

**REPORT ON THE
IMPLEMENTATION OF THE P.A. 295
RENEWABLE ENERGY STANDARD
AND THE COST-EFFECTIVENESS
OF THE ENERGY STANDARDS**

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MICHIGAN PUBLIC SERVICE COMMISSION
Department of Licensing and Regulatory Affairs
In compliance with Public Act 295 of 2008

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Introduction

Report Criteria

In October 2008, Public Act 295 of 2008 (PA 295 or the Act) was enacted. Section 51(5) (MCL 460.1051(5)) requires that by February 15, 2011, and each year thereafter, the Michigan Public Service Commission (MPSC or Commission) submit to the standing committees of the Senate and House of Representatives with primary responsibility for energy and environmental issues a report that does all of the following:

- a) Summarizes data collected under this section.
- b) Discusses the status of renewable energy and advanced cleaner energy in this state and the effect of Subparts A and B on electricity prices.¹
- c) For each of the different types of renewable energy sold at retail in this state, specifies the difference between the cost of the renewable energy and the cost of electricity generated from new conventional coal-fired electric generating facilities.
- d) Discusses how the Commission is ensuring that actions taken under this Act by electric providers serving customers in the same distribution territory do not create an unfair competitive advantage for any of those electric providers.
- e) Evaluates whether Subpart A has been cost-effective.
- f) Provides a comparison of the cost effectiveness of the methods of an electric utility with one million or more retail customers in this state as of January 1, 2008, obtaining renewable energy credits from renewable energy systems owned by the electric provider and from contracts that do not require the transfer of ownership of the renewable energy system.
- g) Describes the impact of Subpart A on employment in this state. The Commission shall consult with other appropriate agencies of the department of labor and economic growth in the development of this information.²
- h) Describes the effect of the 10 percent limit on using energy optimization credits or advanced cleaner energy credits to meet the renewable energy credit standards.

¹ Subpart A (MCL 460.1021-1053) deals with renewable energy standards. Subpart B (MCL 460.1071-1097) deals with energy optimization standards.

² A State government reorganization took place in 2011 which moved employment-related agencies outside the newly-formed Department of Licensing and Regulatory Affairs (LARA). Consultation with the appropriate agencies is continuing.

- i) Makes any recommendations the Commission may have concerning amendments to Subpart A, including changes in the 10 percent limits described in (h) or changes in the definition of renewable energy resource or renewable energy system to reflect environmentally preferable technology.

Additionally, Section 97 of the Act (MCL 460.1097) requires the following:

(6) By February 15, 2011 and each year thereafter and by September 30, 2015, the Commission shall submit to the standing committees described above a report that evaluates and determines whether Subpart B and Subpart A have each been cost-effective and makes recommendations to the legislature. The report shall be combined with any concurrent report by the Commission under section 51.

This fifth annual report provides information on Commission renewable energy activities related to the Act through calendar year 2014 and summarizes data from the electric provider annual reports through the 2013 calendar year.³ This report also includes 2013 renewable energy credit compliance data for the second interim step compliance year.

Renewable Energy Plans and Commission Approval

Subpart A of the Act requires electric providers to meet a 10 percent renewable energy standard based on retail sales by the end of 2015. The Act includes interim compliance steps for 2012, 2013 and 2014. For 2016 and each year thereafter, the Act requires electric providers to maintain the same amount of renewable energy credits (RECs) needed to meet the standard in 2015.

The renewable energy standard is applicable to Michigan's investor-owned electric utilities, cooperative electric utilities, municipal electric utilities and alternative electric suppliers (AESs). The Act directed electric providers to file initial renewable energy plans (REPs) in 2009.⁴ The 74 initial REPs described how each electric provider intended to meet the renewable energy standard requirements. The Act also directs electric providers to file REPs biennially for Commission review.

³ See: the Commission's February 14, 2014 report:

http://www.michigan.gov/documents/mpsc/implementation_of_PA295_renewable_energy_411615_7.pdf?20140102105631

⁴ There are currently a total of 85 electric providers. Of those 85, 14 are AESs not serving customers and therefore are not required to file annual reports or register in MIRECS, the REC tracking system. Seventy-one electric providers are required to meet the REC standard in the Act.

A listing of case numbers, electric provider names, and dates for upcoming biennial renewable energy plan filings can be found in *Appendix A*. Commission Staff created a [web page](#) with links to each electric provider's renewable energy plan case docket.

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 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.

Through 2014, there are four rate-regulated providers collecting renewable energy surcharges on customer bills. Additionally, there are three non-rate-regulated electric providers with revenue recovery mechanisms. In July 2014, Consumers Energy Company (Consumers Energy) reduced its renewable energy surcharge to zero for all customers. DTE Electric Company (DTE Electric) implemented a surcharge reduction that lowered the residential surcharge from \$3.00 per meter per month to \$0.43 effective January 2014, and also lowered surcharges for other customer classes. Fifty-one non-AES providers do not collect surcharges. Of the seven electric providers with surcharges, five electric providers have residential surcharges under \$1 per month and two have surcharges in the \$2 - \$3 range. Details about the surcharges can be found in *Appendix B*.

Based upon a review of REPs filed with the Commission, all providers are expected to be able to meet the 10 percent renewable energy standard in 2015.⁵

⁵It was previously reported that Detroit Public Lighting (DPL) was not expected to meet the 10 percent renewable energy standard in 2015, however, all of DPL's customers became DTE electric customers effective July 1, 2014 and a five- to seven-year system conversion is in process that will transition former DPL customers to the DTE Electric distribution

Renewable Energy Cost Reconciliation Cases and Commission Approval

Per Section 49 (1) of PA 295, the eleven MPSC rate-regulated electric providers filed annual renewable energy cost reconciliation cases for 2013.⁶ After Staff review, three rate-regulated electric cooperatives and six investor-owned utilities filed settlement agreements. The two other investor-owned utilities, Consumers Energy and DTE Electric, have cases currently under review to determine the reasonableness and prudence of expenditures and amounts collected pursuant to the revenue recovery mechanism. Case numbers and order dates for each renewable energy cost reconciliation case for the reporting period can be found in *Appendix A*. Commission Staff created a [web page](#) with links to each electric provider's reconciliation case docket.

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. Michigan electric provider annual reports for 2009 through 2013 are available on the [Commission's website](#).⁷ Commission Staff worked with electric providers to develop an annual report template based on Section 51 of the Act. A summary of data from annual reports is shown in *Appendix C*.

Renewable Energy Credit Requirements – 2013 Compliance

For 2013, electric providers were required to meet the second interim compliance step on the path to the full 10 percent standard which averaged 4.9% based on statewide data. The number of renewable energy credits required for 2013 compliance varies by electric provider and is calculated by “closing the gap” between the full 10 percent compliance level and each electric provider's pre-Act

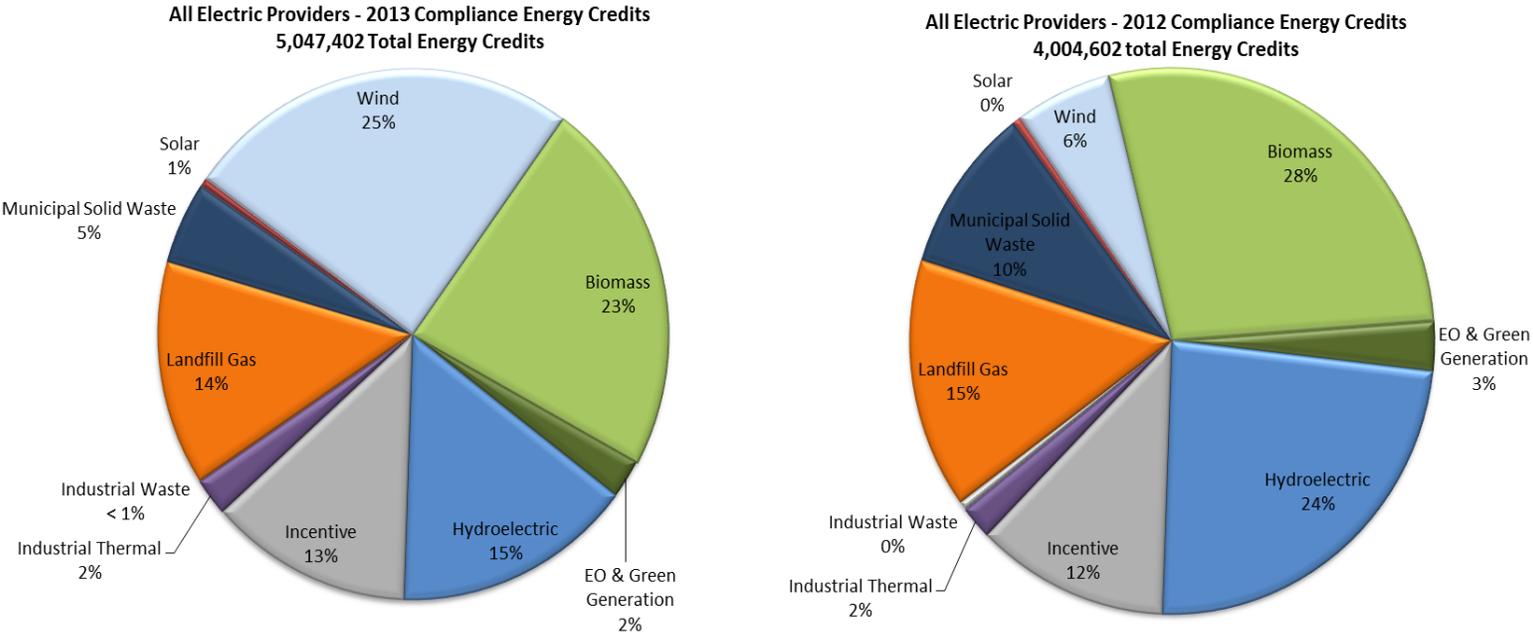
system. In the interim, the MPSC has suspended all of DPL's renewable energy filings. DTE Electric is expected to meet the 10 percent renewable energy standard in 2015.

⁶ Commission Staff audits the pertinent revenues and expenses, determines the electric provider's compliance with its filed REP and assesses whether the provider has met its compliance targets.

⁷See: http://www.michigan.gov/mpsc/0,1607,7-159-16393_53570-240179--,00.html.

295 baseline renewable energy credits by 33 percent.⁸ All of Michigan’s 71 electric providers (alternative electric suppliers not serving customers and Detroit Public Lighting are not included in this total) met the 2013 requirements and retired⁹ a total of 5,047,402 energy credits. **Figure 1** shows the different renewable energy technology types used to generate the credits used for compliance by all electric providers and separately for both Consumers Energy and DTE Electric. The percentage of wind used for 2013 compliance has increased significantly over 2012 compliance.

Figure 1: Compliance Energy Credit Breakdown

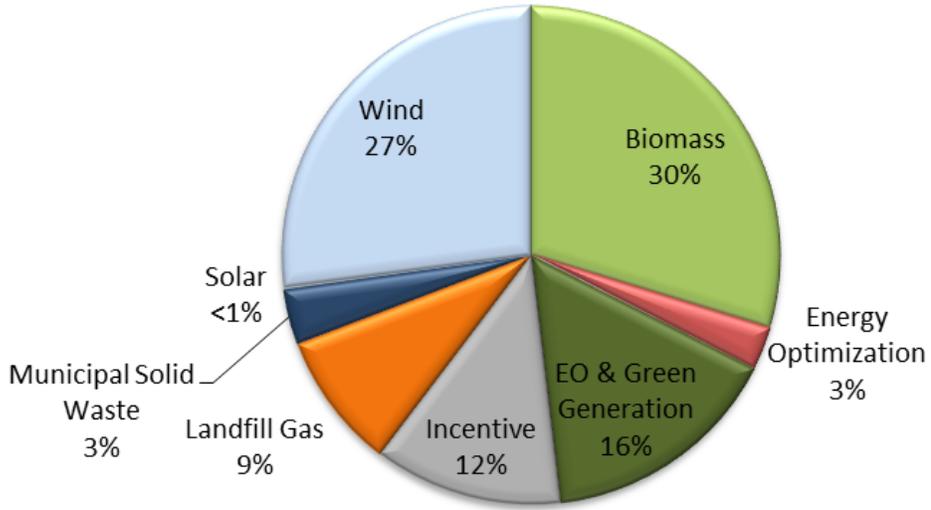


⁸ The number of baseline renewable energy credits is the sum of the number of renewable energy credits that would have been transferred to the electric provider plus the number of credits that would have been generated by the electric provider during the year preceding the effective date of the Act.

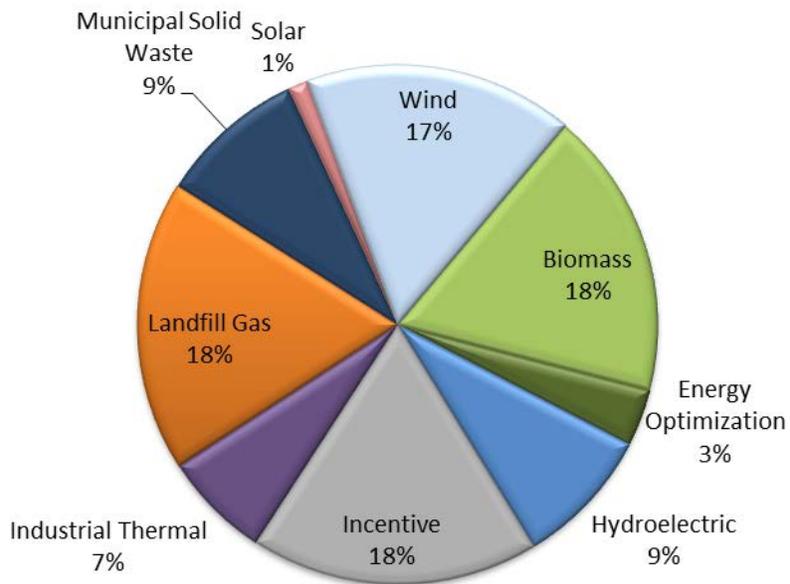
⁹ Energy credits are “retired” when used for compliance.

Figure 1: Compliance Energy Credit Breakdown (continued)

**Consumers Energy – 2013 Compliance
2,145,536 Total Energy Credits**



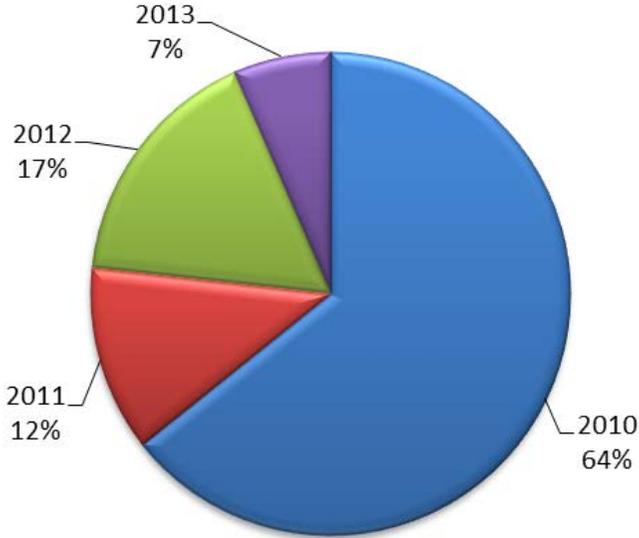
**DTE Electric – 2013 Compliance
1,756,567 Total Energy Credits**



Section 29 of the Act includes provisions for determining whether the location of a renewable energy system is eligible for Michigan’s RPS. Ninety-three percent of the energy credits used for 2013 compliance were from renewable energy generated in Michigan. Wisconsin was the source for four percent and the remaining credits came from renewable energy generated in Indiana, Iowa, and Minnesota. Michigan’s multi-state utilities and electric providers with out-of-state wholesale suppliers are most likely to use energy credits from states other than Michigan.

Section 39 of the Act includes a provision that allows energy credits to be “banked” up to 36 months. **Figure 2** shows a breakdown of energy credits retired for compliance by vintage year of generation. The data shows that providers are utilizing the 36-month energy credit banking provision in the Act. Approximately 64% of the energy credits used to comply in 2013 were from renewable energy generated in 2010. Michigan Renewable Energy Certification System (MIRECS) data shows that approximately 2.9 million energy credits to date have expired without being used for compliance.

Figure 2: 2013 Compliance Energy Credits – Year of Generation



Status of Renewable Energy

Based on the number of energy credits generated or acquired during 2013 as reported by electric providers, Michigan's 2013 estimated energy credit percentage is 7.8 percent of retail sales as shown in *Appendix C*. Based on the projected credit generation from **Figure 3**, Michigan's 2014 estimated renewable energy credit percentage is 8.1 percent of retail sales. The 2014 estimated renewable energy percentage changed very little from the 2013 7.8 percent figure. This is due to the fact that a number of wind farms came online at the end of 2014 and did not have enough generation during the year to impact the renewable energy credit quantity. The nearly 2 percent gap between 2014 and the 2015 full 10% compliance requirement will be achieved through the additional generation from the new wind farms that came online at the end of 2014, possible new generation coming online during 2015, and by electric providers making use of banked RECs.

