

**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.<sup>1</sup>
- 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.<sup>2</sup>
- 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.
- 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

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

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

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 sixth annual report provides information on the Commission's renewable energy activities related to the Act through calendar year 2015 and summarizes data from the electric provider annual reports through the 2014 calendar year.<sup>3</sup> This report also includes 2014 renewable energy credit compliance data for the last interim compliance step that builds up to the full 10 percent requirement for the 2015 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.<sup>4</sup> 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.

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<sup>3</sup> See: the Commission's February 13, 2015 report: [http://www.michigan.gov/documents/mpsc/PA\\_295\\_Renewable\\_Energy\\_481423\\_7.pdf?20160119101320](http://www.michigan.gov/documents/mpsc/PA_295_Renewable_Energy_481423_7.pdf?20160119101320)

<sup>4</sup> There are currently a total of 84 electric providers. Of those 84, 15 are AESs not serving customers and therefore are not required to file annual reports or register in MIRECS, the REC tracking system. Sixty-nine 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.

At the end of 2015, two rate-regulated providers, Indiana Michigan Power Company and Wisconsin Electric Power Company, are collecting renewable energy surcharges on customer bills. Additionally, there are seven 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. Alpena Power Company and DTE Electric reduced renewable energy surcharges to zero for all customers effective July 2015 and December 2015, respectively. Forty-nine non-AES providers do not collect surcharges. 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.<sup>5</sup>

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<sup>5</sup>It 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 system. DTE Electric is expected to meet the 10 percent renewable energy standard in 2015.

## **Renewable Energy Cost Reconciliation Cases and Commission Approval**

Per Section 49(1) of PA 295, the 11 MPSC rate-regulated electric providers filed annual renewable energy cost reconciliation cases for 2014.<sup>6</sup> Midwest Energy Cooperative's reconciliation filing was dismissed on September 23, 2015 because the cooperative became member-regulated. After Staff review, settlement agreements are expected in all cases. 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 2014 are available on the [Commission's website](#).<sup>7</sup> 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 – 2014 Compliance**

For 2014, electric providers were required to meet the last interim compliance step on the path to the full 10 percent standard which averaged 6.2 percent based on statewide data. The number of renewable energy credits required for 2014 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 295 baseline renewable energy credits by 50 percent.<sup>8</sup> All of Michigan's 69 electric providers (alternative electric suppliers not serving customers are not included in this total) met the 2014

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<sup>6</sup> 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.

<sup>7</sup> See: [http://www.michigan.gov/mpsc/0,1607,7-159-16393\\_53570-240179--,00.html](http://www.michigan.gov/mpsc/0,1607,7-159-16393_53570-240179--,00.html).

<sup>8</sup> 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.

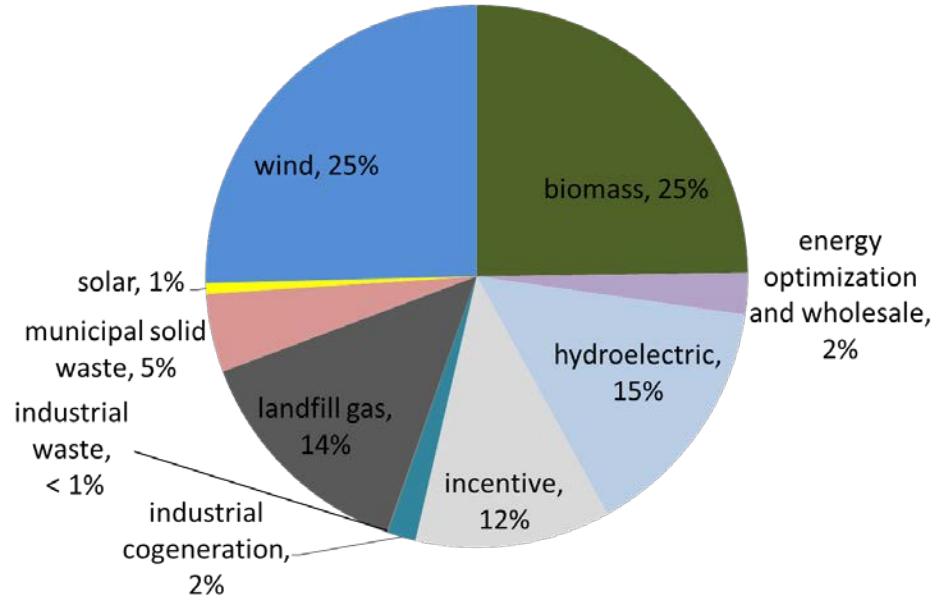
requirements and retired<sup>9</sup> a total of 6,400,548 energy credits. **Figure 1** shows the different renewable energy technology types used to generate the credits used for compliance by all electric providers in 2013 and 2014 as well as separately for both Consumers Energy's and DTE Electric's 2014 compliance.

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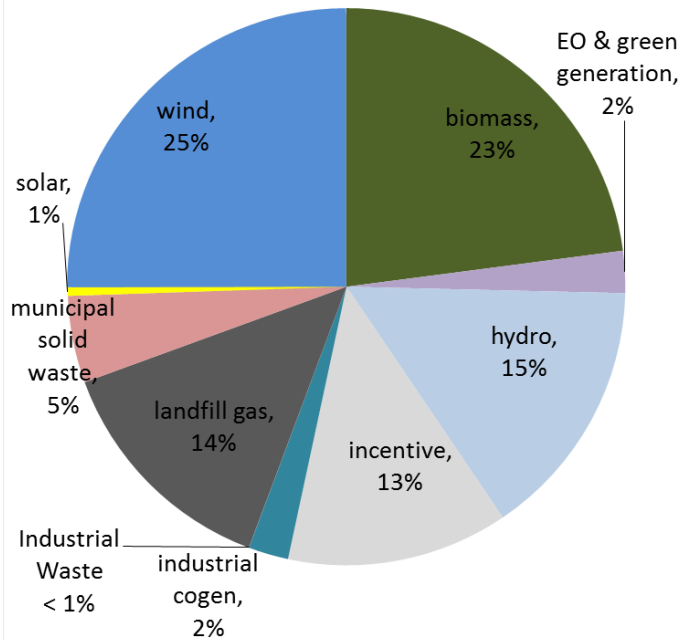
<sup>9</sup> Energy credits are “retired” when used for compliance.

**Figure 1: Compliance Energy Credit Breakdown**

**All Electric Providers - 2014 Compliance Energy Credits  
6,400,548 Total Energy Credits**

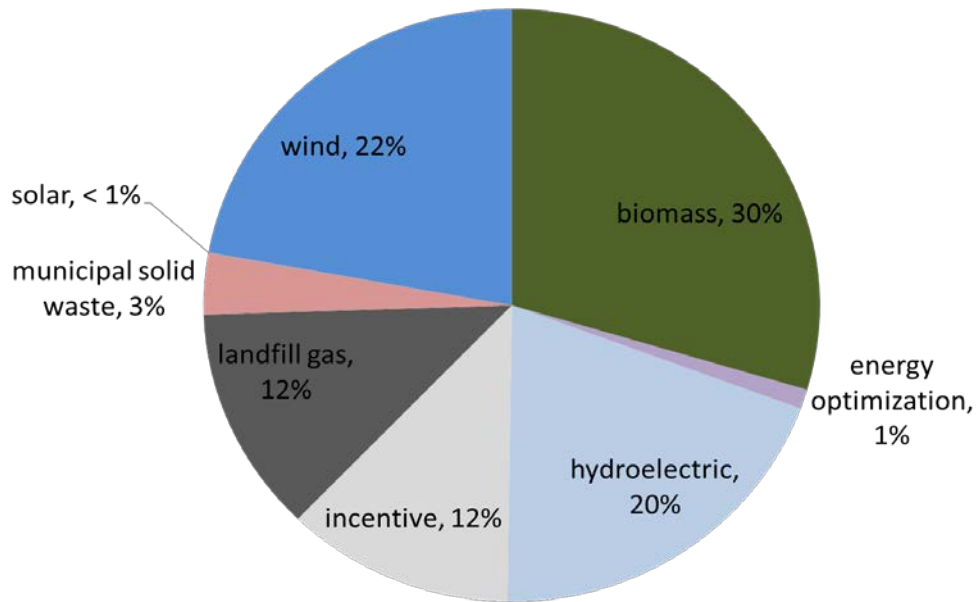


**All Electric Providers - 2013 Compliance Energy Credits  
5,047,402 Total Energy Credits**

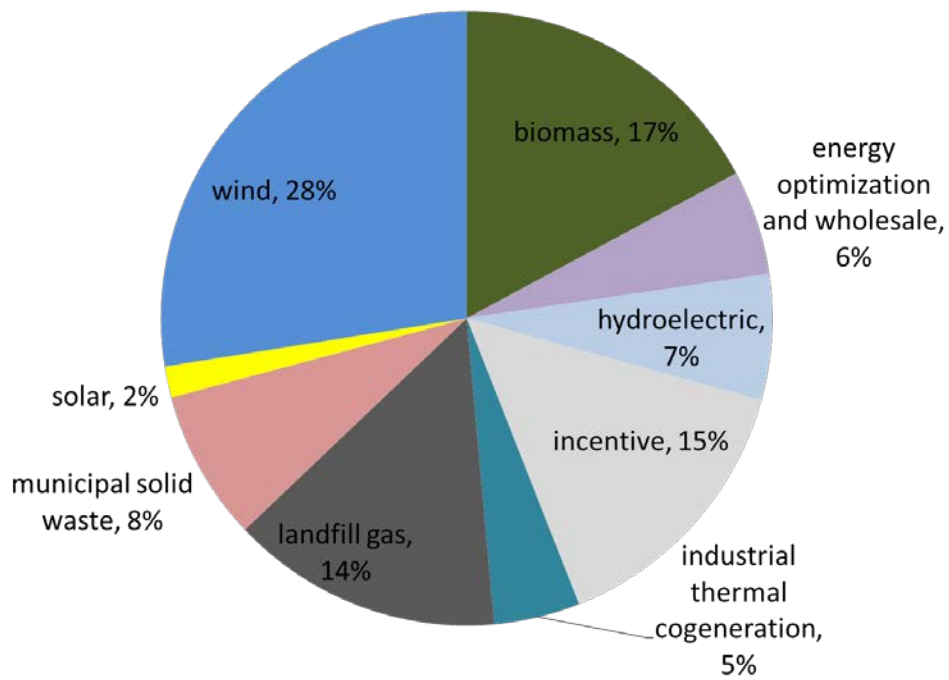




**Figure 1: Compliance Energy Credit Breakdown (continued)**  
**Consumers Energy – 2014 Compliance**  
**2,440,174 Total Energy Credits**



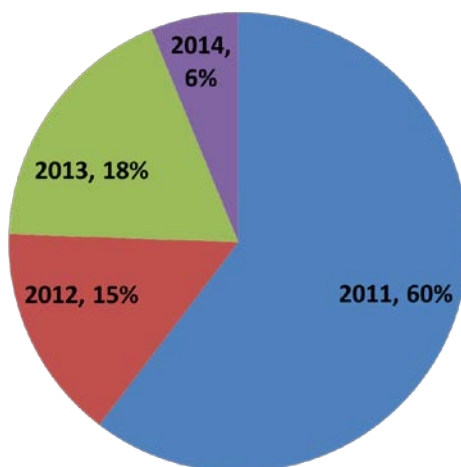
**DTE Electric – 2014 Compliance**  
**2,409,028 Total Energy Credits**



Section 29 of the Act includes provisions for determining whether the location of a renewable energy system is eligible for Michigan’s RPS. Ninety-four percent of the energy credits used for 2014 compliance were from renewable energy generated in Michigan. Wisconsin was the source for over three 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 60% of the energy credits used to comply in 2014 were from renewable energy generated in 2011. Michigan Renewable Energy Certification System (MIRECS) data shows that, to date, approximately 2.4 million energy credits to date have expired without being used for compliance.

**Figure 2: 2014 Compliance Energy Credits – Year of Generation**



## Status of Renewable Energy

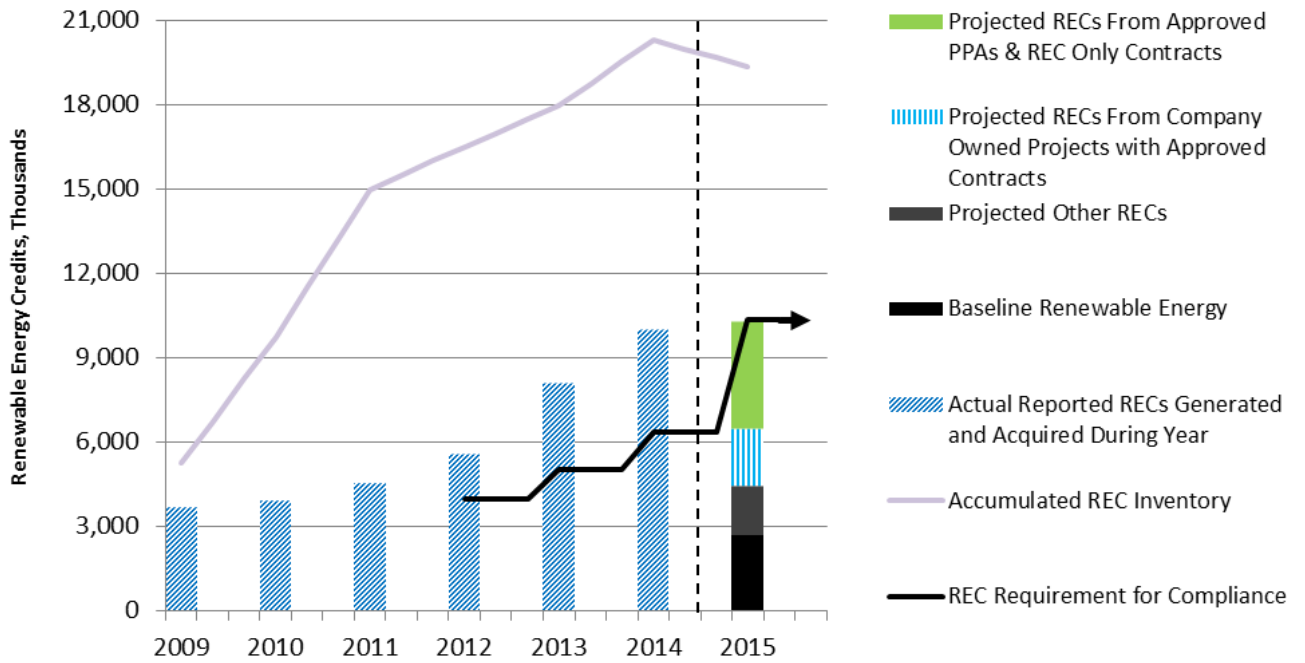
Based on the number of energy credits generated or acquired during 2014 as reported by electric providers, Michigan's 2014 estimated energy credit percentage is 9.1 percent of retail sales as shown in *Appendix C*. Based on the projected credit generation from **Figure 3**, Michigan's 2015 estimated renewable energy credit percentage will exceed the 10 percent of retail sales requirement.

