



CITY COUNCIL/ELECTRICAL
ADVISORY COMMITTEE

November 11, 2015 – 6:00 p.m.
Regular Meeting

CITY COUNCIL

Marc Tall, Mayor
Ronald Beauchamp, Mayor Pro-Tem
Patricia Baribeau, Council Member
Michael Satten, Council Member
Ralph Blasier, Council Member

ADMINISTRATION

James V. O'Toole, City Manager
Robert S. Richards, CMC, City Clerk
Ralph B.K. Peterson, City Attorney
Mike Furmanski, Electrical Superintendent
Melissa Becotte, City Controller

ELECTRICAL ADVISORY COMMITTEE

Tim Wilson, Chairperson
Ann Bissell, Vice Chairperson
Larry Arkens, Committee Member
Glendon Brown, Committee Member
John Anthony, Committee Member
Jack Mellinger, Committee Member
Vacant Seat

Escanaba City Council Chambers: 410 Ludington Street - Escanaba, MI 49829

Meeting Agenda

Wednesday, November 11, 2015

CALL TO ORDER

ROLL CALL

APPROVAL/ADJUSTMENTS TO THE AGENDA

CONFLICT OF INTEREST DECLARATION

NEW BUSINESS

1. **Update - Electric Department –General Operations.**

Explanation: Electrical Superintendent Mike Furmanski will update the City Council, Electrical Advisory Committee and Citizens of Escanaba on the current departmental activities.

2. **Discussion – Community Solar Garden Concept – P.A. 295 – The Clean, Renewable and Efficient Energy Act.**

Explanation: Administration will discuss the concept of installing a Community Solar Garden in the City of Escanaba that would be in compliance with energy efficient requirements found in P.A. 295, the Clean, Renewable and Efficient Energy Act.

3. **Update – Power Plant Facility and Site.**

Explanation: The administration will update the City Council, Electrical Advisory Committee and the Citizens of Escanaba regarding the status of the power plant.

GENERAL PUBLIC COMMENT

COMMISSION/STAFF COMMENT AND ANNOUNCEMENTS

ADJOURNMENT

The City of Escanaba will provide all necessary, reasonable aids and services, such as signers for the hearing impaired and audiotapes of printed materials being considered at the meeting to individuals with disabilities at the meeting/hearing upon five days notice to the City of Escanaba. Individuals with disabilities requiring auxiliary aids or services should contact the City of Escanaba by writing or calling City Hall at (906) 786-9402.

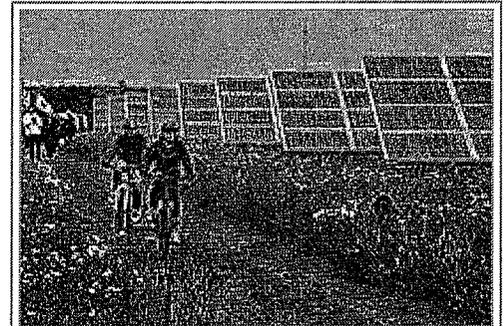
Respectfully Submitted,

James V. O'Toole
City Manager

Community solar farm

From Wikipedia, the free encyclopedia

A **community solar farm** or **garden** is a solar power installation that accepts capital from and provides output credit and tax benefits to individual and other investors. In some systems you buy individual solar panels which are installed in the farm after your purchase. In others you purchase kW capacity or kWh of production. The farm's power output is credited to investors in proportion to their investment, with adjustments to reflect ongoing changes in capacity, technology, costs and electricity rates. Companies, cooperatives, governments or non-profits operate the farms.^[1]



Westmill Solar Park

Centralizing the location of solar systems has advantages over residential installation that include:

- Trees, roof size and/or configuration, adjacent buildings, the immediate microclimate and/or other factors which may reduce power output.^{[2][3]}
- Building codes, zoning restrictions, homeowner association rules and aesthetic concerns.^[4]
- Lack of skills and commitment to install and maintain solar systems.^[2]
- Expanding participation to include renters and others who are not residential property owners.^[1]

The Solar Gardens Institute^[5] maintains a national directory^[6] of community solar projects and organizations. As of 2011, farms encompassed both photovoltaic and concentrating solar power technologies.

Contents

- 1 Community solar in the United States
 - 1.1 California
 - 1.2 Colorado
 - 1.3 Florida
 - 1.4 Massachusetts
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- 2 Community solar in the United Kingdom
- 3 See also
- 4 References

Community solar in the United States

An estimated 85 percent of US residential can neither own nor lease systems because their roofs are physically unsuitable for solar or because they live in multi-family housing. At least 52 projects are under development in at least 17 states, and at least 10 states encourage their development through policy and

programs.^[7]

Federal and other tax policies are necessary to finance community solar farms. U.S. Senator Mark Udall introduced the SUN Act (Solar Uniting Neighborhoods) to extend the existing 30% tax credit to community solar farms in 2010 and 2011.^{[8][9]}

The bill would enable groups of individuals or homeowner associations to develop utility-scale solar power facilities in collaboration with local utilities that would distribute the power and credit owners based on their percentage of investment in the solar farm, extending the tax credits accordingly.^[9]

“These projects have the potential to drastically increase the adoption of clean energy nationwide, but the tax code hasn’t kept up,” Udall said. “You can get a 30-percent tax credit for putting a solar panel on your house, but not for investing in a solar farm.”^[9]

California

SolarShares^[10] (2007) offers customers of the Sacramento Municipal Utility District the opportunity to buy "shares" in its solar farm. The electricity generated by each customer’s “shares” appears as a credit on his or her energy bill, a savings expected to average between \$4–\$50 a month, given sunshine variability. For a monthly fee—starting at \$10.75 a month (averaging 9%) for a 0.5 kW system—participants opt into solar power production. The current phase is sold out, although plans are in progress to expand capacity.^[11]

The PVUSA array in Davis, California (2001) provides virtual net metering for city-owned meters. The California legislature passed a law specifically allowing this for this individual array. Senate Bill 43 was signed by Governor Brown on September 28, 2013 ^[12]

Colorado

Colorado legislation passed in 2010 that requires the Public Utilities Commission to rewrite rules to direct investor-owned utilities to offer rebates for community solar gardens. ^[9]

HB10-1342, the Community Solar Gardens Act specified:^[13]

- Energy must be sold directly to an investor-owned utility.
- Utility pays retail + REC’s.
- Utility provides Virtual Net Metering credit on the subscribing customer’s bill.
- System size limited to 2 megawatts (MW).
- 6 MW total limit on the program for first three years.
- There must be at least 10 subscribers.
- Subscribers must be located in same county or city as the solar garden. Subscribers whose county has a population less than 20,000 may subscribe in a neighboring county.
- Subscribers may buy up to 120% of their own power use worth of solar power.
- Either a for-profit or nonprofit entity may own and administer the solar garden.