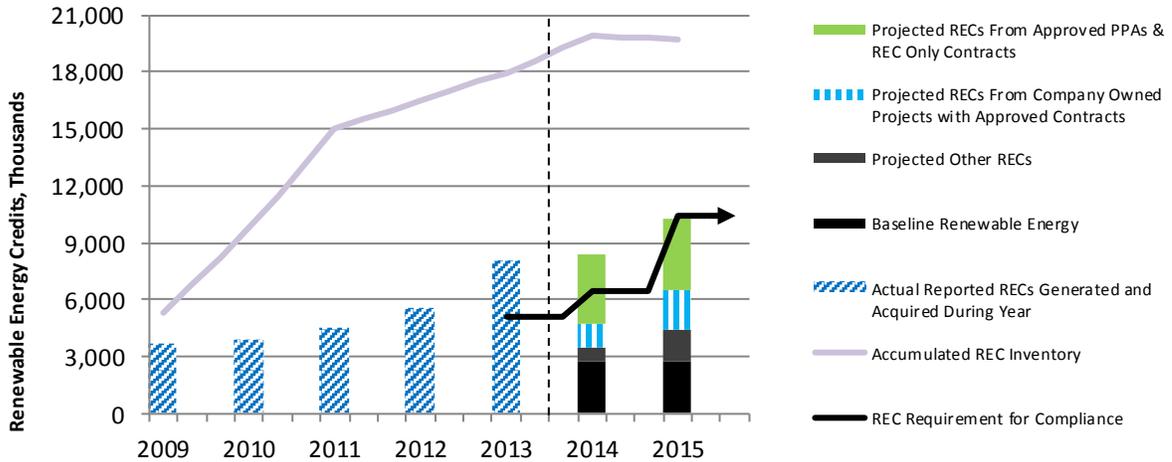
A projection of Michigan's energy credits for 2014 through 2015 is shown in **Figure 3** along with the annual REC compliance requirement and accumulated RECs. In order to reflect only renewable energy generated or acquired in each year, accumulated RECs from previous years are not included in the yearly renewable energy totals but are shown separately in the line called 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 and REC-only contracts.

The accumulated REC inventory for 2013 reflects energy credits that were retired for 2013 compliance, voluntary retirements, and 2010 energy credits that expired, due to the 36-month banking provision, without being used.

Figure 3 incorporates Michigan's current renewable energy status and forecasts that renewable

energy credit amounts will reach 10% of total retail sales in 2015. The renewable energy projections clearly indicate that providers are on track to meet the 10% renewable energy standard in 2015.

Figure 3: Michigan Renewable Energy Projection, 2014 – 2015

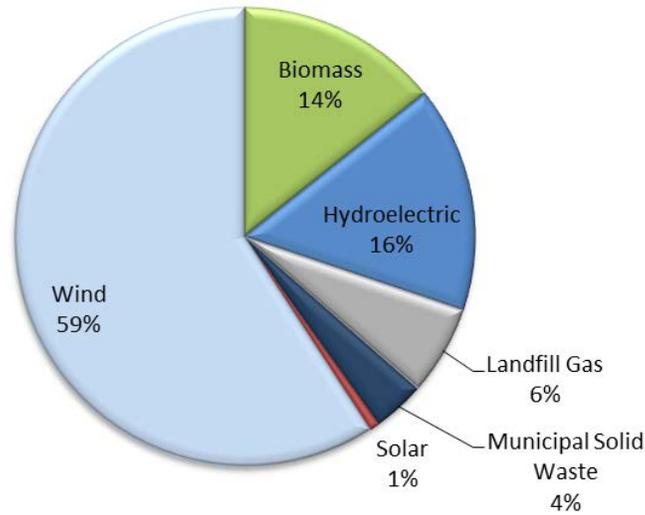


Source: Electric provider annual reports, PA 295 contracts, MIRECS and Commission Staff projections.

Figure 4 provides the technology type of total renewable energy generators operating in Michigan. Approximately 2,300 MW of renewable energy generators are operating in Michigan and registered with the MIRECS. Additional renewable energy generators exist within Michigan that are not used to meet the energy credit nor capacity requirements of the RPS. Such renewable generators may be used for green pricing programs or for compliance with another state’s RPS. Additionally, since the MIRECS registration process usually begins at the time of commercial operations, there are renewable energy generators currently under development and/or contracted for, which are not yet operational, that are not included within this figure. Further, renewable energy generators registered within the MIRECS that are outside of Michigan are also not included within **Figure 4**.

Figure 4: Renewable Energy Generators in Michigan, by Technology Type
Source: MIRECS Project Registrations

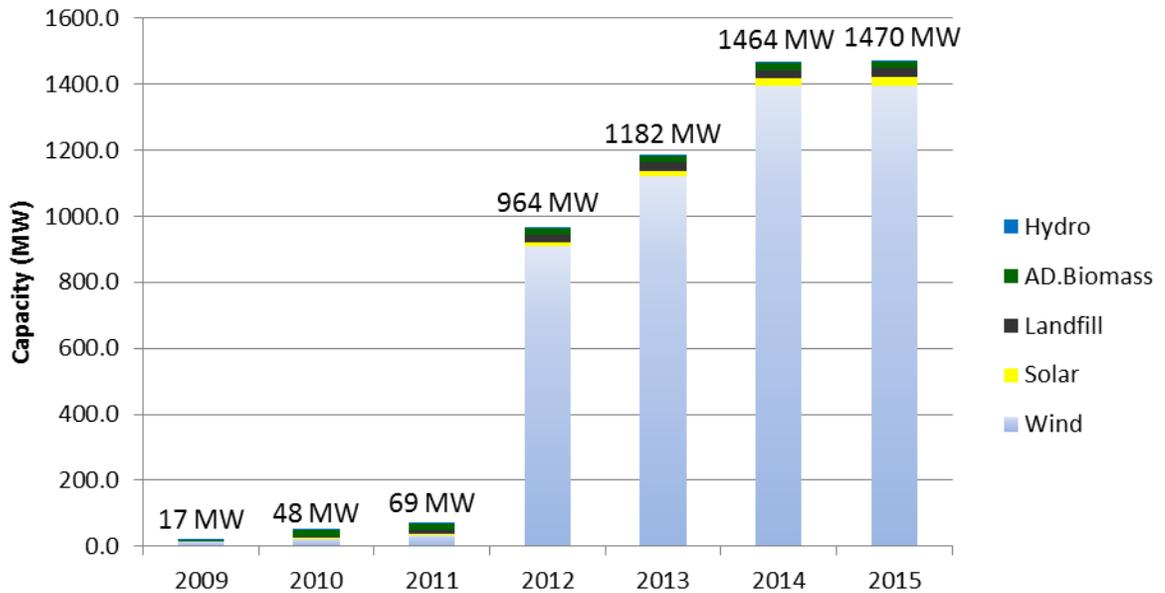
**MIRECS Renewable Projects, All Commercial Operation Dates
Approximately 2,300 MW**



As of January 2015, 61 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 2015 based on the contracts and solar programs approved by the Commission.¹⁰

¹⁰ Assumes 17 MW of DTE Electric Company's 22 MW SolarCurrents program and 5.25 MW of Consumers Energy's 6 MW Experimental Advanced Renewable Programs were commercially operational by the end of 2013. The remainder of the Companies' programs are assumed to continue development through 2015.

Figure 5: Cumulative Renewable Energy Capacity by Commercial Operation Date



Consumers Energy and DTE Electric both continue solar photovoltaic (PV) programs. During 2015, Consumers Energy is expected to complete awarding the final capacity of its approximately 6 MW solar program. On January 23, 2015, Consumers Energy filed an Amended Renewable Energy Plan requesting approval for a Community Solar program up to 10 MW. DTE Electric’s customer-owned program met its goal of awarding 7 MW in 2014. DTE Electric is continuing development under its 15 MW Company-owned SolarCurrents program. These PV programs are discussed in more detail in *Appendix D*.

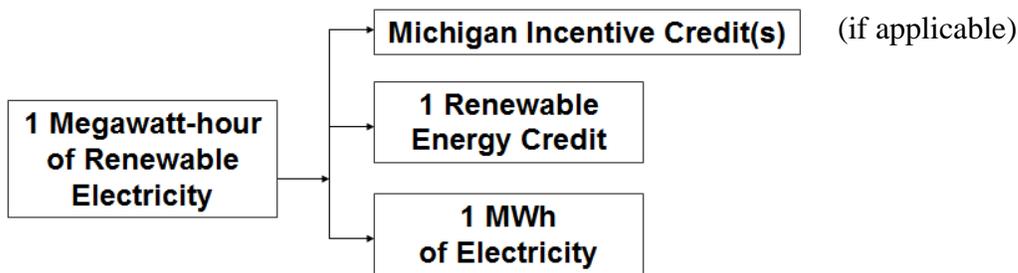
Electric providers have secured nearly all of the renewable energy necessary for compliance with the Act.¹¹ Looking forward, electric providers are on pace to hit the interim targets as well as the 10 percent by the end of 2015.

¹¹ 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.

Michigan Renewable Energy Certification System (MIRECS)

Compliance with the renewable energy standard is demonstrated through the use of energy credits. One renewable energy credit is created for each megawatt-hour (MWh) of renewable energy generated. Additionally, the Act provides for Michigan incentive renewable energy credits (IRECs) and the substitution of energy optimization credits (EOCs)¹² and advanced cleaner energy credits (ACECs) for RECs. RECs may be sold separately from energy as shown in **Figure 6**.

Figure 6: Renewable Energy Credits



Section 41 of PA 295 directed the Commission to “establish a renewable energy credit certification and tracking program.” On August 11, 2009, the Commission approved the contract between the Department of Energy, Labor and Economic Growth (now Licensing and Regulatory Affairs or LARA) and APX, Inc., that designates APX, Inc. as the State of Michigan Administrator of the renewable energy credit and tracking program.¹³ MIRECS was launched on October 30, 2009.¹⁴

As of January 21, 2015, a total of 36,777,690 Michigan energy credits have been created in MIRECS from 2009 through 2014. **Figure 7** shows the categorization of Michigan’s energy credits by technology type. A yearly breakout of energy credits is available in **Appendix E**. Analysis of these

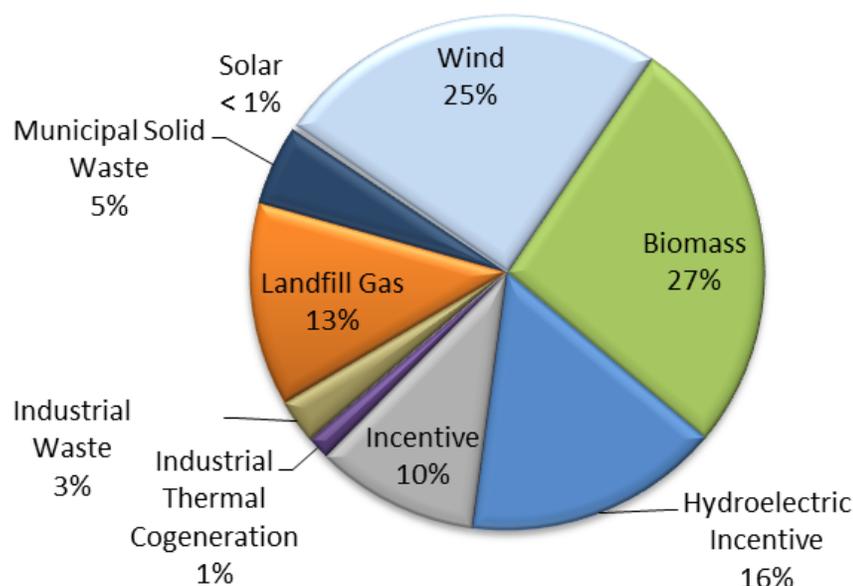
¹² At this time, energy optimization credits are not transferable from one electric provider to another, meaning that they cannot be sold or otherwise traded.

¹³ The initial contract between the State of Michigan and APX was extended for another 2 years in July 2014.

¹⁴ MIRECS may be accessed at <http://www.mirecs.org>.

breakouts shows the significant growth of wind in Michigan’s REC portfolio, from 24 percent in 2012 to 44 percent in 2014. The 25 percent wind figure shown in **Figure 7** represents total credits created over the 2009 – 2014 period. This data differs from **Figure 1** because all energy credits created in MIRECS since its inception are reflected, while **Figure 1** shows only energy credits used for 2013 compliance.

Figure 7: MIRECS 2009-2014 Vintage Energy Credits - 36,777,690 Total Credits



The number of generating units within MIRECS continues to grow. As of January 2015, there were 290 registered projects (generators) in MIRECS. MIRECS has 139 account holders which include electric service providers, generator owners, and others.

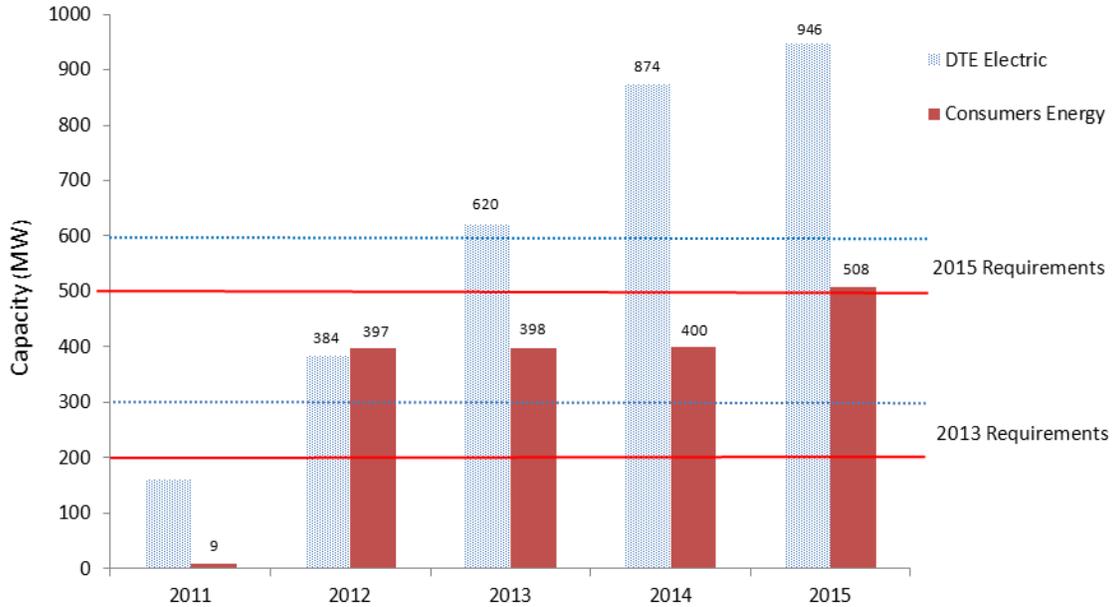
MIRECS is able to fully integrate with other tracking systems such as the Midwest Renewable Energy Tracking System (M-RETS), North American Renewables Registry (NAR) and, to a lesser extent, the North Carolina Renewable Energy Tracking System (NC-RETS) and PJM-Generation Attribute Tracking System (PJM-GATS) which allow energy credit imports from and exports to

MIRECS. This integration allows both businesses and individual citizens to sell their product to a wider market. Generators registered with other tracking systems have, as of January 2015, registered 55 projects for the purpose of importing RECs 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

Consumers Energy and DTE Electric have made substantial progress toward complying with the renewable energy standard. Consumers Energy has filed renewable energy contracts with the Commission totaling 503 MW, and DTE Electric totaling 989.4 MW, as shown in *Appendix F*. In addition to meeting the requirement in PA 295 for RECs that is applicable to all electric providers, both Consumers Energy and DTE Electric have renewable capacity requirements pursuant to Section 27 of PA 295. By the end of 2013, Consumers Energy was required to obtain 200 MW of nameplate capacity that was not in commercial operation before the effective date of the Act. Similarly, DTE Electric's capacity portfolio requirement for 2013 was 300 MW. By the end of 2015, Consumers Energy's and DTE Electric's total capacity portfolio requirement increases to 500 MW and 600 MW, respectively. At the end of 2013, both companies had obtained Commission approval of PPA and company-owned renewable energy projects that provide the necessary capacity to exceed the 2015 legislative capacity requirements. Planned new cumulative capacity and capacity portfolio requirements are shown for each company in **Figure 8**.

Figure 8: Planned New Cumulative capacity through 2015 for Consumers Energy and DTE Electric¹⁵



AESs are required to meet the energy credit requirement contained in the Act. Almost all AESs have indicated through REPs and 2013 annual reports that they will purchase RECs instead of building and owning renewable energy projects or signing long term renewable energy purchase agreements to meet the renewable energy standard requirement. Customer choice participation levels for DTE Electric and Consumers Energy are at the maximum amount allowed by law and both electric providers currently have customers waiting to switch providers. Through building or contracting to purchase energy, capacity, and RECs from new renewable energy projects, the two largest utilities in Michigan have driven the expansion of renewable energy.

¹⁵ Data shows planned capacity through 2015 only. Both companies expect to build or acquire additional capacity after 2015. Consumers Energy source data is from biennial REP Case No. U-17301. DTE Electric source data is from biennial REP Case No. U-17302.

Cost-Effectiveness of Power Purchase Agreements and Owned Generation

Section 33 of PA 295 includes a provision relating to competitive bidding and unsolicited contracts for electric providers who served more than 1,000,000 electric customers in this state as of January 1, 2008. Consumers Energy and DTE Electric fall under this provision.

Pursuant to Section 33, the companies are required to obtain RECs necessary to meet the REC standard in 2015 by one or more of the following methods:

(i) Renewable energy systems that were developed by and are owned by the electric provider. An electric provider shall competitively bid any contracts for engineering, procurement, or construction of any new renewable energy systems...

(ii) Renewable energy systems that were developed by 1 or more third parties pursuant to a contract with the electric provider under which the ownership of the renewable energy system may be transferred to the electric provider, but only after the renewable energy system begins commercial operation. Any such contract shall be executed after a competitive bidding process conducted pursuant to guidelines issued by the commission.

Additionally:

(b) At least 50 percent of the renewable energy credits shall be from renewable energy contracts that do not require transfer of ownership of the applicable renewable energy system to the electric provider or from contracts for the purchase of RECs without the associated renewable energy. A renewable energy contract or contract for the purchase of RECs under this subdivision shall be executed after a competitive bidding process conducted pursuant to guidelines issued by the commission. However, an electric provider may consider unsolicited proposals presented to it outside of a competitive bid process by a renewable energy system developer that is not affiliated with the electric provider. If the provider determines that such an unsolicited proposal provides opportunities that may not otherwise be available or commercially practical, the provider may enter into a contract with the developer.

