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

February 16, 2021

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Executive Summary

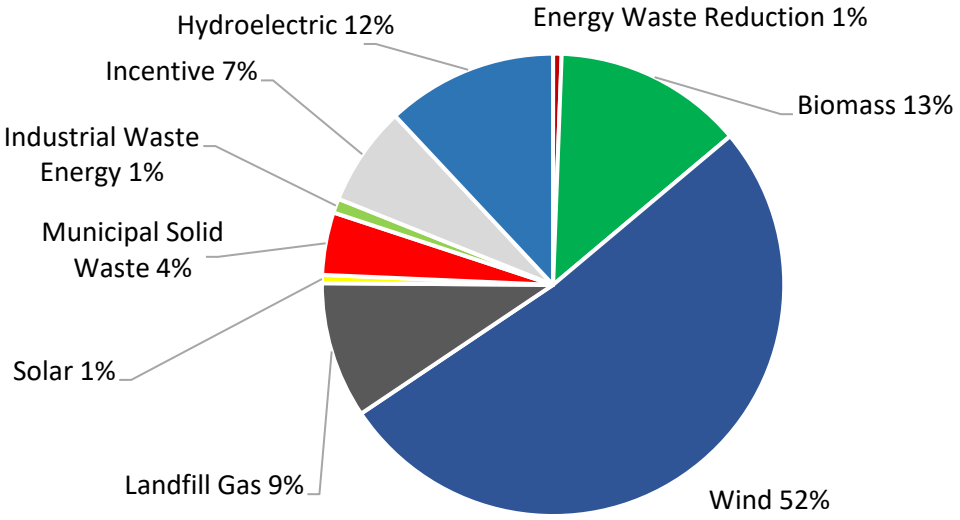
Pursuant to Public Act 295 of 2008, as amended by Public Act 342 of 2016 (Act), the Michigan Public Service Commission (MPSC or Commission) is directed to prepare a report summarizing both the Commission's activities related to the Act and electric provider's annual reports.

For 2019, electric providers were required to retire[1] the number of renewable energy credits (RECs)[2] 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. All[3] of Michigan's electric providers subject to the renewable energy standard in 2019 met the standard and retired a total of 12,812,152 RECs. **Figure ES-1** shows the different renewable energy technology types used to generate the RECs retired for compliance by all electric providers in 2019.

Figure ES-1: Compliance REC Breakdown

All Electric Providers – 2019 Compliance RECs

12,812,152 Total RECs



[1] Renewable energy credits are "retired" when used for compliance.

[2] 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.

[3] There are currently 69 electric providers subject to the renewable energy standard including: 8 rate-regulated utilities, 10 cooperative utilities, 40 municipal utilities, and 11 alternative electric suppliers. Twelve licensed alternative electric suppliers not currently serving customers are excluded from this total.

While electric providers retired enough RECs to achieve the 12.5% renewable energy standard using RECs generated from 2016 to 2020, it is useful to note that based on the number of RECs generated during 2019, Michigan's 2019 renewable energy percentage is equal to 11.2%[4] of retail sales.

By the end of 2022, Michigan will have 3,354 MW of operational renewable energy in response to the renewable energy standard. The weighted average price of renewable energy contracts approved by the Commission over the 2009 through 2020 time-period is $64.48 per MWh, which is considerably less than forecasted in the initial 2009 renewable energy plans. In addition, the weighted average price of renewable energy contracts approved since 2017 is $55.46/MWh.

[4] MIRECS vintage 2019 RECs and 2018 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[5]. 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 eleventh annual report provides information on the Commission's renewable energy activities related to the Act through calendar year 2020 and summarizes data from electric provider 2019 annual reports.

Renewable Energy Plans and Commission Approval

The renewable energy standard is applicable to Michigan's investor-owned electric utilities, cooperative electric utilities, municipal electric utilities, and alternative electric suppliers (AESs). Electric providers filed initial renewable energy plans (REPs) in 2009.[6] 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.[7]

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, eight rate-regulated electric providers filed annual renewable energy cost reconciliation cases for 2019. Commission staff examined the pertinent revenues and expenses, determined the electric provider's compliance with its filed REP and assessed whether

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[5] Michigan Legislature - Section 460.1051

[6] There are currently 69 electric providers subject to the renewable energy standard including: 8 rate-regulated utilities, 10 cooperative utilities, 40 municipal utilities, and 11 AESs. Twelve licensed AESs not currently serving customers are not included in this total.

[7] http://www.michigan.gov/documents/mpsc/U-18409_8-23-17_598908_7.pdf

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**.[8]

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 during 2022 due to the PA 342 repeal of Section 51, effective January 1, 2023. Michigan electric provider annual reports for 2009 through 2019 are available on the Commission's website.[9] A summary of selected data from annual reports is shown in **Appendix C**.

Renewable Energy Credit Requirements – 2019 Compliance

For 2019, electric providers were required to meet an interim compliance of 12.5%. The number of renewable energy credits (RECs)[10] required for 2019 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 2019 met the standard and retired[11] a total of 12,812,152 RECs. **Figure 1** shows the different renewable energy technology types used to generate the RECs for compliance by all electric providers in 2018 and 2019 as well as separately for both Consumers Energy's and DTE Electric's 2019 compliance.

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[8]Link to 2019 electric provider reconciliation filings: https://www.michigan.gov/mpsc/0,9535,7-395-93308_93325_93423_93502_94989-506587--,00.html

[9] Link to 2019 electric provider annual reports: https://www.michigan.gov/mpsc/0,9535,7-395-93309_93439_93463_93724_93726-534198--,00.html

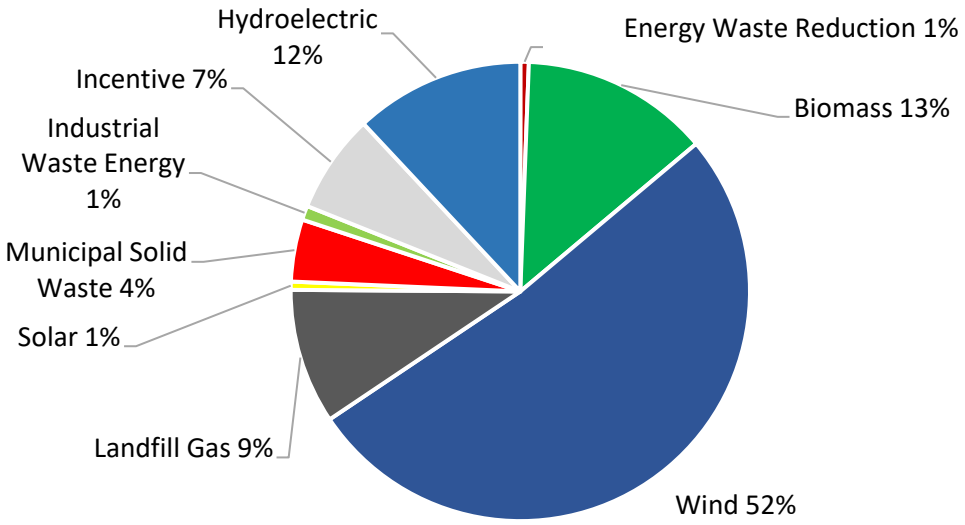
[10] The term "renewable energy credit" includes renewable energy credits, Michigan incentive renewable energy credits, and energy waste reduction credits when substituted for renewable energy credits.

[11] RECs are "retired" when used for compliance.

Figure 1: Compliance REC Breakdown

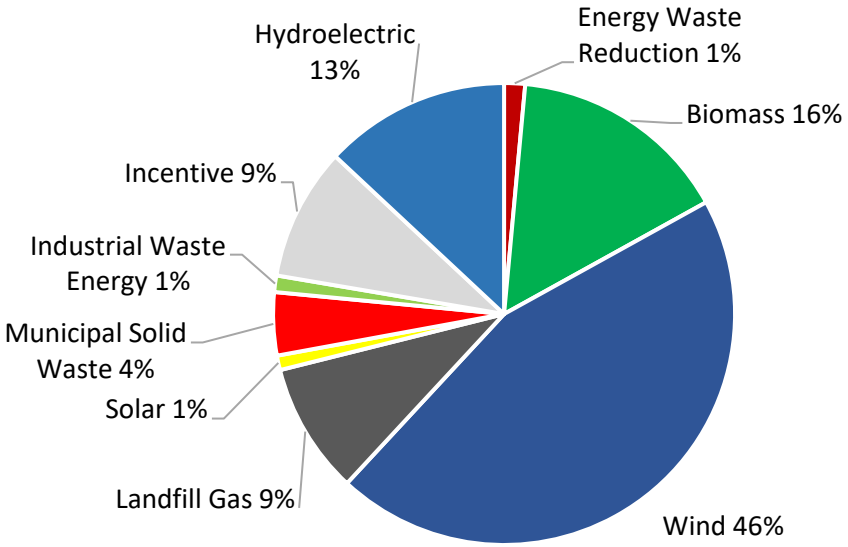
All Electric Providers – 2019 Compliance RECs

12,812,152 Total RECs

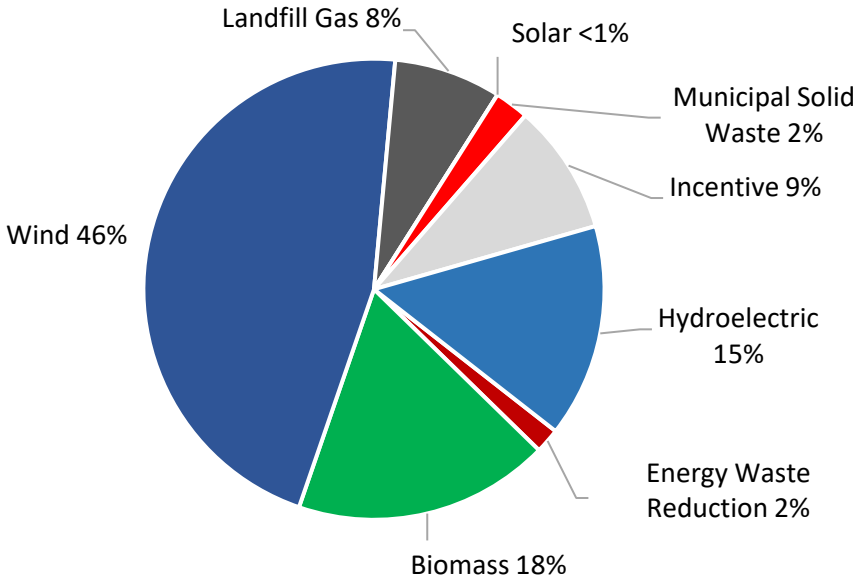


All Electric Providers – 2018 Compliance RECs

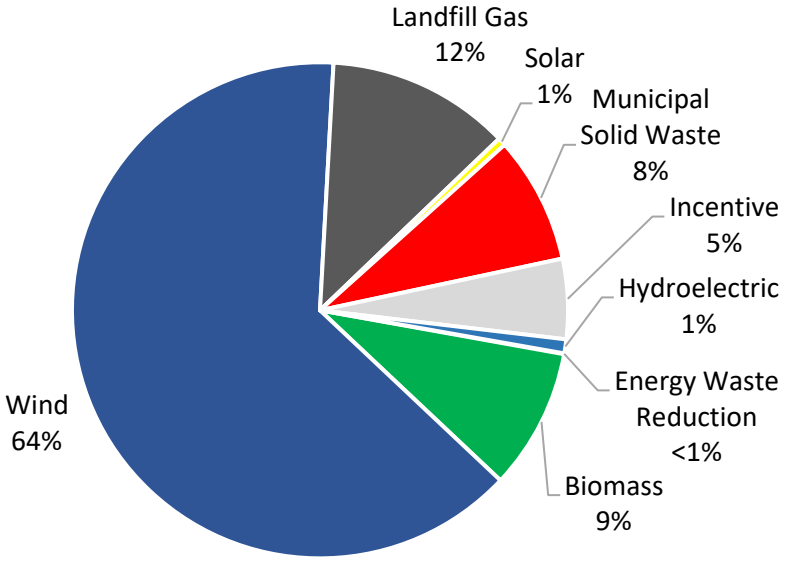
10,214,303 Total RECs



Consumers Energy - 2019 Compliance
4,208,207 RECs



DTE Electric – 2019 Compliance
5,299,690 Total RECs

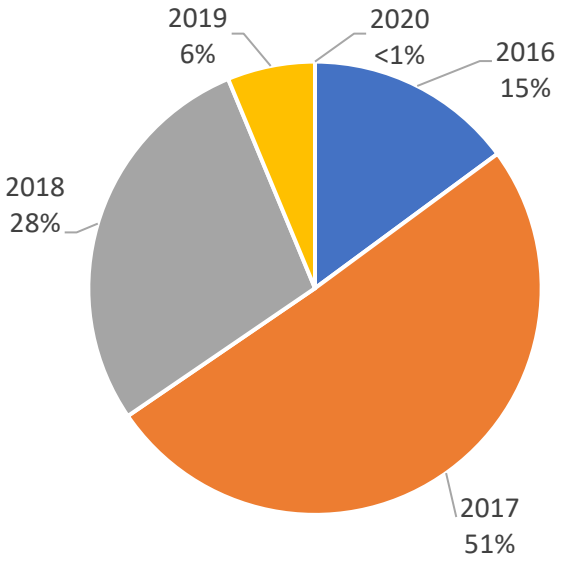


Section 29 of the Act includes provisions for determining whether the location of a renewable energy system is eligible for Michigan's renewable energy standard. Nearly 96% of the RECs used for 2019 compliance were from renewable energy generated in Michigan. Indiana was the source for 2.7%, Wisconsin nearly 1.5% 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. Sixty-six percent of the RECs used to comply in 2019 were from renewable energy generated in 2016 or 2017. Michigan Renewable Energy Certification System (MIRECS) data shows that, through 2019, approximately 4.5 million RECs have expired without being used for compliance.[12]