In Colorado, Xcel Energy customers continue to pay the standard non-energy fees, but can buy enough solar shares to offset 120 percent of their load.^[7]

Florida

Orlando Utilities Commission (OUC) has a solar farm that began producing power in October 2013. The municipal utility, which has approximately 55 percent of its 230,000 electric customers living in multi-family housing, sought a unique solution for those wanting to use solar power, but unable to modify the homes they rent or lease. This project also allows those customers the ability to buy into solar without all of the upfront costs. Subscribing customers volunteered to pay a higher rate on their power bill, but they were also able to lock in that rate for the estimated life of the project – 25 years. Today, 1,312 solar panels are generating up to 400 kilowatts (kW) of electricity at OUC's Gardenia Operations facility next to Interstate 4. The panels are on three canopies, which have created 151 covered LED-lit parking spaces over about 2.5 acres. A total of 39 customers have subscribed to the project. Each kW of the array's 400 kW was sold in blocks, with a limit of 15 blocks per customer. Each block represents 112 kilowatt hours (kWh) on a customer's monthly bill, so the maximum benefit per customer is 1,680 kWh. The average OUC residential customer uses around 1,200 kWh. Any unused power is credited on the account for the next month.^[14]

Massachusetts

The Green Communities Act of 2008 authorized what was formally known as “neighborhood net-metering”, which allowed a group of residents in a neighborhood/town to pool resources to cover the capital cost of a renewable energy installation.^[15]

Residents of Brewster founded the first cooperatively run solar garden in Massachusetts. The solar garden was built by solar installer My Generation Energy Inc. Each member of the cooperative was to receive benefits from the co-op; including the net-metering credits from the solar garden through Nstar.^[15] Known as the Brewster Community Solar Garden,^{[16][17]} it is a 345.6 kW community solar farm located on Cape Cod.

Massachusetts and the Federal government each offered incentives to improve solar economics. A traditional investment in photovoltaics without incentives would take 12 or more years to pay back the initial cost. The incentives lowered the payback period to 6–10 years.^[15]

Gardens built by developer Clean Energy Collective started producing power in Newton, Massachusetts in July 2014. The company teamed with energy efficiency firm Next Step Living.^[7]

Utah

Electric utilities in St. George built a large photovoltaic facility to exploit 310 days a year with sunlight, and allowed residents to purchase it to supplement conventional energy. The program required no set-up or maintenance for the participant.

Participation is sold in whole and half units of 1 kilowatt (“kW”). A 1 kW “unit” on the SunSmart grid cost \$6,000. One unit equals approximately 15% of the average home's monthly power (or about 140 kWh). A one-time tax credit of 25% of the purchase price, up to a maximum of \$2,000, was available from the state of Utah. Purchasers received a monthly energy credit for the energy produced that month by the “unit” of panels.^{[18][19]}

Community solar in the United Kingdom

The first community solar farm in the United Kingdom is the 5 MW Westmill Solar Park, near Watchfield.^[20]

See also

- Community wind energy
- Remote area power supply
- Wadebridge Renewable Energy Network

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Categories: Solar power stations | Tax credits

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

**John D. Quackenbush, Chairman
Greg R. White, Commissioner
Sally A. Talberg, Commissioner**

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

February 13, 2015



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Introduction

Report Criteria

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

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

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

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

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

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

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

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

Renewable Energy Plans and Commission Approval

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

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

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

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

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

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

The Act allows providers to recover the incremental costs of compliance with the renewable energy standard requirements through a renewable energy surcharge on customer bills. Commission approval is only required for rate-regulated electric providers. Section 45 of the Act limits the retail rate impact (surcharge amount) of the renewable energy standard to the following:

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

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

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

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

Renewable Energy Cost Reconciliation Cases and Commission Approval

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

Summary of Renewable Energy Data Collected

Electric providers are directed by Section 51(1) of PA 295 to file annual reports for each plan year beginning with 2009. Michigan electric provider annual reports for 2009 through 2013 are available on the Commission's website.⁷ Commission Staff worked with electric providers to develop an annual report template based on Section 51 of the Act. A summary of data from annual reports is shown in *Appendix C*.

Renewable Energy Credit Requirements – 2013 Compliance

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

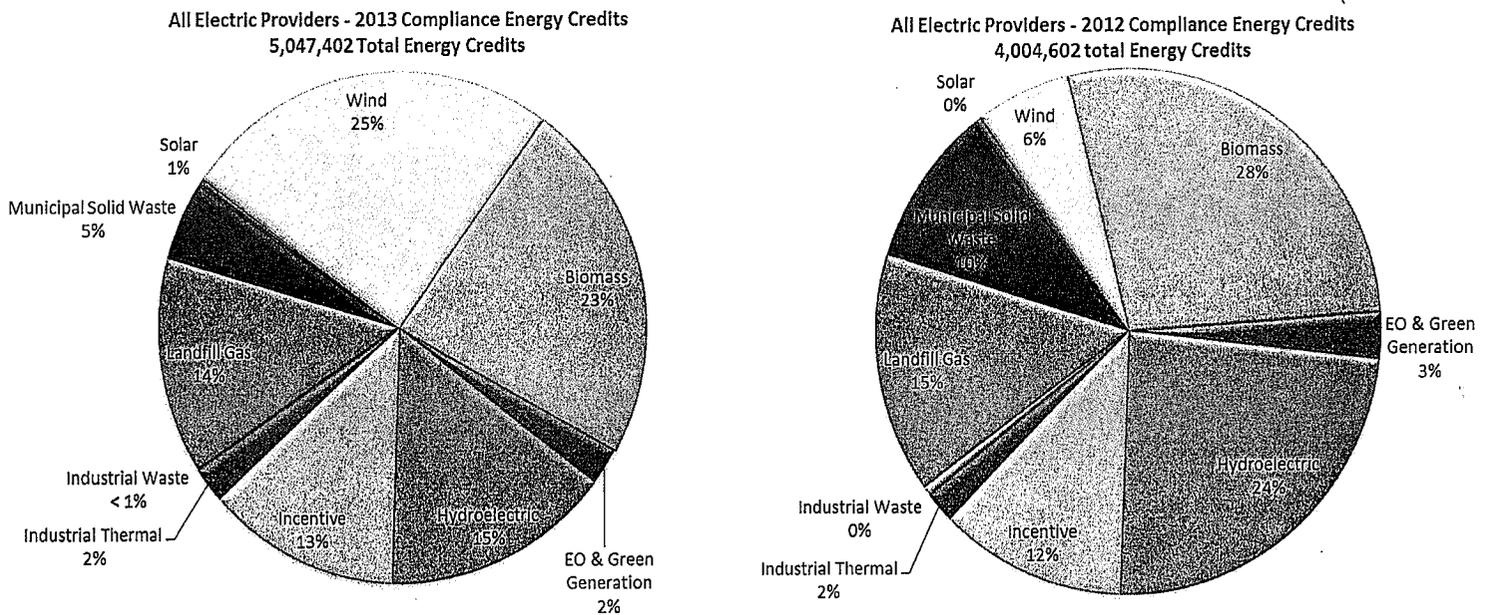
system. In the interim, the MPSC has suspended all of DPL's renewable energy filings. DTE Electric is expected to meet the 10 percent renewable energy standard in 2015.