A projection of Michigan's energy credits for 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 (PPA) and REC-only contracts.

The accumulated REC inventory for 2014 reflects the deduction of energy credits that were retired for 2014 compliance, voluntary retirements, and 2011 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 percent of total retail sales in 2015. The renewable energy projections clearly indicate that providers are on track to exceed the 10 percent renewable energy standard in 2015.

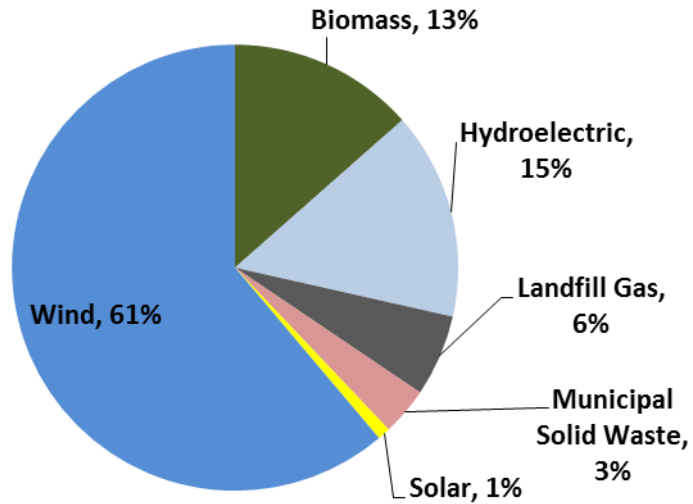
**Figure 3: Michigan Renewable Energy Projection, 2015**



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 2,500 MW of renewable energy generators are operating in Michigan. 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 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 & Electric Provider Annual Reports**  
**Approximately 2,500 MW**

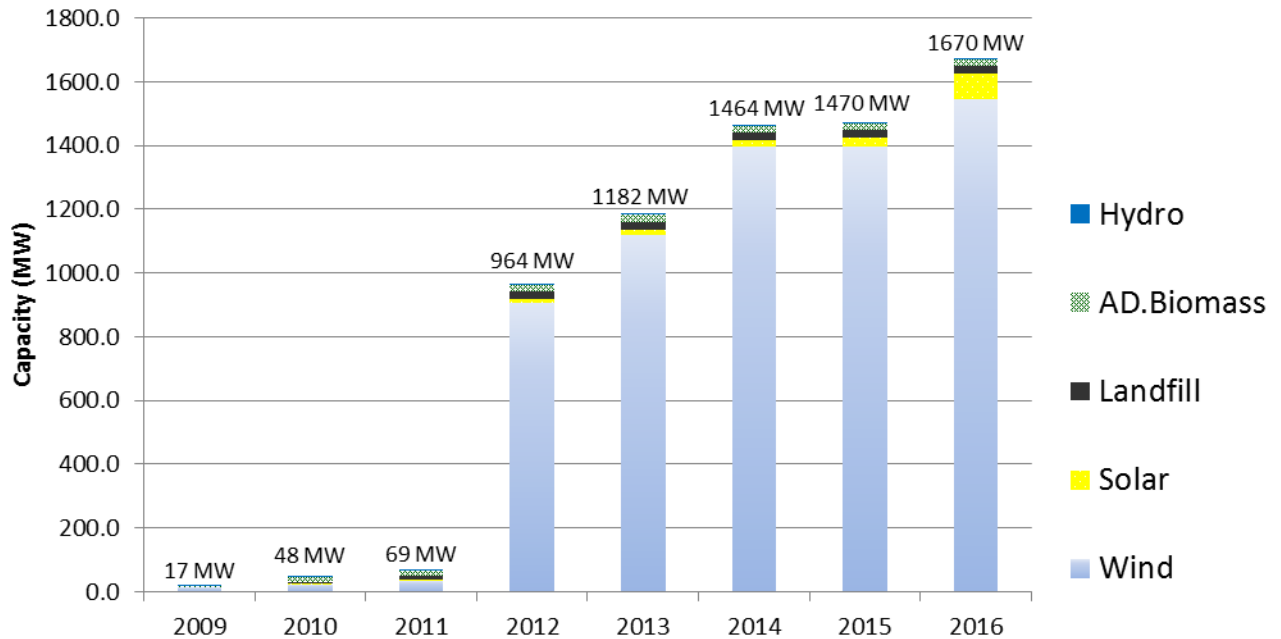


As of January 2016, 64 renewable contracts and amendments have been approved by the Commission pursuant to PA 295. **Figure 5** shows the expected commercial operation dates for renewable energy projects through 2016 based on the contracts and solar programs approved by the Commission.<sup>10</sup> Renewable projects developed by non-rate-regulated electric providers, where contracts are not filed for approval with the MPSC, are not reflected in **Figure 5**.

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<sup>10</sup> Assumes all of DTE Electric Company's 22 MW SolarCurrents program and Consumers Energy's 6 MW Experimental Advanced Renewable Programs will be commercially operational by the end of 2016.

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



Consumers Energy and DTE Electric both implemented solar photovoltaic (PV) programs.

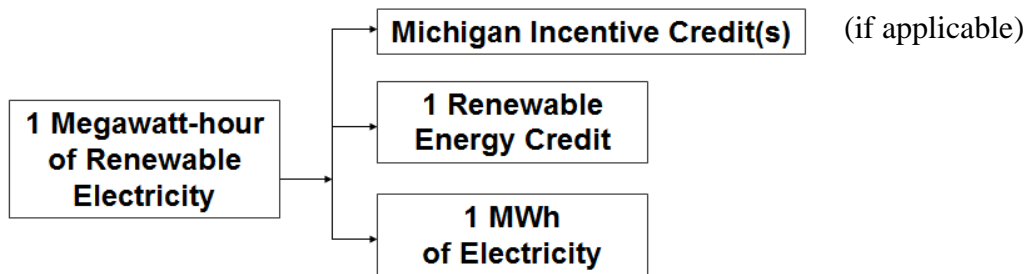
During 2015, Consumers Energy completed awarding the final capacity of its approximately 6 MW solar program. In 2015, Consumers Energy implemented a Community Solar program named Solar Gardens that is expected to result in 5 MW by the end of 2016 and could grow to a total of 10 MW in future years. DTE Electric is continuing development under its 15 MW Company-owned SolarCurrents program. These PV programs are discussed in more detail in *Appendix D*. In addition, DTE Electric filed an application for approval of up to 50 MW of company-owned solar which was approved by the Commission in December 2015.

Electric providers have secured all of the renewable energy necessary for compliance with the Act.<sup>11</sup> Electric providers are on pace to exceed the capacity and 10 percent requirement for 2015 and beyond.

### **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)<sup>12</sup> 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

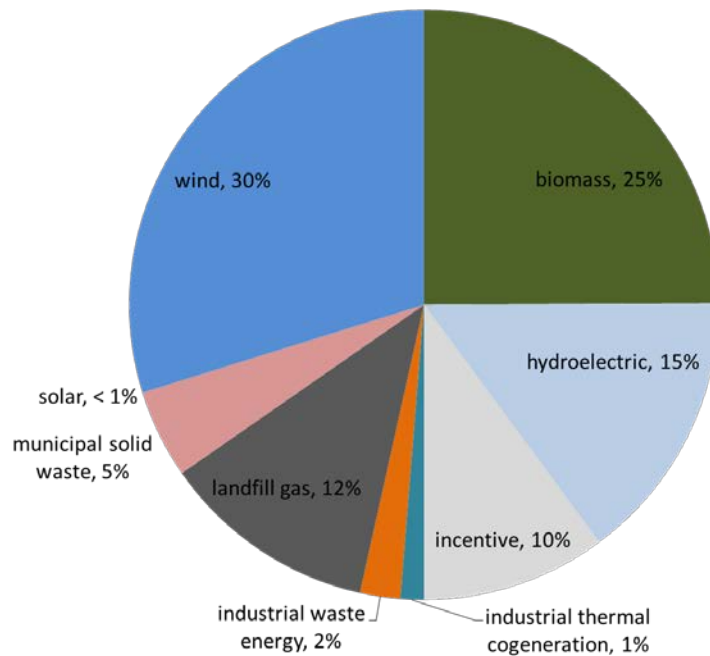
<sup>11</sup> Nearly all AESs are purchasing unbundled renewable energy credits to meet the renewable energy credit portfolio requirements. The terms and conditions of these purchases are unknown.

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

the renewable energy credit and tracking program.<sup>13</sup> MIRECS was launched on October 30, 2009.<sup>14</sup>

As of January 21, 2016, a total of 46,517,008 energy credits have been created in MIRECS from 2009 through 2015. **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 breakouts shows the significant growth of wind in Michigan’s REC portfolio, from 7 percent in 2009 to 44 percent in 2014. The 30 percent wind figure shown in **Figure 7** represents total credits created over the 2009 – 2015 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 2014 compliance.

**Figure 7: MIRECS 2009-2015 Vintage Energy Credits – 46,517,008 Total Credits**



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

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



The number of generating units within MIRECS continues to grow. As of January 2016, there were 300 registered projects (generators) in MIRECS. MIRECS has 141 account holders which include electric service providers, generator owners, and others.

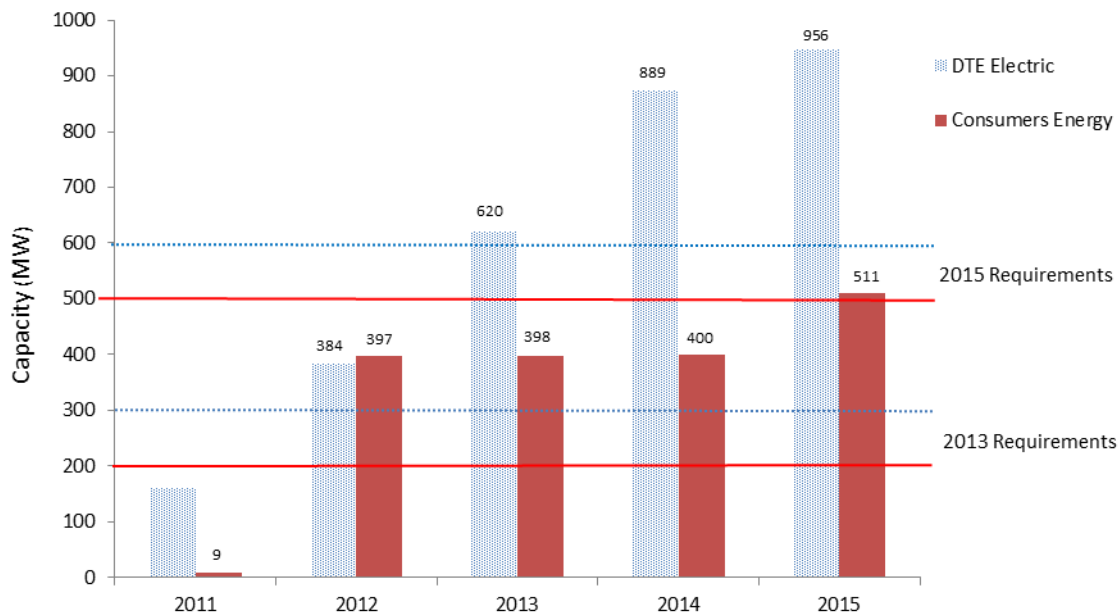
MIRECS is able to fully integrate with other tracking systems such as the Midwest Renewable Energy Tracking System (M-RETS), North American Renewables Registry (NAR) and, to a lesser extent, the North Carolina Renewable Energy Tracking System (NC-RETS) and PJM-Generation Attribute Tracking System (PJM-GATS) 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 2016, registered 58 projects for the purpose of importing energy credits into MIRECS. Commission Staff assists electric providers with the compliance process and will continue to hold training/information meetings.

### **Competition in Areas Served by Multiple Providers**

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 604 MW, and DTE Electric totaling 990 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 increased to 500 MW and 600 MW, respectively. Both companies have obtained Commission approval of power purchase agreement and company-owned renewable energy projects to 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 Electric**<sup>15</sup>



AESs are required to meet the energy credit requirement contained in the Act. Almost all AESs have indicated through REPs and 2014 annual reports that they will purchase energy credits 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

<sup>15</sup> Data shows planned capacity that will become operational through 2015. Both companies expect to build or acquire additional capacity after 2015. Consumers Energy source data is from biennial REP Case No. U-17792. DTE Electric source data is from biennial REP Case No. U-17793.

