP | of \$12.46/REC                   | REC pricing    | 10 Years      | MISC     |             |                            |            |
| <a href="#">Heritage Sustainable Energy Stoney Corners Wind Farm</a> | Missaukee & Osceola | 14  | REP | \$116.00/MWh                     | LCOE           | 20 Years      | Wind     | Unsolicited | <a href="#">4/30/2009</a>  | 12/21/2009 |
| DTE Electric Totals  |                     | 2,549   | MW  | Combined                         |                |               |          |             |                            |            |
|  |                     | 1,573   | MW  | REP                              |                |               |          |             |                            |            |
|  |                     | 976   | MW  | VGP                              |                |               |          |             |                            |            |

\*\* Pre-existing projects prior to 2008 PA 295 - The commercial operation date refers to the effective date of the contract.

\*\*\*Staff calculated leveled cost



**Upper Michigan Energy Resources Corporation**

|  |         |                      |     |          |  |          |         |                             |                           |          |
|--|---------|----------------------|-----|----------|--|----------|---------|-----------------------------|---------------------------|----------|
| <a href="#">Cadillac Renewable Energy, LLC</a> | Various | REC-Only<br>Redacted | REP | Redacted |  | Redacted | Biomass | Competitive<br>Solicitation | <a href="#">1/23/2014</a> | Redacted |
|--|---------|----------------------|-----|----------|--|----------|---------|-----------------------------|---------------------------|----------|

## Appendix F - Requests for Proposal (RFP) Summary

| Consumers Energy : Request for Proposals/Requests for Information/Pre-Qualifications |      |  |                    |               |                               |
|--|------|--|--------------------|---------------|-------------------------------|
| Issue Date   | Type | Description  | Requested Capacity | Company Owned | Applicable Technology*        |
| 9/24/2021  | RFP  | Requested Proposals for a Power Purchase Agreement (Integrated Resource Plan)                        | 250 MW             | No            | Solar or QF (QF up to 5 MW)** |
| 9/24/2021  | RFP  | Requested Proposals for the Installation of a Utility Owned Solar Farm (Integrated Resource Plan)    | 250 MW             | Yes           | Solar                         |
| 7/29/2020  | RFP  | Requested Proposals for a Power Purchase Agreement (Integrated Resource Plan)                        | 150 MW             | No            | Solar or QF (QF up to 20 MW)  |
| 7/29/2020  | RFP  | Requested Proposals for the Installation of a Utility Owned Solar Farm (Integrated Resource Plan)    | 150 MW             | Yes           | Solar                         |
| 9/30/2019  | RFP  | Requested Proposals for a Power Purchase Agreement (Integrated Resource Plan)                        | 150 MW             | No            | Solar or QF (QF up to 20 MW)  |
| 9/30/2019  | RFP  | Requested Proposals for the Installation of a Utility Owned Solar Farm (Integrated Resource Plan)    | 150 MW             | Yes           | Solar                         |
| 6/8/2018   | RFP  | Requested Proposals for a Power Purchase Agreement or the Installation of a Utility Owned Solar Farm | 100 MW             | Optional      | Solar                         |
| 6/8/2018   | RFP  | Requested Proposals for the installation of a Utility Owned Wind Farm                                | 400 MW             | Yes           | Wind                          |
| 6/5/2017   | RFP  | Requested Proposals for the Installation of a Utility Owned Solar Farm (Energy Storage Optional)     | 100 MW             | Yes           | Solar                         |
| 6/5/2017   | RFP  | Requested Proposals for the Installation of a Utility Owned Wind Farm (Energy Storage Optional)      | 100 to 450 MW      | Yes           | Wind                          |
| 6/3/2016   | RFP  | Requested Proposals for the Installation of a Utility Owned Solar Farm                               | 50 MW              | Yes           | Solar                         |
| 6/3/2016   | RFP  | Requested Proposals for the Installation of a Utility Owned Wind Farm                                | 50 to 200 MW       | Yes           | Wind                          |
| 12/1/2016  | RFP  | Requested bids for the Installation of a Utility Owned Wind Farm (Cross Winds II and III)            | Up to 150 MW       | Yes           | Wind                          |
| 10/2/2012  | RFP  | Request for Qualifications for 150 MWs of Utility Owned Wind Turbines                                | Up to 150 MW       | Yes           | Wind                          |
| 8/7/2015   | RFP  | Request for Proposal for Solar String Inverters  |                    |               |                               |
| 7/31/2015  | RFP  | Request for Proposal for Solar Modules   |                    |               |                               |
| 8/7/2015   | RFP  | Request for Proposal for Solar Park Racking  |                    |               |                               |
| 8/24/2015  | RFP  | Request for Proposal for Solar Park Construction   |                    |               |                               |
|  | RFQ  | Request for Qualifications for Solar Park Construction   | Up to 10 MW        | Yes           | Solar                         |
| 4/25/2013  | RFP  | Requested bids for the Installation of a Utility Owned Wind Farm (Cross Winds)                       |                    |               |                               |
| 2/27/2013  | RFP  | Requested Substation Transformer Bids for Utility Owned Wind Farm (Cross Winds)                      |                    |               |                               |
| 10/2/2012  | RFP  | Requested bids for Utility Owned Wind Turbines (Cross Winds)   | 105 MW by          | Yes           | Wind                          |
| May-12   | RFQ  | Request for Qualifications for 105 MWs of Utility Owned Wind Turbines                                | N/A                | Yes           | Wind                          |