The companies have conducted 26 requests for proposals (RFPs) in total. Consumers Energy has conducted eight RFPs and three requests for qualifications. DTE Electric has conducted 18 RFPs, two pre-qualification events, one solar solicitation of interest, a request for information, and an auction for 2009 and 2010 vintage RECs. In response to the majority of the companies' RFPs, Commission Staff has reviewed competitive bidding activities through process audits. The purpose and design of

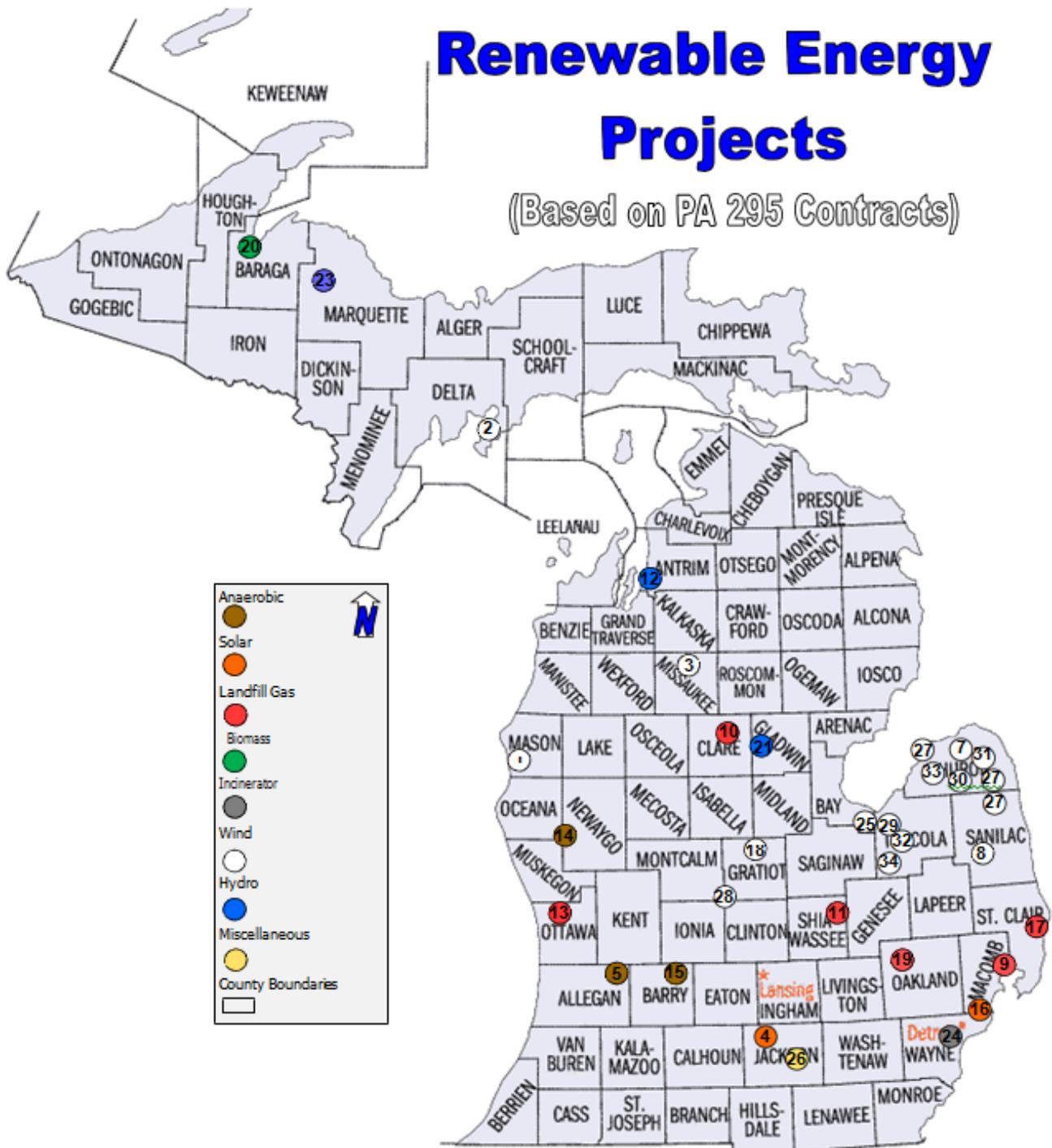
the audits was to ensure that the companies followed the processes and procedures outlined in the Commission's December 4, 2008 Temporary Order in [MPSC Case No. U-15800, Attachment D](#)¹⁶ and pursuant to Section 33 of PA 295. Details about each company's competitive bidding activities are shown in *Appendix G*.

Pursuant to Section 37 of the Act, 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 determination of whether the terms are reasonable and prudent. *Appendix F* lists all renewable energy contracts that have been approved by the MPSC to date.

There has been significant renewable energy development as a result of PA 295. *Appendix H* lists all of the renewable energy projects that have approved PA 295 contracts. The *Appendix F* and *Appendix H* map key corresponds to the map in **Figure 9**. Wind energy has been the primary source of new renewable energy in Michigan. At the end of 2014, including wind projects developed shortly before Act 295 and wind projects developed under the PA 295 contract approval and cost recovery mechanisms, there were over 1,500 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 indicated in *Appendix I*.

¹⁶ See: <http://efile.mpsc.state.mi.us/efile/docs/15800/0001.pdf>.

Figure 9: Locations of Renewable Energy Projects



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 Detroit Edison'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. Detroit Edison 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.

*Numbers shown on map correspond to the Map Key Column provided on *Appendices F and H*.

The MWh contract prices represented in *Appendix F* are levelized cost calculations and reflect the prices over the contract term for all power purchase agreements or, in the case of a company-owned project, the depreciable composite life.¹⁷ The levelized cost value is used to compare multiple contracts with varying terms and conditions. Of the 61 contracts and amendments from five electric providers approved by the Commission to date, all but four have been from Consumers Energy or DTE Electric and 14 have been unsolicited. With the exception of several early contracts for small renewable energy projects, the contract prices have been much lower than expected and have continued to decline.

Pricing for wind farms has declined rapidly in Michigan which makes the timing of wind farm development a major factor in the price. A comparison of the actual costs of the renewable energy resource acquired through power purchase agreements using the methods described in Section 33 of the Act to company-owned projects, shows that company-owned projects have been approximately 5% lower in cost when compared to similar power purchase agreements. Many of the power purchase agreements were entered into in the first few years of implementation of the renewable energy standard, whereas many of the company-owned projects became operational later and benefited from the decline in prices over time. Consumers Energy filed two applications for approval of company-owned wind farms totaling 206.2 MW. DTE Electric filed five applications for approval of Company-owned wind farms totaling up to 422.8 MW and applications for 15 MW of company-owned solar through its SolarCurrents program. Since no large scale solar installations have been contracted through power purchase agreements, only the above-mentioned wind contracts are compared for purposes of this section of the report.

¹⁷ MPSC Staff performed audits of the companies' levelized cost calculations starting in the early part of 2011. Additionally, through RFP process audits, Staff reviewed actual costs of contracts obtained through most of the companies' competitive solicitations. Staff reviewed the actual costs of all contracts listed in *Appendix F*.

In late 2014 DTE Electric filed applications for approval of contracts to purchase up to 100 MW of turbines from General Electric and utilize Aristeo Construction Company for its Meade Wind Farm. The combined levelized cost for the Meade Wind Farm is in the range of \$47 - \$53¹⁸ per MWh with the Production Tax Credit and approximately \$80 per MWh without the Production Tax Credit. At this time it is still uncertain whether or not the tax credit will be extended and applicable to the Meade Wind Farm. To determine a cost of non-company-owned projects, a weighted average of the levelized wind contract costs equal to \$76.27 per MWh was calculated based on 12 wind power purchase agreements from non-Company-owned contracts filed by DTE Electric and Consumers Energy. This cost compares to the weighted average levelized cost of Company-owned wind projects of \$72.55 per MWh. As explained previously, cost comparisons are impacted by the timing of wind farm development.

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. In 2014, generating facilities were constructed utilizing Michigan equipment and labor; contracts for utility scale projects, which will employ Michiganders, were approved; and solar pilot programs that utilize Michigan labor for installations continued and expanded. During 2014, the following utility scale wind farms became commercially operational in Michigan:

- Beebe 1B – 50.4 MW
- Big Turtle – 20 MW

¹⁸ For purposes of determining weighted average costs throughout this report Staff has utilized the simple average of \$50 per MWh for Meade Wind Farm.

- Brookfield – 74.8 MW
- Cross Winds Energy Park – 105.4 MW
- Echo Wind Farm – 112 MW

These projects utilized Michigan companies including Barton Malow and Ventower. During 2014, the Commission approved contracts for the Meade Wind Farm which will be constructed by the Michigan-based Aristeo Construction. Section 39 of PA 295 provides for Michigan Incentive Renewable Energy Credits for renewable energy systems that meet 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 10 and 11** below.

Figure 10: Michigan Equipment Incentive Credits 2009-2014

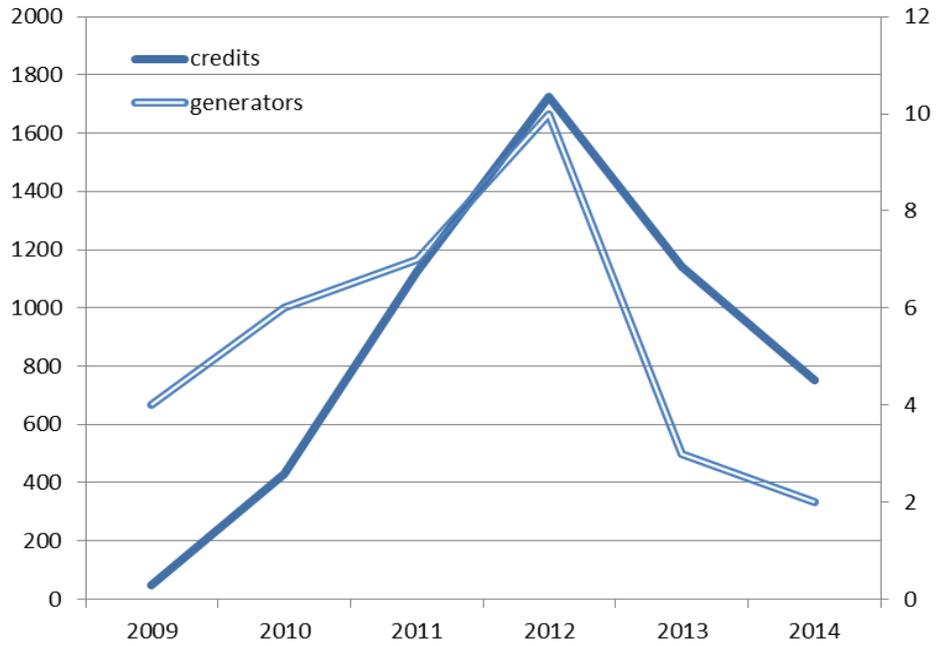
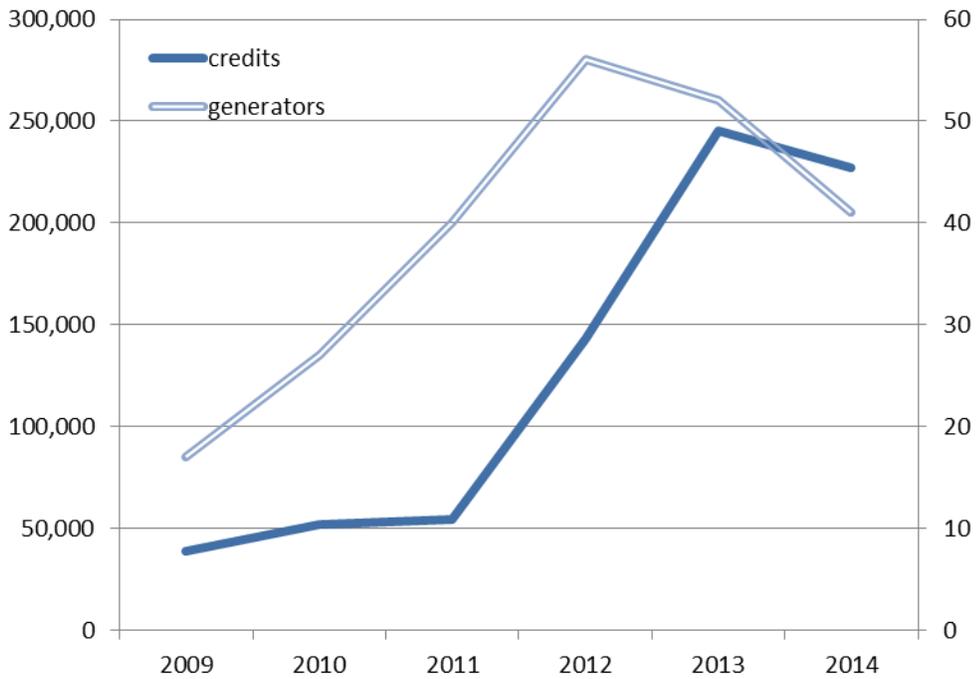


Figure 11: Michigan Labor Incentive Credits 2009-2014



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 kW¹⁹ for new renewable energy projects, \$2.9 billion has been invested to bring approximately 1,450 MW²⁰ of new renewable energy projects on-line through 2014 in Michigan. The \$2.9 billion includes both incremental cost of compliance and the portion of costs recovered as energy costs.

In September 2014, the Michigan Workforce Development Agency in partnership with the Bureau of Labor Market Information and Strategic Initiatives issued a 2014 Energy Cluster Workforce Updates report. The 2014 report is an update to the 2013 Cluster Workforce Analysis which tracked eight detailed industry sectors as a proxy for employment trends in the Renewable and Alternative Energy cluster. That analysis found the cluster grew from 6,775 jobs in 2005 to 8,200 jobs in 2013.²¹ The 2014 Cluster Workforce Update found that overall the Energy Cluster is expected to grow 7.1 percent between 2010 and 2020.²² An additional update for the second quarter of 2014 showed 8,375 jobs among Michigan industries related to the Renewable and Alternative Energy cluster.²³ The employment information presented in this report is not intended to serve as a complete analysis of the impact of PA 295 on employment, but instead serve as the best possible estimate given the available data.

Michigan is continuing to realize its position as a regional leader in the development and manufacturing of renewable energy systems, building on the state's engineering expertise, modernized machining, and RPS compliance efforts. It appears that Michigan's incentive REC

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 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.

²¹ The report's author (Michigan Workforce Development Agency) provided additional information to MPSC staff showing job data for 2005 and 2013. Data presented in the report is for 2011. See http://milmi.org/admin/uploadedPublications/1992_WDA_EnergyFINAL.pdf.

²² See 2014 Cluster Workforce Updates – Energy: http://milmi.org/admin/uploadedPublications/2227_Energy.pdf

²³ The report's author provided additional information to MPSC staff showing job data for 2014.

provision is meeting its intended purpose to encourage developers to maximize utilization of Michigan equipment and labor. The Commission will continue to monitor data on the impact of the renewable energy standard on employment in Michigan.

Impact of Percentage Limits on the Use of Advanced Cleaner Energy Credits

Advanced cleaner energy (ACE) is defined in PA 295 as any of the four following facilities: 1) gasification, 2) industrial cogeneration, 3) coal-fired electric generating if at least 85 percent of the carbon dioxide emissions are captured and permanently geologically sequestered, or 4) electric generating that uses technologies not in commercial operation on the effective date of PA 295. Energy produced from these facilities is eligible for ACE credits (ACEC); the credits are tracked within MIRECS. Electric providers may substitute ACECs for RECs to meet the renewable energy standard. However, there are conditions on the substitution and there is a statutorily imposed limit on the percentage of ACECs eligible to be used each year for the renewable energy standard.

Section 27(7) of PA 295 describes the conditions and substitution limits. ACECs from industrial cogeneration may be substituted for RECs without Commission approval. For other types of ACECs, substitution may only be made with Commission approval and if the advanced cleaner energy is both cost effective and provides a carbon dioxide emission benefit. The combination of energy optimization credits and ACECs may not account for more than 10 percent of the total energy credits used to meet the standard in a given year. Older non-plasma arc gasification advanced cleaner energy systems (in existence on January 1, 2008) cannot be used to meet more than 70 percent of the 10 percent limit. The substitution ratio of plasma arc

gasification or industrial cogeneration is one ACEC to one REC while the ratio for other forms of advanced cleaner energy is 10 ACECs to one REC.

The Commission has found no negative impact on advanced cleaner energy development based on the above-described percentage limits. To better answer this question, the MPSC Staff asked the question “Did the percentage limits in Section 27(7) affect development of advanced cleaner energy by the electric provider? How so?” in the annual reports required under Section 51. No electric provider indicated the percentage limits in Section 27(7) affected development of advanced cleaner energy. Advanced cleaner energy generation has increased substantially to 92,155 MWh in 2014 with only three facilities generating advanced cleaner energy in 2014. Advanced cleaner energy continues to be a small percentage of the Michigan renewable energy portfolio (just greater than 2.0 percent of the 2013 compliance portfolio). The percentage limits, which in all cases are far from being met, do not appear to be affecting the development of advanced cleaner energy in Michigan.

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

Pursuant to Section 21(6)(b) of the Act, rate-regulated electric providers’ REPs were required to show that the life cycle cost of renewable energy acquired, less the life cycle net savings associated with Energy Optimization Plans, did not exceed the life cycle cost of electricity generated by a new conventional coal-fired facility. 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, 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 has diligently

worked with the providers to develop the guidepost rate and finds that the number is \$133 per MWh.²⁴

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. In its amended REP in Case No. U-16543, Consumers Energy updated the levelized cost of a conventional coal plant to \$107 per MWh using the same construction cost estimates used in determining the \$133 per MWh rate. The decrease in cost was primarily due to updated emissions assumptions.²⁵ However, the cost of coal had declined compared to the costs in 2008 when the original analysis had taken place. This had the effect of reducing the long-term fuel price projections. Additionally, federal legislation regarding carbon emissions had not been enacted, which resulted in emissions costs having less of an impact on the cost of a coal plant in the company's revamped calculation. Given all of this suggested change based on the evidence mentioned above, the Commission continues to find that the \$133 per MWh guidepost is reasonable as discussed below.