Figure 2: 2019 Compliance RECs – Year of Generation



Status of Renewable Energy

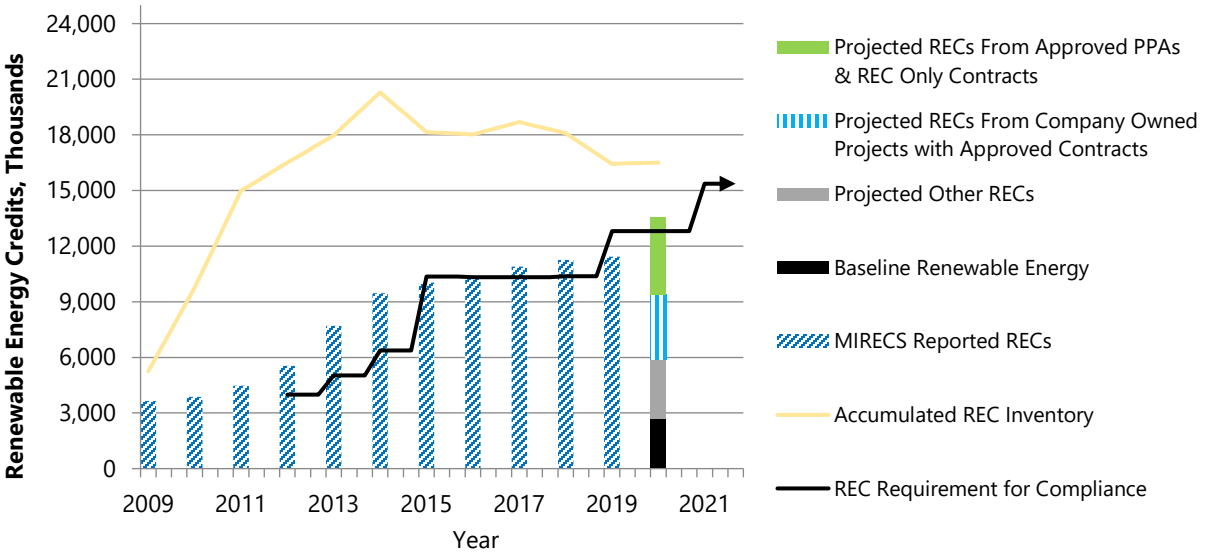
MIRECS data for 2019 shows a total of 11,428,641 vintage 2019 RECs. A breakdown of these RECs by type is shown in **Figure 7**. Dividing the number of 2019 RECs by the 2018 compliance retail sales figure of 102,447,669 MWh as calculated in **Appendix B,** yields an estimate of Michigan's 2019 renewable energy percentage of 11.2%. 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 2019 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.

[12] Previous reports have stated that as many as 6.1 million RECs had expired without being used. This report revises the number downward to 4.5 million.

A projection of Michigan's RECs for 2020 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 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 incorporates Michigan's current renewable energy status and projects that electric providers are on track to comply with the standard in 2020 by adding a portion of the accumulated RECs to projected renewable energy generation.

Figure 3: Michigan REC Projection

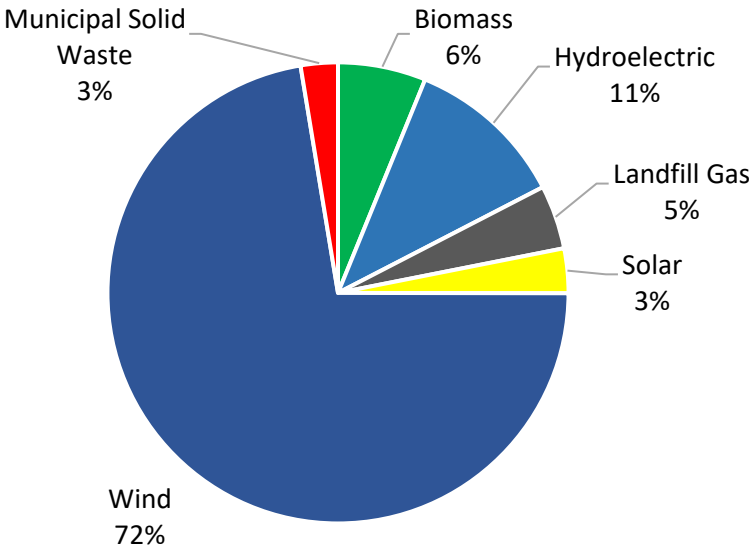


Source: Electric provider annual reports, PA 295 contracts, MIRECS and Commission staff.

Figure 4 provides a breakdown of the technology type and total nameplate capacity for the approximately 3,300 MW of renewable energy generators operating in Michigan as of the date of this report. Additional renewable energy generators 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 renewable energy generators currently under development and/or contracted for, which are not yet operational, that are not included within this figure.

Figure 4: Renewable Energy Generators in Michigan, by Technology Type

Approximately 3,300 MW Nameplate Capacity

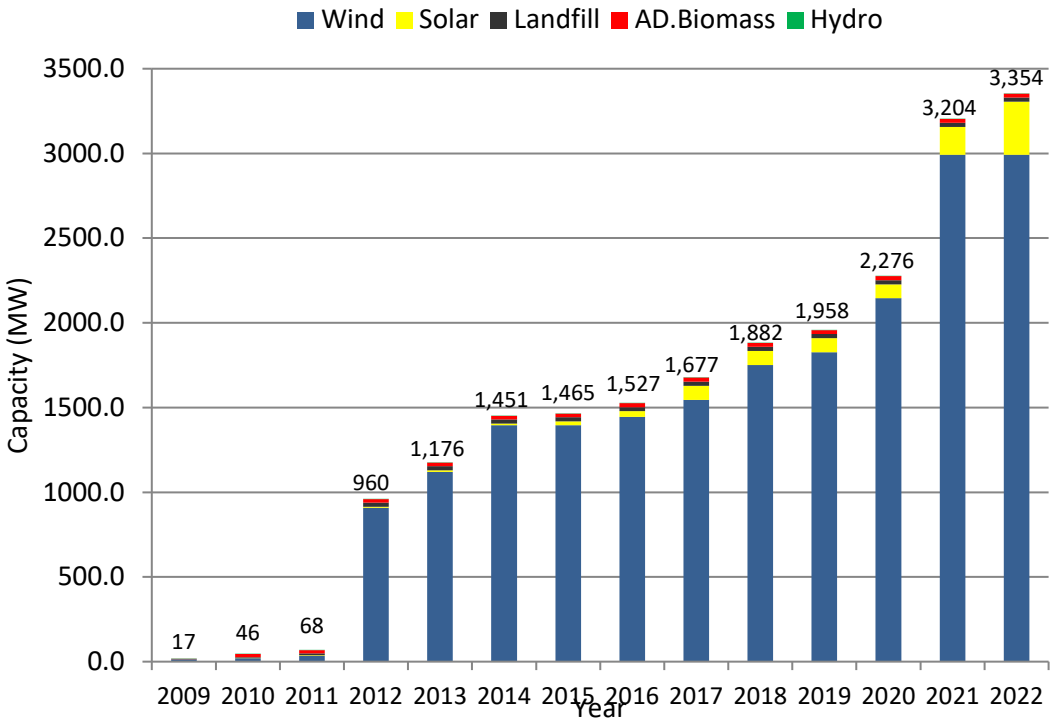


Source: MIRECS Project Registrations

As of January 2021, 87 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. In 2020, Consumers Energy filed an amendment for the 100 MW River Fork solar project changing its expected commercial operation date from 2021 to 2022 due to delays in interconnection to the transmission system. Additional delays, due to the Covid-19 pandemic, have impacted the timing to bring several projects from development to commercial operation. The expected commercial operation date for three of DTE Electric's wind projects shifted from 2020 to 2021. The expected operation date for one of Consumers Energy's wind projects shifted from 2020 to 2021. While the total cumulative project capacity remains the same, the changes in commercial operation dates are reflected 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.**[13]

[13] 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.

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



During 2019 and 2020, consistent with utility renewable energy plans, three utility-scale wind farms became operational in Michigan:

- Cross Winds Energy Park III – 76 MW, Tuscola County, 2019
- Polaris Wind – 168 MW, Gratiot County, 2020
- Gratiot Farms Wind – 150 MW, Gratiot County, 2020

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

- Crescent Wind – 166 MW, Hillsdale County (delayed to 2021)
- Isabella I Wind – 197 MW, Isabella County (delayed to 2021)
- Isabella II Wind – 186 MW, Isabella County (delayed to 2021)
- Fairbanks Wind Park – 72.45 MW, Delta County (delayed to 2021)
- Meridian Wind Farm – 224.9 MW, Midland and Saginaw Counties (2021)
- Assembly Solar – 79 MW, Shiawassee County (2021)
- 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 1,074 MW of new, utility-scale renewable generation.

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 Programs

Renewable energy supply needed for compliance with the renewable energy standard has largely been constructed. 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

Consumers Energy	DTE Electric
Solar Gardens	**MIGreenPower - Rider 17**
Western Michigan University and Grand Valley State University - 4 MW	Lapeer Solar and O'Shea Solar – 50 MW
	Pinnebog Wind - 50 MW
City of Cadillac - 0.5 MW	
	MIGreenPower – Rider 19
Large Customer Renewable Energy Program (LC-REP)	Isabella I – 197 MW (delayed to 2021)
	Isabella II – 186 MW (delayed to 2021)
Crosswinds II - 44 MW	Fairbanks Wind – 72.45 MW (delayed to 2021)
	Approval requested for approximately 800 MW of voluntary green pricing program supply in MPSC Case No. U-20173/U-20851

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 2018 and 2019, Consumers Energy issued four requests for proposals for a total of 600 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

Utility	MPSC Case Number	Renewable Energy Approved for the Initial 3-Years	3-Year Post IRP Filing Period	Renewable Energy in Current Preferred Course of Action throughout IRP Planning Horizon
Alpena Power	U-20300		07/2019-07/2022	
Consumers Energy	U-20165	626 MW wind, 550.5 MW solar	06/2019-06/2022	7050 MW (550 MW wind, 6,350 MW solar, 150 MW PURPA)
DTE Electric	U-20471	839.4 MW wind, 190 MW solar	04/2020-04/2023	1667 MW (205 MW solar, 1462 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[14]
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-20470		10/2019-10/2022	None, future IRP will include an analysis of future energy procurement.
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.

*Data provided for Indiana Michigan Power Company and Northern States Power Wisconsin (Xcel) is representative of the Company's entire multi-state service territory.

Renewable energy quantities are subject to change according to actual contracting results and adjustments to the preferred course of action in future IRP cases.

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

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.

In MPSC Case No. U-20615, the Commission approved a settlement agreement that ended disputes between Consumers Energy and independent power producers. The agreement approved by the Commission includes a commitment from Consumers Energy to purchase a total of 584 MW of solar energy under set terms from project developers. The agreement also resolves complaints by more than 40 entities.[15] The utility cannot reduce its renewable energy standard or integrated resource plan solar purchase quantities due to the settlement unless Consumers Energy and the QFs execute separate contracts covering the purchase of RECs.

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.

[15] See U-20615 docket https://mi-psc.force.com/s/global-search/20615

Michigan has reached 21% and is continuing to progress toward the goal of 35% combined renewable energy and energy waste reduction by 2025.[16]

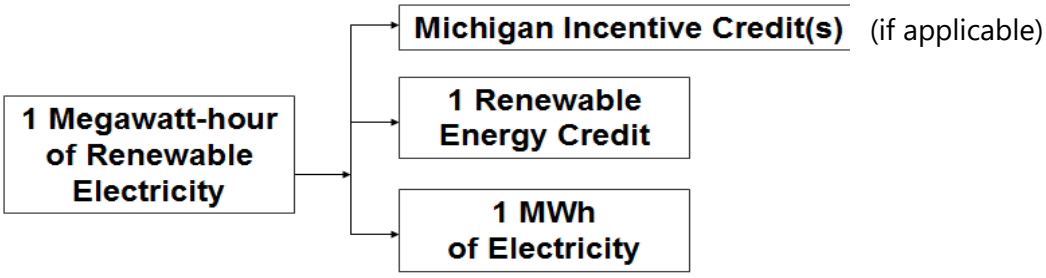
Impact of Percentage Limits on the Use of Energy Waste Reduction Credits

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 2019 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 2019 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 1.5% 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[17] 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 with the 2017 compliance year. One energy waste reduction credit is created for each MWh of energy saved.[18]

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[16] See Figure 3 in the MPSC's Annual Report on the Implementation of PA 295 2019 Utility Energy Waste Reduction Programs, February 15, 2021

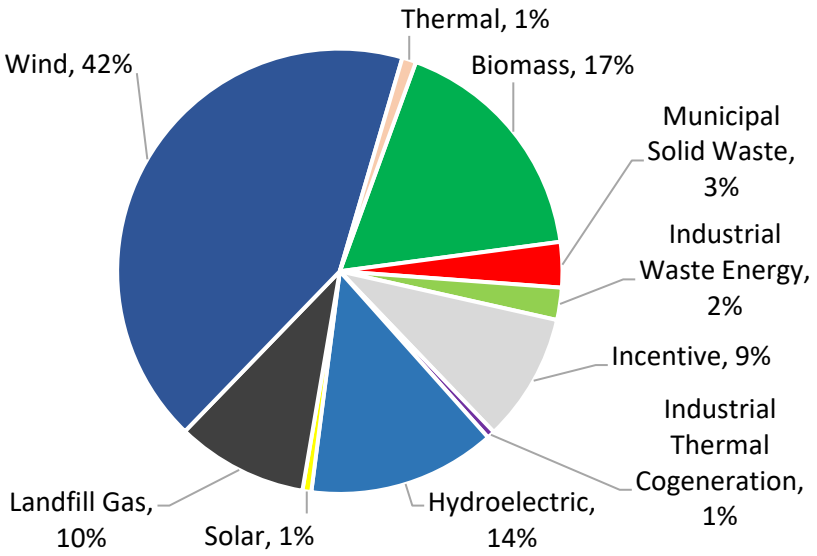
[17] At this time, energy waste reduction credits are not transferable from one electric provider to another, meaning that they cannot be sold or otherwise traded.