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.

## **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 27 requests for proposals (RFPs) in total. Consumers Energy has conducted eight RFPs and three requests for qualifications. DTE Electric has conducted 19 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](#)<sup>16</sup> and pursuant to Section 33 of PA 295. Details about each company's competitive bidding activities are shown in *Appendix G*.

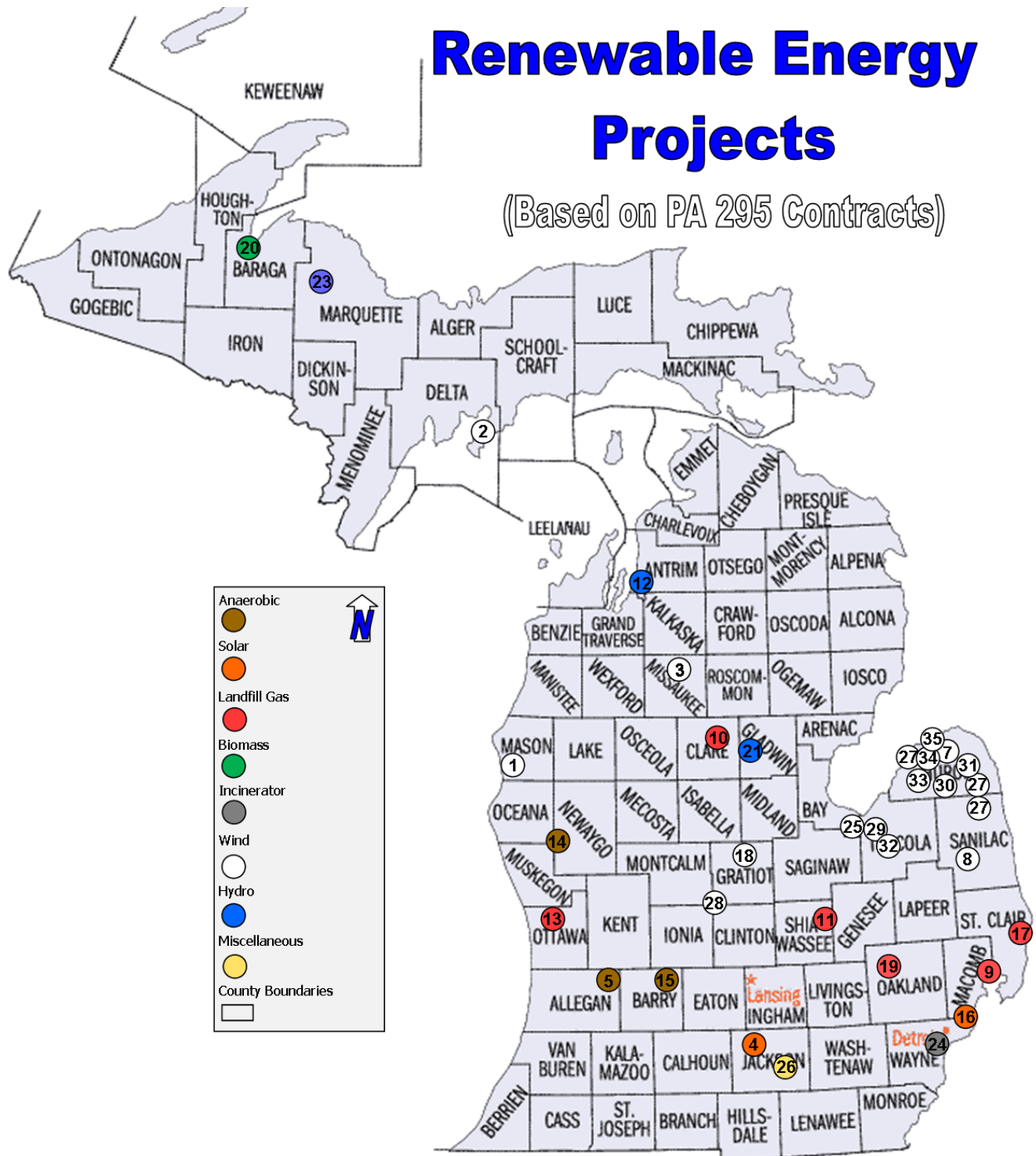
Pursuant to Section 37 of the Act, renewable energy power purchase and REC-only agreements entered into by any electric provider whose rates are regulated by the Commission must be submitted to the Commission for determination of whether the terms are reasonable and prudent. *Appendix F* lists all renewable energy contracts that have been approved by the MPSC under PA 295 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 2015, 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*. A total of 484 MW of new wind generation (333 MW will be developed by non-MPSC rate-regulated providers) is expected to begin operating by the end of 2016. All known wind farms in Michigan are listed on *Appendix I*.

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<sup>16</sup> 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.<sup>17</sup> The levelized cost value is used to compare multiple contracts with varying terms and conditions. Of the 64 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 16 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 and power purchase agreements have been competitive when costs are compared. 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 has six Company-owned wind farms totaling up to 375.8 MW, applications for 15 MW of company-owned solar through its SolarCurrents program and up to 50 MW of company-owned solar outside of the SolarCurrents program. Since no large scale solar installations have been contracted through power purchase agreements (only Company-owned facilities have been

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<sup>17</sup> 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*.

proposed), only the above-mentioned wind contracts are compared for purposes of this section of the report.

An annual comparison of the weighted-average levelized cost (dollars per MWh) of commission-approved company-owned project costs to power purchase agreements is tabulated below.

<b>Weighted Average Cost Comparison</b>		
<b>Commission Approval</b>	<b>Company Owned</b>	<b>Power Purchase</b>
<b>2015</b>	\$50.00	\$45.00
<b>2014</b>	N/A	N/A
<b>2013</b>	\$55.95	\$50.04
<b>2012</b>	\$52.50	\$49.25
<b>2011</b>	\$67.16	\$60.90
<b>2010</b>	\$104.00	\$97.33
<b>2009</b>	N/A	\$115.00
<b>Total</b>	<b>\$74.49</b>	<b>\$73.58</b>

In aggregate, over the 2009-2015 time period, the weighted average cost of power purchase agreements has been slightly lower than the weighted average of company owned projects.

### **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. During 2016, the following utility scale wind farms are expected to become commercially operational in Michigan:

- Apple Blossom – 100 MW, Huron County
- Big Turtle II – 30 MW, Huron County
- Deerfield – 150 MW, Huron County
- Michigan Wind III – 153 MW, Sanilac County
- Pinnebog – 51 MW, Huron County

These projects will result in 484 MW of new, utility scale wind generation. Several large solar projects are under development in Michigan and planned to begin commercial operation during 2016.<sup>18</sup>

- DTE Electric's 50 MW, Lapeer and Wayne Counties
- Consumers Energy's 5 MW Solar Gardens Project, Ottawa and Kalamazoo Counties
- Indiana Michigan's 4.6 MW Clean Energy Solar Pilot Project, Berrien County

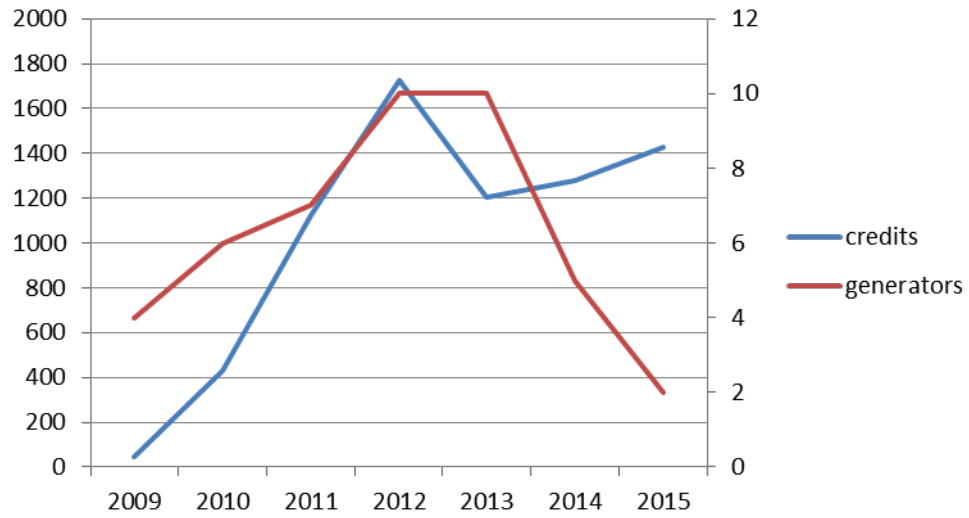
Section 39 of PA 295 provides for Michigan Incentive Renewable Energy Credits for renewable energy systems that meet certain criteria. For renewable energy systems constructed using a threshold level of Michigan labor, the amount of the incentive is one-tenth of a REC for each MWh generated during the 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.

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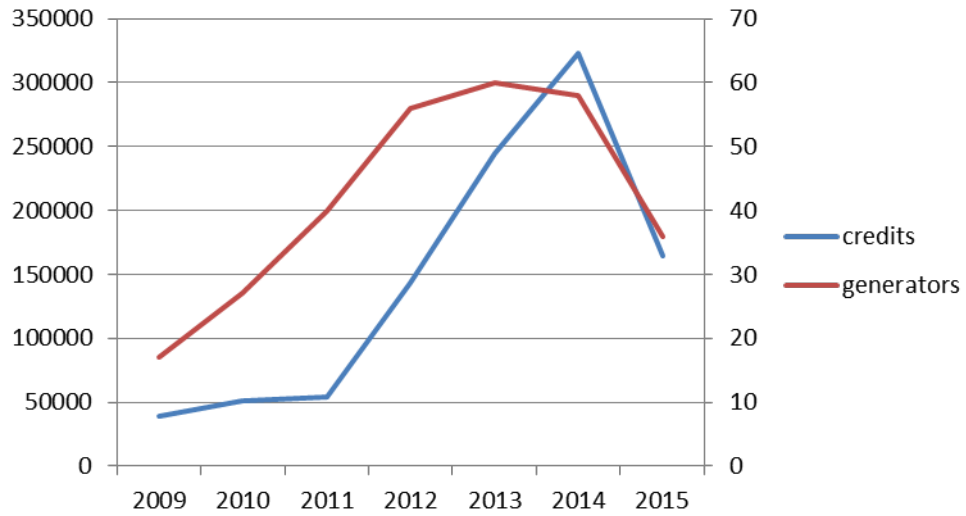
<sup>18</sup> The Solar Investment Tax Credit was extended at 30% through 2019 with a gradual stepdown beginning in 2020. See <http://programs.dsireusa.org/system/program/detail/658>.



**Figure 10: Michigan Equipment Incentive Credits 2009-2015**



**Figure 11: Michigan Labor Incentive Credits 2009-2015**



Statewide, there has been significant investment in the renewable energy sector since the passage of PA 295 in 2008. Assuming an installed cost of \$2,000 per kW<sup>19</sup> for new renewable energy projects, \$2.9 billion has been invested to bring approximately 1,470 MW<sup>20</sup> of new renewable energy projects on-line through 2015 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.<sup>21</sup> The 2014 Cluster Workforce Update found that overall, the Energy Cluster is expected to grow 7.1 percent between 2010 and 2020.<sup>22</sup> An additional update for the second quarter of 2015 showed 8,750 jobs among Michigan industries related to the Renewable and Alternative Energy cluster.<sup>23</sup> 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 provides perspective given the available data.

Michigan is continuing to build on its position as a regional leader in the development and manufacturing of renewable energy systems, drawing on the state's engineering expertise,

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<sup>19</sup> DTE Electric reported an installed cost of \$2,225 to \$2,438 per kW for its Echo Wind Park contract approval application filed on August 10, 2012.

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

<sup>21</sup> The report's author 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](http://milmi.org/admin/uploadedPublications/1992_WDA_EnergyFINAL.pdf).

<sup>22</sup> See 2014 Cluster Workforce Updates – Energy: [http://milmi.org/admin/uploadedPublications/2227\\_Energy.pdf](http://milmi.org/admin/uploadedPublications/2227_Energy.pdf)

<sup>23</sup> The report's author provided additional information to MPSC staff showing job data for 2015.

modernized machining, and RPS compliance efforts. It appears that Michigan's incentive REC 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. Three electric providers utilized a total of 110,920 ACECs for 2014 compliance which is less than two percent of the total energy credits used for 2014 compliance. In addition, there has been no advanced cleaner energy generation for 2015 registered yet within MIRECS. This figure is down from 166,359 MWh in 2014 when three facilities generated advanced cleaner energy. The percentage limits 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.<sup>24</sup>

This guidepost rate was derived from data provided to Consumers Energy as a result of the Company's inquiry into building a new 830 MW coal fired power facility, and was adopted by all electric providers. The Commission continues to find that the \$133 per MWh guidepost is reasonable.

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.