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

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

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

Figure 1: Compliance Energy Credit Breakdown

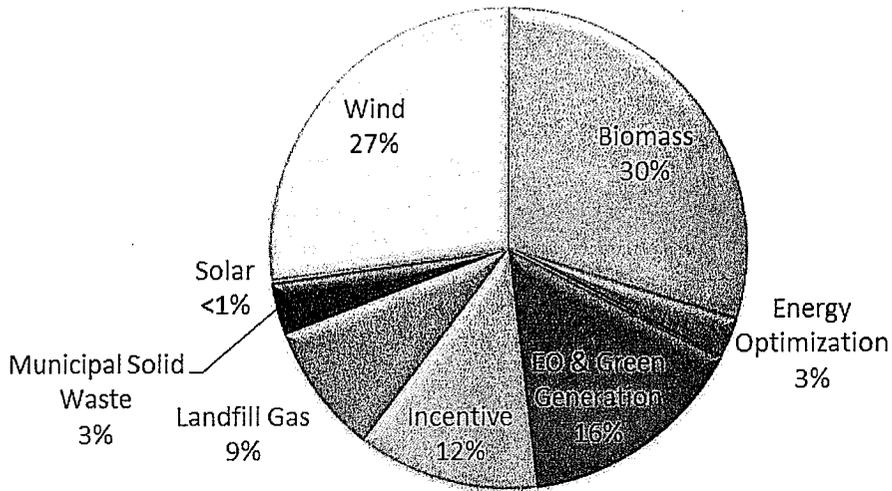


⁸ The number of baseline renewable energy credits is the sum of the number of renewable energy credits that would have been transferred to the electric provider plus the number of credits that would have been generated by the electric provider during the year preceding the effective date of the Act.

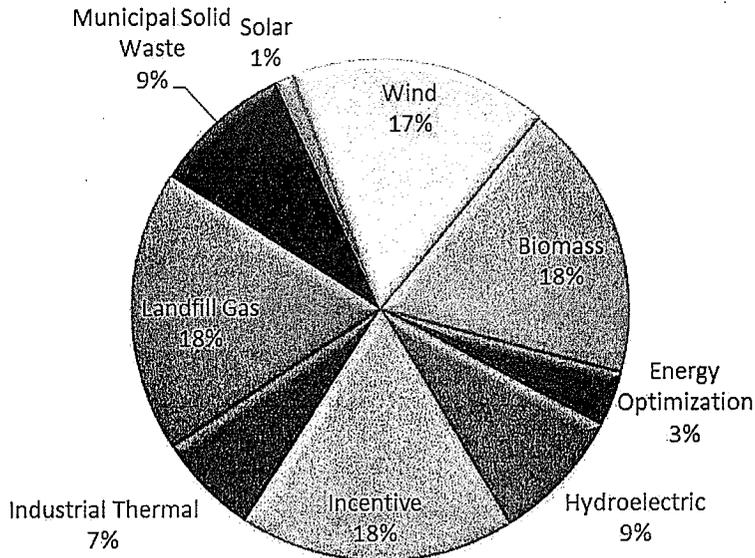
⁹ Energy credits are “retired” when used for compliance.

Figure 1: Compliance Energy Credit Breakdown (continued)

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



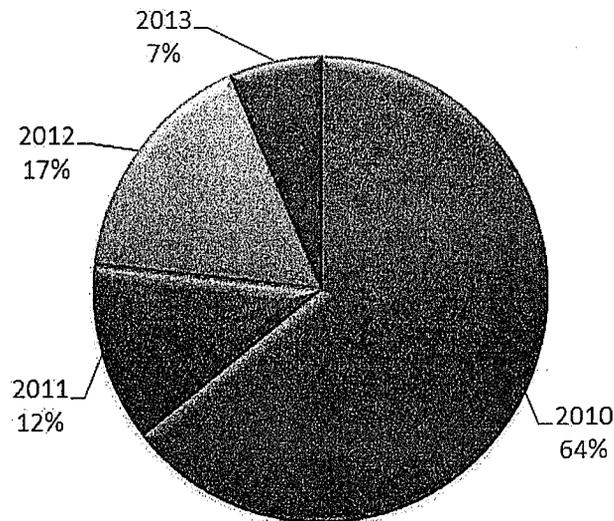
**DTE Electric – 2013 Compliance
1,756,567 Total Energy Credits**



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

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

Figure 2: 2013 Compliance Energy Credits – Year of Generation



Status of Renewable Energy

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

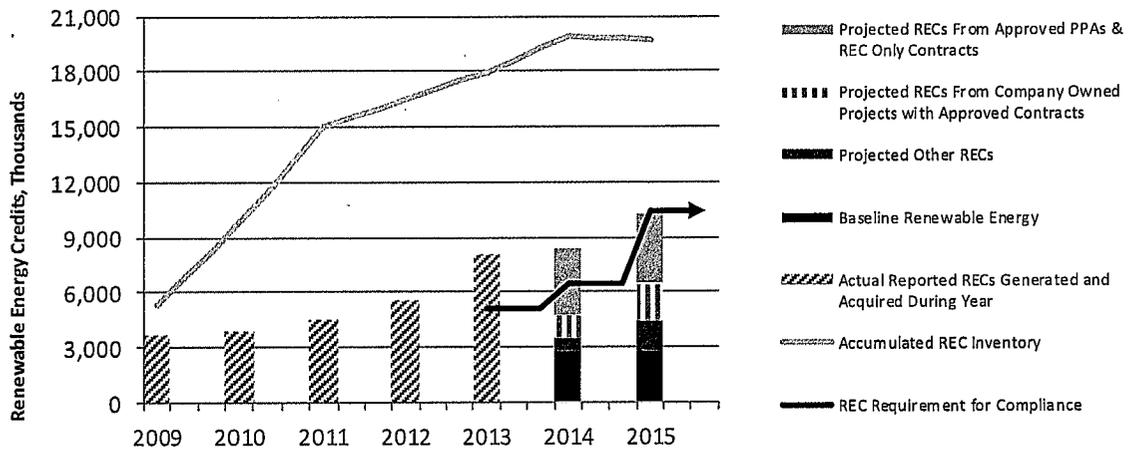
A projection of Michigan's energy credits for 2014 through 2015 is shown in **Figure 3** along with the annual REC compliance requirement and accumulated RECs. In order to reflect only renewable energy generated or acquired in each year, accumulated RECs from previous years are not included in the yearly renewable energy totals but are shown separately in the line called accumulated REC inventory. The projected renewable energy includes: i) baseline renewable energy (renewable energy that was operational prior to the passage of PA 295); ii) a projection of other RECs from non-rate regulated providers and contracts that do not require Commission approval under PA 295; iii) an estimate of RECs from PA 295 approved contracts for company-owned renewable energy projects; and iv) power purchase agreements and REC-only contracts.