\* All=Any Renewable Energy Resource defined by 2008 PA 295; REC=Renewable Energy Credit; ACEC=Advanced Cleaner Energy Credit

\*\* CEREC=Capacity, Energy, and Renewable Energy Attributes

## Appendix F - Requests for Proposal (RFP) Summary

|           |     |   |                                 |     |      |
|-----------|-----|---|---------------------------------|-----|------|
| 7/23/2010 | RFP | Requested bids for the Installation of a Utility Owned Wind Farm                    |                                 |     |      |
| 1/15/2010 | RFP | Requested bids for Utility Owned Wind Turbines                                      |                                 |     |      |
| 7/27/2009 | RFP | Requested Substation Transformer Bids for Utility Owned Wind Farm                   |                                 |     |      |
|           |     |   | 100 MW by 2012                  | Yes | Wind |
| 2/19/2010 | RFQ | Request for Qualifications for the Installation of a 100 MW Utility Owned Wind Farm | N/A                             | Yes | Wind |
| 7/14/2010 | RFQ | Request for Qualifications for 100 MWs of Utility Owned Wind Turbines               | N/A                             | Yes | Wind |
| 5/7/2009  | RFP | Requested CEREC**   | 100 MW by 2012 / 150 MW by 2014 | No  | All  |
| 1/29/2009 | RFP | Requested CEREC**   | 17.4 MW                         | No  | All  |

\* All=Any Renewable Energy Resource defined by 2008 PA 295; REC=Renewable Energy Credit; ACEC=Advanced Cleaner Energy Credit