There are several proposed and final regulations that could dramatically impact electric providers' generation sources, primarily coal-fired plants. On December 16, 2011, the U.S. Environmental Protection Agency (EPA) finalized the Mercury and Air Toxics (MATS) rule, which regulates emissions of mercury, acid gases and metallic toxics.²⁶ On December 15, 2011, the EPA supplemented its rulemaking under the Cross State Air Pollution Rule (CSAPR)²⁷ by requiring Michigan, along with four other states, to reduce summertime NOx emissions under an ozone season control program. In August 2014 the EPA issued, under Section 316(b) of the

²⁴ Source: Excerpt from Commission Staff January 30, 2009 Guidepost Rate Letter, <http://efile.mpsc.state.mi.us/efile/docs/15800/0023.pdf>.

²⁵ See: <http://efile.mpsc.state.mi.us/efile/docs/16543/0010.pdf>.

²⁶ Clean Power Plants: www.epa.gov/airquality/powerplanttoxics/powerplants.html

²⁷ Cross State Air Pollution Rule: <http://www.epa.gov/crossstaterule/>

Clean Water Act, a final rule which seeks to reduce the impingement and entrainment of aquatic organisms.²⁸ Affected sources must comply within eight years of the 2014 date. On June 7, 2013 the EPA published Steam Electric Generating Station Effluent Limitation Guidelines (SEEG) in the Federal Register. These guidelines are expected to be finalized by September 30, 2015. On December 19, 2014, the EPA issued a final rule regulating the disposal of coal combustion residuals from electric utilities.²⁹ On September 20, 2013, the EPA proposed New Source Performance Standards (NSPS) for electric generating units (EGUs) that would require all new fossil-fueled plants to meet greenhouse gas emissions standards of either 1,000 or 1,100 pounds of CO₂ per MWh, depending on the technology of the EGU and its heat input rating. A June 2013 Presidential Memorandum directed the EPA to propose carbon standards by June 2014 and have final rules in place a year later.³⁰ This directive led to the EPA's proposed Clean Power Plan³¹ in June of 2014, which aims to cut carbon pollution from power plants nationally by 30% compared to 2005 levels by the year 2030. The EPA calculated this reduction goal using a combination of four building blocks: 1) make fossil fuel plants more efficient through a 6% reduction in heat rates; 2) increase the capacity factor of natural gas combined cycle plants; 3) utilize zero carbon generation such as renewables and nuclear plants more frequently; and 4) increase energy efficiency and demand-side management. On June 18, 2014 a 120-day comment period commenced and was then extended by 45 days. By the end of the comment period on December 1, 2014, the EPA had received over 2 million public comments and expects to finalize

²⁸ Cooling Water Intakes: water.epa.gov/lawsregs/lawsguidance/cwa/316b/

²⁹2014 Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities: www2.epa.gov/coalash/coal-ash-rule .

³⁰ <http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards>

³¹ <http://www2.epa.gov/sites/production/files/2014-05/documents/20140602fs-setting-goals.pdf>

the rule in the summer of 2015.³² These EPA regulations could have a considerable impact on the price of electricity going forward, as electric providers will have to make the decision to either retire or retrofit existing generators. Any new coal capacity would likely require significant capital and operating costs under the existing and proposed rules.

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 1**, the cost of all renewable energy projects using multiple renewable energy technologies is less than the coal guidepost rate with the exception of two anaerobic digester contracts representing less than 4 MW of capacity. These contracts were the result of Consumers Energy's first solicitation for small (under 5 MW) facilities. Consumers Energy and DTE Electric have since seen much lower prices for renewable energy. Even using Consumers Energy's revised \$107 per MWh levelized cost, wind and biomass still compare favorably while landfill gas is competitive. As solar development in Michigan only includes small-scale projects or pilot programs, it was not analyzed in this section or included in **Table 1**.

³² <http://www2.epa.gov/carbon-pollution-standards/fact-sheet-clean-power-plan-carbon-pollution-standards-key-dates>

Table 1: Weighted Average Levelized Renewable Energy Contract Prices

| Consumers Energy | | | | | |
|----------------------------------|----------------|-----------------|----------------|-----------------|-----------------|
| Technology | Wind | Digester | Biomass | Landfill | Hydro |
| Weighted Average | \$90.60 | \$137.77 | NA | \$106.21 | \$121.31 |
| Detroit Edison | | | | | |
| Technology | Wind | Digester | Biomass | Landfill | Hydro |
| Weighted Average | \$64.59 | NA | \$98.94 | \$98.97 | NA |
| Combined Weighted Average | \$74.52 | \$137.02 | \$98.94 | \$104.05 | \$121.31 |

While the Commission is required to make a determination about the cost effectiveness of the renewable energy standard as compared to the life-cycle cost of electricity of coal-fired generation, it should be noted that renewable energy wind resources are not equivalent on a capacity basis when compared to coal-fired or other base load generation. The differences in energy availability during peak loads can be significant. For example, regional transmission organizations such as Midcontinent Independent System Operator (MISO) discounted the capacity value of wind resources during the peak load to as low as 14.7 percent for the 2015 – 2016 planning year,³³ compared to an availability ranging as high, or higher than 80 percent for base load generation plants.³⁴ Comparing per unit energy costs of different generation types may not reflect the true value of the resource to the reliability of the electric system as a whole.

³³ <https://www.misoenergy.org/Library/Repository/Report/2015%20Wind%20Capacity%20Report.pdf>

³⁴ The availability on-peak for base load generators is unit-specific. Older units may have capacity values significantly lower than 80 percent, however, newer units, especially newer nuclear units may have capacity values on-peak above ninety percent.

Cost-Effectiveness of Renewable Energy and Energy Optimization Standards

Section 51(5)(e) of PA 295 requires an evaluation of the cost-effectiveness of the renewable energy standard. In a similar vein, Section 97 of PA 295 requires the Commission to evaluate and determine whether the energy optimization and renewable energy standards have been cost-effective. The actual cost of renewable energy contracts submitted to the Commission to date continues to show a downward pricing trend. The most recent contracts approved by the Commission for new wind capacity have levelized costs in the low \$50s per MWh range, which is about 10 percent less than the least expensive levelized contract prices from 2011 and half of the levelized cost of the first few renewable energy contracts approved in 2009 and 2010. Contracts submitted to the Commission through 2014 total approximately 1,500 MW³⁵ of renewable capacity. Weighting the levelized costs of these contracts by the generation in MWh results in an average cost of \$76.55 per MWh. Almost all renewable energy contract prices are lower than the \$133 per MWh coal guidepost rate as shown in **Figure 12**. This calculation does not include DTE Electric's and Consumers Energy's solar programs as these are considered pilot programs and make up less than two percent of the REC and IREC creation from contracts and projects approved by the Commission to date, and levelized costs of the solar pilot programs are not available.

³⁵ This includes DTE Electric Company's 22 MW SolarCurrents program and Consumers Energy Company's 6 MW EARP programs. Additionally, this only accounts for Michigan's allocation (67.5 MW) of Indiana Michigan Power Company's two wind contracts.

the generation anticipated over the term of the contract.³⁶ To determine the anticipated generation for the company-owned projects, the depreciable composite life of the project was used. For Consumers Energy's company-owned projects, the present value of the generation based on a 31.2-year life was used. For DTE Electric Company-owned projects, the present value of the generation based on a 22-year life was used. IRECs were not factored into the weighting of any of the renewable energy projects; however, doing so would increase the cost effectiveness of renewable energy. The combined cost of \$37.00 per MWh for both Subpart A (Renewable Energy Standard) and Subpart B (Energy Optimization Standard) of 2008 PA 295 is approximately 28 percent of the cost of a new conventional coal plant, using \$133 per MWh as the coal plant cost. On a stand-alone basis, the \$76.55 per MWh cost of the renewable energy standard is substantially lower than the cost of a new coal-fired plant, but the combined cost of \$37.00 per MWh, is less than any new generation, including new natural gas combined cycle plants, when compared to the Energy Information Administration levelized plant costs for 2014.³⁷ In the middle of December 2014, the Federal Production Tax Credit (PTC) was extended through year-end 2014. This short time frame made it difficult for Michigan's utilities to plan new projects, but DTE Electric's Meade Wind Farm was already in the planning phase and ratepayers are expected to benefit from the tax credit. It is unknown if additional extensions of the PTC will be granted.

³⁶ Solar pilot programs were excluded because levelized cost data is not available and the solar pilot programs would contribute minimally to the weighted average because they are very small compared to the total.

³⁷ See: http://www.eia.gov/forecasts/aeo/electricity_generation.cfm

Table 2: Cost Effectiveness of Energy Optimization and Renewable Energy Standards

| | |
|--|----------------|
| Energy Optimization Cost of Conserved Energy Weighted Average (\$/MWh) | \$20.00 |
| Renewable Energy Weighted Average Cost (\$/MWh) | \$76.55 |
| Combined Weighted Average Cost of Energy Optimization and Renewable Energy (\$/MWh) | \$37.00 |
| <p>Source: EO cost data assumes EO plans renew similar measures on a yearly basis through 2029 (corresponding to the 20 year period of the initial 2009 renewable energy plans) Renewable energy cost data is based on levelized costs provided as part of the renewable energy contract approval process.</p> | |

Effect of the Renewable Energy and Energy Optimization Standard on Electricity Prices

PA 295 provides for the recovery of costs associated with complying with both the renewable energy standard and the energy optimization standard. As described in the 2013 [report](#) 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.³⁸

In 2013, the average annual transfer price for DTE Electric was \$69.08 per MWh and the average annual transfer price for Consumers Energy was \$77.60 per MWh. For the 2014 calendar year, Michigan had four rate-regulated electric providers collecting revenue through a renewable energy surcharge: Alpena Power, DTE Electric, Indiana Michigan and Wisconsin Electric Power Company. Renewable energy surcharge amounts are listed in *Appendix B*.

In addition, all investor-owned, cooperative and municipal electric providers (as well as Commission-regulated natural gas utilities) implement energy optimization programs, and are able to recover costs associated with running those programs in a cost-effective manner through energy optimization surcharges. Specific surcharge amounts are detailed in the Commission's *2014 Report on the Implementation of the P.A. 295 Utility Energy Optimization Programs*, issued on November 26, 2014.³⁹

Spending on renewable energy and energy optimization has had an impact on electric rates, but should be considered in context of other rate drivers as well. Information submitted as part of the *Readying Michigan to Make Good Energy Decisions* process indicates that several factors, including load loss, fuel costs, environmental investment, and base system investment, have contributed to electric rate increases since 2008, most more significantly than spending on renewable energy or energy optimization.⁴⁰ There are also benefits attributable to an increase in renewable energy generation sources and improved energy efficiency. Wind and solar generation have zero fuel costs and the integration of zero fuel-cost generation into the regional market

³⁸ For more detailed information on the Staff Transfer Price Schedule see: <http://efile.mpsc.state.mi.us/efile/docs/15800/0036.pdf>

³⁹ See: http://www.michigan.gov/documents/mpsc/eo_report_441092_7.pdf

⁴⁰ See: http://michigan.gov/documents/energy/Additional_Areas_final_440032_7.pdf, Figures 6 and 7, pp. 24-25.

results in lower locational marginal prices in the energy market. In addition, the Commission's *2014 Report on the Implementation of the P.A. 295 Utility Energy Optimization Programs* found that for every dollar spent on energy optimization, customers realize a cost of service benefit of \$3.75.⁴¹ And, as noted in previous sections, the cost of energy generated by renewable sources continues to decline and is cheaper than new coal-fired generation. Using the most recent cost of service data available for Consumers Energy and DTE Electric, Commission Staff calculated \$64 per MWh⁴² as the combined weighted average of all power supply costs (conventional, renewable and other), including purchased power, which is higher than the combined cost of the renewable energy and energy efficiency standards of \$37.00 per MWh.

Recommendations

The second interim compliance requirement was accomplished successfully by all of Michigan's electric providers for 2013, and progress toward the 10 percent renewable energy target in 2015 is going smoothly. Michigan's electric providers are on track to meet the 10 percent renewable energy requirement. The renewable energy standard is resulting in the development of new renewable capacity and can be credited with over 1,450 MW of new renewable energy projects becoming commercially operational since the Act took effect. The weighted average price of existing renewable energy contracts is \$76.55 per MWh, which is less than forecasted in REPs, and is continuing to trend downward. The combined weighted average cost of the companies' energy optimization and renewable energy is \$37.00 per MWh, significantly lower than the cost of all types of new fossil fuel generation plants. The Commission will continue to monitor electric provider progress toward meeting the requirements of the standards as provided under the Act.

⁴¹ See: http://www.michigan.gov/documents/mpsc/2014_eo_report_475141_7.pdf

⁴² The \$64 per MWh weighted average is based on 2012 filings and excludes transmission costs.

The Commission has no recommendation for legislation at this time. In 2015, the Commission stands ready to assist policymakers as they consider Michigan's future energy policy.

Appendix A - RE Filings: Case Numbers, Companies, Plan Filing Dates and Reconciliation Approval Dates

| | COMPANY | 2009 Initial RE Plan Case # | Next RE Biennial Plan Case # | Next RE Plan Filing Date | 2013 Reconciliation Case # | 2013 Reconciliation Approval Date | | |
|--|---|--------------------------------------|---------------------------------------|-----------------------------|----------------------------------|--------------------------------------|--|--|
| IOUs | | | | | | | | |
| 1 | Alpena Power Company | U-15804 | U-17791 | 5/12/2015 | U-17630 | Pending | | |
| 2 | Consumers Energy Company | U-15805 | U-17792 | 5/26/2015 | U-17631 | Pending | | |
| 3 | DTE Electric Company | U-15806 | U-17793 | 6/2/2015 | U-17632 | Pending | | |
| 4 | Indiana Michigan Power Company | U-15808 | U-17794 | 5/12/2015 | U-17633 | Pending | | |
| 5 | Northern States Power Company-Wisconsin | U-15809 | U-17795 | 5/12/2015 | U-17634 | 9/26/2014 | | |
| 6 | Upper Peninsula Power Company | U-15810 | U-17796 | 5/26/2015 | U-17635 | 10/7/2014 | | |
| 7 | Wisconsin Public Service Corporation | U-15811 | U-17797 | 5/26/2015 | U-17363 | 11/6/2014 | | |
| | Wisconsin Electric Power Company | U-15812 | U-17798 | 5/26/2015 | | | | |
| 8 | Wisconsin Electric Power Company | U-15812 | U-17798 | 5/26/2015 | U-17570 | Pending | | |
| Cooperatives - Rate Regulated | | | | | | | | |
| 9 | Cloverland Electric Cooperative/Edison Sault | U-15816 | U-17799 | 5/12/2015 | U-17637 | Pending | | |
| 10 | Midwest Energy Cooperative | U-15818 | U-17800 | 5/12/2015 | U-17638 | Pending | | |
| 11 | Thumb Electric Cooperative | U-15821 | U-17801 | 5/12/2015 | U-17639 | Pending | | |
| Cooperatives - Member Regulated | | | | | | | | |
| 12 | Alger Delta Cooperative Electric Association | U-15813 | | 5/12/2015 | Not Required | | | |
| 13 | Bayfield Electric Cooperative | U-15814 | | 6/2/2015 | | | | |
| 14 | Cherryland Electric Cooperative | U-15815 | | 5/12/2015 | | | | |
| 15 | Great Lakes Energy Cooperative (2012) | U-15817 | | 5/12/2015 | | | | |
| 16 | Ontonagon Co. Rural Electrification Assoc. (2012) | U-15819 | | 5/12/2015 | | | | |
| 17 | Presque Isle Electric and Gas Co-op (2012) | U-15820 | | 9/24/2015 | | | | |
| 18 | Tri-County Electric Cooperative | U-15822 | | 8/13/2015 | Not Required | | | |
| Municipals | | | | | | | | |
| 19 | Village of Baraga | U-15848 | | 7/1/2015 | | | | |
| 20 | City of Bay City | U-15849 | | 7/1/2015 | | | | |
| 21 | City of Charlevoix | U-15850 | | 7/1/2015 | | | | |
| 22 | Chelsea Department of Electric and Water | U-15851 | | 7/1/2015 | | | | |
| 23 | Village of Clinton | U-15852 | | 7/1/2015 | | | | |
| 24 | Coldwater Board of Public Utilities | U-15853 | | 7/1/2015 | | | | |
| 25 | Croswell Municipal Light & Power Department | U-15854 | | 7/1/2015 | | | | |
| 26 | City of Crystal Falls | U-15855 | | 7/1/2015 | | | | |
| 27 | Daggett Electric Department | U-15856 | | 10/13/2015 | | | | |
| | Detroit Public Lighting Department | U-15857 | | 7/1/2015 | | | | |
| 28 | City of Dowagiac | U-15858 | | 7/1/2015 | | | | |
| 29 | City of Eaton Rapids | U-15859 | | 7/1/2015 | | | | |
| 30 | City of Escanaba | U-15860 | | 7/1/2015 | | | | |
| 31 | City of Gladstone | U-15861 | | 7/1/2015 | | | | |
| 32 | Grand Haven Board of Light and Power | U-15862 | | 7/1/2015 | | | | |
| 33 | City of Harbor Springs | U-15863 | | 7/1/2015 | | | | |
| 34 | City of Hart Hydro | U-15864 | | 7/1/2015 | | | | |
| 35 | Hillsdale Board of Public Utilities | U-15865 | | 7/1/2015 | | | | |
| 36 | Holland Board of Public Works | U-15866 | | 7/1/2015 | | | | |
| 37 | Village of L'Anse | U-15867 | | 7/1/2015 | | | | |
| 38 | Lansing Board of Water & Light | U-15868 | | 7/1/2015 | | | | |
| 39 | Lowell Light and Power | U-15869 | | 7/1/2015 | | | | |
| 40 | Marquette Board of Light and Power | U-15870 | | 7/1/2015 | | | | |
| 41 | Marshall Electric Department | U-15871 | | 7/1/2015 | | | | |
| 42 | Negaunee Department of Public Works | U-15872 | | 7/1/2015 | | | | |
| 43 | Newberry Water and Light Board | U-15873 | | 7/1/2015 | | | | |
| 44 | Niles Utility Department | U-15874 | | 7/1/2015 | | | | |
| 45 | City of Norway | U-15875 | | 7/1/2015 | | | | |
| 46 | City of Paw Paw | U-15876 | | 7/1/2015 | | | | |
| 47 | City of Petoskey | U-15877 | | 7/1/2015 | | | | |
| 48 | City of Portland | U-15878 | | 7/1/2015 | | | | |
| 49 | City of Sebewaing | U-15879 | | 7/1/2015 | | | | |
| 50 | City of South Haven | U-15880 | | 7/1/2015 | | | | |
| 51 | City of St. Louis | U-15881 | | 7/1/2015 | | | | |
| 52 | City of Stephenson | U-15882 | | 7/1/2015 | | | | |
| 53 | City of Sturgis | U-15883 | | 7/1/2015 | | | | |
| 54 | Traverse City Light & Power | U-15884 | | 7/1/2015 | | | | |
| 55 | Union City Electric Department | U-15885 | | 7/1/2015 | | | | |
| 56 | City of Wakefield | U-15886 | | 7/1/2015 | | | | |
| 57 | Wyandotte Department of Municipal Service | U-15887 | | 7/1/2015 | | | | |
| 58 | Zeeland Board of Public Works | U-15888 | | 7/1/2015 | | | | |