[18] Annual Report on the Implementation of PA 295 2019 Energy Waste Reduction Report to the Legislature

As of January 28, 2021, a total of 124,848,118 energy credits have been created in MIRECS from 2009 through 2020. **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**.

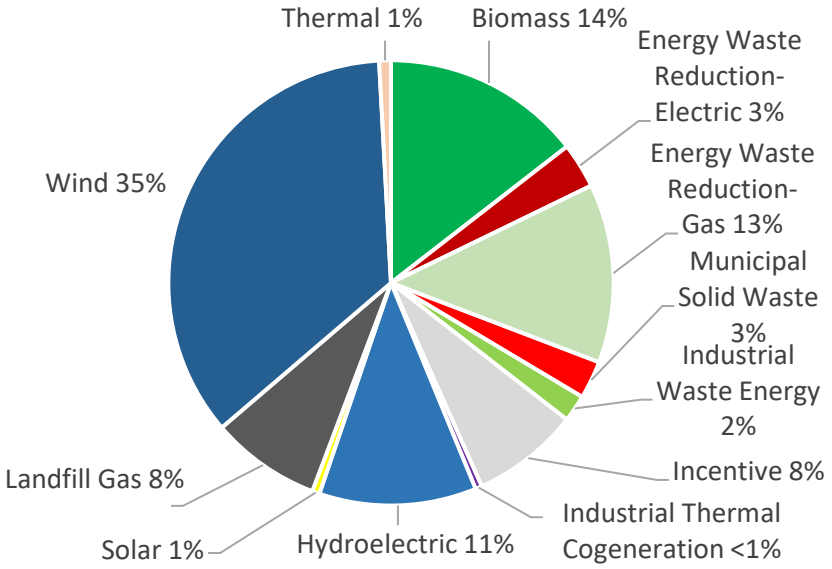
Figure 7: MIRECS 2009-2020 Vintage Energy Credits (Without Energy Waste Reduction Credits)

120,736,824 Total Credits



MIRECS 2009-2020 Vintage Energy Credits (With Energy Waste Reduction Credits)

124,848,118 Total Credits



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

The number of generating units within MIRECS increased slightly throughout 2020. As of January 2021, there were 319 registered projects (generators) in MIRECS. MIRECS has 149 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 2021, registered 69 projects for the purpose of importing energy credits into MIRECS. Commission staff assists electric providers with the compliance process and will continue to hold training/information meetings.

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.

Figure 8: Michigan Labor Incentive Credits 2009-2020

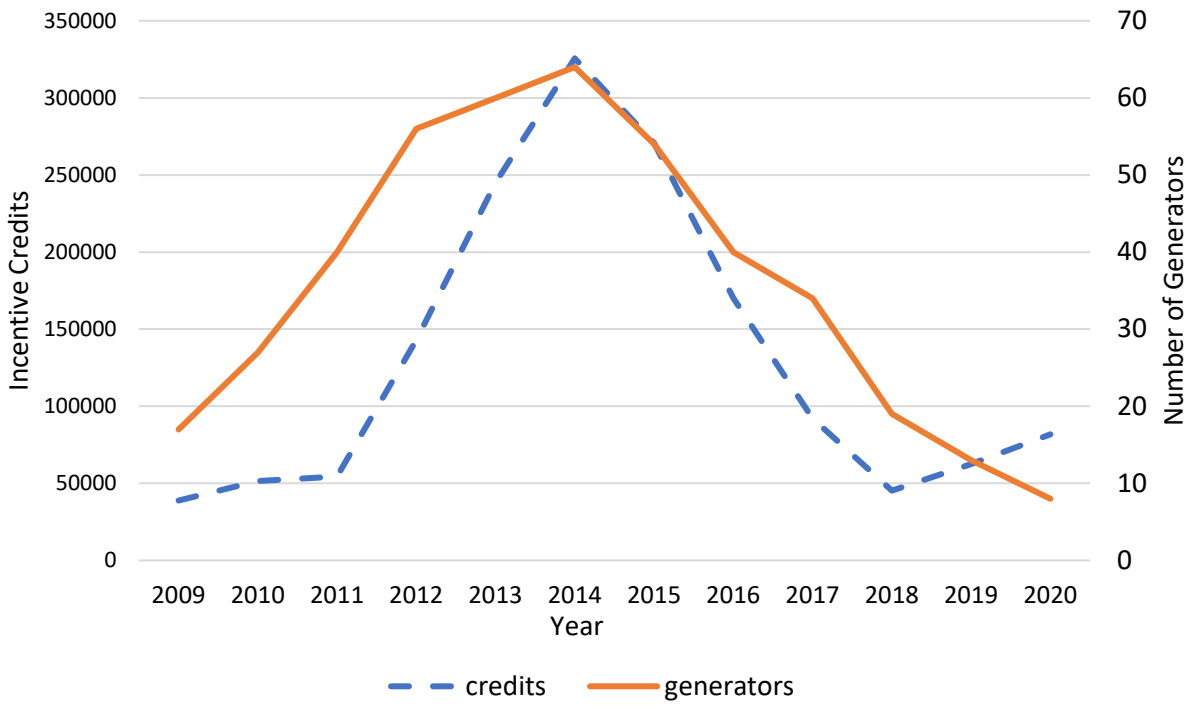
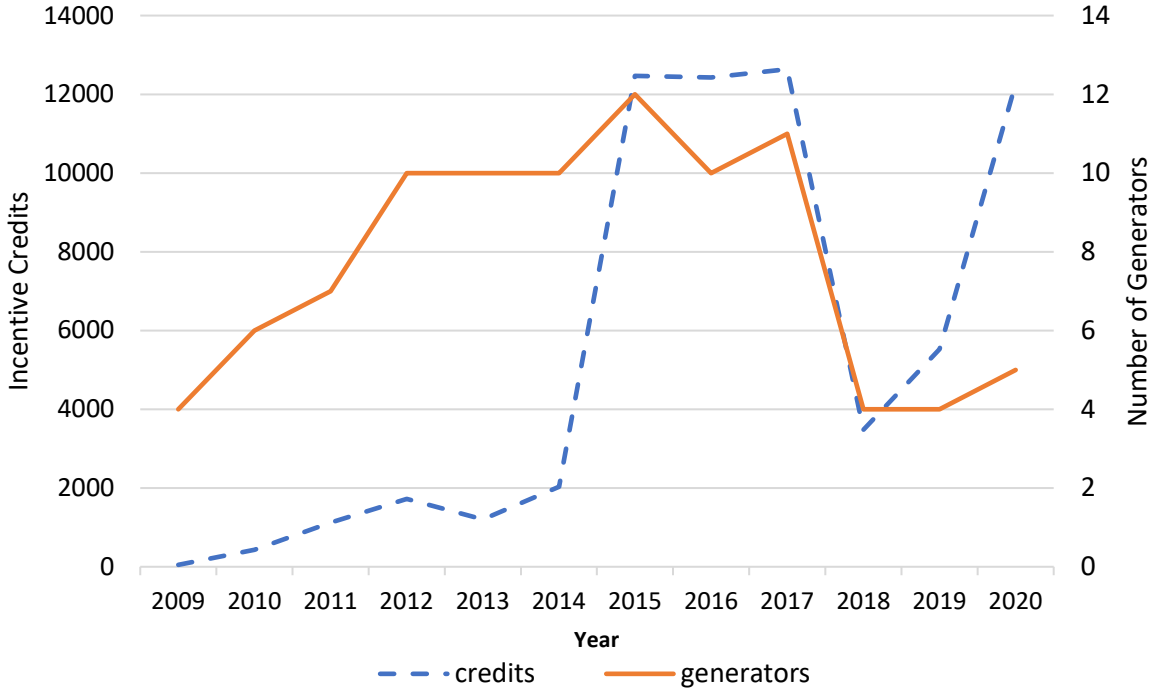


Figure 9: Michigan Equipment Incentive Credits 2009-2020



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[19] for renewable energy projects

with commercial operation dates through 2018, and $1,500/kW[20] for projects with commercial operation dates in 2019 and 2020, over $4.3 billion has been invested to bring approximately 2,276 MW[21] 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.[22] 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 10,033 jobs in the first quarter of 2020. [23] In 2019, the Bureau of Labor Market Information and Strategic Initiatives published a new report on the Michigan Energy Cluster.[24] 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.[25]

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[19] 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.

[20] 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

[21] 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 bio-digestion projects that were commercially operational prior to PA 295.

[22] See 2014 Cluster Workforce Updates – Energy: http://milmi.org/Research/cluster-workforce-updates-2014

[23] The report's author provided additional information to MPSC staff showing job data for 2020.

[24] https://milmi.org/Research/michigan-industry-cluster-workforce-analysis-reports

[25] Excerpt from Commission staff January 30, 2009 Guidepost Rate Letter, https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000000wNU3AAM

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 electric providers. The Commission continues to find that the $133 per MWh guidepost is reasonable.[26]

By comparing the levelized cost of $133 per MWh for a new conventional coal-fired power facility with the combined weighted average levelized contract prices in **Table 3**, the cost of all approved PA 295 renewable energy projects utilizing multiple renewable energy technologies is less than the coal 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. Previous reports have shown weighted averages of levelized prices based on calculating the quantity of generation over the estimated life of each project. The weighted average cost of solar for DTE Electric decreased significantly from $113.52 per MWh to $70.84 per MWh. The reduction was due to the approval of two new solar power purchase agreements. Consequently, this lower weighted average for DTE Electric affected the combined weighted average for Consumers Energy and DTE Electric. The combined weighted average of levelized costs for solar is now $69.41 per MWh - a decrease from last year's combined weighted average of $73.08 per MWh.

Table 3: Weighted Average Levelized Renewable Energy Contract Prices (2009 through the Present)

Technology	Wind	Digester	Biomass	Landfill	Hydro	Solar
Consumers Energy						
Weighted Avg.	$67.96	$134.51	NA	$107.24	$121.31	$54.69
DTE Electric						
Weighted Avg	$64.01	NA	$98.94	$99.97	NA	$70.84
Combined Weighted Avg.	**$65.50**	**$134.51**	**$98.94**	**$99.90**	**$121.31**	**$69.41**

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. Consumers Energy has filed renewable energy

[26] See MCL 460.1051(5)

contracts with the Commission totaling approximately 1,154 MW, and DTE Electric totaling approximately 1,775 MW, as shown in **Appendix E.**

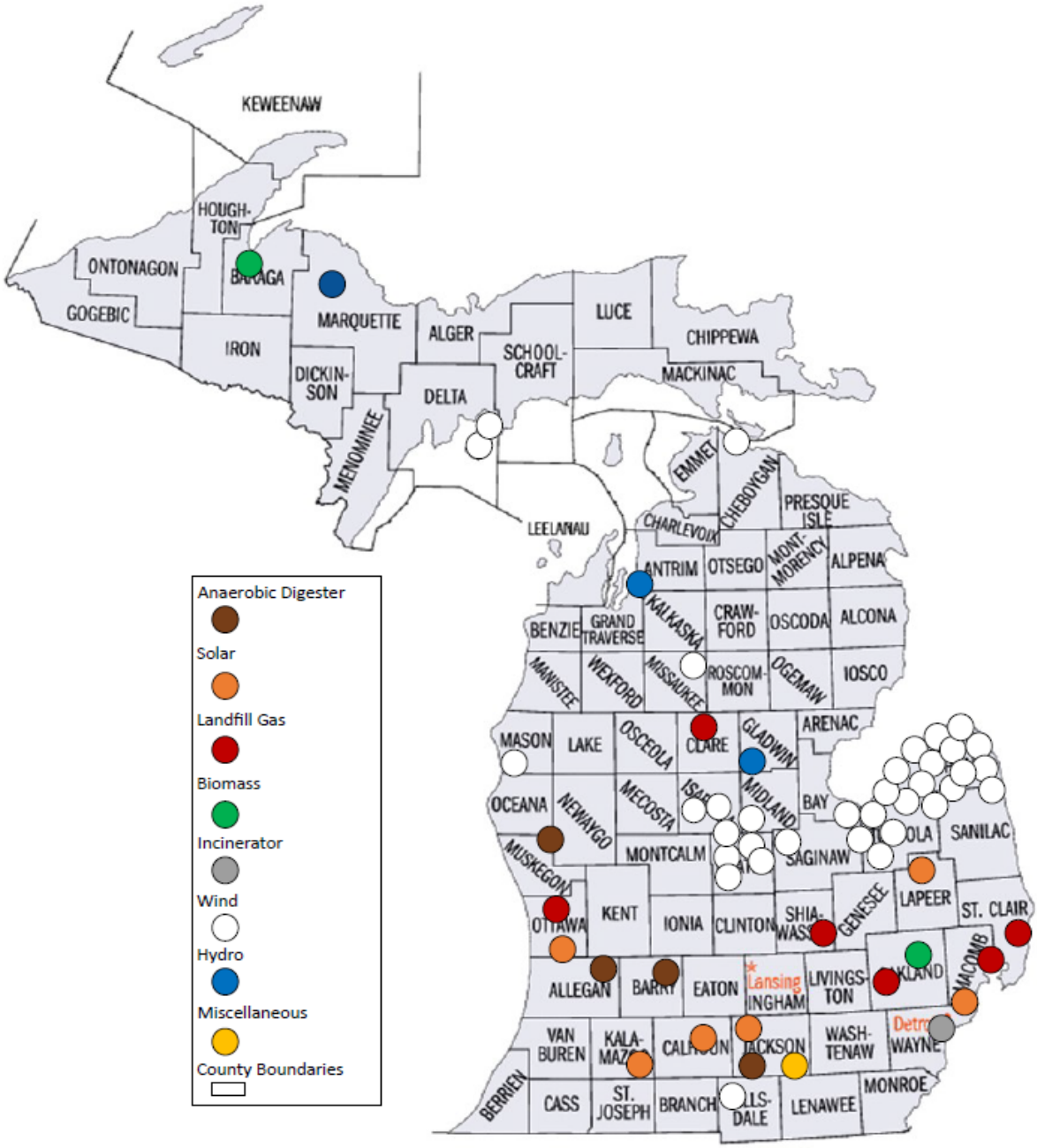
Consumers Energy and DTE Electric have conducted 51 requests for proposals (RFPs) in total. During 2020, Consumers Energy conducted two RFPs and DTE Electric did not conduct any new RFPs. In total, Consumers Energy has conducted 24 RFPs and four requests for qualifications and DTE Electric has conducted 27 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[27] 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** lists all renewable energy 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. At the end of 2020, 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 2,481 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**. Five wind farms and three solar farms totaling 1,074 MW of new capacity, are expected to begin operating during 2021 and 2022.