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

**Table 1: Weighted Average Levelized Renewable Energy Contract Prices**

<b>Consumers Energy</b>						
<b>Technology</b>	<b>Wind</b>	<b>Digester</b>	<b>Biomass</b>	<b>Landfill</b>	<b>Hydro</b>	<b>Solar</b>
<b>Weighted Average</b>	\$90.60	\$137.77	NA	\$106.21	\$121.31	NA
<b>Detroit Edison</b>						
<b>Technology</b>	<b>Wind</b>	<b>Digester</b>	<b>Biomass</b>	<b>Landfill</b>	<b>Hydro</b>	<b>Solar</b>
<b>Weighted Average</b>	\$64.59	NA	\$98.94	\$98.97	NA	\$113.52
<b>Combined Weighted Average</b>	<b>\$74.52</b>	<b>\$137.02</b>	<b>\$98.94</b>	<b>\$104.05</b>	<b>\$121.31</b>	<b>\$113.52</b>

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,<sup>25</sup> compared to an availability ranging as high, or higher than 80 percent for base load generation plants.<sup>26</sup> 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.

<sup>25</sup> <https://www.misoenergy.org/Library/Repository/Report/2015%20Wind%20Capacity%20Report.pdf>

<sup>26</sup> 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 90 percent.

## Cost-Effectiveness of Renewable Energy and Energy Optimization

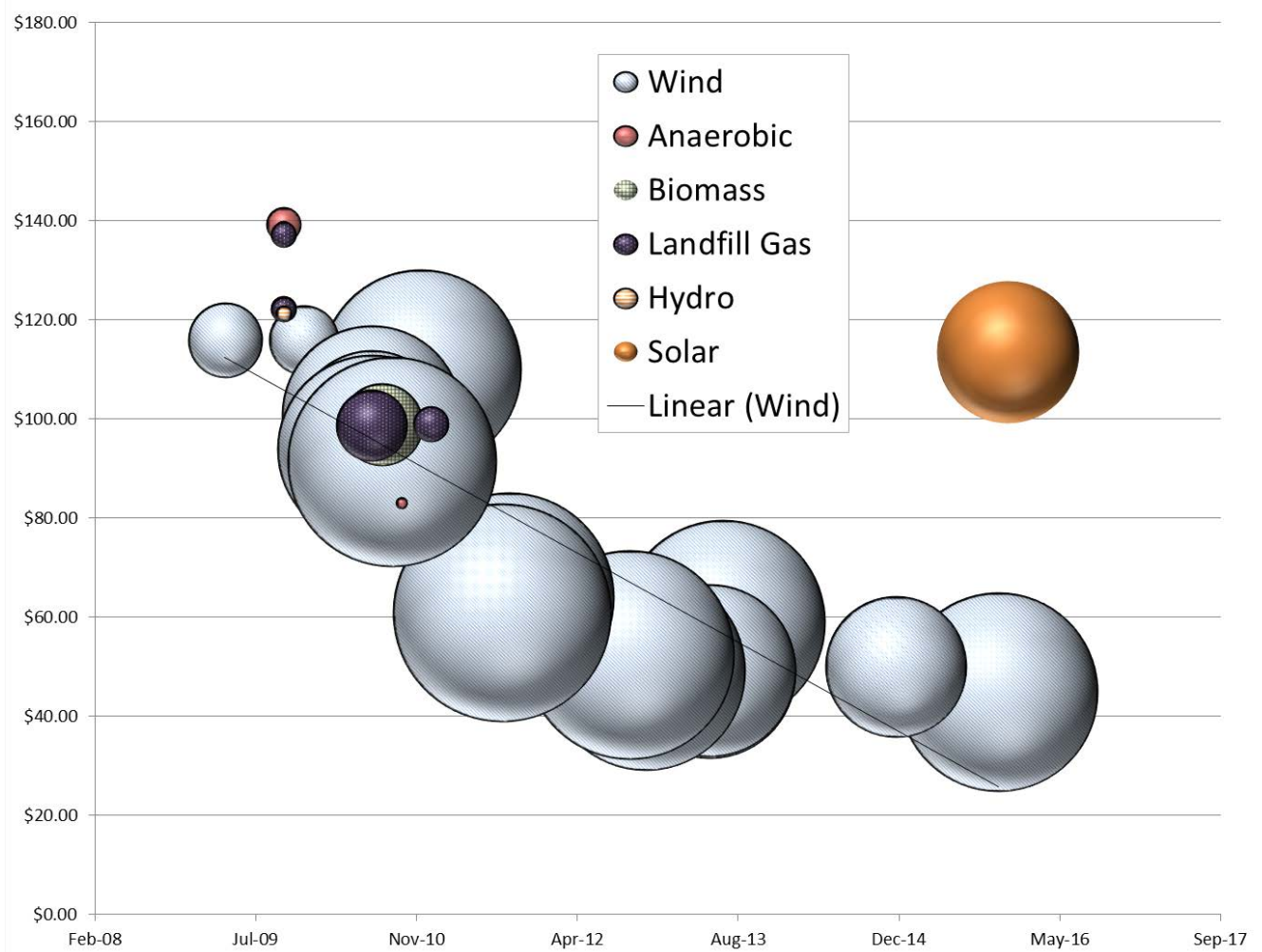
### Standards

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. A recent contract approved by the Commission for new wind capacity has leveled costs lower than \$45 per MWh, which is about 10 percent less than the least expensive leveled contract prices from 2011 and half of the leveled cost of the first few renewable energy contracts approved in 2009 and 2010. Contracts submitted to the Commission through 2015 total approximately 1,670 MW<sup>27</sup> of renewable capacity. Weighting the leveled costs of these contracts by the generation in MWh results in an average cost of \$76.42 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 SolarCurrents or Consumers Energy's Experimental Advanced Renewable Program 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.

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<sup>27</sup> 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.

**Figure 12: Levelized Cost of MPSC Approved Contracts Over Time**



Factoring in the cost per MWh of energy optimization programs, as required by Section 21(6)(b) of PA 295, **Table 2** demonstrates the cost-effectiveness of the renewable energy and energy optimization standards on a combined basis using the state’s two largest electric providers. The levelized cost of conserved energy of the energy optimization programs was weighted by the life cycle energy savings, through 2029, expected from the companies’ Energy Optimization Programs. For renewable energy, the levelized costs of all DTE Electric and Consumers Energy contracts approved by the Commission were weighted by the generation



anticipated over the term of the contract.<sup>28</sup> 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 \$37.43 per MWh for both Subpart A (Renewable Energy Standard) and Subpart B (Energy Optimization Standard) of 2008 PA 295 is approximately 25 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 \$76.42 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 \$37.43 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.<sup>29</sup> In the middle of December 2014, the Federal Production Tax Credit (PTC) was extended through year-end 2014. Additionally, in December 2015, the PTC was extended yet again, with ramp downs through 2019.<sup>30</sup> This may lead to the development of additional renewable projects that will supplement electric providers' Renewable Energy Plans and result in development above and beyond the 10 percent standard.

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<sup>28</sup> 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. DTE Electric's 50 MW solar project is included.

<sup>29</sup> See: [http://www.eia.gov/forecasts/aeo/electricity\\_generation.cfm](http://www.eia.gov/forecasts/aeo/electricity_generation.cfm)

<sup>30</sup> See: <https://www.gpo.gov/fdsys/pkg/BILLS-114hr2029enr/pdf/BILLS-114hr2029enr.pdf>

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

<b>Energy Optimization Cost of Conserved Energy Weighted Average (\$/MWh)</b>	<b>\$20.00<sup>31</sup></b>
<b>Renewable Energy Weighted Average Cost (\$/MWh)</b>	<b>\$76.42</b>
<b>Combined Weighted Average Cost of Energy Optimization and Renewable Energy (\$/MWh)</b>	<b>\$37.43</b>
<p><b>Source:</b>            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

<sup>31</sup> On a lifecycle cost basis, over a 20 year period, the energy optimization cost of conserved energy weighted average is \$13.33 per MWh.

generation. To best determine the value of the non-renewable component of Act 295 compliant generation, Commission Staff determined, for purposes of developing a uniform Transfer Price Schedule, that the levelized cost of a new natural gas combined cycle (NGCC) plant would likely be analogous to the market price mentioned above.<sup>32</sup>

In 2014, the average annual transfer price for DTE Electric was \$63.70 per MWh and the average annual transfer price for Consumers Energy was \$80.23 per MWh. At the beginning of 2015, Michigan had four rate-regulated electric providers collecting revenue through a renewable energy surcharge: Alpena Power, DTE Electric, Indiana Michigan Power Company and Wisconsin Electric Power Company, although Alpena and DTE have since reduced their surcharges to \$0 across all rate classes during the year. 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 *2015 Report on the Implementation of the P.A. 295 Utility Energy Optimization Programs*, issued on September 30, 2015.<sup>33</sup>

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

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<sup>32</sup> For more detailed information on the Staff Transfer Price Schedule see: <http://efile.mpsc.state.mi.us/efile/docs/15800/0042.pdf>

<sup>33</sup> See: [http://www.michigan.gov/documents/mpsc/2015\\_Energy\\_Optimization\\_Report\\_501851\\_7.pdf](http://www.michigan.gov/documents/mpsc/2015_Energy_Optimization_Report_501851_7.pdf)

renewable energy or energy optimization.<sup>34</sup> 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 results in lower locational marginal prices in the energy market. In addition, the Commission's *2015 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 benefit of \$4.38.<sup>35</sup> 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 MWh<sup>36</sup> as the combined weighted average of all existing 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 \$37.43 per MWh.

## **Conclusion and Recommendations**

The compliance requirements were accomplished successfully by all of Michigan's electric providers for the 2014 compliance year, and all providers are expected to meet the 10 percent renewable energy target in 2015. The renewable energy standard has resulted in the development of new renewable capacity and can be credited with over 1,668 MW of new renewable energy projects. The weighted average price of existing renewable energy contracts is \$76.42 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

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<sup>34</sup> See: [http://michigan.gov/documents/energy/Additional\\_Areas\\_final\\_440032\\_7.pdf](http://michigan.gov/documents/energy/Additional_Areas_final_440032_7.pdf), Figures 6 and 7, pp. 24-25.

<sup>35</sup> See: [http://www.michigan.gov/documents/mpsc/2015\\_Energy\\_Optimization\\_Report\\_501851\\_7.pdf](http://www.michigan.gov/documents/mpsc/2015_Energy_Optimization_Report_501851_7.pdf)

<sup>36</sup> The \$64 per MWh weighted average is based on 2012 filings and excludes transmission costs.

renewable energy is \$37.43 per MWh, significantly lower than the cost of all types of new fossil fuel generation plants.

The Commission has no recommendation for legislation at this time. In 2016, 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	2014 Reconciliation Case #	2014 Reconciliation Approval Date
<b>IOUs</b>						
1	Alpena Power Company	U-15804		5/12/2017	U-17802	2/11/2016
2	Consumers Energy Company	U-15805		5/26/2017	U-17803	Pending
3	DTE Electric Company	U-15806		6/2/2017	U-17804	Pending
4	Indiana Michigan Power Company	U-15808		5/12/2017	U-17805	12/11/2015
5	Northern States Power Company-Wisconsin	U-15809		5/12/2017	U-17806	10/27/2015
6	Upper Peninsula Power Company	U-15810		5/26/2017	U-17807	10/27/2015
7	Wisconsin Public Service Corporation	U-15811		5/26/2017	U-17808	11/5/2015
8	Wisconsin Electric Power Company	U-15812		5/26/2017	U-17809	2/11/2016
<b>Cooperatives - Rate Regulated</b>						
9	Cloverland Electric Cooperative/Edison Sault	U-15816		5/12/2017	U-17810	11/19/2015
10	Thumb Electric Cooperative	U-15821		5/12/2017	U-17812	10/27/2015
<b>Cooperatives - Member Regulated</b>					<b>Not Required</b>	
11	Alger Delta Cooperative Electric Association	U-15813		5/12/2017		
12	Bayfield Electric Cooperative	U-15814		6/2/2017		
13	Cherryland Electric Cooperative	U-15815		5/12/2017		
14	Great Lakes Energy Cooperative (2012)	U-15817		5/12/2017		
15	Midwest Energy Cooperative	U-15818		5/12/2017		
16	Ontonagon Co. Rural Electrification Assoc. (2012)	U-15819		5/12/2017		
17	Presque Isle Electric and Gas Co-op (2012)	U-15820		9/24/2017		
18	Tri-County Electric Cooperative	U-15822		8/13/2017		
<b>Municipals</b>					<b>Not Required</b>	
19	Village of Baraga	U-15848		7/1/2017		
20	City of Bay City	U-15849		7/1/2017		
21	City of Charlevoix	U-15850		7/1/2017		
22	Chelsea Department of Electric and Water	U-15851		7/1/2017		
23	Village of Clinton	U-15852		7/1/2017		
24	Coldwater Board of Public Utilities	U-15853		7/1/2017		
25	Crosswell Municipal Light & Power Department	U-15854		7/1/2017		
26	City of Crystal Falls	U-15855		7/1/2017		
27	Daggett Electric Department	U-15856		10/13/2017		
28	City of Dowagiac	U-15858		7/1/2017		
29	City of Eaton Rapids	U-15859		7/1/2017		
30	City of Escanaba	U-15860		7/1/2017		
31	City of Gladstone	U-15861		7/1/2017		
32	Grand Haven Board of Light and Power	U-15862		7/1/2017		
33	City of Harbor Springs	U-15863		7/1/2017		
34	City of Hart Hydro	U-15864		7/1/2017		
35	Hillsdale Board of Public Utilities	U-15865		7/1/2017		
36	Holland Board of Public Works	U-15866		7/1/2017		
37	Village of L'Anse	U-15867		7/1/2017		
38	Lansing Board of Water & Light	U-15868		7/1/2015		
39	Lowell Light and Power	U-15869		7/1/2017		
40	Marquette Board of Light and Power	U-15870		7/1/2017		
41	Marshall Electric Department	U-15871		7/1/2017		
42	Negaunee Department of Public Works	U-15872		7/1/2017		
43	Newberry Water and Light Board	U-15873		7/1/2017		
44	Niles Utility Department	U-15874		7/1/2017		
45	City of Norway	U-15875		7/1/2017		
46	City of Paw Paw	U-15876		7/1/2017		
47	City of Petoskey	U-15877		7/1/2017		
48	City of Portland	U-15878		7/1/2017		
49	City of Sebewaing	U-15879		7/1/2017		
50	City of South Haven	U-15880		7/1/2017		
51	City of St. Louis	U-15881		7/1/2017		
52	City of Stephenson	U-15882		7/1/2017		
53	City of Sturgis	U-15883		7/1/2017		
54	Traverse City Light & Power	U-15884		7/1/2017		
55	Union City Electric Department	U-15885		7/1/2017		
56	City of Wakefield	U-15886		7/1/2017		
57	Wyandotte Department of Municipal Service	U-15887		7/1/2017		
58	Zeeland Board of Public Works	U-15888		7/1/2017		