Appendix A - RE Filings: Case Numbers, Companies, Plan Filing Dates and Reconciliation Approval Dates

| | COMPANY | 2009 Initial RE Plan Case # | Next RE Biennial Plan Case # | Next RE Plan Filing Date | 2013 Reconciliation Case # | 2013 Reconciliation Approval Date |
|---|---|--------------------------------------|---------------------------------------|-----------------------------|----------------------------------|--------------------------------------|
| Alternative Electric Suppliers (AES) Serving Customers | | | | | Not Required | |
| 59 | CMS ERM Michigan LLC | U-15826 | U-16640 | 4/16/2015 | | |
| 60 | Commerce Energy Inc | U-15828 | U-16641 | 4/16/2015 | | |
| 61 | Constellation NewEnergy Inc | U-15829 | U-16642 | 4/16/2015 | | |
| 62 | Direct Energy Business LLC | U-15845 | U-16643 | 4/16/2015 | | |
| 63 | Duke Energy Retail Sales, LLC | | | 10/20/2015 | | |
| 64 | FirstEnergy Solutions Corp | U-15832 | U-16644 | 4/16/2015 | | |
| 65 | Glacial Energy of Illinois | U-16007 | U-16645 | 12/16/2015 | | |
| 66 | Integrays Energy Services Inc | U-15833 | U-16646 | 4/16/2015 | | |
| 67 | MidAmerican Energy Company | U-15837 | U-16647 | 4/16/2015 | | |
| 68 | Noble Americas Energy Solutions LLC f/k/a Sempra Energy Solutions LLC | U-15843 | U-16650 | 4/16/2015 | | |
| 69 | Spartan Renewable Energy Inc | U-15844 | U-16651 | 4/16/2015 | | |
| 70 | U.P. Power Marketing LLC | U-16586 | U-16652 | 5/26/2015 | | |
| 71 | Wolverine Power Marketing Cooperative Inc | U-15847 | U-16653 | 4/16/2015 | | |
| Alternative Electric Suppliers (AES) Not Serving Customers | | | | | Not Required | |
| 72 | AEP Energy, Inc | U-15825 | U-15825 | 4/16/2015 | | |
| 73 | Dillon Power, LLC | | U-17769 | 4/15/2015 | | |
| 74 | Direct Energy Services LLC | U-15830 | U-15830 | 4/16/2015 | | |
| 75 | Energy Int'l Power Marketing d/b/a PowerOne | U-15831 | U-15831 | 5/26/2015 | | |
| 76 | energy.me Midwest LLC d/b/a energy.me | | U-17455 | 2/20/2016 | | |
| 77 | Energy Service Providers, Inc d/b/a Michigan Gas & Electric | | U-17010 | 9/11/2016 | | |
| 78 | Interstate Gas Supply, Inc d/b/a IGS Energy | | U-17338 | 2/20/2016 | | |
| 79 | Lakeshore Energy Services, LLC | | U-16979 | 9/11/2016 | | |
| 80 | Liberty Power Delaware | U-15834 | U-15834 | 5/26/2015 | | |
| 81 | Libery Power Holdings LLC | U-15835 | U-15835 | 5/26/2015 | | |
| 82 | Plymouth Rock Energy LLC | | U-17549 | 4/15/2016 | | |
| 83 | Premier Energy Marketing LLC | U-15841 | U-16648 | 5/26/2015 | | |
| 84 | Santana Energy Services | | U-17254 | 6/28/2015 | | |
| 85 | Texas Retail Energy, LLC | | U-17168 | 5/29/2015 | | |

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

| Company | Initial Plan | 2013 Plan Docket | 2013 Compliance Year Sales* | Retail Sales Method** | 2007/2008 Baseline RECs | 2012 REC Requirement | 2013 REC Requirement | 2013 Excess RECs Retired | 2013 EO & Green Pricing Credit Substitutions | Estimated 2014 REC Requirement | Estimated 2015 REC Requirement | Expected to Meet 2015 10% Standard | Current Residential Surcharge \$/Month |
|---|--------------|------------------|-----------------------------|-----------------------|-------------------------|----------------------|----------------------|--------------------------|--|--------------------------------|--------------------------------|------------------------------------|--|
| Rate Regulated Utilities | | | | | | | | | | | | | |
| Alpena Power | U-15804 | U-17300 | 329,719 | 3Y | 0 | 6,438 | 10,881 | 3,187 | | 16,486 | 32,972 | Yes | 0.24 |
| Consumers Energy | U-15805 | U-17301 | 33,549,790 | 3Y | 1,549,840 | 1,906,592 | 2,145,536 | 0 | 59,711 | 2,452,410 | 3,354,979 | Yes | 0.00 |
| DTE Electric | U-15806 | U-17302 | 41,721,159 | W | 566,819 | 1,281,962 | 1,756,567 | 0 | 63,029 | 2,369,467 | 4,172,116 | Yes | 0.43 |
| Indiana Michigan | U-15808 | U-17303 | 2,813,544 | W | 17,450 | 70,231 | 104,538 | 4 | | 149,402 | 281,354 | Yes | 0.43 |
| NSP-Wisc (Xcel) | U-15809 | U-17304 | 140,804 | 3Y | 12,679 | 12,926 | 13,142 | 0 | | 13,380 | 14,080 | Yes | 0.00 |
| Upper Peninsula Power | U-15810 | U-17305 | 846,706 | 3Y | 98,521 | 84,682 | 84,671 | 0 | | 84,671 | 84,671 | Yes | 0.00 |
| Wisc. PSC | U-15811 | U-17306 | 283,236 | 3Y | 11,145 | 14,383 | 16,815 | 2,155 | | 19,734 | 28,324 | Yes | 0.00 |
| Wisc. Elec Co | U-15812 | U-17072 | 2,772,812 | 3Y | 53,196 | 95,975 | 127,144 | 0 | | 165,239 | 277,281 | Yes* | 0.28 |
| *Revised Plan Pending Approval | | | | | | | | | | | | | |
| Rate Regulated Cooperatives | | | | | | | | | | | | | |
| Cloverland Electric Coop | U-15816 | U-17308 | 802,313 | 3Y | 301,126 | 80,335 | 80,231 | 2,251 | | 80,231 | 80,231 | Yes | 0.00 |
| Midwest Energy Coop | U-15818 | U-17309 | 586,487 | 3Y | 0 | 11,580 | 19,354 | 0 | | 29,324 | 58,649 | Yes | 0.00 |
| Thumb Elec. Coop | U-15821 | U-17310 | 156,361 | 3Y | 1,562 | 4,302 | 6,206 | 0 | | 8,599 | 15,636 | Yes | 0.00 |
| Member Regulated Cooperatives | | | | | | | | | | | | | |
| Alger Delta Coop Elec | U-15813 | U-16589 | 60,902 | 3Y | 920 | 1,914 | 2,626 | 2 | | 3,505 | 6,090 | Yes | 0.00 |
| Bayfield Elec. Coop | U-15814 | U-16590 | 183 | 3Y | 4 | 7 | 9 | 0 | | 11 | 18 | Yes | 0.00 |
| Cherryland Elec Coop | U-15815 | U-16591 | 371,877 | 3Y | 0 | 7,290 | 12,272 | 0 | | 18,594 | 37,188 | Yes | 0.00 |
| Great Lakes Energy Coop | U-15817 | U-16593 | 1,358,195 | 3Y | 0 | 26,798 | 44,820 | 0 | | 67,910 | 135,820 | Yes | 0.00 |
| Homeworks Tri-County Elec. Coop | U-15822 | U-16598 | 325,642 | 3Y | 0 | 6,321 | 10,746 | 0 | | 16,282 | 32,564 | Yes | 0.00 |
| Ontonagon Co. Rural Elec. | U-15819 | U-16595 | 24,982 | 3Y | 2,246 | 2,292 | 2,329 | 0 | | 2,372 | 2,498 | Yes | 0.00 |
| Presque Isle Elec & Coop | U-15820 | U-16596 | 236,308 | 3Y | 0 | 4,741 | 7,798 | 0 | | 11,815 | 23,631 | Yes | 0.00 |
| Alternative Electric Suppliers | | | | | | | | | | | | | |
| CMS ERM Michigan | U-15826 | U-16640 | | 3Y | | | | | | | | Yes | 0.00 |
| Commerce Energy | U-15828 | U-16641 | | W | | | | | | | | Yes | 0.00 |
| Constellation NewEnergy | U-15829 | U-16642 | | W | | | | | | | | Yes | 0.00 |
| Direct Energy Business | U-15845 | U-16643 | | W | | | | | | | | Yes | 0.00 |
| First Energy Solutions | U-15832 | U-16644 | | W | | | | | | | | Yes | 0.00 |
| Glacial Energy of Illinois | U-16007 | U-16645 | | W | | | | | | | | Yes | 0.00 |
| Integrus Energy Services | U-15833 | U-16646 | | W | | | | | | | | Yes | 0.00 |
| MidAmerican Energy Company | U-15837 | U-16647 | | W | | | | | | | | Yes | 0.00 |
| Noble Americas Energy Solutions f/k/a Sempra Energy Solutions | U-15843 | U-16650 | | W | | | | | | | | Yes | 0.00 |
| Spartan Renewable Energy | U-15844 | U-16651 | | 3Y | | | | | | | | Yes | 0.00 |
| U.P. Power Marketing | U-15846 | U-16652 | | W | | | | | | | | Yes | 0.00 |
| Wolverine Power Marketing Cooperative | U-15847 | U-16653 | | 3Y | | | | | | | | Yes | 0.00 |
| Aggregated Totals** | | | 9,289,253 | | 0 | 184,145 | 306,545 | 5,981 | | 464,463 | 928,925 | | |

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

| Company | Initial Plan | 2013 Plan Docket | 2013 Compliance Year Sales* | Retail Sales Method** | 2007/2008 Baseline RECs | 2012 REC Requirement | 2013 REC Requirement | 2013 Excess RECs Retired | 2013 EO & Green Pricing Credit Substitutions | Estimated 2014 REC Requirement | Estimated 2015 REC Requirement | Expected to Meet 2015 10% Standard | Current Residential Surcharge \$/Month |
|--|--------------|------------------|-----------------------------|-----------------------|-------------------------|----------------------|----------------------|--------------------------|--|--------------------------------|--------------------------------|------------------------------------|--|
| Municipal Utilities | | | | | | | | | | | | | |
| Village of Baraga | U-15848 | U-16599 | 18,679 | 3Y | 0 | 368 | 617 | 0 | | 934 | 1,868 | Yes | 0.00 |
| City of Bay City | U-15849 | U-16600 | 323,054 | 3Y | 0 | 6,402 | 10,661 | 0 | | 16,153 | 32,305 | Yes | 0.00 |
| City of Charlevoix | U-15850 | U-16601 | 61,807 | 3Y | 0 | 1,226 | 2,040 | 0 | | 3,090 | 6,181 | Yes | 0.00 |
| Chelsea Dept. of Electric & Water | U-15851 | U-16602 | 97,241 | 3Y | 0 | 1,830 | 3,209 | 0 | | 4,862 | 9,724 | Yes | 0.00 |
| Village of Clinton | U-15852 | U-16603 | 22,433 | 3Y | 0 | 443 | 740 | 12 | | 1,122 | 2,243 | Yes | 0.00 |
| Coldwater Board of Public Utilities | U-15853 | U-16604 | 297,781 | 3Y | 0 | 5,576 | 9,827 | 0 | | 14,889 | 29,778 | Yes | 0.00 |
| Croswell Municipal Light & Power Dept. | U-15854 | U-16605 | 35,927 | 3Y | 0 | 708 | 1,186 | 0 | | 1,796 | 3,593 | Yes | 0.00 |
| City of Crystal Falls | U-15855 | U-16606 | 16,173 | 3Y | 4,400 | 1,623 | 1,618 | 0 | | 1,617 | 1,617 | Yes | 0.00 |
| Daggett Electric Department | U-15856 | U-16607 | 1,294 | 3Y | 0 | 26 | 42 | 40 | | 65 | 129 | Yes | 0.00 |
| Detroit Public Lighting Department | U-15857 | U-16608 | 460,840 | 3Y | 0 | 9,725 | 0 | 3,406 | | 23,042 | 46,084 | N/A | 3.00 |
| City of Dowagiac | U-15858 | U-16609 | 65,968 | 3Y | 0 | 1,269 | 2,177 | 0 | | 3,298 | 6,597 | Yes | 0.00 |
| City of Eaton Rapids | U-15859 | U-16610 | 93,098 | 3Y | 2,263 | 3,534 | 4,588 | 0 | | 5,786 | 9,310 | Yes | 0.00 |
| City of Escanaba | U-15860 | U-16611 | 145,231 | 3Y | 0 | 2,877 | 4,793 | 355 | | 7,262 | 14,523 | Yes | 0.00 |
| City of Gladstone | U-15861 | U-16612 | 32,464 | 3Y | 0 | 641 | 1,071 | 0 | | 1,623 | 3,246 | Yes | 0.00 |
| Grand Haven Board of Light & Power | U-15862 | U-16613 | 274,962 | 3Y | 0 | 5,347 | 9,074 | 0 | | 13,748 | 27,496 | Yes | 0.00 |
| City of Harbor Springs | U-15863 | U-16614 | 37,539 | 3Y | 0 | 750 | 1,239 | 0 | | 1,877 | 3,754 | Yes | 0.00 |
| City of Hart | U-15864 | U-16615 | 43,340 | 3Y | 804 | 1,453 | 1,969 | 0 | | 2,569 | 4,334 | Yes | 0.00 |
| Hillsdale Board of Public Utilities | U-15865 | U-16616 | 120,503 | 3Y | 0 | 2,424 | 3,977 | 0 | | 6,025 | 12,050 | Yes | 0.00 |
| Holland Board of Public Works | U-15866 | U-16617 | 997,034 | 3Y | 0 | 18,913 | 32,901 | 8,417 | | 49,852 | 99,703 | Yes | 0.00 |
| Village of L'anse | U-15867 | U-16618 | 12,735 | 3Y | 0 | 264 | 421 | 0 | | 637 | 1,274 | Yes | 0.00 |
| Lansing Board of Water & Light | U-15868 | U-16619 | 2,190,130 | 3Y | 6,655 | 48,317 | 76,733 | 16 | | 112,834 | 219,013 | Yes | 2.50 |
| Lowell Light & Power | U-15869 | U-16620 | 64,706 | 3Y | 0 | 1,235 | 2,135 | 0 | | 3,235 | 6,471 | Yes | 0.00 |
| Marquette Board of Light & Power | U-15870 | U-16621 | 305,806 | 3Y | 14,016 | 17,370 | 19,482 | 0 | | 22,298 | 30,581 | Yes | 0.00 |
| Marshall Electric Department | U-15871 | U-16622 | 108,951 | 3Y | 1,318 | 3,195 | 4,479 | 0 | | 6,107 | 10,895 | Yes | 0.00 |
| Negaunee Dept. of Public Works | U-15872 | U-16623 | 22,203 | 3Y | 0 | 442 | 733 | 0 | | 1,110 | 2,220 | Yes | 0.00 |
| Newberry Water and Light Board | U-15873 | U-16624 | 18,280 | 3Y | 4,931 | 1,852 | 1,828 | 0 | | 1,828 | 1,828 | Yes | 0.00 |
| Niles Utilities Department | U-15874 | U-16625 | 130,631 | 3Y | 0 | 2,579 | 4,311 | 0 | | 6,532 | 13,063 | Yes | 0.00 |
| City of Norway | U-15875 | U-16626 | 29,294 | 3Y | 21,080 | 2,938 | 2,930 | 0 | | 2,929 | 2,929 | Yes | 0.00 |
| Village of Paw Paw | U-15876 | U-16627 | 39,718 | 3Y | 0 | 804 | 1,311 | 7 | | 1,986 | 3,972 | Yes | 0.00 |
| City of Petoskey | U-15877 | U-16628 | 106,804 | 3Y | 0 | 2,109 | 3,525 | 0 | | 5,340 | 10,680 | Yes | 0.00 |
| City of Portland | U-15878 | U-16629 | 36,611 | 3Y | 1,746 | 2,118 | 2,378 | 0 | | 2,704 | 3,661 | Yes | 0.00 |
| City of Sebawaing | U-15879 | U-16630 | 39,547 | 3Y | 0 | 788 | 1,305 | 729 | | 1,977 | 3,955 | Yes | 0.87 |
| City of South Haven | U-15880 | U-16631 | 134,759 | 3Y | 0 | 2,633 | 4,447 | 0 | | 6,738 | 13,476 | Yes | 0.00 |
| City of St. Louis | U-15881 | U-16632 | 39,112 | 3Y | 680 | 1,310 | 1,746 | 0 | | 2,296 | 3,911 | Yes | 0.00 |
| City of Stephenson | U-15882 | U-16633 | 6,073 | 3Y | 0 | 122 | 200 | 742 | | 304 | 607 | Yes | 0.00 |
| City of Sturgis | U-15883 | U-16634 | 224,250 | 3Y | 11,232 | 13,416 | 14,926 | 0 | | 16,829 | 22,425 | Yes | 0.00 |
| Traverse City Light & Power | U-15884 | U-16635 | 321,435 | 3Y | 778 | 6,986 | 11,129 | 9 | | 16,461 | 32,144 | Yes | 0.00 |
| Union City Electric Department | U-15885 | U-16636 | 15,828 | 3Y | 1,625 | 1,517 | 1,583 | 0 | | 1,583 | 1,583 | Yes | 0.00 |
| City of Wakefield | U-15886 | U-16637 | 12,608 | 3Y | 0 | 263 | 416 | 4 | | 630 | 1,261 | Yes | 0.00 |
| Wyandotte Dept. of Municipal Service | U-15887 | U-16638 | 290,706 | 3Y | 0 | 5,505 | 9,593 | 0 | | 14,535 | 29,071 | Yes | 0.00 |
| Zeeland Board of Public Works | U-15888 | U-16639 | 318,274 | 3Y | 0 | 6,054 | 10,503 | 17 | | 15,914 | 31,827 | Yes | 0.00 |
| ***Total | | | 103,284,102 | | 2,687,036 | 3,989,866 | 5,020,067 | 27,334 | 122,740 | 6,378,311 | 10,328,410 | | |
| Compliance Renewable Energy % | | | | | | 3.9% | 4.9% | | | 6.2% | 10.0% | | |