[27] https://mi-psc.force.com/s/filing/a00t0000005pa5hAAA/u158000001

Figure 10: Locations of PA 295 Renewable Energy Projects

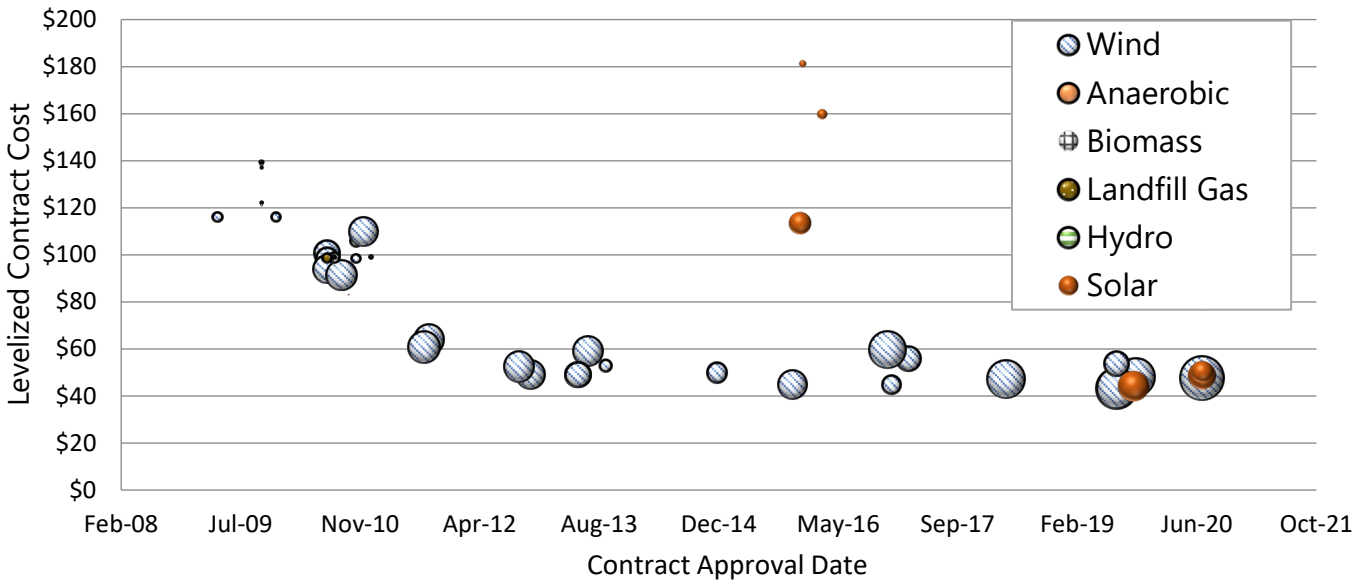


Multiple Anaerobic Digester projects participating in Consumers Energy's Experimental Advanced Renewable Program are represented by a brown symbol at Jackson. Multiple Solar projects participating in Consumers Energy's Experimental Advanced Renewable Program are represented by a solar symbol placed at 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.

The most recent wind contracts approved by the Commission have levelized costs in the $43 - $53 per MWh range, approximately half of the levelized cost of the first renewable energy contracts approved in 2009 and 2010. The weighted average of levelized costs for all Consumers Energy and DTE Electric contracts results in an average cost of $64.48 per MWh.[28] With the exception of 14 MW of capacity, all renewable energy contract prices are lower than the $133 per MWh coal guidepost rate. **Figure 11** shows the trend in declining levelized costs over time. The $64.48 per MWh weighted average cost of renewable energy under the standard for Consumers Energy and DTE Electric is substantially lower than the cost of a new coal-fired plant and demonstrates that the renewable energy standard has been cost effective. The MWh contract prices used in the weighted average cost of renewable energy calculation are shown in **Appendix E**.

Of the 87 contracts and amendments from the five electric providers approved by the Commission to date, all but six have been from Consumers Energy or DTE Electric and 20 have been unsolicited. With the exception of several early contracts for small renewable energy projects and several of Michigan's first utility scale solar projects, the contract prices have been much lower than expected and have generally continued to decline.

Figure 11[29]: Levelized Cost of MPSC Approved Contracts ($ per MWh)



[28] The weighted average cost increased from $61.74 per MWh in 2018 to $64.48 per MWh in 2019 due to a change in the calculation methodology. The previous method based the MWh weighting on the amount of MWh expected over the contract term or depreciable life of the project. The revised methodology uses one year of expected generation in the weighting calculation. This change was made in response to some utility-owned projects using a thirty-five-year project life which is significantly longer than a typical twenty-year PPA.

[29] Circle size denotes project capacity size.

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[30] 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.[31]

For 2019, the average annual transfer price for DTE Electric was $66.11 per MWh and the average annual transfer price for Consumers Energy was $80.26 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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[30] https://www.michigan.gov/documents/energy/renewable_final_438952_7.pdf

[31] For more detailed information on the staff Transfer Price Schedule: https://mi-psc.force.com/s/case/500t0000008efN6AAI/in-the-matter-on-the-commissions-own-motion-to-implement-2008-pa-295-through-issuance-of-a-temporary-order-as-required-by-mcl-4601191

At the end of 2019, the only rate-regulated electric providers collecting a renewable energy surcharge on bills were Indiana Michigan Power Company and Upper Michigan Energy Resource Corporation. However, effective December 2020, the Commission approved Upper Michigan Energy Resource Corporation's request to temporarily suspend its renewable energy surcharge.[32] Additionally, there are three non-rate-regulated electric providers collecting renewable energy surcharges. Surcharge details can be found in **Appendix B**.

Conclusion

The Commission is pleased to note that all electric providers were able to achieve the renewable energy standard for 2019. 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 3,354 MW of new renewable energy projects. The weighted average price of renewable energy contracts approved by the Commission over the 2009 through 2020 time-period is $64.48 per MWh, which is considerably less than forecasted in the initial 2009 renewable energy plans.

The Commission intends to build on the successful activities already in place to guide Michigan's path to the 15% renewable energy standard in 2021 and achieving the combined goal of meeting Michigan's electric needs through a combination of 35% energy waste reduction and renewable energy by 2025.

[32] https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000Gbq0gAAB

Appendix A - Renewable Energy Case Numbers and Electric Providers

	COMPANY	Initial RE Plan Case #	Most Recent Plan Case #	2018 Reconciliation Case #	2019 Reconciliation Case #
	Rate Regulated Utilities				
1	Alpena Power Company	U-15804	U-18230	U-20482	U-20721
2	Consumers Energy Company	U-15805	U-18231	U-20483	U-20722
3	DTE Electric Company	U-15806	U-18232	U-20484	U-20723
4	Indiana Michigan Power Company	U-15808	U-18233	U-20485	U-20724
5	Northern States Power Company-Wisconsin	U-15809	U-18234	U-20486	U-20725
6	Upper Peninsula Power Company	U-15810	U-18235	U-20487	U-20726
7	Upper Michigan Energy Resources Corporation		U-18236	U-20488	U-20727
	Wisconsin Public Service Corporation	U-15811			
8	Wisconsin Electric Power Company	U-15812	U-18237	U-20489 (15 mo period thru 3/2019)	
	Member Regulated Cooperatives			**Not Required**	
9	Alger Delta Cooperative Electric Association	U-15813	U-16589		
10	Bayfield Electric Cooperative	U-15814	U-16590		
11	Cherryland Electric Cooperative	U-15815	U-16591		
12	Cloverland Electric Cooperative/Edison Sault	U-15816	U-17799		
13	Great Lakes Energy Cooperative (2012)	U-15817	U-16593		
14	Midwest Energy Cooperative	U-15818	U-16594		
15	Ontonagon Co. Rural Electricification Assoc. (2012)	U-15819	U-16595		
16	Presque Isle Electric and Gas Co-op (2012)	U-15820	U-16596		
17	Thumb Electric Cooperative	U-15821	U-16598		
18	Tri-County Electric Cooperative	U-15822	U-17801		
	Municipal Utilities			**Not Required**	
19	Village of Baraga	U-15848	U-16599		
20	City of Bay City	U-15849	U-16600		
21	City of Charlevoix	U-15850	U-16601		
22	Chelsea Department of Electric and Water	U-15851	U-16602		
23	Village of Clinton	U-15852	U-16603		
24	Coldwater Board of Public Utilities	U-15853	U-16604		
25	Croswell Municipal Light & Power Department	U-15854	U-16605		
26	City of Crystal Falls	U-15855	U-16606		
27	Daggett Electric Department	U-15856	U-16607		
28	City of Dowagiac	U-15858	U-16609		
29	City of Eaton Rapids	U-15859	U-16610		
30	City of Escanaba	U-15860	U-16611		
31	City of Gladstone	U-15861	U-16612		
32	Grand Haven Board of Light and Power	U-15862	U-16613		
33	City of Harbor Springs	U-15863	U-16614		
34	City of Hart Hydro	U-15864	U-16615		
35	Hillsdale Board of Public Utilities	U-15865	U-16616		
36	Holland Board of Public Works	U-15866	U-16617		
37	Village of L'Anse	U-15867	U-16618		
38	Lansing Board of Water & Light	U-15868	U-16619		
39	Lowell Light and Power	U-15869	U-16620		
40	Marquette Board of Light and Power	U-15870	U-16621		
41	Marshall Electric Department	U-15871	U-16622		
42	Negaunee Department of Public Works	U-15872	U-16623		
43	Newberry Water and Light Board	U-15873	U-16624		
44	Niles Utility Department	U-15874	U-16625		
45	City of Norway	U-15875	U-16626		
46	City of Paw Paw	U-15876	U-16627		
47	City of Petoskey	U-15877	U-16628		
48	City of Portland	U-15878	U-16629		
49	City of Sebewaing	U-15879	U-16630		
50	City of South Haven	U-15880	U-16631		
51	City of St. Louis	U-15881	U-16632		
52	City of Stephenson	U-15882	U-16633		
53	City of Sturgis	U-15883	U-16634		
54	Traverse City Light & Power	U-15884	U-16635		
55	Union City Electric Department	U-15885	U-16636		
56	City of Wakefield	U-15886	U-16637		
57	Wyandotte Department of Municipal Service	U-15887	U-16638		
58	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 #	2018 Reconciliation Case #	2019 Reconciliation Case #
	Alternative Electric Suppliers (AES) Serving Customers			**Not Required**	
59	Calpine Energy Solutions f/k/a Noble Americas Energy Solutions LLC	U-15843	U-16650		
60	CMS ERM Michigan LLC	U-15826	U-16640		
61	Constellation NewEnergy Inc	U-15829	U-16642		
62	Direct Energy Business LLC	U-15845	U-16643		
63	Eligo Energy MI, LLC	U-17885	U-17885		
64	Energy Harbor, LLC f/k/a FirstEnergy Solutions Corp	U-15832	U-16644		
65	Just Energy Inc f/k/a Commerce Energy	U-15828	U-16641		
66	MidAmerican Energy Services	U-17934	U-17934		
67	Spartan Renewable Energy Inc	U-15844	U-16651		
68	U.P. Power Marketing LLC	U-16586	U-16652		
69	Wolverine Power Marketing Cooperative Inc	U-15847	U-16653		
	Alternative Electric Suppliers (AES) Not Serving Customers			**Not Required**	
70	AEP Energy, Inc	U-15825	U-15825		
71	Dillon Power, LLC	U-17769	U-17769		
72	Direct Energy Services LLC	U-15830	U-15830		
73	EDF Energy Services	U-18037	U-18037		
74	Energy Int'l Power Marketing d/b/a PowerOne	U-15831	U-15831		
75	Energy Services Providers, Inc. d/b/a Michigan Gas & Electric	U-17010	U-17010		
76	Interstate Gas Supply, Inc d/b/a IGS Energy	U-17338	U-17338		
77	Liberty Power Delaware	U-15834	U-15834		
78	Libery Power Holdings LLC	U-15835	U-15835		
79	Nordic Energy Services, LLC	U-18066	U-18066		
80	Plymouth Rock Energy LLC	U-17549	U-17549		
81	Texas Retail Energy, LLC	U-17168	U-17168		
	Alternative Electric Suppliers (AES) Licenses Rescinded			**Not Required**	
	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			
	Rate Regulated Renewable Energy Voluntary Green Pricing Case Numbers				
	COMPANY	**2017-2018 Cycle**	**2019-2020 Cycle**		
1	Alpena Power Company	U-18350	U-18350		
2	Consumers Energy Company	U-18351	U-20649		
3	DTE Electric Company	U-18352	U-20713		
4	Indiana Michigan Power Company	U-18353	U-18353		
5	Northern States Power Company-Wisconsin	U-18354	U-20638		
6	Upper Peninsula Power Company	U-18355	U-20652		
7	Upper Michigan Energy Resources Corporation	U-18356	U-18356		