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

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

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

Figure 3: Michigan Renewable Energy Projection, 2014 – 2015

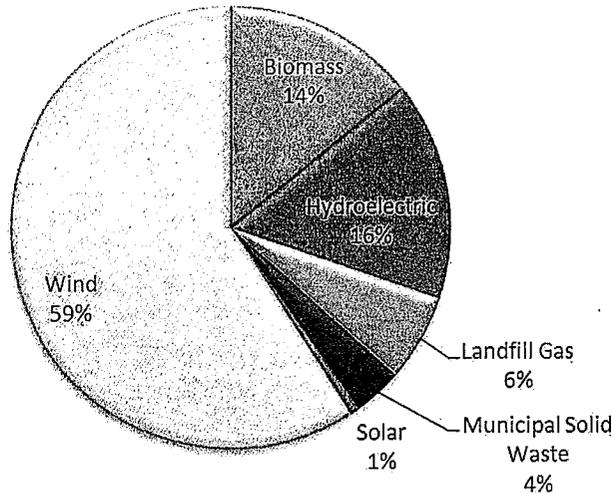


Source: Electric provider annual reports, PA 295 contracts, MIRECS and Commission Staff projections.

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

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

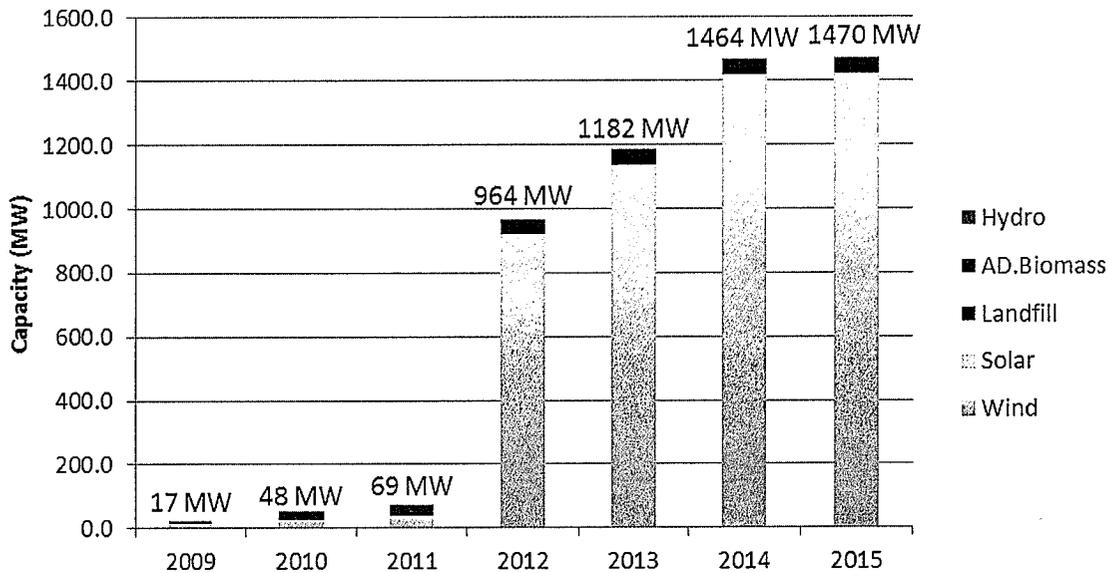
**MIRECS Renewable Projects, All Commercial Operation Dates
Approximately 2,300 MW**



As of January 2015, 61 renewable contracts and amendments have been approved by the Commission pursuant to PA 295. **Figure 5** shows the expected commercial operation dates for renewable energy projects through 2015 based on the contracts and solar programs approved by the Commission.¹⁰

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

Figure 5: Cumulative Renewable Energy Capacity by Commercial Operation Date



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

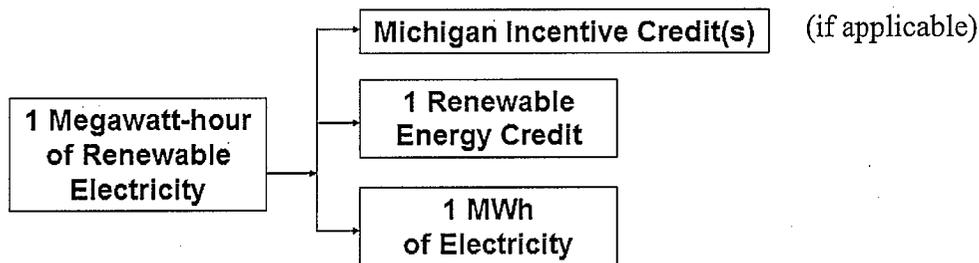
Electric providers have secured nearly all of the renewable energy necessary for compliance with the Act.¹¹ Looking forward, electric providers are on pace to hit the interim targets as well as the 10 percent by the end of 2015.