*Sales from Annual Report

** 3Y = 3 Year Average W = Weather Normalized

***AES totals are aggregated.

Appendix C - ELECTRIC PROVIDER RENEWABLE ENERGY ANNUAL REPORT SUMMARY

2013 Reporting Year

| Company Name | 2013 Generated or Acquired (RECs) | 2013 Generated or AQueCs (AQueCs) | Energy Credits Sold in 2013 (RECs) | 2009-2012 Reported Incremental Cost of Compliance (\$) | 2013 Reported Incremental Cost of Compliance (\$) | Remaining Anticipated Incremental Cost of Compliance (\$) | Total Plan Period Anticipated Incremental Cost of Compliance (Prior Years plus Anticipated) (\$) |
|---|-----------------------------------|-----------------------------------|------------------------------------|--|---|---|--|
| Investor Owned Utilities: | | | | | | | |
| Alpena Power Company | 14,957 | 0 | 0 | 1,506,729 | 786,196 | 2,025,000 | 4,317,925 |
| Consumers Energy Company | 2,737,756 | 0 | 0 | 32,768,171 | 22,200,000 | 463,000,000 | 517,968,171 |
| Detroit Edison Company | 2,889,117 | 46,983 | 759 | 110,330,136 | 56,603,819 | 474,585,385 | 641,519,340 |
| Indiana Michigan Power Company | 245,501 | 0 | 27,166 | 0 | 826,963 | 14,513,501 | 15,340,464 |
| Northern States Power Company | 27,666 | 0 | 2,226 | 0 | 0 | 0 | 0 |
| Upper Peninsula Power Company | 154,842 | 0 | 90,000 | 0 | 0 | 0 | 0 |
| Wisconsin Public Service Corporation | 72,500 | 0 | 45,280 | 0 | 0 | 0 | 0 |
| Wisconsin Electric Power Co | 121,658 | 0 | 0 | 153,495 | 1,395,855 | 10,082,647 | 11,631,997 |
| | 6,263,997 | 46,983 | 165,431 | 144,758,531 | 81,812,833 | 964,206,533 | 1,190,777,897 |
| Rate Regulated Cooperatives: | | | | | | | |
| Cloverland Electric Cooperative | 437,530 | 132,613 | 0 | 0 | 0 | 0 | 0 |
| Midwest Energy Cooperative | 18,809 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thumb Electric Cooperative | 1,253 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 457,592 | 132,613 | 0 | 0 | 0 | 0 | 0 |
| Member Regulated Electric Cooperatives: | | | | | | | |
| Alger Delta Cooperative Electric Association | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bayfield Electric Cooperative | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cherryland Electric Cooperative | 12,141 | 0 | 0 | 0 | 0 | 0 | 0 |
| Great Lakes Energy Cooperative | 44,262 | 0 | 0 | 0 | 0 | 0 | 0 |
| Homeworks Tri-County Electric Cooperative | 10,617 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ontonagon County Rural Electrification Association | 2,638 | 0 | 0 | 0 | 0 | 0 | 0 |
| Presque Isle Electric and Gas Co-op | 7,604 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 77,271 | 0 | 0 | 0 | 0 | 0 | 0 |
| Municipally-Owned Electric Utilities: | | | | | | | |
| City of Bay City | 18,952 | 0 | 0 | 594,868 | 275,726 | 0 | 870,594 |
| City of Charlevoix | 3,796 | 0 | 0 | 35,312 | 55,145 | 0 | 90,457 |
| City of Crystal Falls | 4,108 | 0 | 0 | 0 | 0 | 0 | 0 |
| City of Dowagiac | 1,300 | 0 | 0 | 7,146 | 0 | 0 | 7,146 |
| City of Eaton Rapids | 4,586 | 0 | 0 | 161,210 | 45,323 | 684,217 | 890,750 |
| City of Escanaba | 1,300 | 0 | 0 | 0 | 0 | 0 | 0 |
| City of Gladstone | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| City of Harbor Springs | 3,794 | 0 | 0 | 21,190 | 0 | 0 | 21,190 |
| City of Hart Hydro | 3,495 | 0 | 0 | 10,595 | 0 | 0 | 10,595 |
| City of Norway | 26,982 | 0 | 20,648 | 0 | 0 | 0 | 0 |
| City of Petoskey | 8,206 | 0 | 0 | 70,451 | 96,919 | 0 | 167,370 |
| City of Portland | 3,131 | 0 | 0 | 7,948 | 4,488 | 0 | 12,436 |
| City of Sebewaing | 2,527 | 0 | 0 | 0 | 7,830 | 433,541 | 441,371 |
| City of South Haven | 4,447 | 0 | 0 | 7,719 | 0 | 0 | 7,719 |
| City of St. Louis | 1,926 | 0 | 0 | 27,818 | 18,044 | 0 | 45,862 |
| City of Stephenson | 634 | 0 | 0 | 0 | 0 | 0 | 0 |
| City of Sturgis | 13,594 | 0 | 0 | 12,051 | 0 | 0 | 12,051 |
| City of Wakefield | 263 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chelsea Dept of Electric & Water | 2,472 | 0 | 0 | 113,875 | 40,026 | 16,369 | 170,270 |
| Coldwater Board of Public Utilities | 49,770 | 0 | 0 | 3,411 | 0 | 0 | 3,411 |
| Croswell Municipal Light & Power Dept | 708 | 0 | 0 | 0 | 0 | 228,742 | 228,742 |
| Daggett Electric Dept | 120 | 0 | 0 | 1,905 | 0 | 0 | 1,905 |
| Detroit Public Lighting Dep | 0 | 0 | 0 | 28,302 | 0 | 0 | 28,302 |
| Grand Haven Board of Light & Power | 15,162 | 0 | 0 | 387,664 | 416,881 | 3,284,864 | 4,089,409 |
| Hillsdale Board of Public Utilities | 49,770 | 0 | 0 | 1,473 | 0 | 0 | 1,473 |
| Holland Board of Public Works | 92,460 | 0 | 0 | 6,352,628 | 0 | 0 | 6,352,628 |
| Lansing Board of Water & Light | 94,760 | 0 | 442 | 6,350,649 | 1,835,130 | 51,047,333 | 59,233,112 |
| Lowell Light & Power | 5,747 | 0 | 0 | 101,377 | 149,652 | 4,886,876 | 5,137,905 |
| Marquette Board of Light & Power | 26,957 | 0 | 0 | 42,175 | 0 | 1,262,194 | 1,304,369 |
| Marshall Electric Dept | 49,770 | 0 | 0 | 7,186 | 0 | 0 | 7,186 |
| Negaunee Dept of Public Works | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Newberry Water & Light Board | 15,613 | 0 | 0 | 2,173,289 | 0 | 0 | 2,173,289 |
| Niles Utility Dept | 5,158 | 0 | 0 | 7,529 | 0 | 0 | 7,529 |
| Traverse City Light & Power | 35,470 | 0 | 0 | 0 | 0 | 0 | 0 |
| Union City Electric Dept | 49,770 | 0 | 0 | 506 | 0 | 0 | 506 |
| Wyandotte Dept of Municipal Service | 7,574 | 0 | 0 | 138,219 | 128,290 | 0 | 266,509 |
| Village of Baraga | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Village of Clinton | 49,770 | 0 | 0 | 269 | 0 | 0 | 269 |
| Village of L'Anse | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Village of Paw Paw | 817 | 0 | 0 | 2,505 | 0 | 0 | 2,505 |
| Zeeland Board of Public Works | 8,438 | 0 | 0 | 1,106 | 0 | 0 | 1,106 |
| | 464,267 | 0 | 21,090 | 16,670,376 | 3,073,454 | 61,844,136 | 81,587,966 |
| Combined Annual Report | | | | | | | |
| Alternative Electric Suppliers (AES): | | | | | | | |
| CMS ERM Michigan LLC | | | | | | | |
| Commerce Energy Inc | | | | | | | |
| Constellation NewEnergy Inc | | | | | | | |
| Direct Energy Business LLC | | | | | | | |
| FirstEnergy Solutions Corp | | | | | | | |
| Glacial Energy of Illinois, Inc. | | | | | | | |
| Integrus Energy Services Inc | | | | | | | |
| Midamerican Energy Company | | | | | | | |
| Noble Americas Energy Solutions LLC f/k/a Sempra Energy Solutions LLC | | | | | | | |
| Spartan Renewable Energy Inc | | | | | | | |
| UP Power Marketing LLC | | | | | | | |
| Wolverine Power Marketing Cooperative Inc | | | | | | | |
| | 913,306 | 439 | 121,703 | 0 | 0 | 0 | 0 |
| *Totals: | 8,176,433 | 180,035 | 308,224 | 161,428,907 | 84,886,287 | 1,026,050,669 | 1,272,365,862 |

Michigan Retail Sales (MWh): 103,284,102
 Michigan Estimated Renewable Energy %: 7.8%

(Based on Appendix B Retail Sales Total)

Source: PA 295 Annual Reports:
http://www.michigan.gov/mpsc/0,4639,7-159-16393_53570-240179--00.html
 *AES totals are aggregated

Michigan’s Solar Programs

Consumers Energy and DTE Electric continued previously established solar programs designed to incentivize solar installations. During 2013, Cherryland Electric Cooperative and Traverse City Light & Power implemented Michigan’s first community solar program.

Experimental Advanced Renewable Program

Consumers Energy’s original EARP was approved by the Commission in 2009. The maximum program size was 2 MW (2,000 kW) with 1,500 kW reserved for commercial projects and the remaining 500 kW allotted to residential projects. In June 2011, the company announced that the program had become fully subscribed after completing 102 agreements. After careful review and design, Consumers Energy expanded the program by an additional 3 MW. The Commission approved the expanded program in May 2011 with the option for additional capacity should program funding allow. Later in 2011, the Commission approved an additional 0.25 MW for a total of 5.25 MW. As of its most recent biennial renewable energy plan review filed on May 28, 2013, the company expects to solicit a total of 6 MW of solar installations under its EARP.

Under Consumers Energy’s original EARP (Phase 1 and 2), customers receive a firm price for each kWh generated by the customer’s solar generation system over a 12 year period. Phase 1 agreements began in September 2009 paying \$0.65 per kWh for residential systems up to 20 kW and \$0.45 per kWh for commercial systems up to 150 kW. Phase 2 agreements began in May 2010 paying \$0.525 per kWh for residential systems up to 20 kW and \$0.375 per kWh for commercial systems up to 150 kW.

The 4 MWs of capacity under the expanded program is split between residential and non-residential customers and will be awarded in phases pertaining to the respective customer class. The price is set with a maximum offer of \$0.259 per kWh, which was dynamic; increasing or decreasing based on interest in prior phases. Additionally, the company offers a \$0.001 per kWh bonus for systems constructed using both Michigan labor and Michigan materials. Beginning in January 2015, the offer price will be \$0.240 per kWh for all new residential participants, and \$0.199 per kWh for all new non-residential participants.

A system’s size is limited to the customer’s annual electricity use, similar to the net-metering program. This is a change from the original Phase 1 and 2 of the EARP that allowed for systems larger than customer use within the respective category. The program will continue to add new participants until the approved budget is filled or the end of 2015, whichever comes first. Agreements will have 15 year terms or will expire at the end of the Renewable Energy Plan period in 2029, whichever comes first.

Consumers Energy has awarded agreements through 19 Phases under the expanded program (21 Phases have been awarded including phase 1 and phase 2 of the original program). Twelve have been residential Phases and seven have been non-residential Phases. One hundred sixty residential projects are expected to be completed totaling 1,272.3 kW of installed capacity since the program’s 2011 expansion. As a result of the seven non-residential Phases since the expansion, 32 non-residential projects totaling 1,870.1 kW are

Appendix D – Michigan’s Solar Programs

expected to be completed. Consumers Energy currently has a total of 5.16 MW of solar capacity participating or under construction as part of the EARP.

SolarCurrents

DTE Electric’s 20 MW SolarCurrents pilot program includes a 5 MW customer-owned program and a 15 MW company-owned program. In May 2011, DTE Electric announced that the customer-owned program was fully subscribed. On December 20, 2011, the Commission ordered MPSC Staff to convene a collaborative to explore opportunities for the continuation of the customer-owned SolarCurrents program. Pursuant to the collaborative, the company filed an application for a 2 MW expansion on October 8, 2012 and the Commission approved the application on November 16, 2012.

The 5 MW Phase 1 customer-owned SolarCurrents program provided an up-front REC payment equal to \$2.40 per Watt of installed solar PV which is approximately half of the total system cost. The company will purchase the remaining RECs through a monthly payment/on-bill credit equal to \$0.11 per kWh for 20 years. System size is limited by the customer's annual electricity use or by the 20 kW size cap (whichever is smaller).

Phase 2 provides for an up-front purchase of approximately 30% of the RECs the company anticipates will be generated over the life of the system. The remaining RECs will be purchased via monthly bill credits based on actual generation. This purchase is done through cents per kWh payments starting on the agreement execution date and ending on August 31, 2029, for a maximum term of 16 years. The company accepted applications for the 2 MW Phase 2 program from residential and non-residential customers through four 500 kW tranches. The agreements were awarded using random selection events starting in January 2013 with the last offering awarded in August 2014. To date, the company has contracted for 5,030 kW from 589 customers representing full participation for Phase 1 of SolarCurrents. For Phase 2 the company has commitments from 263 customers representing 2 MW. Of the 263 projects, 147 projects representing 1 MW have been fully commissioned.

DTE Electric’s 15 MW company-owned SolarCurrents program includes solar PV projects ranging from 60 kW to 820 kW that are either located on DTE Energy property or on customer premises. Customers selected to host a solar project receive a one-time, upfront construction payment to cover any inconvenience during installation in addition to an annual easement payment for the life of the installation. Pursuant to two separate competitive solicitations, the company contracted with Nova Consultants to construct up to 15 MW of solar. The panels will be provided by either McNaughton-McKay Electric Company or Inovatus Solar, LLC. Currently, 20 projects are complete totaling 8.19 MW of solar PV capacity. An additional three projects are in the construction, design or feasibility phase totaling approximately 5.2 MW of capacity.