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

Company	2018 Compliance Year Sales*	Retail Sales Method**	2019 REC Requirement	2019 Excess RECs Retired	2019 EWR Credit Substitutions	Met the 2019 Standard	Current Residential Surcharge $/Month
Rate Regulated Utilities							
Alpena Power	353,229	3Y	44,154			Yes	
Consumers Energy	33,665,656	3Y	4,208,207		73,316	Yes	
DTE Electric	42,397,517	W	5,299,690		2,874	Yes	
Indiana Michigan	2,808,897	W	351,112			Yes	3.00
NSP-Wisc (Xcel)	138,217	3y	17,277			Yes	
Upper Michigan Energy Resource Corporation							
UMERC - WPSC Rate Zone	261,794	3Y	32,724			Yes	
UMERC - WEPCO Rate Zone	353,027	3Y	44,128			Yes	1.20
Upper Peninsula Power	720,623	3Y	90,078			Yes	
Wisconsin Electric Power Company	1,254,338	W	156,792			Yes	

Member Regulated Cooperatives							
Alger Delta Coop Elec	79,052	3Y	9,882			Yes	
Bayfield Elec. Coop	168	3Y	21			Yes	
Cherryland Elec Coop	393,670	3Y	49,209			Yes	
Cloverland Electric Coop	708,733	3Y	88,592	2,404		Yes	
Great Lakes Energy Coop	1,444,093	3Y	180,512			Yes	
Midwest Energy Coop	608,509	3Y	76,064			Yes	
Ontonagon Co. Rural Elec.	24,306	3Y	3,038			Yes	
Presque Isle Elec & Coop	241,027	3Y	30,128			Yes	
Tri-County Elec. Coop	345,564	3Y	43,196			Yes	
Thumb Elec. Coop	169,471	3Y	21,184	16		Yes	

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

Company	2018 Compliance Year Sales*	Retail Sales Method**	2019 REC Requirement	2019 Excess RECs Retired	2019 EWR Credit Substitutions	Met the 2019 Standard	Current Residential Surcharge $/Month
Municipal Utilities							
Village of Baraga	18,871	3Y	2,359			Yes	
City of Bay City	316,475	3Y	39,559			Yes	
City of Charlevoix	57,799	3Y	7,225			Yes	
Chelsea Dept. of Electric & Water	95,811	3Y	11,976			Yes	
Village of Clinton	23,878	3Y	2,985			Yes	
Coldwater Board of Public Utilities	450,688	3Y	56,336			Yes	
Croswell Municipal Light & Power Dept.	35,790	3Y	4,474	150		Yes	0.11
City of Crystal Falls	16,246	3Y	2,031			Yes	
Daggett Electric Department	1,555	3Y	194			Yes	
City of Dowagiac	64,471	3Y	8,059			Yes	
City of Eaton Rapids	99,215	3Y	12,402			Yes	
City of Escanaba	136,786	3Y	17,098			Yes	
City of Gladstone	31,032	3Y	3,879			Yes	
Grand Haven Board of Light & Power	299,014	3Y	37,377			Yes	
City of Harbor Springs	39,471	3Y	4,943			Yes	
City of Hart	47,002	3Y	5,875			Yes	
Hillsdale Board of Public Utilities	122,402	3Y	15,300			Yes	
Holland Board of Public Works	1,102,052	3Y	137,757			Yes	
Village of L'anse	11,941	3Y	1,493			Yes	
Lansing Board of Water & Light	2,129,134	3Y	266,142			Yes	
Lowell Light & Power	77,234	3Y	9,654			Yes	3.00
Marquette Board of Light & Power	288,204	3Y	36,026			Yes	
Marshall Electric Department	105,913	3Y	13,239			Yes	
Negaunee Dept. of Public Works	21,390	3Y	2,674			Yes	
Newberry Water and Light Board	16,028	3Y	2,003	348		Yes	
Niles Utilities Department	122,071	3Y	15,259			Yes	
City of Norway	23,693	3y	2,962			Yes	
Village of Paw Paw	40,530	3Y	5,066			Yes	
City of Petoskey	101,928	3Y	12,741			Yes	
City of Portland	34,617	3Y	4,327			Yes	
City of Sebewaing	42,831	3Y	5,354			Yes	0.87
City of South Haven	136,794	3Y	17,099			Yes	
City of St. Louis	41,109	3Y	5,139			Yes	
City of Stephenson	6,160	3Y	770			Yes	
City of Sturgis	220,761	3Y	27,595			Yes	
Traverse City Light & Power	330,026	3Y	41,253			Yes	
Union City Electric Department	15,650	3Y	1,956			Yes	
City of Wakefield	12,330	3Y	1,541	209		Yes	
Wyandotte Dept. of Muncipal Service	297,772	3Y	37,222			Yes	

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

Company	2018 Compliance Year Sales*	Retail Sales Method**	2019 REC Requirement	2019 Excess RECs Retired	2019 EWR Credit Substitutions	Met the 2019 Standard	Current Residential Surcharge $/Month
Zeeland Board of Public Works	390,522	3Y	48,815			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	
Eligo Energy MI, LLC		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	
MidAmerican Energy Services		W				Yes	
Spartan Renewable Energy		3Y				Yes	
U.P. Power Marketing		W				Yes	
Wolverine Power Marketing Cooperative		3Y				Yes	
Aggregated Totals	**9,054,582**		**1,131,825**	**3,053**			
Totals	**102,447,669**		**12,805,972**	**6,180**	**76,190**		
Renewable % Based on Credits retired for 2019	**12.6%**		**12,812,152**	**RECS Retired**			

Appendix C - ELECTRIC PROVIDER RENEWABLE ENERGY ANNUAL REPORT SUMMARY

2019 Reporting Year

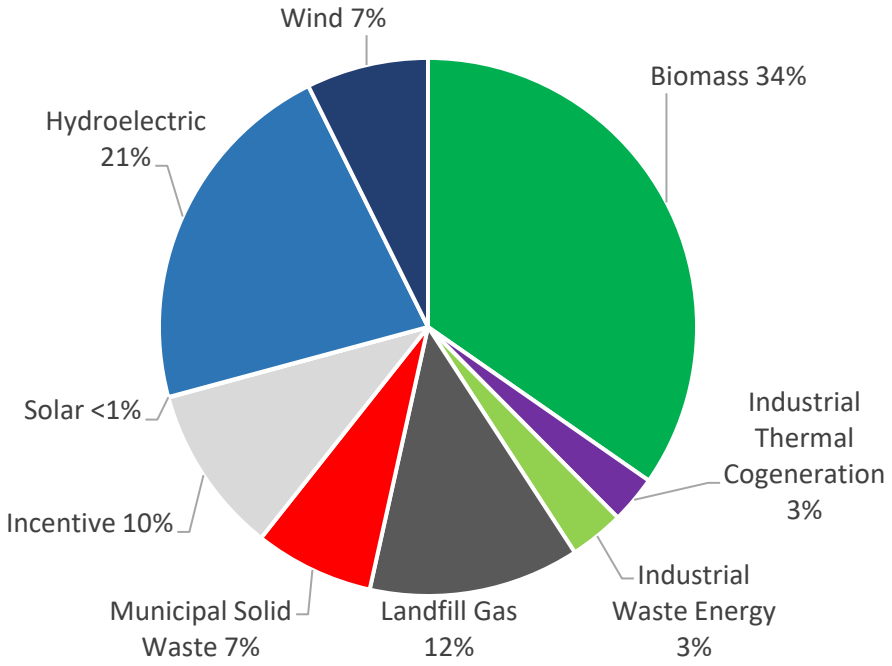
Company Name	2019 Generated or Aquired (RECs)	Energy Credits Sold in 2019 (RECs)	2009-2018 Reported Incremental Cost of Compliance ($)	2019 Reported Incremental Cost of Compliance ($)	Remaining Anticipated Incremental Cost of Compliance ($)	Total Plan Period Anticipated Incremental Cost of Compliance (Prior Years plus Anticipated) ($)
Rate Regulated Utilities:						
Alpena Power Company	44,154	0	3,035,053	39,032	523,412	3,597,497
Consumers Energy Company	3,256,797	29,326	183,968,171	18,800,000	43,770,000	246,538,171
DTE Electric Company	3,437,777	5084	384,658,637	31,933,405	0	416,592,042
Indiana Michigan Power Company	353,042	73,411	11,793,768	3,376,773	76,932,405	92,102,946
Northern States Power Company	32,398	0	0	0	0	0
Upper Peninsula Power Company	199,672	300,000	0	0	0	0
Upper Michigan Energy Resource Corporation						
UMERC - WPSC Rate Zone	27,418	0	0	0	0	0
UMERC - WEPCO Rate Zone	23,836	0	1,480,779	0	0	1,480,779
Wisconsin Electric Power Co Mines	87,759	0	9,241,214	1,142,861	0	10,384,075
	7,462,853	**407,821**	**594,177,622**	**55,292,071**	**121,225,817**	**770,695,510**
Member Regulated Cooperatives:						
Alger Delta Cooperative Electric Association	7,133	0	0	0	0	0
Bayfield Electric Cooperative	0	0	255	0	0	255
Cherryland Electric Cooperative	56,823	0	0	0	0	0
Cloverland Electric Cooperative	420,328	663231	0	0	0	0
Great Lakes Energy Cooperative	220,264	0	0	0	0	0
Homeworks Tri-County Electric Cooperative	50,203	0	0	0	0	0
Midwest Energy Cooperative	84,977	0	0	0	0	0
Ontonagon County Rural Electricification Association	0	0	0	0	0	0
Presque Isle Electric and Gas Co-op	36,081	0	0	0	0	0
Thumb Electric Cooperative	21,200	21,200	0	0	0	0
	897,009	**684,431**	**255**	**0**	**0**	**255**
Municipal Utilities:						
City of Bay City	70,720	0	4,336,711	0	0	4,336,711
City of Charlevoix	9,212	0	748,040	0	0	748,040
City of Crystal Falls	2,401	25,772	0	0	0	0
City of Dowagiac	6,921	0	7,146	0	0	7,146
City of Eaton Rapids	22,189	0	1,125,456	0	0	1,125,456
City of Escanaba	0	0	64,771	0	341,574	406,345
City of Gladstone	3,240	0	0	0	0	0
City of Harbor Springs	5,633	0	21,190	0	0	21,190
City of Hart Hydro	4,413	0	10,595	0	0	10,595
City of Norway	27,610	47,696	0		0	0
City of Petoskey	11,266	0	1,020,225	0	0	1,020,225
City of Portland	4,114	0	211,576	0	0	211,576
City of Sebewaing	15,069	0	30,138	6,960	97,452	134,550
City of South Haven	36,802	0	7,719	0	0	7,719
City of St. Louis	4,945	0	256,381	0	0	256,381
City of Stephenson	504	0	0	0	0	0
City of Sturgis	39,290	0	12,051	0	0	12,051
City of Wakefield	1,855	0	0	0	0	0
Chelsea Dept of Electric & Water	24,712	0	699,266	17,554	0	716,820
Coldwater Board of Public Utilties*	see Village of Clinton		3,411		0	3,411
Croswell Municipal Light & Power Dept	4,725	0	18,646	5,157	61,037	84,840
Daggett Electric Dept	122	0	1,905	0	0	1,905
Grand Haven Board of Light & Power	28,807	0	3,051,951	0	0	3,051,951
Hillsdale Board of Public Utilities*	see Village of Clinton		1,473		0	1,473
Holland Board of Public Works	68,757	0	6,352,628	0	0	6,352,628
Lansing Board of Water & Light	267,052	0	22,328,326	2,527,195	5,376,476	30,231,997
Lowell Light & Power	7,888	0	2,023,014	316,778	2,009,478	4,349,270
Marquette Board of Light & Power	35,639	0	42,175	0	0	42,175
Marshall Electric Dept*	see Village of Clinton		7,186		0	7,186
Negaunee Dept of Public Works	2,269	0	0	0	0	0
Newberry Water & Light Board	20,670	0	2,173,289	0	0	2,173,289
Niles Utility Dept	33,790	0	7,529	0	0	7,529
Traverse City Light & Power	111,170	28,391	0	0	0	0
Union City Electric Dept*	see Village of Clinton		506		0	506
Village of Baraga	1,880	0	0	0	0	0
Village of Clinton*	51,604	0	269	0	0	269
Village of L'Anse	1,195	0	0	0	0	0
Village of Paw Paw	11,223	0	2,505	0	0	2,505
Wyandotte Dept of Municipal Service	52,487	0	1,694,896	0	0	1,694,896
Zeeland Board of Public Works	52,161	0	1,652,839	94,207	0	1,747,046
	1,042,335	**101,859**	**47,913,813**	**2,967,851**	**7,886,017**	**58,767,681**
Combined Annual Report*						
Alternative Electric Suppliers:						
Calpine Energy Solutions, LLC f/k/a Noble Americas Energy Solutions LLC						
CMS ERM Michigan LLC						
Constellation NewEnergy Inc						
Direct Energy Business LLC						
Eligo Energy MI, LLC						
Energy Harbor (Formally FirstEnergy Solutions Corp)						
Just Energy Solutions Inc. (Foramlly Commerce)						
MidAmerican Energy Services						
Spartan Renewable Energy Inc						
UP Power Marketing LLC						
Wolverine Power Marketing Cooperative Inc						
	1,615,681	**126,124**	**2,444,145**	**266,372**	**731,152**	**3,244,103**
***Totals:**	**11,017,878**	**1,320,235**	**644,535,835**	**58,526,294**	**129,842,986**	**832,707,548**

Source: PA 295 Annual Reports:
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