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

Michigan Renewable Energy Certification System (MIRECS)

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

Figure 6: Renewable Energy Credits



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

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

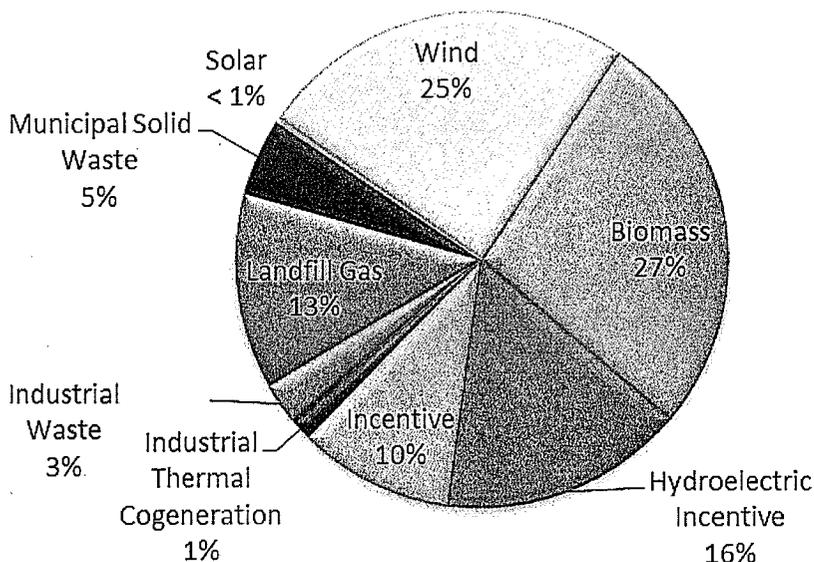
¹² At this time, energy optimization credits are not transferable from one electric provider to another, meaning that they cannot be sold or otherwise traded.

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

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

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

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



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

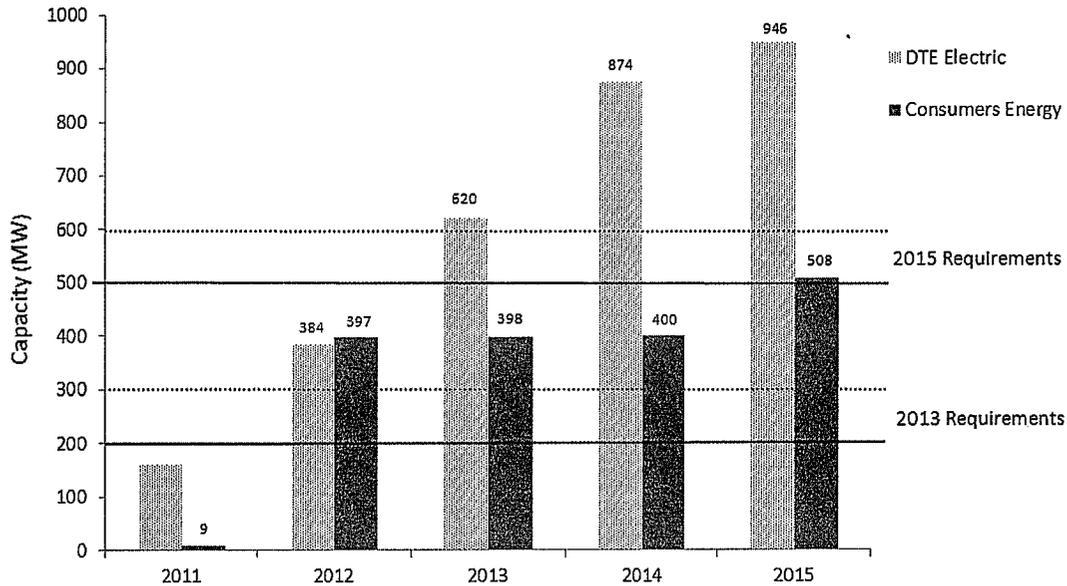
MIRECS is able to fully integrate with other tracking systems such as the Midwest Renewable Energy Tracking System (M-RETS), North American Renewables Registry (NAR) and, to a lesser extent, the North Carolina Renewable Energy Tracking System (NC-RETS) and PJM-Generation Attribute Tracking System (PJM-GATS)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

MIRECS. This integration allows both businesses and individual citizens to sell their product to a wider market. Generators registered with other tracking systems have, as of January 2015, registered 55 projects for the purpose of importing RECs into MIRECS. Commission Staff assists electric providers with the compliance process and will continue to hold training/information meetings.

Competition in Areas Served by Multiple Providers

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

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



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

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

Cost-Effectiveness of Power Purchase Agreements and Owned Generation

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

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

- (i) Renewable energy systems that were developed by and are owned by the electric provider. An electric provider shall competitively bid any contracts for engineering, procurement, or construction of any new renewable energy systems...
- (ii) Renewable energy systems that were developed by 1 or more third parties pursuant to a contract with the electric provider under which the ownership of the renewable energy system may be transferred to the electric provider, but only after the renewable energy system begins commercial operation. Any such contract shall be executed after a competitive bidding process conducted pursuant to guidelines issued by the commission.

Additionally:

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

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

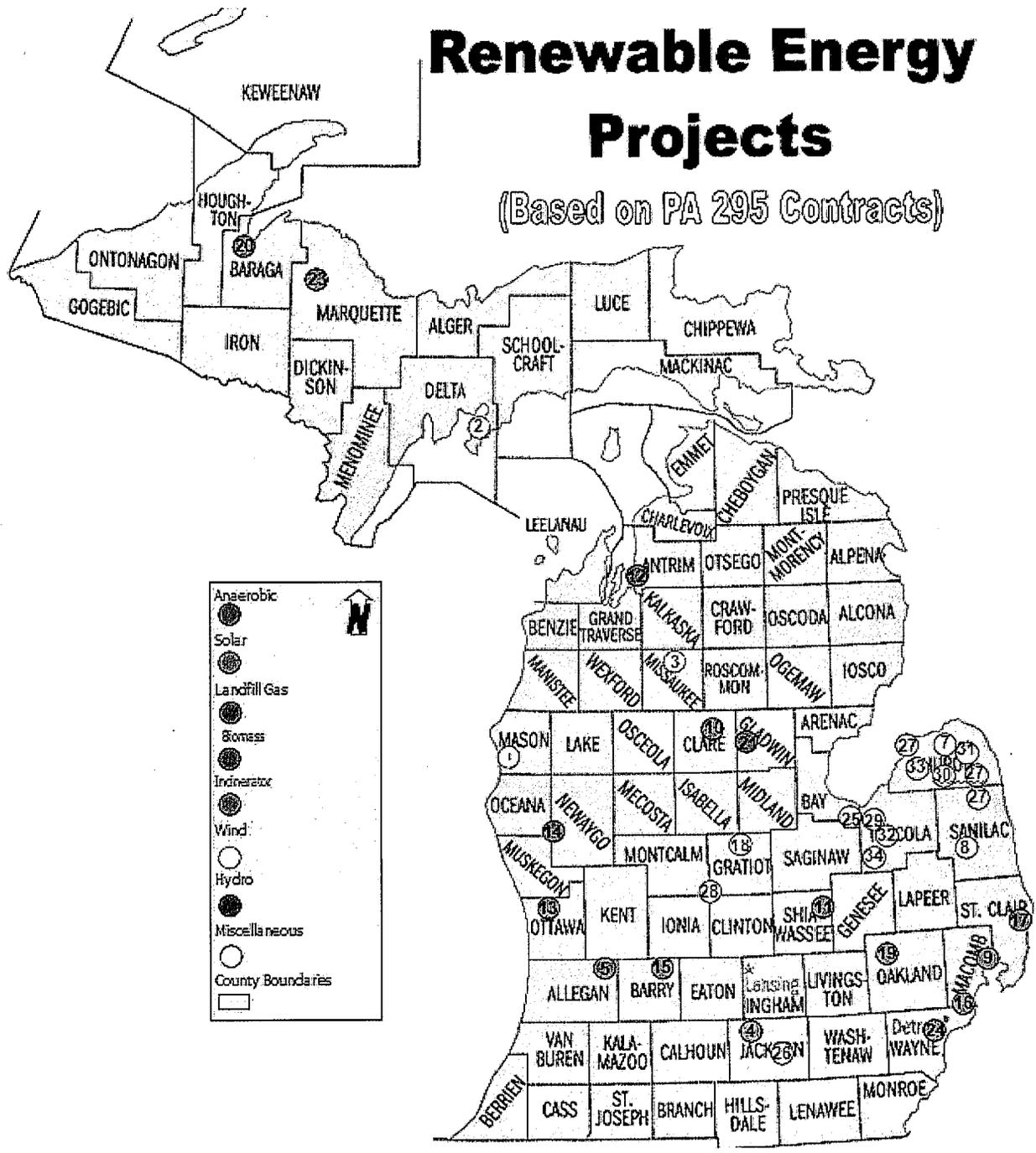
the audits was to ensure that the companies followed the processes and procedures outlined in the Commission's December 4, 2008 Temporary Order in MPSC Case No. U-15800, Attachment D¹⁶ and pursuant to Section 33 of PA 295. Details about each company's competitive bidding activities are shown in *Appendix G*.