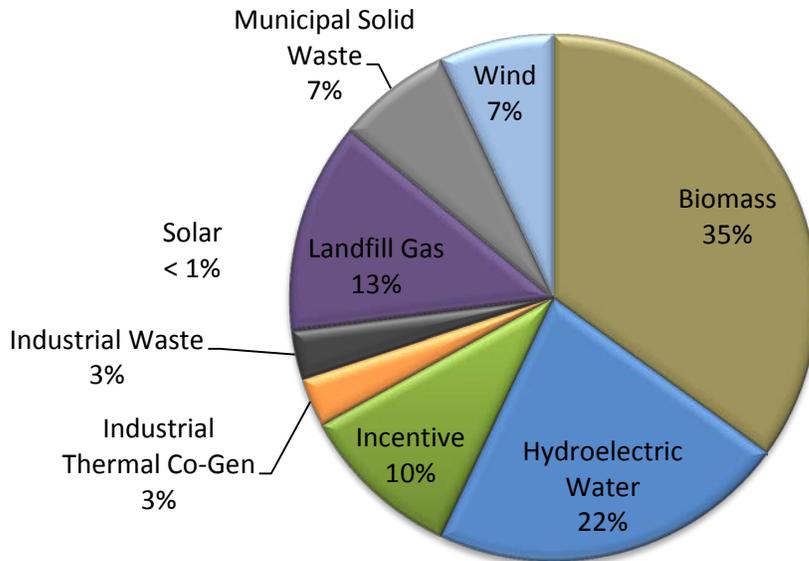
Appendix D – Michigan's Solar Programs

Community Solar

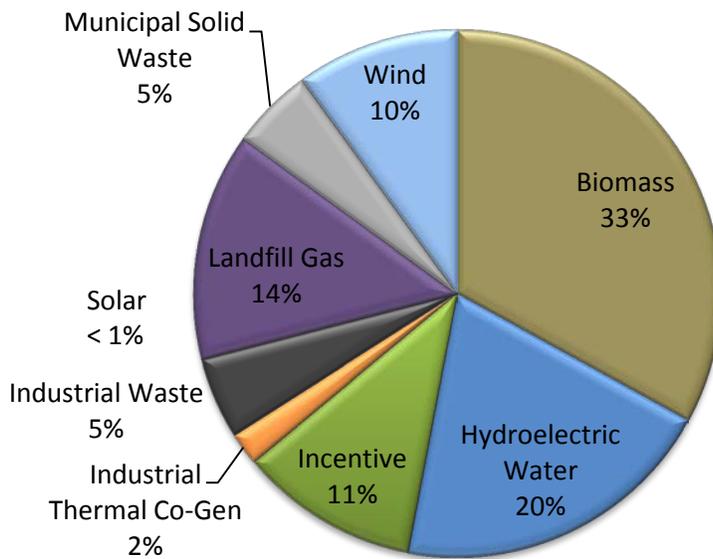
Cherryland Electric Cooperative and Traverse City Light & Power are the first electric providers in Michigan to offer a joint community solar program – Solar Up North (SUN) Alliance Program. The framework for this program comes from the energy optimization standard of Act 295 as opposed to net metering or the renewable energy standard. Cherryland Electric Cooperative members and Traverse City Light & Power customers can purchase solar shares for a one time investment of \$470.00 each. The participants receive a \$75.00 Energy Optimization rebate per panel. The electric providers use the wholesale electric market prices to determine the amount of monthly bill credit to provide to the participants. It is estimated that the credit will be an average of \$2.00 per month. This amount will be based on total monthly array output and will vary based on weather conditions. The community solar program has been very successful and is continuing to grow. As of July 2013, one hundred thirty six shares had been purchased.¹

¹ See *A Guidebook for Community Solar Programs in Michigan Communities* <http://glrea.org/>

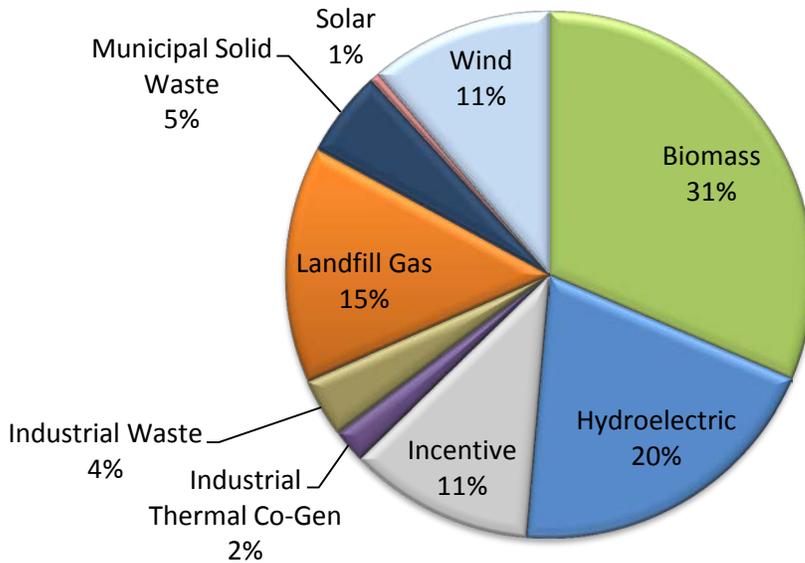
MIRECS 2009 Vintage Energy Credits 5,256,722 Total Credits



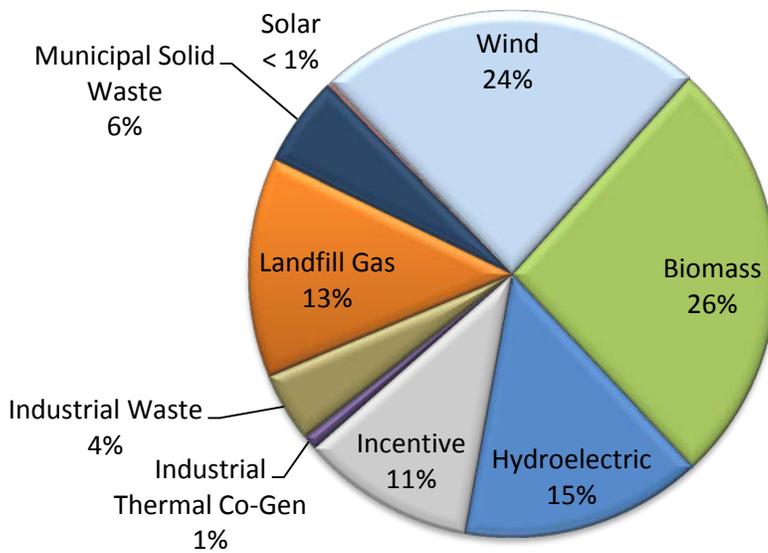
MIRECS 2010 Vintage Energy Credits 5,109,511 Total Credits



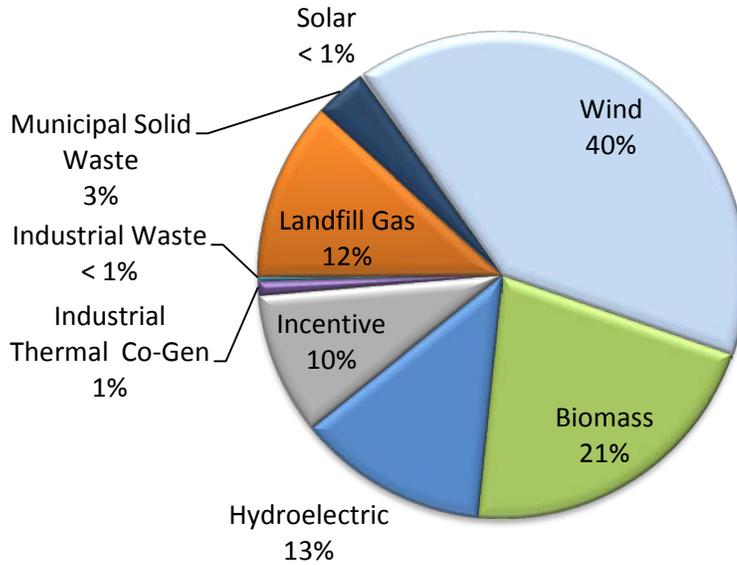
MIRECS 2011 Vintage Energy Credits 5,404,910 Total Credits



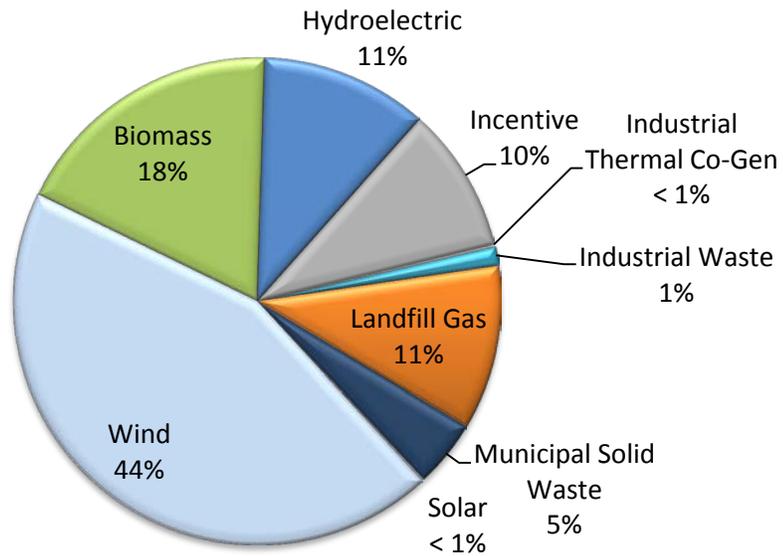
MIRECS 2012 Vintage Energy Credits 6,587,139 Total Credits



MIRECS 2013 Vintage Energy Credits 8,049,246 Total Credits



MIRECS 2014 Vintage Energy Credits 6,370,162* Total Credits



*Not all data has been reported for 2014.

Appendix F- Contract Summary

| Consumers Energy : Contracts | | | | | | | | |
|------------------------------|---|---|--|----------------|-----------------------|----------------------|----------------------------|---------------------------|
| Map Key | Seller | Quantity | Cost* | Term | Renewable Energy Type | Request for Proposal | Commission Approval | Commercial Operation Date |
| | 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 | 05/02/2014 | Varies |
| 32 | Barton Malow Company | Construction | \$59.00/MWh | 20 Years | Wind | 04/25/2013 | 09/10/2013 | 12/31/2014 |
| | General Electric Company | 62 1.7-100 1.7 MW | | | | 10/2/2012 | 06/28/2013 | |
| | ABB Transformers | 2- 34.5KV to 345KV transformers | | | | 02/27/2013 | 09/10/2013 | |
| 28 | Blissfield Wind (Beebe Wind) | Unchanged | Unchanged | 20 Years | Wind | Amendment | 01/26/2012 | 12/31/2012 |
| 2 | Heritage Garden Wind Farm I | 20 MW | Unchanged | 20 Years | Wind | Amendment | 01/26/2012 | 12/31/2012 |
| 3 | Heritage Stoney Corners Wind Farm II | Unchanged | Unchanged | 20 Years | Wind | Amendment | 01/26/2012 | 1/1/2012 |
| 3 | Heritage Stoney Corners Wind Farm I (Phase 3) | 8.35 MW | \$106.20 MWh | 20 Years | Wind | Result of Amendments | 01/26/2012 | 1/1/2012 |
| 4 | Experimental Advanced Renewable Program | 987.7 KW | Commercial \$0.375/KWh Residential \$0.525/KWh | 12 Years | Solar | Unsolicited | 05/10/2011 | Varies |
| 1 | Vestas-American Wind Technology | 56 V100 1.8 MW Turbines | \$110.00/MWh | 20 Years | 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 | | |
| 2 | Heritage Garden Wind Farm I | 28.6 MW | \$106.20 MWh | 20 Years | Wind | Unsolicited | 11/19/2010 | 1/1/2012 |
| 3 | Heritage Stoney Corners Wind Farm II | 12.3 MW | \$98.50 MWh | 20 Years | Wind | Unsolicited | 11/19/2010 | 1/1/2012 |
| 4 | 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 |
| 5 | Scenic View Dairy** | 0.35 MW | \$83.07/MWh | 63 Months | Anaerobic | Unsolicited | 10/26/2010 | 7/29/2010 |
| 6 | Blissfield Wind (Now Beebe Wind) | 81 MW | \$100.88/MWh | 20 Years | Wind | 5/7/2009 | 7/27/2010 | 12/31/2012 |
| 7 | Harvest II Wind | 59.4 MW | \$98.38/MWh | 20 Years | Wind | 5/7/2009 | 7/27/2010 | 12/31/2012 |
| 8 | Michigan Wind 2 | 90 MW | \$94.00/MWh | 20 Years | Wind | 5/7/2009 | 7/27/2010 | 6/30/2012 |
| 9 | 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 |
| 10 | 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 |
| 11 | NANR – Lennon | 1.6 MW | \$137.27/MWh | 20 Years | Landfill Gas | 1/29/2009 | 10/13/2009 | 12/31/2010 |
| 12 | Elk Rapids Hydro Electric** 1 | 0.7 MW | \$121.31/MWh | 10 Years | Hydro | 1/29/2009 | 10/13/2009 | 7/11/2009 |
| 13 | Zeeland** | 1.6 MW | \$122.20/MWh | 7 Years | Landfill Gas | 1/29/2009 | 10/13/2009 | 7/11/2009 |
| 14 | Freemont Community Digester | 3.1 MW | \$139.35/MWh | 20 Years | Anaerobic | 1/29/2009 | 10/13/2009 | 11/11/2012 |
| 15 | Scenic View Dairy** 1 , 2 | 0.82 MW | \$138.17/MWh | 7 Years | Anaerobic | 1/29/2009 | 10/13/2009 | 7/11/2009 |
| | Total | 502.99 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.

Appendix F- Contract Summary

| DTE Electric Company : Contracts | | | | | | | | |
|----------------------------------|---|--|--|----------------------------------|-----------------------|----------------------|----------------------------|---------------------------|
| Map Key | Seller | Quantity | Cost* | Term | Renewable Energy Type | Request for Proposal | Commission Approval | Commercial Operation Date |
| | General Electric Company | 1.7MW-100 model turbines up to 100 MW | | | | 2/17/2014 | | |
| | Aristeo Construction Company | Installation and construction | \$47/MWh - \$53/MWh | Company Owned "Meade Wind" | Wind | 6/20/2014 | 12/18/2014 | 12/31/2015 |
| | Rudolf Libbe, Inc | 750 kW | | | | | | |
| | Inovateus Solar, LLC. | 504 kW | \$3,741/kW | Company Owned | Solar | 09/28/2012 | 7/8/2014 | 04/2015 |
| 33 | Big Turtle Wind Farm, LLC | 20 MW | \$53/MWh | 20 Years | Wind | Unsolicited | 09/24/2013 | Expected 2014 |
| 31 | Pheasant Run Wind, LLC | 74.8 MW | Up to \$49.25/MWh | 20 Years | Wind | Unsolicited | 5/17/2013 | 12/31/2014 |
| 31 | Pheasant Run Wind II, LLC "Brookfield" | 74.8 MW | Up to \$49.25/MWh | Company Owned | Wind | Unsolicited | 5/17/2013 | 12/31/2014 |
| 16 | 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 |
| 29 | 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 | | | | 10/12/2011 | | |
| 30 | Barton Malow Company | Installation and construction | \$52.50/MWh | Company Owned "Echo Wind" | Wind | 4/17/2012 | 9/11/2012 | 12/31/2013 |
| 24 | Michigan Waste Energy, Inc. | Up to 65,000 RECs/Year | \$7.00/REC | 13 Years | Incinerator | Unsolicited | 12/6/2011 | 1991 |
| 16 | Nova Consultants, Inc. | Solar EPC | Up to \$48 Million | | | 2/28/2011 | | |
| 16 | McNaughton-McKay Electric Company | Supply up to 12 MW of Modules | Up to \$24 Million | Company Owned | Solar | 3/24/2011 | 11/10/2011 | 12/31/2015 |
| 16 | Inovateus Solar, LLC | Supply up to 12MW | | | | | | |
| | General Electric Company | Up to 69 1.6MW-100 Turbines | \$61-\$64/MWh | Company Owned "Thumb Wind" | Wind | 3/9/2011 | 9/13/2011 | 12/31/2012 |
| 27 | Barton Malow Company | Installation and construction | | | | 5/6/2011 | | |
| 25 | Tuscola Bay Wind, LLC | 120 MW | Up to \$60.90/MWh | 20 Years | Wind | 11/18/2010 | 8/25/2011 | 10/31/2012 |
| 20 | 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 |
| 18 | Gratiot County Wind | 12.8 MW additional | Unchanged from original contract | Company Owned | Wind | Amendment | 5/10/2011 | 12/31/2012 |
| 16 | Nova Consultants | Unchanged from original contract | Unchanged from original contract | Company Owned | Solar | Extension | 12/21/2010 | 12/31/2011 |
| 17 | Blue Water Renewables - Smiths Creek Landfill | 3.2 MW | \$99.00/MWh | 20 Years | Landfill | Unsolicited | 1/20/2011 | 12/31/2011 |
| 18 | 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 | 05/1/2012 03/31/2012 |
| 19 | WM Renewable Energy - Eagle Valley Landfill | 3.2 MW | | 20 years | Landfill | 8/18/2009 | 8/10/2010 | 6/1/2011 |
| 20 | L'Anse Warden Electric Company | 17 MW | Combined average price of \$98.94/MWh | 20 years | Biomass | 8/18/2009 | 8/10/2010 | 7/1/2010 |

Appendix F- Contract Summary

| DTE Electric Company : Contracts | | | | | | | | |
|--|--|---|---------------------------------------|---------------|-----------------------|----------------------|---------------------------|---------------------------|
| Map Key | Seller | Quantity | Cost* | Term | Renewable Energy Type | Request for Proposal | Commission Approval | Commercial Operation Date |
| 21 | 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 |
| 16 | Nova Consultants | Up to 3 MW | Up to \$18 Million | Company Owned | Solar | 11/23/2009 | 3/2/2010 | 12/31/2010 |
| 22 | Heritage Sustainable Energy Stoney Corners Wind Farm | 12.2 MW | Unchanged from original contract | 20 Years | Wind | Unsolicited | 12/1/2009 | 1/1/2011 |
| 23 | UPPCO** | Firm 500,000 RECs | Combined average price of \$12.46/REC | 7 Years | Hydro | 12/23/2009 | 12/1/2009 | 10/1/2009 |
| Not Shown | Sterling Planet** | Firm 2,500,000 RECs | | 10 Years | MISC | 12/23/2009 | 12/1/2009 | 10/1/2009 |
| 22 | Heritage Sustainable Energy Stoney Corners Wind Farm | 14 MW | \$116.00/MWh | 20 Years | Wind | Unsolicited | 4/30/2009 | 12/21/2009 |
| Total | | 989.4 MW | | | | | | |
| <p>* 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, does not include gross-up for taxes.</p> | | | | | | | | |

| Alpena Power Company : Contracts | | | | | | | | |
|--|--|---------------------------------------|---|----------|-----------------------|--------------------------|----------------------------|---------------------------|
| | Seller | Quantity | Cost | Term | Renewable Energy Type | Request for Proposal | Commission Approval | Commercial Operation Date |
| 26 | 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 |
| | 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 | 12/31/12 |
| Wisconsin Electric Power Company : 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 | 01/23/2014 | Redacted |