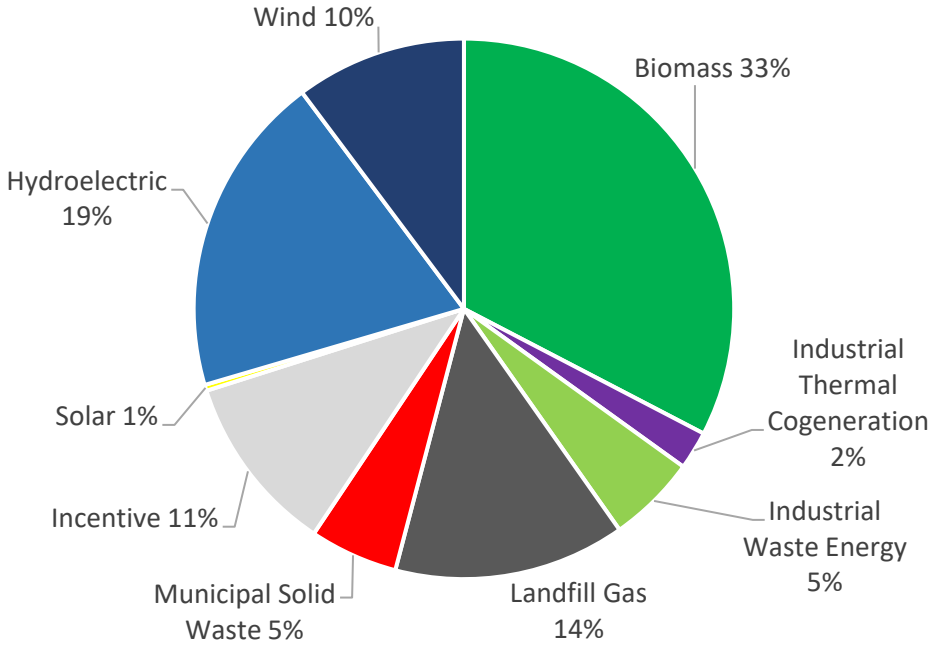
MIRECS 2009 Vintage Energy Credits

5,256,722 Total Credits



MIRECS 2010 Vintage Energy Credits

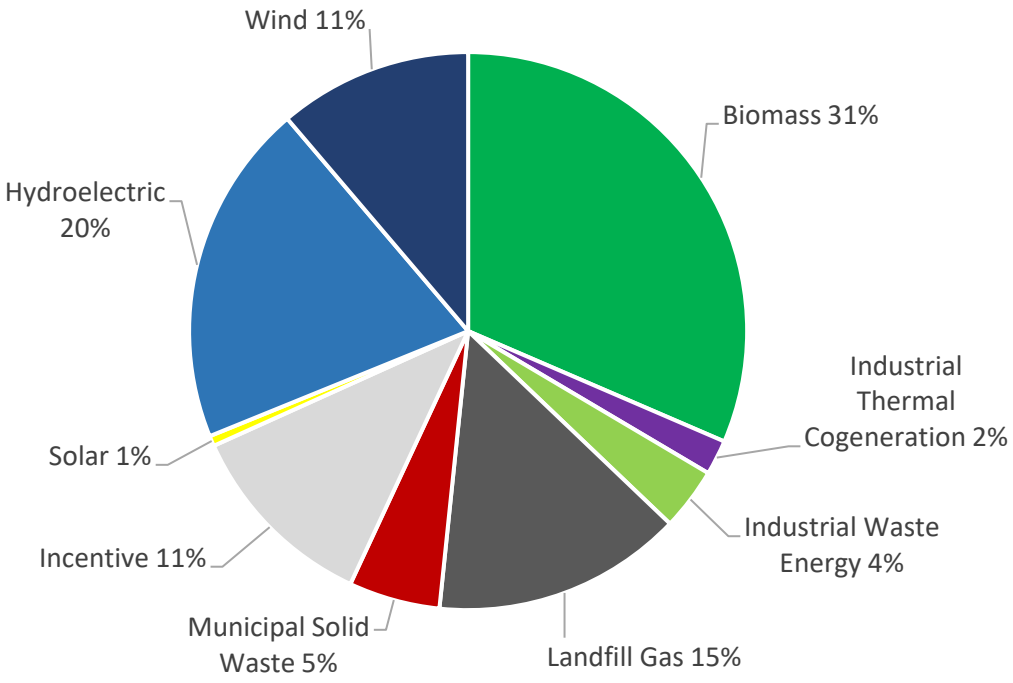
5,109,511 Total Credits



Appendix D- MIRECS Energy Credit Summary

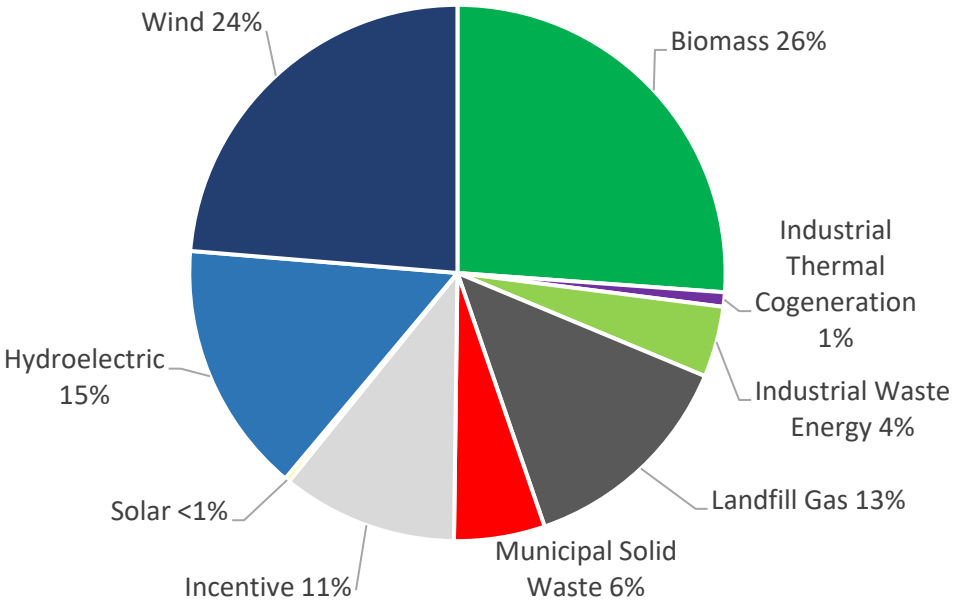
MIRECS 2011 Vintage Energy Credits

5,404,910 Total Credits



MIRECS 2012 Vintage Energy Credits

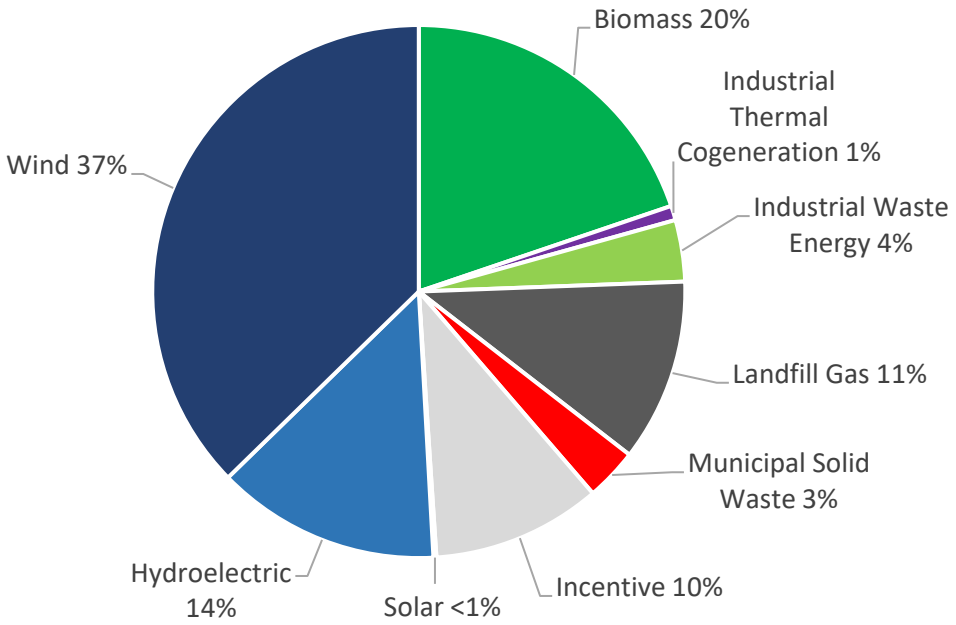
6,642,728 Total Credits



Appendix D- MIRECS Energy Credit Summary

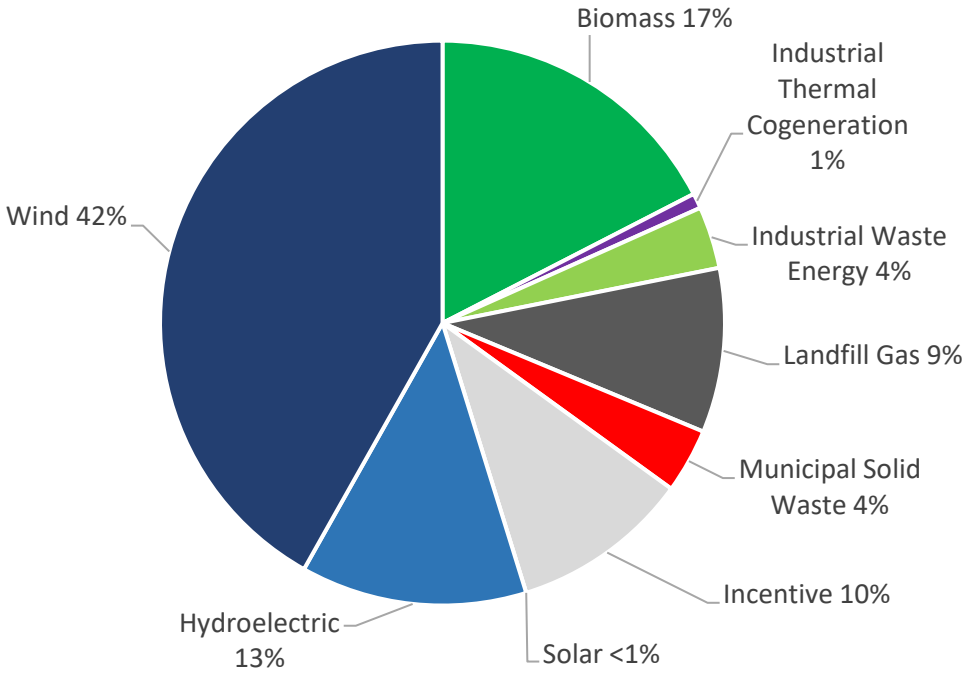
MIRECS 2013 Vintage Energy Credits

8,671,357 Total Credits



MIRECS 2014 Vintage Energy Credits

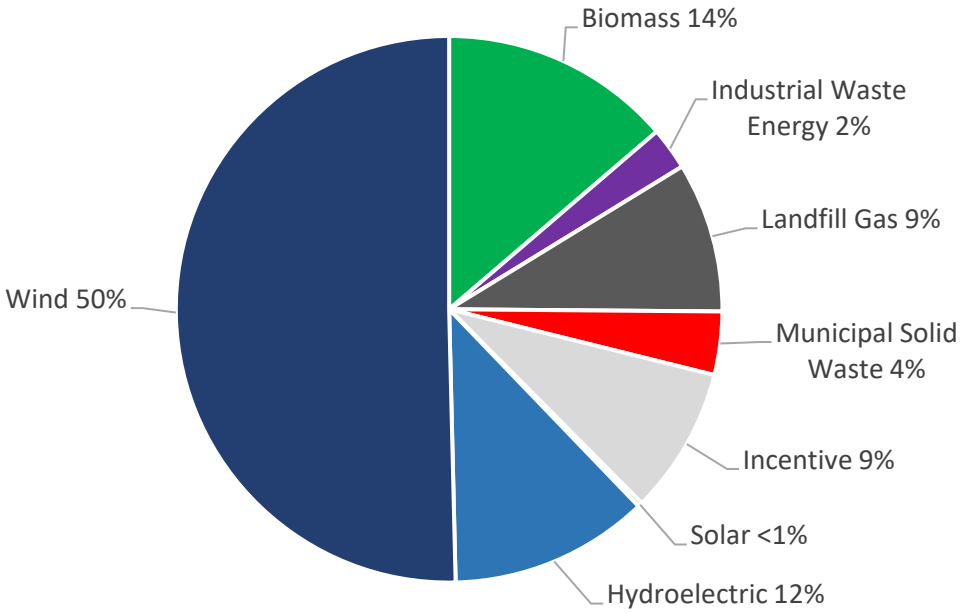
10,133,663 Total Credits



Appendix D- MIRECS Energy Credit Summary

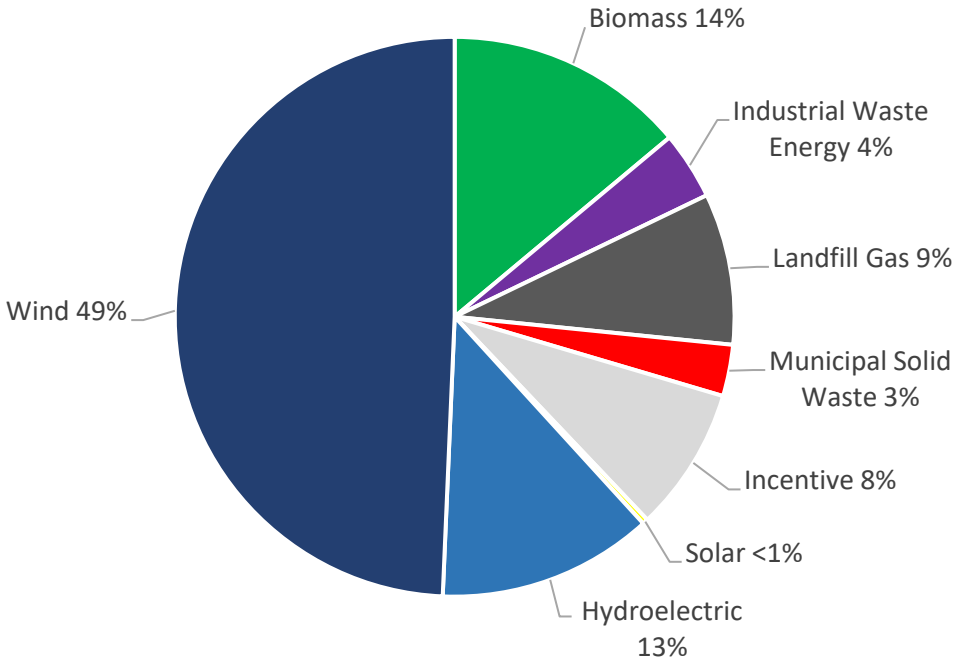
MIRECS 2015 Vintage Energy Credits

10,556,262 Total Credits



MIRECS 2016 Vintage Energy Credits

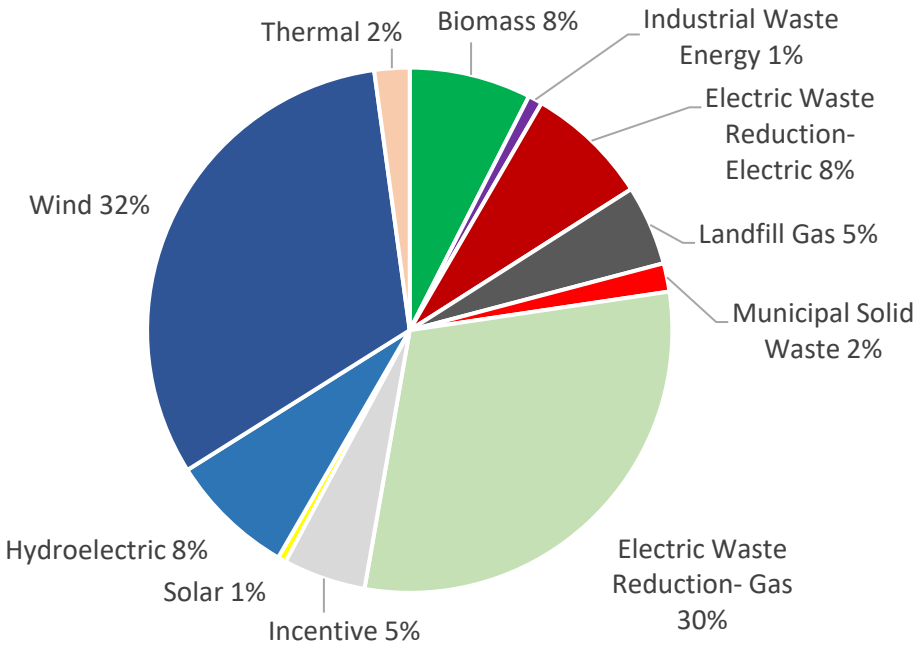
10,570,431 Total Credits



Appendix D- MIRECS Energy Credit Summary

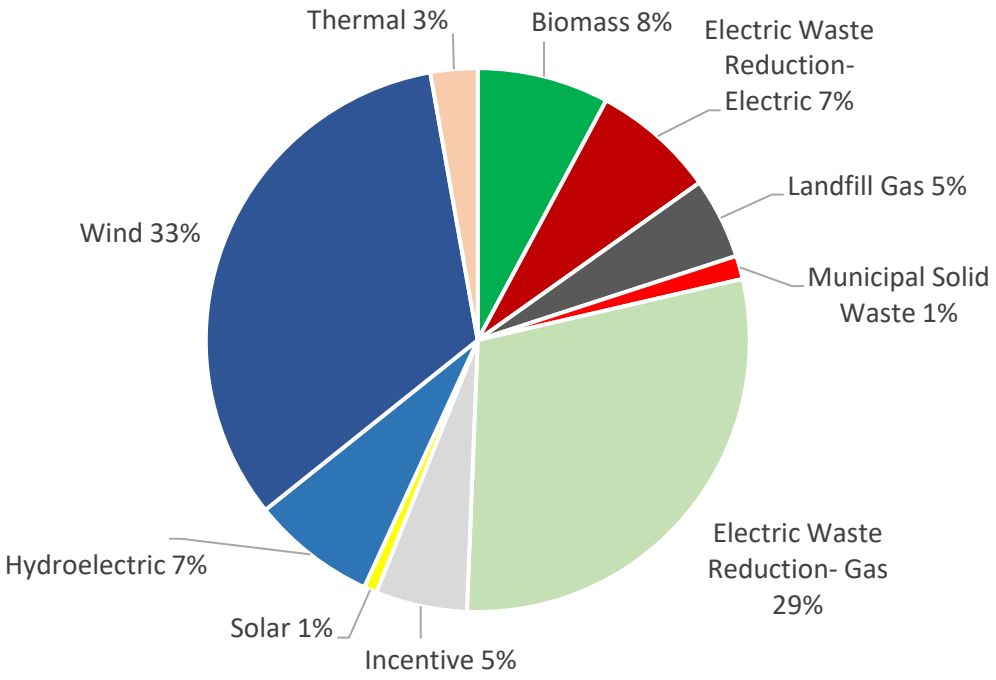
MIRECS 2017 Vintage Energy Credits

18,670,646 Total Credits



MIRECS 2018 Vintage Energy Credits

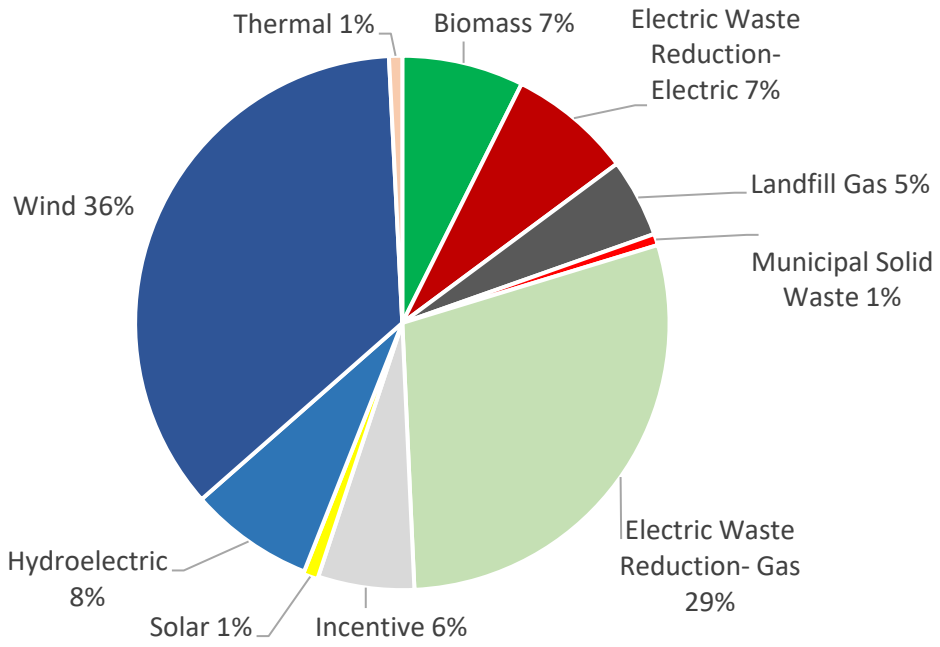
18,378,516 Total Credits



Appendix D- MIRECS Energy Credit Summary

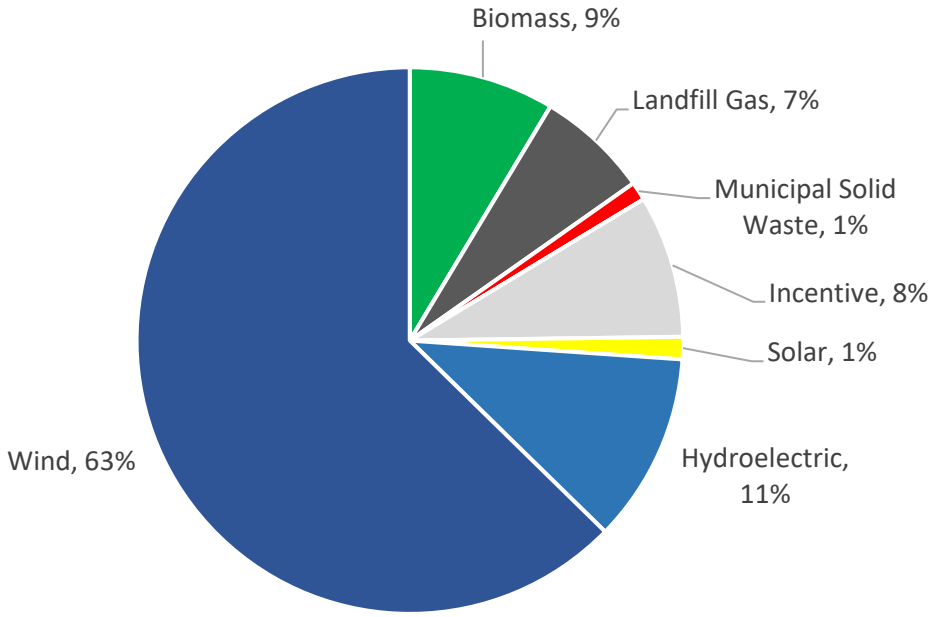
MIRECS 2019 Vintage Energy Credits

17,986,916 Total Credits



MIRECS 2020 Vintage Energy Credits

7,466,456* Total Credits



*Not all data, including EWR credits, has been reported for 2020

Appendix E- Act 295 Contract Summary

Consumers Energy : Contracts							
Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
Crescent Wind	166 MW	$48/MWh	Company owned "Crescent Wind"	Wind	6/1/2018	10/7/2019 12/6/2019	2/1/2021
River Fork Solar	100 MW	$44.16/MWh	20 years	Solar	6/1/2018	9/26/2019 10/29/2020	11/1/2022
Trade Wind Energy	150 MW	$46/MWh	Company Owned "Gratiot Farms"	Wind	7/1/2017	2/7/2019	12/1/2020
General Electric White Construction, Inc.	75.9 MW	$46/MWh	Company Owned "Cross Winds III"	Wind	12/1/2016	3/10/2017	12/31/2019
General Electric Company	44 MW	$45/MWh	Company Owned "Cross Winds II"	Wind	10/2/2012	12/20/2016	12/31/2017
Suniva, Inc.	Solar Modules up to 10 MW	$160.00/MWh	Company Owned "Solar Gardens"	Solar	7/31/2015	3/29/2016	Starting with 4/18/2016
SMA Solar Technology America, LLC	String Inverters				8/7/2015		
J. Ranck Electric, Inc.	Electrical Installation				8/24/2015		
Mounting Systems Inc.	Panel Racking				8/7/2015		
Experimental Advanced Renewable Program Phases 26-35	2,161.5 kW	$0.199-$0.243	Up to 15 years	Solar	Unsolicited	2/11/2016	Varies
Geronimo Huron Wind, LLC (Apple Blossom)	100 MW	Less than $45	Up to 15 years	Wind	Unsolicited	11/19/2015	2017
Experimental Advanced Renewable Program Anaerobic Digester	2.6 MW	$86/MWh or $76.39/MWh-106.39/MWh	20 years	Anaerobic	Unsolicited	4/23/2015	Varies
Experimental Advanced Renewable Program Phases 16-21	1425.1 kW	$0.199-$0.243	Up to 15 Years	Solar	Unsolicited	4/23/2015	Varies