NL = New License  
LVR = License Voluntarily Relinquished  
LR = License Revoked

**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	2014 Reconciliation Case #	2014 Reconciliation Approval Date
<b>Alternative Electric Suppliers (AES) Serving Customers</b>					<b>Not Required</b>	
59	CMS ERM Michigan LLC	U-15826	U-16640	4/16/2017		
60	Commerce Energy Inc	U-15828	U-16641	4/16/2017		
61	Constellation Energy Services, Inc (formally Integrys)	U-15833	U-16646	4/16/2017		
62	Constellation NewEnergy Inc	U-15829	U-16642	4/16/2017		
63	Direct Energy Business LLC	U-15845	U-16643	4/16/2017		
64	FirstEnergy Solutions Corp	U-15832	U-16644	4/16/2017		
65	MidAmerican Energy Services		U-17934	1/11/2016		
66	Noble Americas Energy Solutions LLC	U-15843	U-16650	4/16/2017		
67	Spartan Renewable Energy Inc	U-15844	U-16651	4/16/2017		
68	U.P. Power Marketing LLC	U-16586	U-16652	5/26/2017		
69	Wolverine Power Marketing Cooperative Inc	U-15847	U-16653	4/16/2017		
<b>Alternative Electric Suppliers (AES) Not Serving Customers</b>					<b>Not Required</b>	
70	AEP Energy, Inc	U-15825	U-15825	4/16/2017		
71	Dillon Power, LLC		U-17769	4/15/2017		
72	Direct Energy Services LLC	U-15830	U-15830	4/16/2017		
73	Dynegy Energy Services (East), LLC (Formally Duke Energy)		U-16767	10/20/2017		
74	Eligo Energy MI, LLC		U-17885	9/14/2017		
75	Energy Int'l Power Marketing d/b/a PowerOne	U-15831	U-15831	5/26/2017		
76	Energy Services Providers, Inc. d/b/a Michigan Gas & Electric		U-17010	9/11/2016		
77	Interstate Gas Supply, Inc d/b/a IGS Energy		U-17338	2/20/2016		
78	Lakeshore Energy Services, LLC		U-16979	9/11/2016		
79	Liberty Power Delaware	U-15834	U-15834	5/26/2017		
80	Libery Power Holdings LLC	U-15835	U-15835	5/26/2017		
81	Plymouth Rock Energy LLC		U-17549	4/15/2016		
82	Premier Energy Marketing LLC	U-15841	U-16648	5/26/2017		
83	Santana Energy Services		U-17254	6/28/2017		
84	Texas Retail Energy, LLC		U-17168	5/29/2017		

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

Company	Initial Plan	2015 Plan Docket	2014 Compliance Year Sales*	Retail Sales Method**	2007/2008 Baseline RECs	2013 REC Requirement	2014 REC Requirement	2014 Excess RECs Retired	2014 EO Credit Substitutions	2015 Compliance Year Sales	2015 Energy Credit Requirement	Expected to Meet 2015 10% Standard	Current Residential Surcharge \$/Month
<b>Rate Regulated Utilities</b>													
Alpena Power	U-15804	U-17791	330,445	3Y	0	10,881	16,522	1,518		339,929	33,993	Yes	0.00
Consumers Energy	U-15805	U-17792	33,305,088	3Y	1,549,840	2,145,536	2,440,174	0	25,989	33,188,734	3,318,873	Yes	0.00
DTE Electric	U-15806	U-17793	42,512,369	W	566,819	1,756,567	2,409,028	0	131,068	42,448,318	4,244,832	Yes	0.00
Indiana Michigan	U-15808	U-17794	2,810,444	W	17,450	104,542	149,247	0		2,828,387	282,839	Yes	0.86
NSP-Wisc (Xcel)	U-15809	U-17795	140,736	3Y	12,679	13,142	13,376	0		141,190	14,119	Yes	0.00
Upper Peninsula Power	U-15810	U-17796	847,104	3Y	98,521	84,671	84,710	1,173		838,610	83,861	Yes	0.00
Wisc. PSC	U-15811	U-17797	285,363	3Y	11,145	16,814	19,841	10,540		277,498	27,750	Yes	0.00
Wisc. Elec Co	U-15812	U-17798	1,683,135	W	53,196	127,144	110,755	0		384,001	38,400	Yes	1.20
<b>Rate Regulated Cooperatives</b>													
Cloverland Electric Coop	U-15816	U-17799	800,275	3Y	301,126	80,231	80,028	1,972		809,610	80,961	Yes	0.00
Thumb Elec. Coop	U-15821	U-17801	160,684	3Y	1,562	6,206	8,815	0		165,979	16,598	Yes	0.00
<b>Member Regulated Cooperatives</b>													
Alger Delta Coop Elec	U-15813	U-16589	64,912	3Y	920	2,626	3,706	0		69,691	6,969	Yes	0.00
Bayfield Elec. Coop	U-15814	U-16590	177	3Y	4	9	11	0		167	17	Yes	0.00
Cherryland Elec Coop	U-15815	U-16591	378,464	3Y	0	12,272	18,923	0		383,527	38,353	Yes	0.00
Great Lakes Energy Coop	U-15817	U-16593	1,379,627	3Y	0	44,820	68,981	0		1,399,433	139,943	Yes	0.00
Homeworks Tri-County Elec. Coop	U-15822	U-16598	330,945	3Y	0	10,746	16,547	0		334,324	33,432	Yes	0.00
Midwest Energy Coop	U-15818	U-17800	586,247	3Y	0	19,354	29,312	0		592,064	59,206	Yes	0.00
Ontonagon Co. Rural Elec.	U-15819	U-16595	25,321	3Y	2,246	2,329	2,389	0		25,402	2,540	Yes	0.00
Presque Isle Elec & Coop	U-15820	U-16596	237,008	3Y	0	7,798	11,850	1		238,663	23,866	Yes	0.00
<b>Alternative Electric Suppliers</b>													
CMS ERM Michigan	U-15826	U-16640											
Commerce Energy	U-15828	U-16641											
Constellation Energy Services, Inc (Formally Integrys)	U-15833	U-16646											
Constellation NewEnergy	U-15829	U-16642											
Direct Energy Business	U-15845	U-16643											
First Energy Solutions	U-15832	U-16644											
Glacial Energy of Illinois	U-16007	U-16645											
MidAmerican Energy Company	U-15837	U-16647											
Noble Americas Energy Solutions f/k/a Sempra Energy Solutions	U-15843	U-16650											
Spartan Renewable Energy	U-15844	U-16651											
U.P. Power Marketing	U-15846	U-16652											
Wolverine Power Marketing Cooperative	U-15847	U-16653											
<b>Aggregated Totals***</b>			<b>10,213,711</b>		<b>0</b>	<b>306,641</b>	<b>337,052</b>	<b>7,146</b>		<b>11,876,561</b>	<b>1,187,656</b>		



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

Company	Initial Plan	2015 Plan Docket	2014 Compliance Year Sales*	Retail Sales Method**	2007/2008 Baseline RECs	2013 REC Requirement	2014 REC Requirement	2014 Excess RECs Retired	2014 EO Credit Substitutions	2015 Compliance Year Sales	2015 Energy Credit Requirement	Expected to Meet 2015 10% Standard	Current Residential Surcharge \$/Month
<b>Municipal Utilities</b>													
Village of Baraga	U-15848	U-16599	18,748	3Y	0	616	937	0		18,796	1,880	Yes	0.00
City of Bay City	U-15849	U-16600	318,933	3Y	0	10,661	15,947	0		316,642	31,664	Yes	0.00
City of Charlevoix	U-15850	U-16601	59,877	3Y	0	2,040	2,994	0		59,664	5,966	Yes	0.00
Chelsea Dept. of Electric & Water	U-15851	U-16602	98,169	3Y	0	3,209	4,908	0		98,876	9,888	Yes	0.00
Village of Clinton	U-15852	U-16603	22,741	3Y	0	740	1,137	1		23,397	2,340	Yes	0.00
Coldwater Board of Public Utilities	U-15853	U-16604	322,309	3Y	0	9,827	16,115	1		347,917	34,792	Yes	0.00
Croswell Municipal Light & Power Dept.	U-15854	U-16605	36,956	3Y	0	1,186	1,848	0		38,771	3,877	Yes	0.11
City of Crystal Falls	U-15855	U-16606	16,266	3Y	4,400	1,618	1,627	0		16,340	1,634	Yes	0.00
Daggett Electric Department	U-15856	U-16607	1,251	3Y	0	42	63	1		1,351	135	Yes	0.00
City of Dowagiac	U-15858	U-16609	64,835	3Y	0	2,177	3,242	0		65,057	6,506	Yes	0.00
City of Eaton Rapids	U-15859	U-16610	94,269	3Y	2,263	4,588	5,845	0		93,846	9,385	Yes	0.57
City of Escanaba	U-15860	U-16611	143,562	3Y	0	4,793	7,178	297		141,667	14,167	Yes	0.00
City of Gladstone	U-15861	U-16612	32,539	3Y	0	1,071	1,627	0		32,396	3,240	Yes	0.00
Grand Haven Board of Light & Power	U-15862	U-16613	279,058	3Y	0	9,074	13,953	0		284,808	28,481	Yes	0.00
City of Harbor Springs	U-15863	U-16614	37,901	3Y	0	1,239	1,895	0		37,723	3,772	Yes	0.48
City of Hart	U-15864	U-16615	44,998	3Y	804	1,969	2,652	0		45,047	4,505	Yes	0.63
Hillsdale Board of Public Utilities	U-15865	U-16616	119,978	3Y	0	3,977	5,999	0		118,990	11,899	Yes	0.00
Holland Board of Public Works	U-15866	U-16617	1,021,821	3Y	0	32,902	51,091	2		1,041,000	104,100	Yes	0.00
Village of L'anse	U-15867	U-16618	12,228	3Y	0	421	611	0		11,954	1,195	Yes	0.00
Lansing Board of Water & Light	U-15868	U-16619	2,173,293	3Y	6,655	76,733	111,992	31		2,144,607	214,461	Yes	0.75
Lowell Light & Power	U-15869	U-16620	67,065	3Y	0	2,135	3,353	0		70,011	7,001	Yes	3.00
Marquette Board of Light & Power	U-15870	U-16621	306,572	3Y	14,016	19,482	22,337	1		306,095	30,609	Yes	0.00
Marshall Electric Department	U-15871	U-16622	106,918	3Y	1,318	4,479	6,005	0		105,227	10,523	Yes	0.00
Negaunee Dept. of Public Works	U-15872	U-16623	22,565	3Y	0	733	1,128	0		22,692	2,269	Yes	0.00
Newberry Water and Light Board	U-15873	U-16624	18,050	3Y	4,931	1,828	1,805	352		17,850	1,785	Yes	0.00
Niles Utilities Department	U-15874	U-16625	131,479	3Y	0	4,311	6,574	0		131,018	13,102	Yes	0.00
City of Norway	U-15875	U-16626	29,188	3Y	21,080	2,929	2,919	0		28,664	2,866	Yes	0.00
Village of Paw Paw	U-15876	U-16627	39,867	3Y	0	1,311	1,993	0		40,833	4,083	Yes	0.00
City of Petoskey	U-15877	U-16628	105,172	3Y	0	3,525	5,259	0		105,849	10,585	Yes	0.00
City of Portland	U-15878	U-16629	36,321	3Y	1,746	2,378	2,689	0		35,397	3,540	Yes	0.00
City of Sebawaing	U-15879	U-16630	41,086	3Y	0	1,305	2,054	0		42,491	4,249	Yes	0.19
City of South Haven	U-15880	U-16631	134,245	3Y	0	4,447	6,712	0		134,959	13,496	Yes	0.00
City of St. Louis	U-15881	U-16632	39,527	3Y	680	1,746	2,316	0		39,988	3,999	Yes	0.00
City of Stephenson	U-15882	U-16633	6,126	3Y	0	200	306	99		6,121	612	Yes	0.00
City of Sturgis	U-15883	U-16634	222,747	3Y	11,232	14,926	16,753	0		223,562	22,356	Yes	0.00
Traverse City Light & Power	U-15884	U-16635	323,112	3Y	778	11,129	16,545	9		322,971	32,297	Yes	0.00
Union City Electric Department	U-15885	U-16636	15,886	3Y	1,625	1,583	1,589	0		15,888	1,589	Yes	0.00
City of Wakefield	U-15886	U-16637	12,522	3Y	0	416	626	0		13,125	1,313	Yes	0.00
Wyandotte Dept. of Muncpal Service	U-15887	U-16638	292,801	3Y	0	9,593	14,640	0		292,164	29,216	Yes	0.00
Zeeland Board of Public Works	U-15888	U-16639	328,156	3Y	0	10,503	16,408	40		337,397	33,740	Yes	0.00
<b>***Total</b>			<b>103,291,192</b>		<b>2,687,036</b>	<b>5,020,171</b>	<b>6,378,575</b>	<b>23,184</b>	<b>157,057</b>	<b>103,573,239</b>	<b>10,357,324</b>		
<b>Compliance Renewable Energy %</b>						<b>4.9%</b>	<b>6.2%</b>				<b>10.0%</b>		

\*Sales from Annual Report

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

\*\*\*AES totals are aggregated.