Appendix G - 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* | Responses |
| 4/25/2013 | RFP | Requested bids for the Installation of a Utility Owned Wind Farm (Cross Winds) | 105 MW by | Yes | Wind | 6 Proposals |
| 2/27/2013 | RFP | Requested Substation Transformer Bids for Utility Owned Wind Farm (Cross Winds) | | | | 5 Proposals |
| 10/2/2012 | RFP | Requested bids for Utility Owned Wind Turbines (Cross Winds) | | | | 9 Proposals/ 6 Suppliers |
| May-12 | RFQ | Request for Qualifications for 105 MWs of Utility Owned Wind Turbines | N/A | Yes | Wind | 12 Recipients |
| 7/23/2010 | RFP | Requested bids for the Installation of a Utility Owned Wind Farm | 100 MW by 2012 | Yes | Wind | 7 Proposals |
| 1/15/2010 | RFP | Requested bids for Utility Owned Wind Turbines | | | | 11 Proposals/ 4 Suppliers |
| 7/27/2009 | RFP | Requested Substation Transformer Bids for Utility Owned Wind Farm | | | | 4 Proposals |
| 2/19/2010 | RFQ | Request for Qualifications for the Installation of a 100 MW Utility Owned Wind Farm | N/A | Yes | Wind | 8 Recipients |
| 7/14/2010 | RFQ | Request for Qualifications for 100 MWs of Utility Owned Wind Turbines | N/A | Yes | Wind | 8 Recipients |
| 5/7/2009 | RFP | Requested CEREC** | 100 MW by 2012 / 150 MW by 2014 | No | All | 80 Proposals |
| 1/29/2009 | RFP | Requested CEREC** | 17.4 MW | No | All | 12 Proposals/ 11 Suppliers |

* 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 - 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* | Responses |
| 6/20/2014 | RFP | Requested bids for the Installation of a Utility Owned Wind Farm | 100 MW by 12/31/2015 | Yes | Wind | 3 proposals / 3 suppliers |
| 2/17/2014 | RFP | Up to 100 MW of Utility Owned Wind Turbines (Meade) | | | | 17 proposals / 6 suppliers |
| 2/6/2013 | RFP | Phase II Solar Engineering Procurement and Construction | 1.25 MW | Yes | Solar | 4 responses |
| 9/28/2012 | RFP | Phase I Solar Engineering Procurement and Construction | | | | 19 responses / 106 projects |
| 5/3/2012 | RFP | 100 MW of Wind | 100 MW by 12/31/2013 | No | Wind | 17 proposals / 16 suppliers |
| 4/17/2012 | RFP | EPC (Echo) | NA | Yes | Wind | 13 proposals / 13 suppliers |
| 12/7/2011 | Auction | Requested RECs* Without the Associated Energy | 2009 and 2010 Vintage | No | All | NA |
| 10/12/2011 | RFP | 110 MW of Utility Owned Wind Turbines (Echo) | 110 MW by 12/31/2013 | Yes | Wind | 14 proposals / 7 suppliers |
| 5/6/2011 | RFP | EPC (Thumb) | N/A | Yes | Wind | 6 proposals / 6 suppliers |
| 3/24/2011 | RFP | Solar Panels | 12 MW | Yes | Solar | 38 proposals, 24 companies |
| 3/10/2011 | RFP | Wind Ownership Option | 50 MW by 12/31/2014 | Yes | All | 38 proposals / 15 suppliers |
| 3/9/2011 | RFP | 109 MW of Utility Owned Wind Turbines (Thumb) | 109 MW by 12/31/2012 | Yes | Wind | 17 proposals / 7 suppliers |
| 2/28/2011 | RFP | Requested bids for the Installation of Utility Owned Solar | N/A | Yes | Solar | 27 companies, 27 proposals |
| 2/10/2011 | RFP | O&M Services | N/A | Yes | Wind | 5 proposals / 5 suppliers |
| 11/18/2010 | RFP | Requested CEREC** | 245 MW by 12/31/2014 | No | All | 146 proposals / 46 Suppliers |
| 7/26/2010 | Pre-Q | Pre-qualification for 100-200 MW of Utility Owned Wind Turbines | N/A | Yes | Wind | 27 proposals / 17 Suppliers |
| 3/29/2010 | SOI | Solicitation of Interest to Host Utility Owned Solar at the Customers Location | N/A | Yes | Solar | 10 Responses |
| 11/23/2009 | RFP | Requested bids for the Installation of Utility Owned Solar | 3 MW | Yes | Solar | 11 Proposals |
| 10/23/2009 | Pre-Q | Pre-Qualification for the Installation of 3 MW of Utility Owned Solar | N/A | Yes | Solar | 30 Responses |
| 8/18/2009 | RFP | Joint Development for Utility Owned Wind | 75 MW by 12/31/2011 | Yes | Wind | 12 Proposals/ 9 Suppliers |

* 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 - Requests for Proposal (RFP) Summary

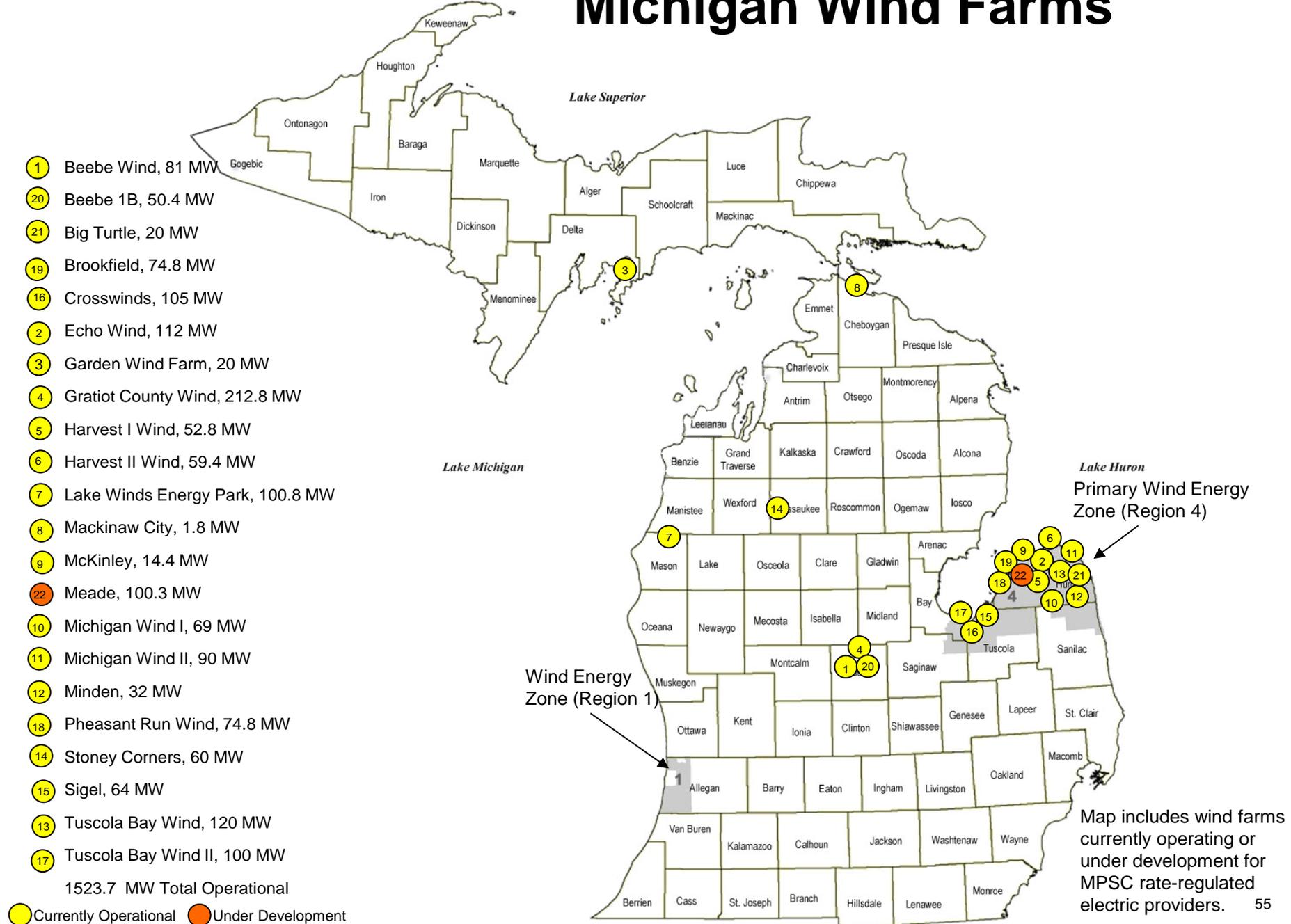
| | | | | | | |
|------------|-----|---|----------------------|-----|------|-----------------------------|
| 8/18/2009 | RFP | Requested CEREC** | 106 MW by 12/31/2011 | No | All | 35 Proposals/ 21 Suppliers |
| 5/22/2009 | RFI | Request for Information for the Joint Development of Wind Farms | N/A | Yes | Wind | 155 Registered 27 Responses |
| 12/23/2008 | RFP | Requested RECs* and ACECs* Without the Associated Energy | 250,000 RECs*/Year | No | All | 43 Proposals/ 11 Suppliers |

* 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 H - PA 295 CONTRACT RENEWABLE ENERGY PROJECTS | | | | | | |
|---|---|------------------------------------|----------------------|--------------------|------------------------------|----------------------------------|
| MPSC Rate Regulated Electric Providers | | | | | | |
| Map Key | Renewable Project Name | County | Capacity (MW) | Type | Power Purchaser | Commercial Operation Date |
| 14 | Freemont Community Digester | Newaygo | 3.1 | Anaerobic Digester | Consumers Energy | 2012 |
| 5, 15 | Scenic View Dairy - 2 Locations | Allegan & Barry | 1.2 | Anaerobic Digester | Consumers Energy | 2009 - 2010 |
| 20 | L'Anse Warden | Baraga | 17 | Biomass | DTE | 2010 |
| | | Biomass Total | 21.3 | MW | | |
| 12 | Elk Rapids Hydro | Antrim | 0.7 | Hydro | DTE | Pre-Act 295 Project |
| | | Hydro Total | 0.7 | MW | | |
| 19 | Eagle Valley Landfill | Oakland | 3.2 | Landfill Gas | DTE | 2011 |
| 11 | Lennon Generation Station | Shiawassee | 1.6 | Landfill Gas | Consumers Energy | 2010 |
| 10 | Northern Oaks Landfill | Clare | 1.6 | Landfill Gas | Consumers Energy | 2010 |
| 9 | Pine Tree Acres Landfill | Macomb | 12.8 | Landfill Gas | Consumers Energy | 2012 |
| 17 | Smith's Creek Landfill | St. Clair | 3.2 | Landfill Gas | DTE | 2011 |
| 13 | Zeeland #2 | Ottawa | 1.6 | Landfill Gas | Consumers Energy | 2009 |
| | | Landfill Gas Total | 24 | MW | | |
| 4 | Experimental Advanced Renewable Program | Varies | 6 | Solar | Consumers Energy | 2009-Present |
| 16 | SolarCurrents | Varies | 22 | Solar | DTE Owned and Customer Owned | 2009 - Present |
| | | Solar Total | 28 | MW | | |
| 28 | Beebe | Gratiot | 81 | Wind | Consumers Energy | December 2012 |
| 33 | Big Turtle | Huron | 20 | Wind | DTE | December 2014 |
| 34 | Cross Winds | Tuscola | 105.4 | Wind | Consumers Energy Owned | December 2014 |
| 30 | Echo | Huron | 112 | Wind | DTE Owned | September 2014 |
| | Fowler Ridge II (MI Allocation) | Benton County, Indiana | 7.5 | Wind | Indiana Michigan | 2010 |
| 2 | Garden I | Delta | 28 | Wind | Consumers Energy & DTE | September 2012 |
| 18 | Gratiot County | Gratiot | 212.8 | Wind | DTE & DTE Owned | June 2012 |
| 7 | Harvest II | Huron | 59.4 | Wind | Consumers Energy | November 2012 |
| 1 | Lake Winds | Mason | 100.8 | Wind | Consumers Energy Owned | November 2012 |
| 27 | McKinley | Huron | 14.4 | Wind | DTE Owned | December 2012 |
| | Meade | Huron | 100 | Wind | DTE Owned | 2015/2016 |
| 8 | Michigan Wind II | Sanilac | 90 | Wind | Consumers Energy | January 2012 |
| 27 | Minden | Sanilac | 32 | Wind | DTE Owned | December 2012 |
| 31 | Pheasant Run | Huron | 74.8 | Wind | DTE | December 2013 |
| 31 | Brookfield | Huron | 74.8 | Wind | DTE Owned | February 2014 |
| 27 | Sigel | Huron | 64 | Wind | DTE Owned | December 2012 |
| 3 | Stoney Corners | Missaukee & Osceola | 60 | Wind | Consumers Energy & DTE | October 2012 |
| 25 | Tuscola Bay Wind | Tuscola, Bay & Saginaw | 120 | Wind | DTE | December 2012 |
| 29 | Tuscola Bay Wind II | Tuscola & Bay | 100 | Wind | DTE | November 2013 |
| | Wildcat I (MI Allocation) | Madison & Tipton Counties, Indiana | 60 | Wind | Indiana Michigan | 2012 |
| | | Wind Total | 1,517 | MW | | |
| | | Total Act 295 Contracts | 1,591 | MW | | |

Michigan Wind Farms



Map includes wind farms currently operating or under development for MPSC rate-regulated electric providers. 55

| Appendix I - Michigan Utility Scale Wind Farms | | | | | | | | | |
|--|-------------------|------------------------|-------------------|--------------------|----------------------|---|-----------------------------|--|----------------|
| Michigan Utility Scale Wind Farms* | | | | | | | | | |
| Project Name | County | Capacity (MW) | Turbine Size (MW) | Number of Turbines | Turbine Manufacturer | Developer | Power Purchaser | Commercial Operation Date | |
| 1 | Beebe | Gratiot | 81 | 2.4 | 34 | Nordex | Exelon & Great Lakes Wind | Consumers Energy | December 2012 |
| 20 | Beebe 1B | Gratiot | 50.4 | 2.4 | 21 | Nordex | Exelon | Municipal Utility | December 2014 |
| 21 | Big Turtle | Huron | 20 | 2.0 | 10 | Gamesa | Heritage Sustainable Energy | DTE | December 2014 |
| 19 | Brookfield | Huron | 74.8 | 1.7 | 44 | GE Energy | NextEra Energy | DTE | February 2014 |
| 16 | Cross Winds | Tuscola | 105.4 | 1.7 | 62 | GE Energy | Consumers Energy | N/A | December 2014 |
| 2 | Echo | Huron | 112 | 1.6 | 70 | GE Energy | DTE | N/A | September 2014 |
| 3 | Garden I | Delta | 28 | 2.0 | 14 | Gamesa | Heritage Sustainable Energy | Consumers Energy & DTE | September 2012 |
| 4 | Gratiot County | Gratiot | 212.8 | 1.6 | 133 | GE Energy | Invenergy & DTE | DTE | June 2012 |
| 5 | Harvest | Huron | 52.8 | 1.65 | 32 | Vestas | Exelon | Wolverine Power Cooperative | 2008 |
| 6 | Harvest II | Huron | 59.4 | 1.8 | 33 | Vestas | Exelon | Consumers Energy | November 2012 |
| 7 | Lake Winds | Mason | 100.8 | 1.8 | 56 | Vestas | Consumers Energy | N/A | November 2012 |
| 8 | Mackinaw City | Emmet | 1.8 | 0.9 | 2 | NEG Micon | Mackinaw Power | Consumers Energy | 2001 |
| 9 | McKinley | Huron | 14.4 | 1.6 | 9 | GE Energy | DTE | N/A | December 2012 |
| 22 | Meade | Huron | 100.3 | 1.7 | 59 | GE Energy | DTE | N/A | 2015/2016 |
| 10 | Michigan Wind I | Huron | 69 | 1.5 | 46 | GE Energy | Exelon | Consumers Energy | 2008 |
| 11 | Michigan Wind II | Sanilac | 90 | 1.8 | 50 | Vestas | Exelon | Consumers Energy | January 2012 |
| 12 | Minden | Sanilac | 32 | 1.6 | 20 | GE Energy | DTE | N/A | December 2012 |
| 18 | Pheasant Run Wind | Huron | 74.8 | 1.7 | 44 | GE Energy | NextEra Energy | DTE | December 2013 |
| 15 | Sigel | Huron | 64 | 1.6 | 40 | GE Energy | Detroit Edison | N/A | December 2012 |
| 14 | Stoney Corners | Missaukee & Osceola | 60 | 2 - 2.5 | 29 | Repower, Fuhrlander, Northern Power Systems | Heritage Sustainable Energy | Consumers Energy, DTE, Traverse City Light & Power | October 2012 |
| 13 | Tuscola Bay Wind | Tuscola, Bay & Saginaw | 120 | 1.6 | 75 | GE Energy | NextEra Energy | DTE | December 2012 |
| 17 | Tuscola Wind II | Tuscola & Bay | 100.3 | 1.7 | 59 | GE Energy | NextEra Energy | DTE Electric | November 2013 |
| Totals | | 1,624.0 | MW | 942 | | Turbines | | | |
| Operational Totals | | 1,523.7 | MW | 883 | | Turbines | | | |
| Bold text indicates the wind farm is operational. | | | | | | | | | |
| * 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 | | | | | | | | | |