Pursuant to Section 37 of the Act, renewable energy power purchase and REC-only agreements entered into by any electric provider whose rates are regulated by the Commission must be submitted to the Commission for determination of whether the terms are reasonable and prudent. *Appendix F* lists all renewable energy contracts that have been approved by the MPSC to date.

There has been significant renewable energy development as a result of PA 295. *Appendix H* lists all of the renewable energy projects that have approved PA 295 contracts. The *Appendix F* and *Appendix H* map key corresponds to the map in **Figure 9**. Wind energy has been the primary source of new renewable energy in Michigan. At the end of 2014, including wind projects developed shortly before Act 295 and wind projects developed under the PA 295 contract approval and cost recovery mechanisms, there were over 1,500 MW (total includes 127 MW of utility scale projects that began operating prior to the Act) of utility scale wind projects in operation in Michigan as indicated in *Appendix I*.

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

Figure 9: Locations of Renewable Energy Projects



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

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

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

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

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

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

Impact of the Renewable Energy Standard on Employment

One purpose of PA 295 is to “provide improved air quality and other benefits to energy consumers and citizens of this state.” The clean and renewable energy sector continues to contribute to employment opportunities in Michigan. In 2014, generating facilities were constructed utilizing Michigan equipment and labor; contracts for utility scale projects, which will employ Michiganders, were approved; and solar pilot programs that utilize Michigan labor for installations continued and expanded. During 2014, the following utility scale wind farms became commercially operational in Michigan:

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

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

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

These projects utilized Michigan companies including Barton Malow and Ventower. During 2014, the Commission approved contracts for the Meade Wind Farm which will be constructed by the Michigan-based Aristeo Construction. Section 39 of PA 295 provides for Michigan Incentive Renewable Energy Credits for renewable energy systems that meet certain criteria. For renewable energy systems constructed using a threshold level of Michigan labor, the amount of the incentive is one-tenth of a REC for each MWh generated during the first three years of commercial operation. The incentive for Michigan equipment is calculated in a similar manner. The Michigan specific incentive credits are shown in **Figures 10 and 11** below.

Figure 10: Michigan Equipment Incentive Credits 2009-2014

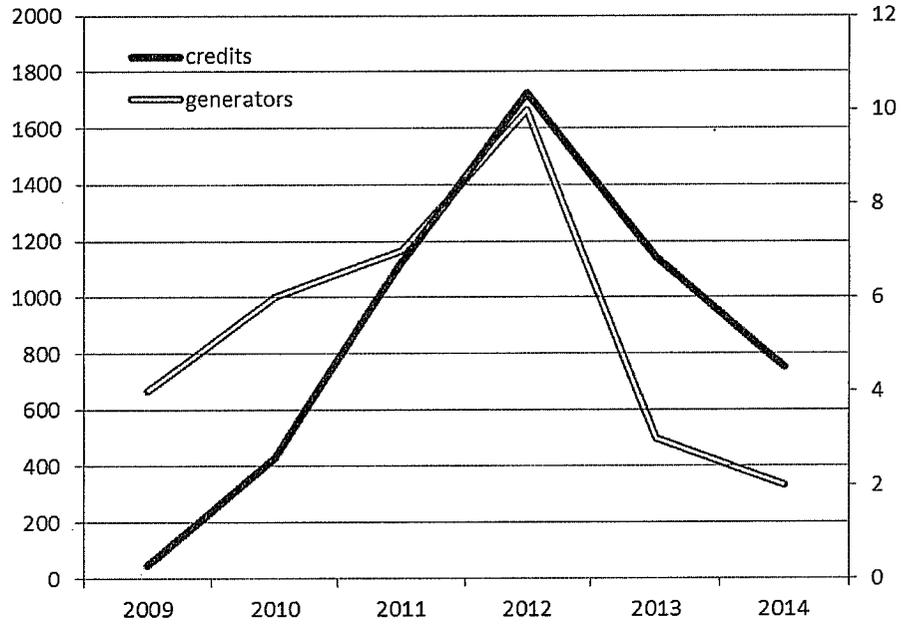
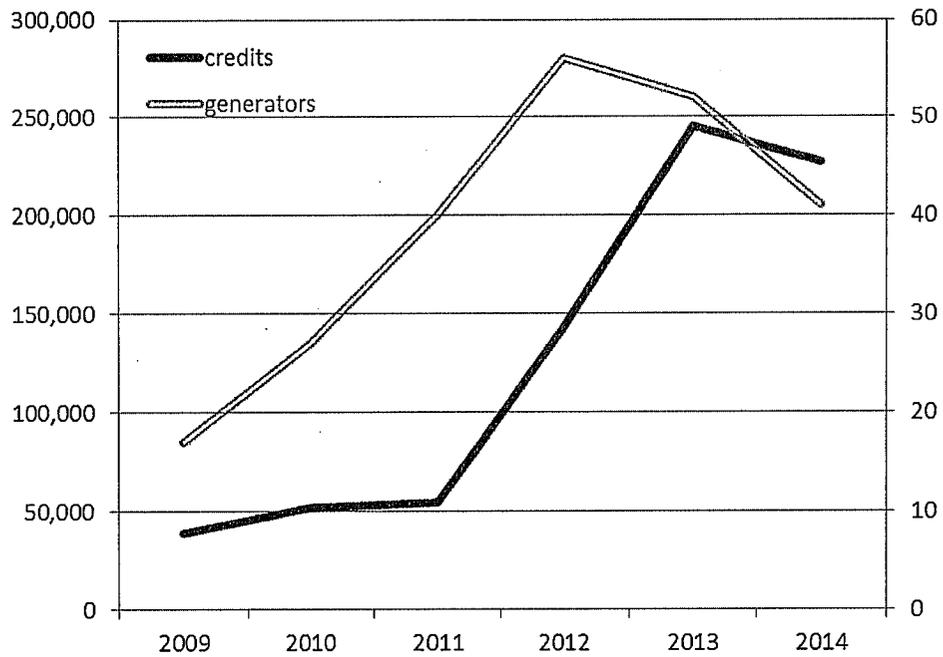