\*\* CEREC=Capacity, Energy, and Renewable Energy Attributes

## Appendix F - Requests for Proposal (RFP) Summary

| DTE Electric Company : Request for Proposals/Requests for Information/Pre-Qualifications |         |   |  |  |                        |
|--|---------|---|--|--|------------------------|
| Issue Date   | Type    | Description   | Requested Capacity   | Company Owned                            | Applicable Technology* |
| 8/6/2021   | RFP     | Small Scale Solar RFP   | Greater than 550 kW and less than 25 MW each   | Yes                                      | Solar                  |
| 12/9/2019  | RFP     | Engineering, Procurement, and Construction for DTE owned asset    | 225 MW   | Yes                                      | Wind                   |
| 9/16/2019  | RFP     | All Source Renewable Energy RFP                                   | Total capacity - TBD (Wind projects no less than 100 MW and no more than 200 MW; Solar projects no less than 25 MW and not more than 200 MW) | Both Company ownership and 3rd Party PPA | Wind, Solar            |
| 6/17/2019  | RFP     | Turbine Supply Acquisition (Project A)                            | 225 MW   | Yes                                      | Wind                   |
| 6/17/2019  | RFP     | Turbine Supply Acquisition (Project B)                            | 150 MW   | Yes                                      | Wind                   |
| 5/29/2018  | RFP     | Build Transfer of Wind Energy Assets Within the State of Michigan | 300 MW   | Yes                                      | Wind                   |
| 8/21/2018  | RFP     | Parking Structure Rooftop Solar + Storage EPC                     | 1.4 MW   | Yes                                      | Solar + Storage        |
| 6/19/2017  | RFP     | Build Transfer of Wind Energy Assets Within the State of Michigan | 150 MW   | Yes                                      | Wind                   |
| 5/20/2016  | RFP     | Wind Ownership Option   | Up to 150  | Yes                                      | Solar                  |
| 6/20/2015  | RFP     | Up to 50 MW Solar Engineering Procurement and Construction        | 50 MW  | Yes                                      | Solar                  |
| 6/20/2014  | RFP     | Requested bids for the Installation of a Utility Owned Wind Farm  | 100 MW by 12/31/2015   | Yes                                      | Wind                   |
| 2/17/2014  | RFP     | Up to 100 MW of Utility Owned Wind Turbines (Pinnebog)            |  |  |                        |
| 2/6/2013   | RFP     | Phase II Solar Engineering Procurement and Construction           | 1.25 MW  | Yes                                      | Solar                  |
| 9/28/2012  | RFP     | Phase I Solar Engineering Procurement and Construction            |  |  |                        |
| 5/3/2012   | RFP     | 100 MW of Wind  | 100 MW by 12/31/2013   | No                                       | Wind                   |
| 4/17/2012  | RFP     | EPC (Echo)  | NA   | Yes                                      | Wind                   |
| 12/7/2011  | Auction | Requested RECs* Without the Associated Energy                     | 2009 and 2010 Vintage  | No                                       | All                    |
| 10/12/2011   | RFP     | 110 MW of Utility Owned Wind Turbines (Echo)                      | 110 MW by 12/31/2013   | Yes                                      | Wind                   |
| 5/6/2011   | RFP     | EPC (Thumb)   | N/A  | Yes                                      | Wind                   |
| 3/24/2011  | RFP     | Solar Panels  | 12 MW  | Yes                                      | Solar                  |
| 3/10/2011  | RFP     | Wind Ownership Option   | 50 MW by 12/31/2014  | Yes                                      | All                    |
| 3/9/2011   | RFP     | 109 MW of Utility Owned Wind Turbines (Thumb)                     | 109 MW by 12/31/2012   | Yes                                      | Wind                   |
| 2/28/2011  | RFP     | Requested bids for the Installation of Utility Owned Solar        | N/A  | Yes                                      | Solar                  |

\* All=Any Renewable Energy Resource defined by 2008 PA 295; REC=Renewable Energy Credit; ACEC=Advanced Cleaner Energy Credit

\*\* CEREC=Capacity, Energy, and Renewable Energy Attributes

## Appendix F - Requests for Proposal (RFP) Summary

|            |       |  |                      |     |       |
|------------|-------|--|----------------------|-----|-------|
| 2/10/2011  | RFP   | O&M Services   | N/A                  | Yes | Wind  |
| 11/18/2010 | RFP   | Requested CEREC**  | 245 MW by 12/31/2014 | No  | All   |
| 7/26/2010  | Pre-Q | Pre-qualification for 100-200 MW of Utility Owned Wind Turbines                | N/A                  | Yes | Wind  |
| 3/29/2010  | SOI   | Solicitation of Interest to Host Utility Owned Solar at the Customers Location | N/A                  | Yes | Solar |
| 11/23/2009 | RFP   | Requested bids for the Installation of Utility Owned Solar                     | 3 MW                 | Yes | Solar |
| 10/23/2009 | Pre-Q | Pre-Qualification for the Installation of 3 MW of Utility Owned Solar          | N/A                  | Yes | Solar |
| 8/18/2009  | RFP   | Joint Development for Utility Owned Wind                                       | 75 MW by 12/31/2011  | Yes | Wind  |
| 8/18/2009  | RFP   | Requested CEREC**  | 106 MW by 12/31/2011 | No  | All   |
| 5/22/2009  | RFI   | Request for Information for the Joint Development of Wind Farms                | N/A                  | Yes | Wind  |
| 12/23/2008 | RFP   | Requested RECs* and ACECs* Without the Associated Energy                       | 250,000 RECs*/Year   | No  | All   |

\* All=Any Renewable Energy Resource defined by 2008 PA 295; REC=Renewable Energy Credit; ACEC=Advanced Cleaner Energy Credit