Experimental Advanced Renewable Program Phases 10-15	1193.7 kW	Non-Residential $0.199-0.209 Residential $0.243-0.249	Up to 15 Years	Solar	Unsolicited	5/2/2014	Varies
Barton Malow Company	Construction	$59.00/MWh	Company Owned "Cross Winds"	Wind	4/25/2013	9/10/2013	12/31/2014
General Electric Company	62 1.7-100 1.7 MW				10/2/2012	6/28/2013	
ABB Transformers	2- 34.5KV to 345KV transformers				2/27/2013	9/10/2013	
Blissfield Wind (Beebe Wind)	Unchanged	Unchanged	20 Years	Wind	Amendment	1/26/2012	12/31/2012
Heritage Garden Wind Farm I	20 MW	Unchanged	20 Years	Wind	Amendment	1/26/2012	12/31/2012
Heritage Stoney Corners Wind Farm II	Unchanged	Unchanged	20 Years	Wind	Amendment	1/26/2012	1/1/2012
Heritage Stoney Corners Wind Farm I (Phase 3)	8.35 MW	$106.20 MWh	20 Years	Wind	Result of Amendments	1/26/2012	1/1/2012

Appendix E- Act 295 Contract Summary

Consumers Energy : Contracts							
Seller	**Quantity**	**Cost***	**Term**	**Renewable Energy Type**	**Request for Proposal**	**Commission Approval**	**Commercial Operation Date**
Experimental Advanced Renewable Program	987.7 KW	Commercial $0.375/KWh Residential $0.525/KWh	12 Years	Solar	Unsolicited	5/10/2011	Varies
Vestas-American Wind Technology	56 V100 1.8 MW Turbines	$110.00/MWh	Company Owned "Lake Winds"	Wind	1/15/2010	12/2/2010	12/31/2012
White Construction, Inc. U-15805 edocket files # 251-256	Installation and construction				7/23/2010		
GE Prolec Transformers, Inc.	2-125 KV transformers				7/27/2009		
Heritage Garden Wind Farm I	28.6 MW	$106.20 MWh	20 Years	Wind	Unsolicited	11/19/2010	1/1/2012
Heritage Stoney Corners Wind Farm II	12.3 MW	$98.50 MWh	20 Years	Wind	Unsolicited	11/19/2010	1/1/2012
Experimental Advanced Renewable Program	Commercial 836.6 KW Residential 200.1 KW	Commercial $0.45/KWh Residential $0.65/KWh	12 Years	Solar	Unsolicited	12/21/2010	5/1/2010
Scenic View Dairy**	0.35 MW	$83.07/MWh	63 Months	Anaerobic	Unsolicited	10/26/2010	7/29/2010
Blissfield Wind (Now Beebe Wind)	81 MW	$100.88/MWh	20 Years	Wind	5/7/2009	7/27/2010	12/31/2012
Harvest II Wind	59.4 MW	$98.38/MWh	20 Years	Wind	5/7/2009	7/27/2010	12/31/2012
Michigan Wind 2	90 MW	$94.00/MWh	20 Years	Wind	5/7/2009	7/27/2010	6/30/2012
WM Renewable Energy - Pine Tree Acres	12.8 MW	$98.75/MWh	20 Years	Landfill Gas	5/7/2009	7/27/2010	6/30/2012
WM Renewable Energy - Northern Oaks Landfill	1.6 MW	$122.39/MWh	20 Years	Landfill Gas	1/29/2009	10/13/2009	11/11/2010
NANR – Lennon	1.6 MW	$137.27/MWh	20 Years	Landfill Gas	1/29/2009	10/13/2009	12/31/2010
Elk Rapids Hydro Electric** 1	0.7 MW	$121.31/MWh	10 Years	Hydro	1/29/2009	10/13/2009	7/11/2009
Zeeland**	1.6 MW	$122.20/MWh	7 Years	Landfill Gas	1/29/2009	10/13/2009	7/11/2009
Freemont Community Digester	3.1 MW	$139.35/MWh	20 Years	Anaerobic	1/29/2009	10/13/2009	11/11/2012
Scenic View Dairy** 1, 2	0.82 MW	$138.17/MWh	7 Years	Anaerobic	1/29/2009	10/13/2009	7/11/2009
Totals:	1,154 MW						