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

**2014 Reporting Year**

Company Name	2014 Generated or Acquired (RECs)	2014 Generated or Acquired (ACECs)	Energy Credits Sold in 2014 (RECs)	2009-2013 Reported Incremental Cost of Compliance (\$)	2014 Reported Incremental Cost of Compliance (\$)	Remaining Anticipated Incremental Cost of Compliance (\$)	Total Plan Period Anticipated Incremental Cost of Compliance (Prior Years plus Anticipated) (\$)
<b>Investor Owned Utilities:</b>							
Alpena Power Company	18,040	0	0	2,292,925	350,589	500,000	3,143,514
Consumers Energy Company	3,004,566	0	47,844	54,968,171	36,500,000	50,200,000	141,668,171
Detroit Edison Company	3,662,195	0	0	166,933,955	65,187,478	398,684,444	630,705,877
Indiana Michigan Power Company	278,931	0	35,274	826,963	476,535	18,854,000	20,157,498
Northern States Power Company	28,144	0	1,589	0	0	0	0
Upper Peninsula Power Company	214,952	0	60,000	0	0	0	0
Wisconsin Public Service Corporation	66,799	0	42,149	0	0	0	0
Wisconsin Electric Power Co	31,052	0	0	153,495	339,673	5,583,895	6,077,063
	<b>7,304,679</b>	<b>0</b>	<b>186,856</b>	<b>225,175,509</b>	<b>102,854,275</b>	<b>473,722,339</b>	<b>801,752,123</b>
<b>Rate Regulated Cooperatives:</b>							
Cloverland Electric Cooperative	430,854	0	119,372	0	0	0	0
Thumb Electric Cooperative	8,815	0	0	0	0	0	0
	<b>439,669</b>	<b>0</b>	<b>119,372</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Member Regulated Electric Cooperatives:</b>							
Alger Delta Cooperative Electric Association	0	0	0	0	0	0	0
Bayfield Electric Cooperative	11	0	0	0	51	760	811
Cherryland Electric Cooperative	13,898	0	0	0	0	0	0
Great Lakes Energy Cooperative	50,708	0	0	0	0	0	0
Homeworks Tri-County Electric Cooperative	12,114	0	0	0	0	0	0
Midwest Energy Cooperative	21,453	0	0	0	0	0	0
Ontonagon County Rural Electrification Association	2,551	0	3,771	0	0	0	0
Presque Isle Electric and Gas Co-op	8,648	0	0	0	0	0	0
	<b>109,383</b>	<b>0</b>	<b>3,771</b>	<b>0</b>	<b>51</b>	<b>760</b>	<b>811</b>
<b>Municipally-Owned Electric Utilities:</b>							
City of Bay City	30,991	0	0	870,594	417,549	9,122,951	10,411,094
City of Charlevoix	6,199	0	2,100	90,457	90,877	2,758,984	2,940,318
City of Crystal Falls	5,730	0	0	0	0	0	0
City of Dowagiac	2,177	0	0	7,146	0	0	7,146
City of Eaton Rapids	0	0	0	206,533	122,852	505,488	834,873
City of Escanaba	0	0	0	0	0	262,883	262,883
City of Gladstone	0	0	0	0	0	0	0
City of Harbor Springs	6,200	0	0	21,190	0	0	21,190
City of Hart Hydro	4,949	0	0	10,595	0	0	10,595
City of Norway	31,883	0	53,043	0	0	0	0
City of Petoskey	11,770	0	3,109	167,370	163,377	5,461,628	5,792,375
City of Portland	4,086	0	0	12,436	40,672	825,888	878,996
City of Sebewiang	1,273	0	0	7,830	4,670	83,808	96,308
City of South Haven	6,712	0	0	7,719	0	0	7,719
City of St. Louis	2,749	0	0	45,862	29,231	572,344	647,437
City of Stephenson	646	0	0	0	0	0	0
City of Sturgis	23,300	0	0	12,051	0	0	12,051
City of Wakefield	460	0	0	0	0	0	0
Chelsea Dept of Electric & Water	5,632	0	0	153,901	220,452	1,876,039	2,250,392
Coldwater Board of Public Utilities*	43,410	0	0	3,411	0	0	3,411
Crosswell Municipal Light & Power Dept	996	0	0	0	822	76,474	77,296
Daggett Electric Dept	126	0	0	1,905	0	0	1,905
Grand Haven Board of Light & Power	24,794	0	0	804,545	0	0	804,545
Hillsdale Board of Public Utilities*	43,410	0	0	1,473	0	0	1,473
Holland Board of Public Works	44,206	0	0	6,352,628	0	0	6,352,628
Lansing Board of Water & Light	102,827	0	442	8,185,779	0	2,009,065	10,194,844
Lowell Light & Power	8,532	0	7,792	251,029	139,893	11,754,282	12,145,204
Marquette Board of Light & Power	31,829	0	0	42,175	0	0	42,175
Marshall Electric Dept*	43,410	0	0	7,186	0	0	7,186
Negaunee Dept of Public Works	0	0	0	0	0	0	0
Newberry Water & Light Board	9,370	0	0	2,173,289	0	0	2,173,289
Niles Utility Dept	4,311	0	0	7,529	0	0	7,529
Traverse City Light & Power	31,254	0	28,852	0	0	0	0
Union City Electric Dept*	43,410	0	0	506	0	0	506
Wyandotte Dept of Municipal Service	16,803	0	0	266,509	199,958	0	466,467
Village of Baraga	0	0	0	0	0	0	0
Village of Clinton*	43,410	0	0	269	0	0	269
Village of L'Anse	0	0	0	0	0	0	0
Village of Paw Paw	1,305	0	0	2,505	0	0	2,505
Zeeland Board of Public Works	36,702	0	0	1,106	10,226	0	11,332
	<b>501,222</b>	<b>0</b>	<b>95,338</b>	<b>19,715,528</b>	<b>1,440,579</b>	<b>35,309,834</b>	<b>56,465,941</b>
<b>Combined Annual Report*</b>							
<b>Alternative Electric Suppliers (AES):</b>							
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							
	<b>1,604,286</b>	<b>621</b>	<b>195,513</b>	<b>0</b>	<b>83,354</b>	<b>126,502</b>	<b>0</b>
<b>*Totals:</b>	<b>9,959,239</b>	<b>621</b>	<b>600,850</b>	<b>244,891,037</b>	<b>104,378,259</b>	<b>509,159,435</b>	<b>858,218,874</b>

Michigan Retail Sales (MWh): **103,291,192**  
 Michigan Estimated Renewable Energy %: **9.1%**

(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](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. Tri-County Electric's Solar Garden Program began in 2014. Consumers Energy Company's Community Solar Program was approved by the Commission in May 2015.<sup>1</sup>

### Experimental Advanced Renewable Program

Consumers Energy's original Experimental Advanced Renewable Program (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. Based on its most recently filed case, the company expects to be able to fund a total of 6 MW of solar installations through 2015 under its EARP.

Under Consumers Energy's original EARP (Phase 1 and 2), customers receive a firm price for each kilowatt hour (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 are 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. As of January 2015, the offer price is fixed at \$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 35 Phases. Of these phases 18 have been residential phases, 11 have been non-residential with the remainder of the 35 being from the first 2 phases and the developer program. At the end of 2015, Consumers Energy had a total of 5.08 MW of solar capacity participating or under construction as part of the EARP with 3.315 MW operational.

<sup>1</sup> <http://efile.mpsc.state.mi.us/efile/docs/17752/0037.pdf>

## SolarCurrents

DTE Electric's SolarCurrents pilot program initially included 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, which increased the SolarCurrents Program to 22MW.

The 5 MW Phase 1 customer-owned SolarCurrents program provided an up-front renewable energy credit (REC)[2] 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 \$0.02 (for non-residential customers) and \$0.03 (for residential customers) 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. As of December 31, 2015, the company has contracted for 5,030 kW from 589 customers representing full participation for Phase 1 of SolarCurrents and commissioned the remaining projects for Phase 2 of the program. SolarCurrents Phase 2 is represented by 242 projects representing 1.7 MW.

DTE Electric's company-owned SolarCurrents program includes solar photovoltaic projects ranging from 60 kW to 1,949 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, Rudolph Libbe, and Inovateus Solar, LLC to construct the solar generating facilities. The panels will be provided by either McNaughton-McKay Electric Company or Inovatus Solar, LLC. Currently, 26 projects are complete totaling 14.2 MW of solar PV capacity. An additional two projects are in the design phase totaling approximately 1.7 MW of capacity. The installation of the final two projects is expected in the summer of 2016 and will conclude the company-owned SolarCurrents pilot program with 15.9 MW, exceeding the program's 15.0 MW target.

## 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

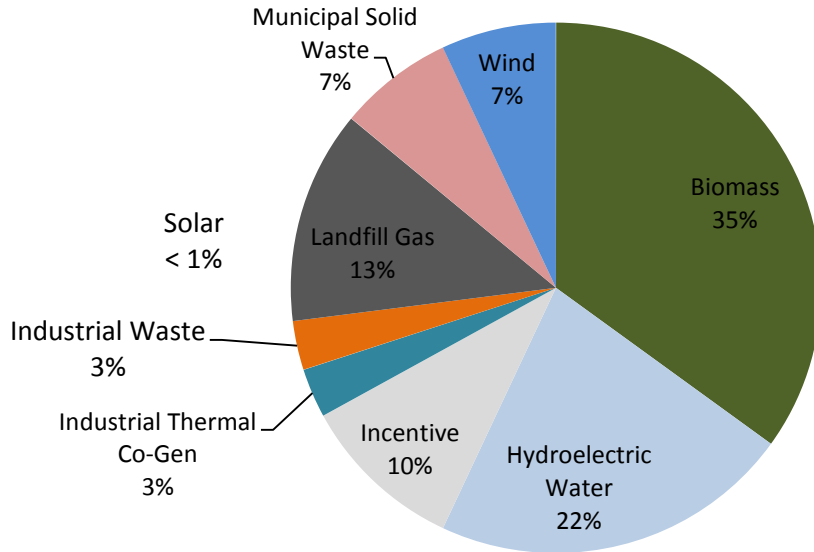
for a one time investment of \$470.00 each. The participants receive a \$75.00 Energy Optimization rebate per panel. The electric providers use the wholesale electric market prices to determine the amount of monthly bill credit to provide to the participants. It is estimated that the credit will be an 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.<sup>2</sup>

In 2014, Tri-County Electric began offering leases as part of its community Solar Garden Program. The solar array is 20.9 kW.

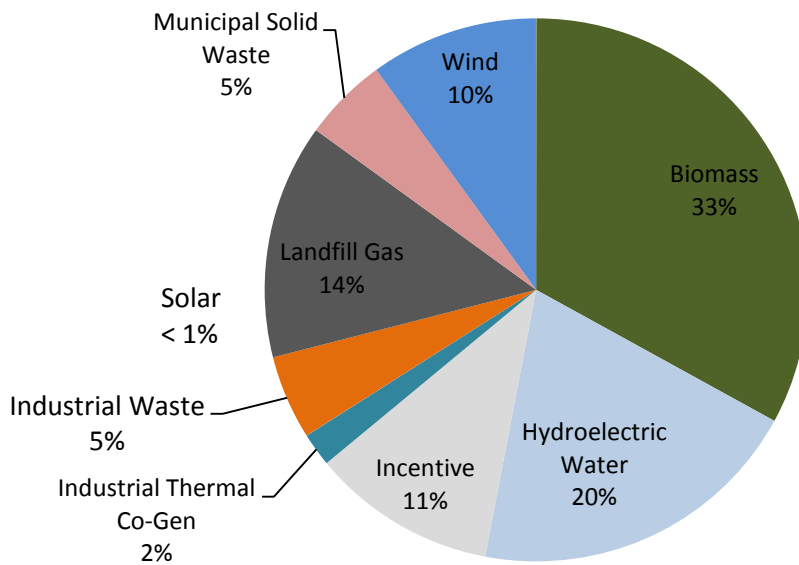
On May 14, 2015 the Commission conditionally approved Consumers Energy's application to add Community Solar to its renewable energy plan. It is the first community solar program offered by a rate regulated utility in Michigan. Participants will be allowed to purchase half kW blocks up to their annual usage and receive bill credits based on a value of solar model for 25 years. The program has a total capacity of up to 10 MW.