\*\* CEREC=Capacity, Energy, and Renewable Energy Attributes

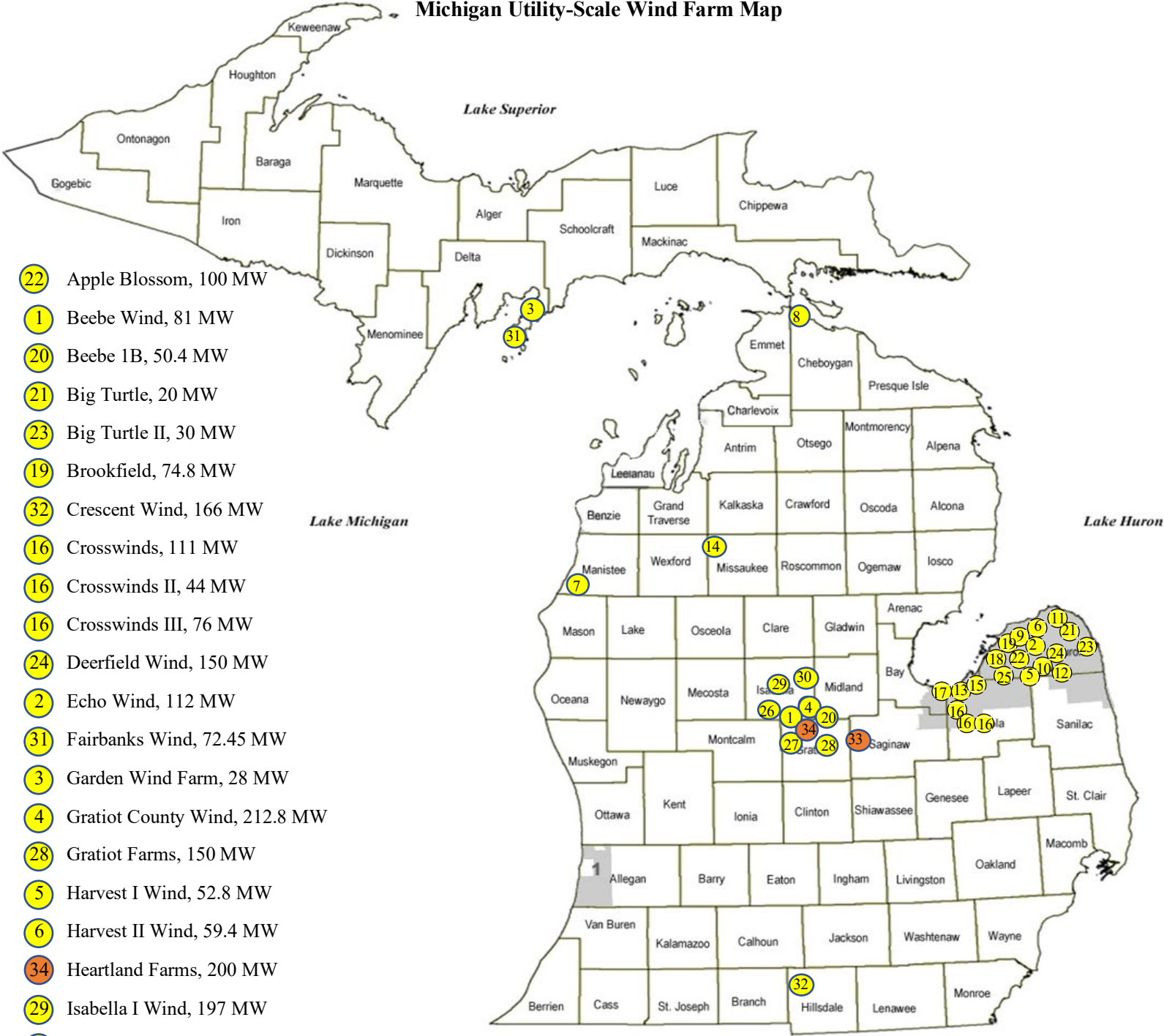


| Appendix G Michigan Utility Scale Wind Farms* |                        |               |                   |                    |   |                                   |  |                           |
|---|------------------------|---------------|-------------------|--------------------|---|-----------------------------------|--|---------------------------|
| Project Name                                  | County                 | Capacity (MW) | Turbine Size (MW) | Number of Turbines | Turbine Manufacturer                        | Developer                         | Power Purchaser                                    | Commercial Operation Date |
| Apple Blossom                                 | Huron                  | 100           | 3.45              | 29                 |   | Geronimo Energy                   | Consumers Energy                                   | October 2017              |
| Beebe   | Gratiot                | 81            | 2.4               | 34                 | Nordex                                      | Exelon & Great Lakes Wind         | Consumers Energy                                   | December 2012             |
| Beebe 1B                                      | Gratiot                | 50.4          | 2.4               | 21                 | Nordex                                      | Exelon                            | Municipal Utility                                  | December 2014             |
| Big Turtle                                    | Huron                  | 20            | 2.0               | 10                 | Gamesa                                      | Heritage Sustainable Energy       | DTE  | December 2014             |
| Big Turtle II                                 | Huron                  | 30            | 2.0               | 15                 | Gamesa                                      | Heritage Sustainable Energy       |  | December 2016             |
| Brookfield                                    | Huron                  | 74.8          | 1.7               | 44                 | GE Energy                                   | NextEra Energy                    | DTE  | February 2014             |
| Crescent Wind                                 | Hillsdale              | 166           | 2.8 & 2.3         | 60                 | GE Energy                                   | Crescent Wind, LLC                | Consumers Energy                                   | February 2021             |
| Cross Winds                                   | Tuscola                | 111           | 1.7               | 65                 | GE Energy                                   | Consumers Energy                  | N/A  | December 2014             |
| Cross Winds II                                | Tuscola                | 44            | 2.3               | 19                 | GE Energy                                   | Consumers Energy                  | N/A  | January 2018              |
| Cross Winds III                               | Tuscola                | 76            | 2.3               | 33                 | GE Energy                                   | Consumers Energy                  | N/A  | December 2019             |
| Deerfield Wind                                | Huron                  | 150           | 2                 | 72                 | Vestas                                      | RES Americas                      | Wolverine Power Cooperative                        | January 2017              |
| Echo  | Huron                  | 112           | 1.6               | 70                 | GE Energy                                   | DTE                               | N/A  | September 2014            |
| Fairbanks Wind Farm                           | Delta                  | 72.45         | 3.0               | 21                 | Siemens Gamesa                              | Gichi Noodin Wind                 | DTE  | January 2022              |
| Garden I                                      | Delta                  | 28            | 2.0               | 14                 | Gamesa                                      | Heritage Sustainable Energy       | Consumers Energy**                                 | September 2012            |
| Gratiot County                                | Gratiot                | 212.8         | 1.6               | 133                | GE Energy                                   | Invenergy & DTE                   | DTE  | June 2012                 |
| Gratiot Farms                                 | Gratiot                | 150           | 2                 | 75                 |   | Tradewind Energy, Inc.            | Consumers  | December 2020             |
| Harvest                                       | Huron                  | 52.8          | 1.65              | 32                 | Vestas                                      | Exelon                            | Wolverine Power Cooperative                        | 2008                      |