Appendix E- Act 295 Contract Summary

DTE Electric Company : Contracts							
Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
Meridian Wind Farm	224.9 MW	$46-49/MWh	Company-owned	Wind	9/1/2019	7/9/2020	Q4 2021
Assembly Solar	79 MW	$47-50/MWh	25 Years	Solar	9/1/2019	7/9/2020	12/31/2021
Riverfork Solar	49 MW	$49-52/MWh	25 Years	Solar	9/1/2019	7/9/2020	12/31/2022
Isabella I Wind Farm	197 MW	$43.20/MWh***	Company Owned	Wind	5/29/2018	7/18/2019	2/1/2021
Isabella II Wind Farm	186 MW	$43.20/MWh***	Company Owned	Wind	5/29/2018	7/18/2019	2/1/2021
Fairbanks Wind Park	72.45 MW	53.78/MWh	Company Owned	Wind	5/59/2018	7/18/2019	2/1/2021
Polaris Wind Park	168 MW	$47.18/MWh***	Company Owned "Polaris "	Wind	6/19/2017	4/12/2018	4/23/2020
Pine River Wind Energy, LLC	161.3 MW	$59.67/MWh***	Company Owned "Pine River"	Wind	5/20/2016	12/20/2016	12/31/2018
Innovatus (DTE Solar)	Up to 50 MW	$113.52/MWh***	Company Owned	Solar	6/24/2015	12/11/2015	10/31/2016
General Electric Company	1.7MW-100 model turbines up to 50 MW	$47/MIWh - $53/MWh	Company Owned "Pinnebog Wind"	Wind	2/17/2014	12/11/2014	12/31/2015
Aristeo Construction Company	Installation and construction				6/20/2014		
Rudolf Libbe, Inc	750 kW	$3,741/kW	Company Owned	Solar	9/28/2012	7/8/2014	Apr-15
Inovateus Solar, LLC. (SolarCurrents)	504 kW						
Big Turtle Wind Farm, LLC	20 MW	$53/MWh	20 Years	Wind	Unsolicited	9/24/2013	Expected 2014
Pheasant Run Wind, LLC	74.8 MW	Up to $49.25/MWh	20 Years	Wind	Unsolicited	5/17/2013	12/31/2014
Pheasant Run Wind II, LLC	74.8 MW	Up to $49.25/MWh	Company Owned "Brookfield"	Wind	Unsolicited	5/17/2013	12/31/2014
SolarCurrents Phase II	0.5 MW Non-Residential 1.5 MW Residential	$0.13/W $0.02/kWh $0.20/W $0.03/kWh	Through 8/31/2029	Solar	Unsolicited	11/16/2012	Varies
Tuscola Wind II, LLC	100 MW	$49.25/MWh***	20 Years	Wind	5/3/2012	10/31/2012	12/31/2013
General Electric Company	1.6MW-100 model turbines up to 110 MW	$52.50/MWh	Company Owned "Echo Wind"	Wind	10/12/2011	9/11/2012	12/31/2013
Barton Malow Company	Installation and construction				4/17/2012		
Michigan Waste Energy, Inc.	Up to 65,000 RECs/Year	$7.00/REC	13 Years	Incinerator	Unsolicited	12/6/2011	1991
Nova Consultants, Inc.	Solar EPC	Up to $48 Million	Company Owned	Solar	2/28/2011	11/10/2011	12/31/2015
McNaughton-McKay Electric Company	Supply up to 12 MW of Modules	Up to $24 Million			3/24/2011		
Inovateus Solar, LLC (SolarCurrents)	Supply up to 12MW						
General Electric Company	Up to 69 1.6MW-100 Turbines	$61-$64/MWh	Company Owned "Thumb Wind" McKinley, Minden, Sigel	Wind	3/9/2011	9/13/2011	12/31/2012
Barton Malow Company	Installation and construction				5/6/2011		

Appendix E- Act 295 Contract Summary

DTE Electric Company : Contracts							
Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
Tuscola Bay Wind. LLC	120 MW	Up to $60.90/MWh	20 Years	Wind	11/18/2010	8/25/2011	10/31/2012
L'Anse Warden Electric Company	110,374 RECs	$11.98 (Average of 4 REC/ACEC Contracts)	Amendment Acquiring Vintage RECs	Biomass	8/18/2009	8/25/2011	7/1/2010
Gratiot County Wind	12.8 MW additional	Unchanged from original contract	Company Owned	Wind	Amendment	5/10/2011	12/31/2012
Nova Consultants (SolarCurrents)	Unchanged from original contract	Unchanged from original contract	Company Owned	Solar	Extension	12/21/2010	12/31/2011
Blue Water Renewables - Smiths Creek Landfill	3.2 MW	$99.00/MWh	20 Years	Landfill	Unsolicited	1/20/2011	12/31/2011
Gratiot County Wind	110.4 MW 89.6 MW Company Owned	$91.43/MWh Up to $94.43/MWh	20 Years Company Owned	Wind	8/18/2009	9/14/2010	5/1/2012 3/31/2012
WM Renewable Energy - Eagle Valley Landfill	3.2 MW	Combined average price of $98.94/MWh	20 years	Landfill	8/18/2009	8/10/2010	6/1/2011
L'Anse Warden Electric Company	17 MW		20 years	Biomass	8/18/2009	8/10/2010	7/1/2010
Boyce Hydro**	Firm 210,000 RECs w/additional 112,000 RECs dependent on generation	$7.75/ REC	7 Years	Hydro	12/23/2009	4/27/2010	3/16/2010
Nova Consultants (SolarCurrents)	Up to 3 MW	Up to $18 Million	Company Owned	Solar	11/23/2009	3/2/2010	12/31/2010
Heritage Sustainable Energy Stoney Corners Wind Farm	12.2 MW	Unchanged from original contract	20 Years	Wind	Unsolicited	12/1/2009	1/1/2011
UPPCO**	Firm 500,000 RECs	Combined average price of $12.46/REC	7 Years	Hydro	12/23/2009	12/1/2009	10/1/2009
Sterling Planet**	Firm 2,500,000 RECs		10 Years	MISC	12/23/2009	12/1/2009	10/1/2009
Heritage Sustainable Energy Stoney Corners Wind Farm	14 MW	$116.00/MWh	20 Years	Wind	Unsolicited	4/30/2009	12/21/2009
Totals:	2127.9 MW						

* Per MWh prices represent levelized costs.

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

***Staff calculated levelized cost

Appendix E- Act 295 Contract Summary

Alpena Power Company : Contracts							
Seller	**Quantity**	**Cost**	**Term**	**Renewable Energy Type**	**Request for Proposal**	**Commission Approval**	**Commercial Operation Date**
Consumers Energy	"Bulk of RECs needed to meet the RPS"	Consumers Energy Company's Average Cost of RECs	20 Years	MISC	Unsolicited	9/15/2009	8/4/2009
AEP/Indiana Michigan : Contracts							
Seller	**Quantity**	**Cost**	**Term**	**Renewable Energy Type**	**Request for Proposal**	**Commission Approval**	**Commercial Operation Date**
South Bend Solar Project	20 MW (3 MW MI Jurisdictional)	$77.58/MWh	30 Years	Solar	Competitive Solicitation	7/23/2020	4/1/2021
Clean Energy Solar Pilot Project (CESPP)	15.7 MW (4.6 MW in MI)	$181.29/MWh (for MI allocated)	20 Years	Solar	Competitive Solicitation	12/11/2015	10/1/2016
Fowler Ridge Wind Farm II	50 MW (7.5MW for MI)	Redacted	20 Years	Wind	Unsolicited	9/15/2009	2/15/2010
Wildcat I Wind Farm, LLC	100 MW (60MW for MI)	Redacted	20 years	Wind	Competitive Solicitation	8/25/2011	12/31/2012
Wisconsin Electric Power Company (Upper Michigan Energy Resources Corporation) : Contracts							
Seller	**Quantity**	**Cost**	**Term**	**Renewable Energy Type**	**Request for Proposal**	**Commission Approval**	**Commercial Operation Date**
Cadillac Renewable Energy. LLC	REC-Only Redacted	Redacted	Redacted	Biomass	Competitive Solicitation	1/23/2014	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***
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
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

* 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

2/19/2010	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***
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			
2/17/2014	RFP	Up to 100 MW of Utility Owned Wind Turbines (Pinnebog)	100 MW by 12/31/2015	Yes	Wind
2/6/2013	RFP	Phase II Solar Engineering Procurement and Construction			
9/28/2012	RFP	Phase I Solar Engineering Procurement and Construction	1.25 MW	Yes	Solar
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
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

* 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

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

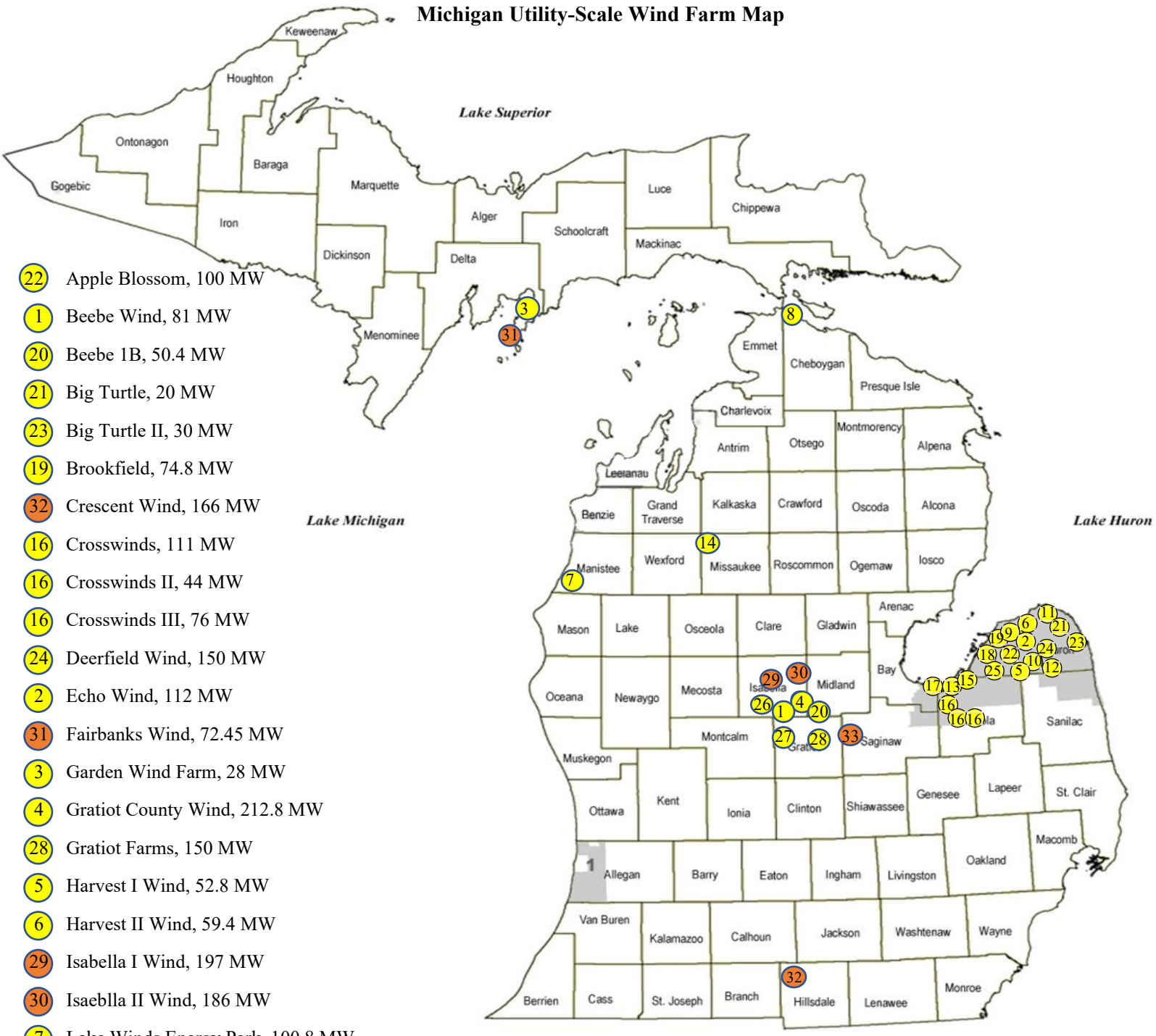
Appendix G

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	February 2021
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
Isabella I	Isabella	197	2.82	70	GE Energy	Isabella Wind, LLC	DTE	2021
Isabella II	Isabella	186	2.82	66	GE Energy	Isabella Wind, LLC	DTE	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	Q4 2021
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
Totals		3,327	MW	1,586	Turbines			
Operational Totals		2,481	MW	1,292	Turbines			

**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
- 29 Isabella I Wind, 197 MW
- 30 Isaeblla 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

2,481 MW Total Operational