<sup>2</sup> See A Guidebook for Community Solar Programs in Michigan Communities <http://glrea.org/>

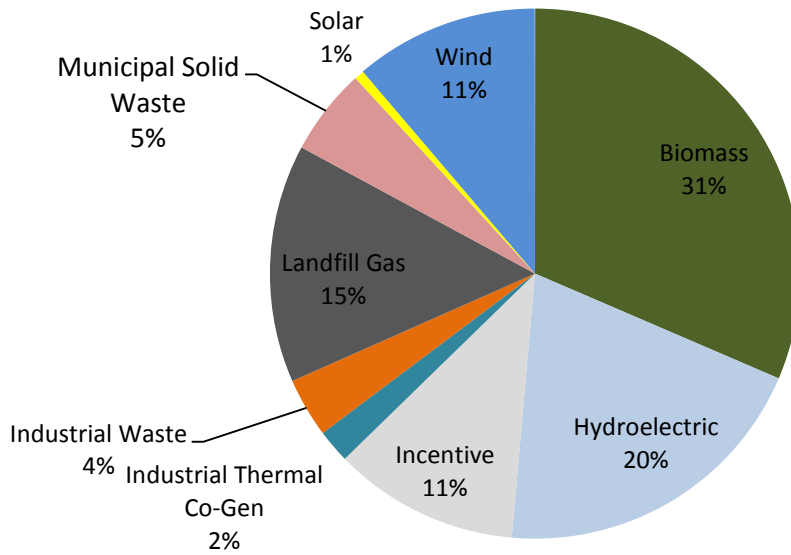
**MIRECS 2009 Vintage Energy Credits  
5,256,722 Total Credits**



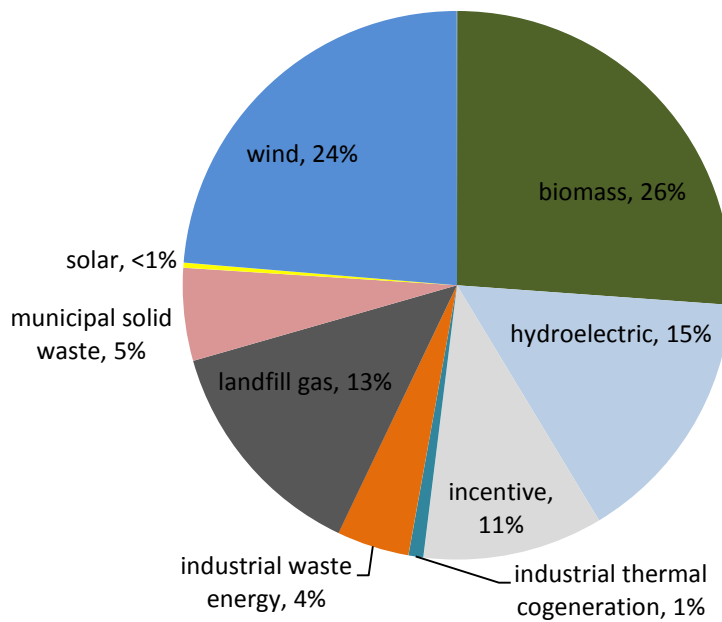
**MIRECS 2010 Vintage Energy Credits  
5,109,511 Total Credits**



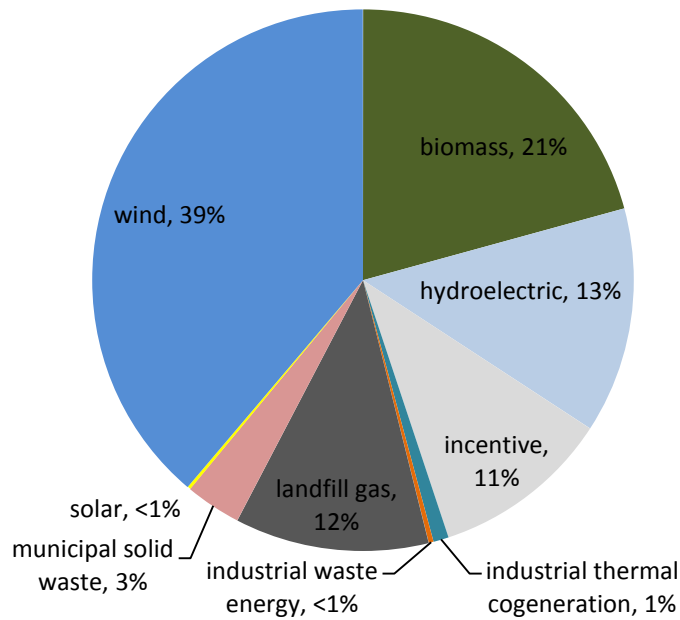
## MIRECS 2011 Vintage Energy Credits 5,404,910 Total Credits



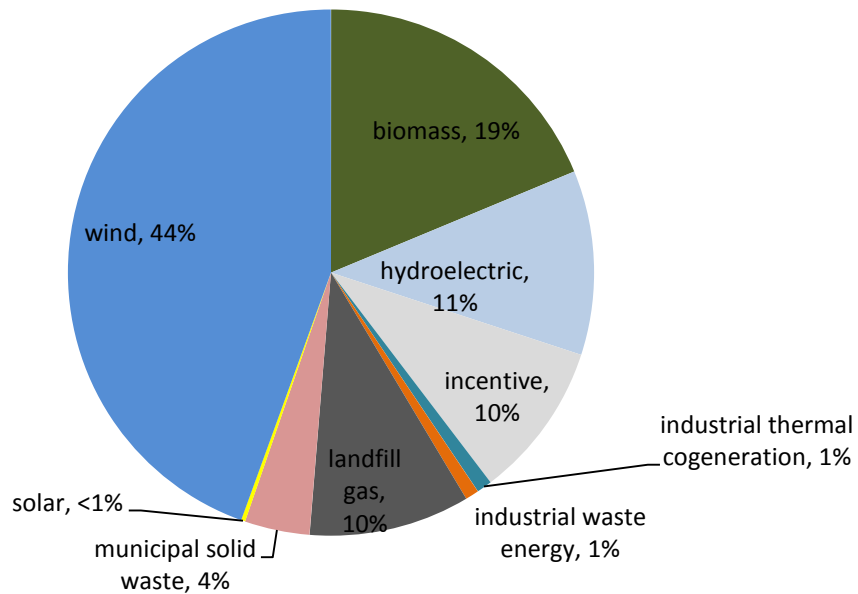
## MIRECS 2012 Vintage Energy Credits 6,642,728 Total Credits



**MIRECS 2013 Vintage Energy Credits  
8,279,504 Total Credits**

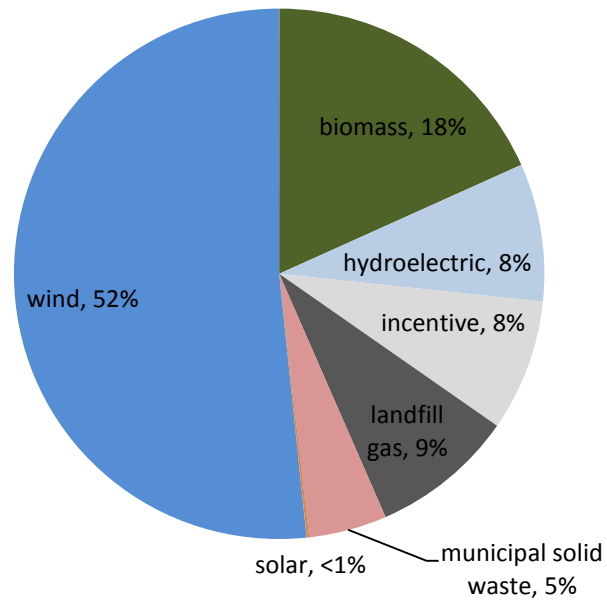


**MIRECS 2014 Vintage Energy Credits  
9,387,862 Total Credits**





## MIRECS 2015 Vintage Energy Credits 6,435,771\* Total Credits



\*Not all data has been reported for 2015.

## Appendix F- Contract Summary

Consumers Energy : Contracts								
Map Key	Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
34	<a href="#">Geronimo Huron Wind, LLC</a> (Apple Blossom)	100 MW	Less than \$45	Up to 15 years	Wind	Unsolicited	<a href="#">11/19/2015</a>	5/31/2016
26	<a href="#">Experimental Advanced Renewable Program Phases 16-21</a>	1425.1 kW	\$0.199-\$0.243	Up to 15 Years	Solar	Unsolicited	<a href="#">04/23/2015</a>	Varies
	<a href="#">Experimental Advanced Renewable Program Phases 10-15</a>	1193.7 kW	Non-Residential \$0.199-0.209 Residential \$0.243-0.249	Up to 15 Years	Solar	Unsolicited	<a href="#">05/02/2014</a>	Varies
32	<a href="#">Barton Malow Company</a>	Construction	\$59.00/MWh	Company Owned "Cross Winds"	Wind	04/25/2013	<a href="#">09/10/2013</a>	12/31/2014
	<a href="#">General Electric Company</a>	62 1.7-100 1.7 MW				10/2/2012	<a href="#">06/28/2013</a>	
	<a href="#">ABB Transformers</a>	2- 34.5KV to 345KV transformers				02/27/2013	<a href="#">09/10/2013</a>	
28	<a href="#">Blissfield Wind</a> (Beebe Wind)	Unchanged	Unchanged	20 Years	Wind	Amendment	<a href="#">01/26/2012</a>	12/31/2012
2	<a href="#">Heritage Garden Wind Farm I</a>	20 MW	Unchanged	20 Years	Wind	Amendment	<a href="#">01/26/2012</a>	12/31/2012
3	<a href="#">Heritage Stoney Corners Wind Farm II</a>	Unchanged	Unchanged	20 Years	Wind	Amendment	<a href="#">01/26/2012</a>	1/1/2012
3	<a href="#">Heritage Stoney Corners Wind Farm I (Phase 3)</a>	8.35 MW	\$106.20 MWh	20 Years	Wind	Result of Amendments	<a href="#">01/26/2012</a>	1/1/2012
4	<a href="#">Experimental Advanced Renewable Program</a>	987.7 KW	Commercial \$0.375/KWh Residential \$0.525/KWh	12 Years	Solar	Unsolicited	<a href="#">05/10/2011</a>	Varies
1	Vestas-American Wind Technology	56 V100 1.8 MW Turbines	\$110.00/MWh	Company Owned "Lake Winds"	Wind	1/15/2010	<a href="#">12/2/2010</a>	12/31/2012
	White Construction, Inc. <a href="#">U-15805 edocket files # 251-256</a>	Installation and construction				7/23/2010		
	GE Prolec Transformers, Inc.	2-125 KV transformers				7/27/2009		
2	<a href="#">Heritage Garden Wind Farm I</a>	28.6 MW	\$106.20 MWh	20 Years	Wind	Unsolicited	<a href="#">11/19/2010</a>	1/1/2012
3	<a href="#">Heritage Stoney Corners Wind Farm II</a>	12.3 MW	\$98.50 MWh	20 Years	Wind	Unsolicited	<a href="#">11/19/2010</a>	1/1/2012
4	<a href="#">Experimental Advanced Renewable Program</a>	Commercial 836.6 KW Residential 200.1 KW	Commercial \$0.45/KWh Residential \$0.65/KWh	12 Years	Solar	Unsolicited	<a href="#">12/21/2010</a>	5/1/2010
5	<a href="#">Scenic View Dairy**</a>	0.35 MW	\$83.07/MWh	63 Months	Anaerobic	Unsolicited	<a href="#">10/26/2010</a>	7/29/2010
6	<a href="#">Blissfield Wind</a> (Now Beebe Wind)	81 MW	\$100.88/MWh	20 Years	Wind	5/7/2009	<a href="#">7/27/2010</a>	12/31/2012
7	<a href="#">Harvest II Wind</a>	59.4 MW	\$98.38/MWh	20 Years	Wind	5/7/2009	<a href="#">7/27/2010</a>	12/31/2012
8	<a href="#">Michigan Wind 2</a>	90 MW	\$94.00/MWh	20 Years	Wind	5/7/2009	<a href="#">7/27/2010</a>	6/30/2012
9	<a href="#">WM Renewable Energy - Pine Tree Acres</a>	12.8 MW	\$98.75/MWh	20 Years	Landfill Gas	5/7/2009	<a href="#">7/27/2010</a>	6/30/2012
10	<a href="#">WM Renewable Energy - Northern Oaks Landfill</a>	1.6 MW	\$122.39/MWh	20 Years	Landfill Gas	1/29/2009	<a href="#">10/13/2009</a>	11/11/2010
11	<a href="#">NANR – Lennon</a>	1.6 MW	\$137.27/MWh	20 Years	Landfill Gas	1/29/2009	<a href="#">10/13/2009</a>	12/31/2010
12	Elk Rapids Hydro Electric** <a href="#">1</a>	0.7 MW	\$121.31/MWh	10 Years	Hydro	1/29/2009	<a href="#">10/13/2009</a>	7/11/2009
13	<a href="#">Zeeland**</a>	1.6 MW	\$122.20/MWh	7 Years	Landfill Gas	1/29/2009	<a href="#">10/13/2009</a>	7/11/2009
14	<a href="#">Freemont Community Digester</a>	3.1 MW	\$139.35/MWh	20 Years	Anaerobic	1/29/2009	<a href="#">10/13/2009</a>	11/11/2012
15	Scenic View Dairy** <a href="#">1, 2</a>	0.82 MW	\$138.17/MWh	7 Years	Anaerobic	1/29/2009	<a href="#">10/13/2009</a>	7/11/2009
	<b>Total</b>	<b>604.79 MW</b>						