| Harvest II                                    | Huron                  | 59.4          | 1.8               | 33                 | Vestas                                      | Exelon                            | Consumers Energy                                   | November 2012             |
| Heartland Farms                               | Gratiot                | 200           | 2.82 & 2.52       | 72                 | GE  | Heartland Farms Wind Project, LLC | Consumers Energy                                   | December 2022             |
| Isabella I                                    | Isabella               | 197           | 2.82              | 70                 | GE Energy                                   | Isabella Wind, LLC                | DTE  | June 2021                 |
| Isabella II                                   | Isabella               | 186           | 2.82              | 66                 | GE Energy                                   | Isabella Wind, LLC                | DTE  | June 2021                 |
| Lake Winds                                    | Mason                  | 100.8         | 1.8               | 56                 | Vestas                                      | Consumers Energy                  | N/A  | November 2012             |
| Mackinaw City                                 | Emmet                  | 1.8           | 0.9               | 2                  | NEG Micon                                   | Mackinaw Power                    | Consumers Energy                                   | 2001                      |
| McKinley                                      | Huron                  | 14.4          | 1.6               | 9                  | GE Energy                                   | DTE                               | N/A  | December 2012             |
| Meridian Wind Farm                            | Saginaw                | 224.9         | 2.82 & 3.6        | 77                 | GE Energy, Vestas                           | DTE                               | N/A  | 2022                      |
| Michigan Wind I                               | Huron                  | 69            | 1.5               | 46                 | GE Energy                                   | Exelon                            | Consumers Energy                                   | 2008                      |
| Michigan Wind II                              | Sanilac                | 90            | 1.8               | 50                 | Vestas                                      | Exelon                            | Consumers Energy                                   | January 2012              |
| Minden  | Sanilac                | 32            | 1.6               | 20                 | GE Energy                                   | DTE                               | N/A  | December 2012             |
| Pheasant Run Wind                             | Huron                  | 74.8          | 1.7               | 44                 | GE Energy                                   | NextEra Energy                    | DTE  | December 2013             |
| Pine River Wind                               | Gratiot, Isabella      | 161.3         | 2.5               | 65                 | GE Energy                                   | Pine River Wind Energy, LLC       | DTE  | December 2018             |
| Pinnebog                                      | Huron                  | 51            | 1.7               | 30                 | GE Energy                                   | DTE                               | DTE  | December 2016             |
| Polaris Wind Park                             | Gratiot                | 168           | 2.5 & 2.3         | 68                 | GE Energy                                   | DTE                               | DTE  | April 2020                |
| Sigel   | Huron                  | 64            | 1.6               | 40                 | GE Energy                                   | DTE                               | N/A  | December 2012             |
| Stoney Corners                                | Missaukee & Osceola    | 81            | 2 - 2.5           | 29                 | Repower, Fuhrlander, Northern Power Systems | Heritage Sustainable Energy       | Consumers Energy, DTE, Traverse City Light & Power | 2008 - October 2012       |
| Tuscola Bay Wind                              | Tuscola, Bay & Saginaw | 120           | 1.6               | 75                 | GE Energy                                   | NextEra Energy                    | DTE  | December 2012             |
| Tuscola Wind II                               | Tuscola & Bay          | 100.3         | 1.7               | 59                 | GE Energy                                   | NextEra Energy                    | DTE  | November 2013             |
| <b>Totals</b>                                 |                        | <b>3,527</b>  | <b>MW</b>         | <b>1,658</b>       | <b>Turbines</b>                             |                                   |  |                           |
| <b>Operational Totals</b>                     |                        | <b>3,102</b>  | <b>MW</b>         | <b>1,581</b>       | <b>Turbines</b>                             |                                   |  |                           |