Figure 11: Michigan Labor Incentive Credits 2009-2014



Statewide, there has been significant investment in the renewable energy sector since the passage of PA 295 in 2008. Assuming an installed cost of \$2,000 per kW¹⁹ for new renewable energy projects, \$2.9 billion has been invested to bring approximately 1,450 MW²⁰ of new renewable energy projects on-line through 2014 in Michigan. The \$2.9 billion includes both incremental cost of compliance and the portion of costs recovered as energy costs.

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

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

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

²⁰ This number does not include 67.5 MW of wind generation attributable to contracts filed by Indiana Michigan Power Company as these projects are outside of Michigan or 1.05 MW of hydro and anaerobic bio-digestion projects that were commercially operational prior to PA 295.

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

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

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

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

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

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

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

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

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

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

Pursuant to Section 21(6)(b) of the Act, rate-regulated electric providers’ REPs were required to show that the life cycle cost of renewable energy acquired, less the life cycle net savings associated with Energy Optimization Plans, did not exceed the life cycle cost of electricity generated by a new conventional coal-fired facility. The Commission Staff filed a letter in MPSC Case No. U-15800 to provide the required life cycle cost of electricity generated by a new conventional coal plant:

The Commission’s temporary order implementing 2008 PA 295, Case Number U-15800, directed the Staff to work with the providers to develop the required life cycle cost of electricity generated by a new conventional coal-fired facility in terms of a guidepost consisting of a levelized busbar rate, in \$/MWh, of an advanced-supercritical pulverized coal plant with a life cycle of 40 years. The Commission directed the Staff to submit the number to the Commission by January 30, 2009. The Staff has diligently

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

This guidepost rate was derived from data provided to Consumers Energy as a result of the Company's inquiry into building a new 830 MW coal fired power facility, and was adopted by all electric providers. In its amended REP in Case No. U-16543, Consumers Energy updated the levelized cost of a conventional coal plant to \$107 per MWh using the same construction cost estimates used in determining the \$133 per MWh rate. The decrease in cost was primarily due to updated emissions assumptions.²⁵ However, the cost of coal had declined compared to the costs in 2008 when the original analysis had taken place. This had the effect of reducing the long-term fuel price projections. Additionally, federal legislation regarding carbon emissions had not been enacted, which resulted in emissions costs having less of an impact on the cost of a coal plant in the company's revamped calculation. Given all of this suggested change based on the evidence mentioned above, the Commission continues to find that the \$133 per MWh guidepost is reasonable as discussed below.

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

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

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

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

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

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

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

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

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

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

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

By comparing the levelized cost of \$133 per MWh for a new conventional coal-fired power facility with the combined weighted average levelized contract prices in **Table 1**, the cost of all renewable energy projects using multiple renewable energy technologies is less than the coal guidepost rate with the exception of two anaerobic digester contracts representing less than 4 MW of capacity. These contracts were the result of Consumers Energy's first solicitation for small (under 5 MW) facilities. Consumers Energy and DTE Electric have since seen much lower prices for renewable energy. Even using Consumers Energy's revised \$107 per MWh levelized cost, wind and biomass still compare favorably while landfill gas is competitive. As solar development in Michigan only includes small-scale projects or pilot programs, it was not analyzed in this section or included in **Table 1**.

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

Table 1: Weighted Average Levelized Renewable Energy Contract Prices

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

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

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

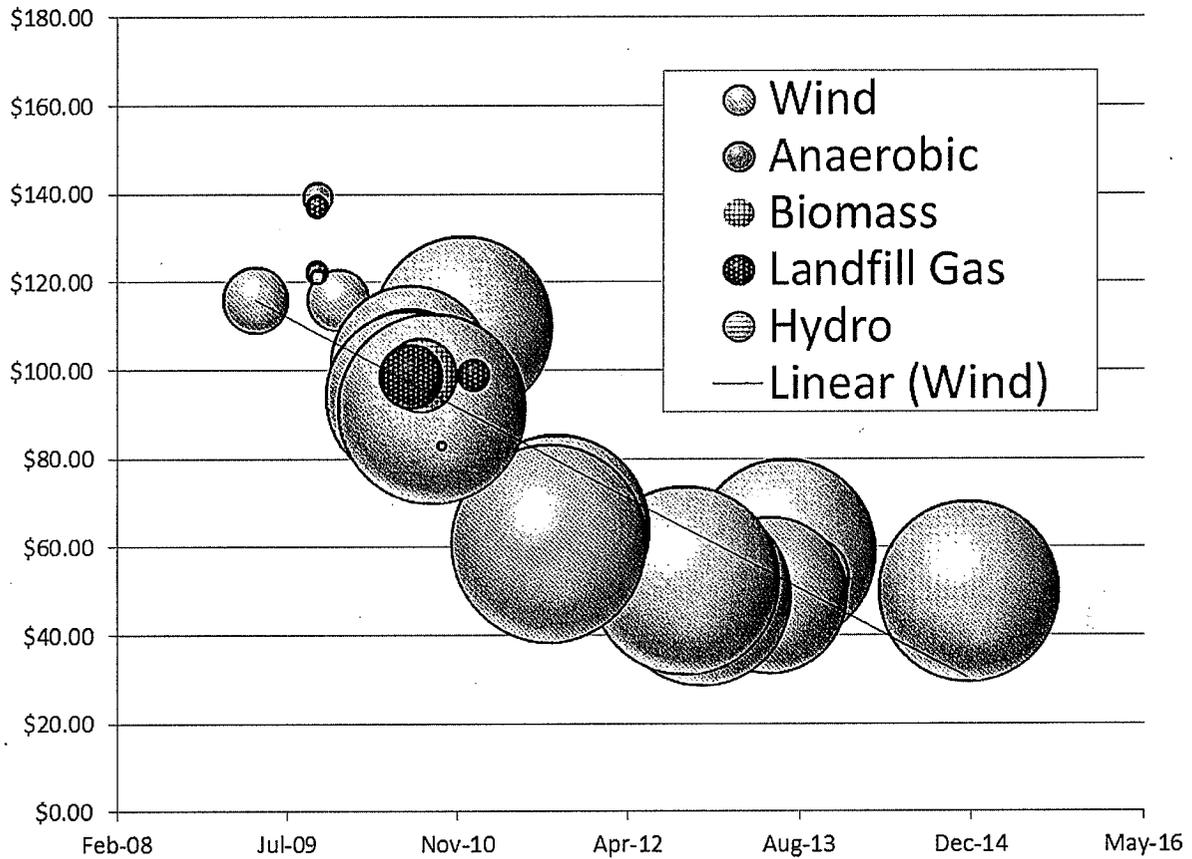
³⁴ The availability on-peak for base load generators is unit-specific. Older units may have capacity values significantly lower than 80 percent, however, newer units, especially newer nuclear units may have capacity values on-peak above ninety percent.