\* 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
	<a href="#">Innovatus</a>	Up to 50 MW	\$113.52/MWh***	Company Owned	Solar	6/24/2015	<a href="#">12/11/2015</a>	10/31/2016
35	<a href="#">General Electric Company</a>	1.7MW-100 model turbines up to 50 MW	\$47/MIWh - \$53/MWh	Company Owned "Pinnebog Wind"	Wind	2/17/2014	<a href="#">12/18/2014</a>	12/31/2015
	<a href="#">Aristeo Construction Company</a>	Installation and construction				6/20/2014		
16	<a href="#">Rudolf Libbe, Inc</a>	750 kW	\$3,741/kW	Company Owned	Solar	09/28/2012	<a href="#">7/8/2014</a>	04/2015
	<a href="#">Inovateus Solar, LLC.</a>	504 kW						
33	<a href="#">Big Turtle Wind Farm, LLC</a>	20 MW	\$53/MWh	20 Years	Wind	Unsolicited	<a href="#">09/24/2013</a>	Expected 2014
31	<a href="#">Pheasant Run Wind, LLC</a>	74.8 MW	Up to \$49.25/MWh	20 Years	Wind	Unsolicited	<a href="#">5/17/2013</a>	12/31/2014
31	<a href="#">Pheasant Run Wind II, LLC</a> "Brookfield"	74.8 MW	Up to \$49.25/MWh	Company Owned	Wind	Unsolicited	<a href="#">5/17/2013</a>	12/31/2014
16	<a href="#">SolarCurrents Phase II</a>	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	<a href="#">11/16/2012</a>	Varies
29	<a href="#">Tuscola Wind II, LLC</a>	100 MW	\$49.25/MWh***	20 Years	Wind	5/3/2012	<a href="#">10/31/2012</a>	12/31/2013
30	<a href="#">General Electric Company</a>	1.6MW-100 model turbines up to 110 MW	\$52.50/MWh	Company Owned "Echo Wind"	Wind	10/12/2011	<a href="#">9/11/2012</a>	12/31/2013
	<a href="#">Barton Malow Company</a>	Installation and construction				4/17/2012		
24	<a href="#">Michigan Waste Energy, Inc.</a>	Up to 65,000 RECs/Year	\$7.00/REC	13 Years	Incinerator	Unsolicited	<a href="#">12/6/2011</a>	1991
16	<a href="#">Nova Consultants, Inc.</a>	Solar EPC	Up to \$48 Million	Company Owned	Solar	2/28/2011	<a href="#">11/10/2011</a>	12/31/2015
16	<a href="#">McNaughton-McKay Electric Company</a>	Supply up to 12 MW of Modules	Up to \$24 Million			3/24/2011		
16	<a href="#">Inovateus Solar, LLC</a>	Supply up to 12MW						
27	<a href="#">General Electric Company</a>	Up to 69 1.6MW-100 Turbines	\$61-\$64/MWh	Company Owned "Thumb Wind"	Wind	3/9/2011	<a href="#">9/13/2011</a>	12/31/2012
	<a href="#">Barton Malow Company</a>	Installation and construction				5/6/2011		
25	<a href="#">Tuscola Bay Wind, LLC</a>	120 MW	Up to \$60.90/MWh	20 Years	Wind	11/18/2010	<a href="#">8/25/2011</a>	10/31/2012
20	<a href="#">L'Anse Warden Electric Company</a>	110,374 RECs	\$11.98 (Average of 4 REC/ACEC Contracts)	Amendment Acquiring Vintage RECs	Biomass	8/18/2009	<a href="#">8/25/2011</a>	7/1/2010
18	<a href="#">Gratiot County Wind</a>	12.8 MW additional	Unchanged from original contract	Company Owned	Wind	Amendment	<a href="#">5/10/2011</a>	12/31/2012
16	<a href="#">Nova Consultants</a>	Unchanged from original contract	Unchanged from original contract	Company Owned	Solar	Extension	<a href="#">12/21/2010</a>	12/31/2011
17	<a href="#">Blue Water Renewables - Smiths Creek Landfill</a>	3.2 MW	\$99.00/MWh	20 Years	Landfill	Unsolicited	<a href="#">1/20/2011</a>	12/31/2011
18	<a href="#">Gratiot County Wind</a>	110.4 MW 89.6 MW Company Owned	\$91.43/MWh Up to \$94.43/MWh	20 Years Company Owned	Wind	8/18/2009	<a href="#">9/14/2010</a>	05/1/2012 03/31/2012

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
19	<a href="#">WM Renewable Energy - Eagle Valley Landfill</a>	3.2 MW	Combined average price of \$98.94/MWh	20 years	Landfill	8/18/2009	<a href="#">8/10/2010</a>	6/1/2011
20	<a href="#">L'Anse Warden Electric Company</a>	17 MW		20 years	Biomass	8/18/2009	<a href="#">8/10/2010</a>	7/1/2010
21	<a href="#">Boyce Hydro**</a>	Firm 210,000 RECs w/additional 112,000 RECs dependent on generation	\$7.75/ REC	7 Years	Hydro	12/23/2009	<a href="#">4/27/2010</a>	3/16/2010
16	<a href="#">Nova Consultants</a>	Up to 3 MW	Up to \$18 Million	Company Owned	Solar	11/23/2009	<a href="#">3/2/2010</a>	12/31/2010
22	<a href="#">Heritage Sustainable Energy Stoney Corners Wind Farm</a>	12.2 MW	Unchanged from original contract	20 Years	Wind	Unsolicited	<a href="#">12/1/2009</a>	1/1/2011
23	<a href="#">UPPCO**</a>	Firm 500,000 RECs	Combined average price of \$12.46/REC	7 Years	Hydro	12/23/2009	<a href="#">12/1/2009</a>	10/1/2009
Not Shown	<a href="#">Sterling Planet**</a>	Firm 2,500,000 RECs		10 Years	MISC	12/23/2009	<a href="#">12/1/2009</a>	10/1/2009
22	<a href="#">Heritage Sustainable Energy Stoney Corners Wind Farm</a>	14 MW	\$116.00/MWh	20 Years	Wind	Unsolicited	<a href="#">4/30/2009</a>	12/21/2009
	<b>Total</b>	<b>990.65 MW</b>						
<p>* Per MWh prices represent leveled costs.                  ** Pre-existing projects prior to 2008 PA 295 - The commercial operation date would refer to the effective date of the contract.                  ***Staff calculated leveled cost</p>								

Alpena Power Company : Contracts								
	Seller	Quantity	Cost	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
26	<a href="#">Consumers Energy</a>	"Bulk of RECs needed to meet the RPS"	Consumers Energy Company's Average Cost of RECs	20 Years	MISC	Unsolicited	<a href="#">9/15/2009</a>	8/4/2009
AEP/Indiana Michigan : Contracts								
	Seller	Quantity	Cost	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
	<a href="#">Fowler Ridge Wind Farm II</a>	50 MW (7.5MW for MI)	Redacted	20 Years	Wind	Unsolicited	<a href="#">9/15/2009</a>	2/15/2010
	<a href="#">Wildcat I Wind Farm, LLC</a>	100 MW (60MW for MI)	Redacted	20 years	Wind	Competitive Solicitation	<a href="#">8/25/2011</a>	12/31/12
Wisconsin Electric Power Company : Contracts								
	Seller	Quantity	Cost	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
	<a href="#">Cadillac Renewable Energy, LLC</a>	REC-Only Redacted	Redacted	Redacted	Biomass	Competitive Solicitation	<a href="#">01/23/2014</a>	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
6/20/2015	RFP	Up to 50 MW Solar Engineering Procurement and Construction	50 MW	Yes	Solar	53 project sites / 12 proposals
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 (Pinnebog)				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

\* 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

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
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

<b>Appendix H - PA 295 CONTRACT RENEWABLE ENERGY PROJECTS</b>						
<b>MPSC Rate Regulated Electric Providers</b>						
<b>Map Key</b>	<b>Renewable Project Name</b>	<b>County</b>	<b>Capacity (MW)</b>	<b>Type</b>	<b>Power Purchaser</b>	<b>Commercial Operation Date</b>
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
	<b>Biomass Total</b>		<b>21.3</b>	<b>MW</b>		
12	Elk Rapids Hydro	Antrim	0.7	Hydro	DTE	Pre-Act 295 Project
	<b>Hydro Total</b>		<b>0.7</b>	<b>MW</b>		
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
	<b>Landfill Gas Total</b>		<b>24</b>	<b>MW</b>		
4	Experimental Advanced Renewable Program	Varies	6	Solar	Consumers Energy	2009-Present
	DTE Solar	Lapeer/Wayne	50	Solar	DTE Owned	2016
	Solar Gardens	Varies	5	Solar	Consumers Energy Owned	2016
16	SolarCurrents	Varies	22	Solar	DTE Owned and Customer Owned	2009 - Present
	<b>Solar Total</b>		<b>83</b>	<b>MW</b>		
34	Apple Blossom	Huron	100	Wind	Consumers Energy	December 2016
28	Beebe	Gratiot	81	Wind	Consumers Energy	December 2012
33	Big Turtle	Huron	20	Wind	DTE	December 2014
31	Brookfield	Huron	74.8	Wind	DTE Owned	February 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
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
35	Pinnebog	Huron	51	Wind	DTE Owned	December 2016
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
	<b>Wind Total</b>		<b>1,568</b>	<b>MW</b>		
	<b>Total Act 295 Contracts</b>		<b>1,697</b>	<b>MW</b>		



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
Apple Blossom	Huron	100	3.3	30		Geronimo Energy	Consumers Energy	Expected 12/31/2016
Beebe	Gratiot	81	2.4	34	Nordex	Exelon & Great Lakes Wind	Consumers Energy	December 2012
Beebe 1B	Gratiot	50.4	2.4	21	Nordex	Exelon	Municipal Utility	December 2014
Big Turtle	Huron	20	2.0	10	Gamesa	Heritage Sustainable Energy	DTE	December 2014
Big Turtle II	Huron	30	2.0	15	Gamesa	Heritage Sustainable Energy		Expected 12/31/2016
Brookfield	Huron	74.8	1.7	44	GE Energy	NextEra Energy	DTE	February 2014
Cross Winds	Tuscola	105.4	1.7	62	GE Energy	Consumers Energy	N/A	December 2014
Deerfield Wind	Huron	150	2	72	Vestas	RES Americas	Wolverine Power Cooperative	Expected 12/31/2016
Echo	Huron	112	1.6	70	GE Energy	DTE	N/A	September 2014
Garden I	Delta	28	2.0	14	Gamesa	Heritage Sustainable Energy	Consumers Energy**	September 2012
Gratiot County	Gratiot	212.8	1.6	133	GE Energy	Invenergy & DTE	DTE	June 2012
Harvest	Huron	52.8	1.65	32	Vestas	Exelon	Wolverine Power Cooperative	2008
Harvest II	Huron	59.4	1.8	33	Vestas	Exelon	Consumers Energy	November 2012
Lake Winds	Mason	100.8	1.8	56	Vestas	Consumers Energy	N/A	November 2012
Mackinaw City	Emmet	1.8	0.9	2	NEG Micon	Mackinaw Power	Consumers Energy	2001
McKinley	Huron	14.4	1.6	9	GE Energy	DTE	N/A	December 2012
Michigan Wind I	Huron	69	1.5	46	GE Energy	Exelon	Consumers Energy	2008
Michigan Wind II	Sanilac	90	1.8	50	Vestas	Exelon	Consumers Energy	January 2012
Michigan Wind III	Sanilac	153	2.4	63	Nordex	Exelon	Wolverine Power Cooperative	Expected 12/31/2016
Minden	Sanilac	32	1.6	20	GE Energy	DTE	N/A	December 2012
Pheasant Run Wind	Huron	74.8	1.7	44	GE Energy	NextEra Energy	DTE	December 2013
Pinnebog	Huron	51	1.7	30	GE Energy	DTE	DTE	Expected 12/31/2016
Sigel	Huron	64	1.6	40	GE Energy	DTE	N/A	December 2012
Stoney Corners	Missaukee & Osceola	60	2 - 2.5	29	Repower, Fuhrlander, Northern Power Systems	Heritage Sustainable Energy	Consumers Energy, DTE, Traverse City Light & Power	2008 - October 2012
Tuscola Bay Wind	Tuscola, Bay & Saginaw	120	1.6	75	GE Energy	NextEra Energy	DTE	December 2012
Tuscola Wind II	Tuscola & Bay	100.3	1.7	59	GE Energy	NextEra Energy	DTE Electric	November 2013
<b>Totals</b>		<b>2,007.7</b>	<b>MW</b>	<b>1,093</b>	<b>Turbines</b>			
<b>Operational Totals</b>		<b>1,523.7</b>	<b>MW</b>	<b>883</b>	<b>Turbines</b>			

**Bold text indicates the wind farm is operational.**

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

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

# Appendix I

- 22 Apple Blossom, 100 MW
  - 1 Beebe Wind, 81 MW
  - 20 Beebe 1B, 50.4 MW
  - 21 Big Turtle, 20 MW
  - 23 Big Turtle II, 30 MW
  - 19 Brookfield, 74.8 MW
  - 16 Crosswinds, 105 MW
  - 24 Deerfield Wind, 150 MW
  - 2 Echo Wind, 112 MW
  - 3 Garden Wind Farm, 28 MW
  - 4 Gratiot County Wind, 212.8 MW
  - 5 Harvest I Wind, 52.8 MW
  - 6 Harvest II Wind, 59.4 MW
  - 7 Lake Winds Energy Park, 100.8 MW
  - 8 Mackinaw City, 1.8 MW
  - 9 McKinley, 14.4 MW
  - 10 Michigan Wind I, 69 MW
  - 11 Michigan Wind II, 90 MW
  - 25 Michigan Wind III, 153 MW
  - 12 Minden, 32 MW
  - 18 Pheasant Run Wind, 74.8 MW
  - 26 Pinnebog, 51 MW
  - 15 Sigel, 64 MW
  - 14 Stoney Corners, 60 MW
  - 13 Tuscola Bay Wind, 120 MW
  - 17 Tuscola Bay Wind II, 100 MW
- 1523.7 MW Total Operational
- Currently Operational    ● Under Development

# Michigan Wind Farm Map