\*\*Heritage may supply power and RECs from this wind farm to DTE under an "additional supply" provision in a separate contract.

\* Prepared by MPSC Staff and includes all wind farms operational, planned or under contract with an MPSC-rate-regulated electric provider. Additional wind farms are included as MPSC Staff becomes aware of the project.

# Michigan Utility-Scale Wind Farm Map



- 22 Apple Blossom, 100 MW
- 1 Beebe Wind, 81 MW
- 20 Beebe 1B, 50.4 MW
- 21 Big Turtle, 20 MW
- 23 Big Turtle II, 30 MW
- 19 Brookfield, 74.8 MW
- 32 Crescent Wind, 166 MW
- 16 Crosswinds, 111 MW
- 16 Crosswinds II, 44 MW
- 16 Crosswinds III, 76 MW
- 24 Deerfield Wind, 150 MW
- 2 Echo Wind, 112 MW
- 31 Fairbanks Wind, 72.45 MW
- 3 Garden Wind Farm, 28 MW
- 4 Gratiot County Wind, 212.8 MW
- 28 Gratiot Farms, 150 MW
- 5 Harvest I Wind, 52.8 MW
- 6 Harvest II Wind, 59.4 MW
- 34 Heartland Farms, 200 MW
- 29 Isabella I Wind, 197 MW
- 30 Isabella II Wind, 186 MW
- 7 Lake Winds Energy Park, 100.8 MW
- 8 Mackinaw City, 1.8 MW
- 9 McKinley, 14.4 MW
- 33 Meridian Wind, 224.9 MW
- 10 Michigan Wind I, 69 MW
- 11 Michigan Wind II, 90 MW
- 12 Minden, 32 MW
- 18 Pheasant Run Wind, 74.8 MW
- 26 Pine River Wind, 161.3 MW
- 25 Pinnebog, 51 MW

- 27 Polaris Wind, 168 MW
- 15 Sigel, 64 MW
- 14 Stoney Corners, 81 MW
- 13 Tuscola Bay Wind, 120 MW
- 17 Tuscola Bay Wind II, 100.3 MW

● Currently Operational  
● Under Development  
 3,102 MW Total Operational