Cost-Effectiveness of Renewable Energy and Energy Optimization Standards

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

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

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

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

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

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

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

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

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

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

natural gas combined cycle (NGCC) plant would likely be analogous to the market price mentioned above.³⁸

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

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

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

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

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

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

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

Recommendations

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

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

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

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

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

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

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

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

Company	Initial Plan	2013 Plan Docket	2013 Compliance Year Sales*	Retail Sales Method**	2007/2008 Baseline RECs	2012 REC Requirement	2013 REC Requirement	2013 Excess RECs Retired	2013 EO & Green Pricing Credit Substitutions	Estimated 2014 REC Requirement	Estimated 2015 REC Requirement	Expected to Meet 2015 10% Standard	Current Residential Surcharge \$/Month
Rate Regulated Utilities													
Alpena Power	U-15804	U-17300	329,719	3Y	0	6,438	10,881	3,187		16,486	32,972	Yes	0.24
Consumers Energy	U-15805	U-17301	33,549,790	3Y	1,549,840	1,906,592	2,145,536	0	59,711	2,452,410	3,354,979	Yes	0.00
DTE Electric	U-15806	U-17302	41,721,159	W	566,819	1,281,962	1,756,567	0	63,029	2,369,467	4,172,116	Yes	0.43
Indiana Michigan	U-15808	U-17303	2,813,544	W	17,450	70,231	104,538	4		149,402	281,354	Yes	0.43
NSP-Wisc (Xcel)	U-15809	U-17304	140,804	3Y	12,679	12,926	13,142	0		13,380	14,080	Yes	0.00
Upper Peninsula Power	U-15810	U-17305	846,706	3Y	98,521	84,682	84,671	0		84,671	84,671	Yes	0.00
Wisc. PSC	U-15811	U-17306	283,236	3Y	11,145	14,383	16,815	2,155		19,734	28,324	Yes	0.00
Wisc. Elec Co	U-15812	U-17072	2,772,812	3Y	53,196	95,975	127,144	0		165,239	277,281	Yes*	0.28

*Revised Plan Pending Approval

Rate Regulated Cooperatives													
Cloverland Electric Coop	U-15816	U-17308	802,313	3Y	301,126	80,335	80,231	2,251		80,231	80,231	Yes	0.00
Midwest Energy Coop	U-15818	U-17309	586,487	3Y	0	11,580	19,354	0		29,324	58,649	Yes	0.00
Thumb Elec. Coop	U-15821	U-17310	156,361	3Y	1,562	4,302	6,206	0		8,599	15,636	Yes	0.00

Member Regulated Cooperatives													
Alger Delta Coop Elec	U-15813	U-16589	60,902	3Y	920	1,914	2,626	2		3,505	6,090	Yes	0.00
Bayfield Elec. Coop	U-15814	U-16590	183	3Y	4	7	9	0		11	18	Yes	0.00
Cherryland Elec Coop	U-15815	U-16591	371,877	3Y	0	7,290	12,272	0		18,594	37,188	Yes	0.00
Great Lakes Energy Coop	U-15817	U-16593	1,358,195	3Y	0	26,798	44,820	0		67,910	135,820	Yes	0.00
Homeworks Tri-County Elec. Coop	U-15822	U-16598	325,642	3Y	0	6,321	10,746	0		16,282	32,564	Yes	0.00
Ontonagon Co. Rural Elec.	U-15819	U-16595	24,982	3Y	2,246	2,292	2,329	0		2,372	2,498	Yes	0.00
Presque Isle Elec & Coop	U-15820	U-16596	236,308	3Y	0	4,741	7,798	0		11,815	23,631	Yes	0.00

Alternative Electric Suppliers													
CMS ERM Michigan	U-15826	U-16640		3Y								Yes	0.00
Commerce Energy	U-15828	U-16641		W								Yes	0.00
Constellation NewEnergy	U-15829	U-16642		W								Yes	0.00
Direct Energy Business	U-15845	U-16643		W								Yes	0.00
First Energy Solutions	U-15832	U-16644		W								Yes	0.00
Glacial Energy of Illinois	U-16007	U-16645		W								Yes	0.00
Integrus Energy Services	U-15833	U-16646		W								Yes	0.00
MidAmerican Energy Company	U-15837	U-16647		W								Yes	0.00
Noble Americas Energy Solutions f/k/a													
Sempra Energy Solutions	U-15843	U-16650		W								Yes	0.00
Spartan Renewable Energy	U-15844	U-16651		3Y								Yes	0.00
U.P. Power Marketing	U-15846	U-16652		W								Yes	0.00
Wolverine Power Marketing Cooperative	U-15847	U-16653		3Y								Yes	0.00
Aggregated Totals**			9,289,253		0	184,145	306,545	5,981		464,463	928,925		

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

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

*Sales from Annual Report
 ** 3Y = 3 Year Average W = Weather Normalized
 ***AES totals are aggregated

Appendix C - ELECTRIC PROVIDER RENEWABLE ENERGY ANNUAL REPORT SUMMARY

2013 Reporting Year

Company Name	2013 Generated or Acquired (RECS)	2013 Generated or Acquired (ACECS)	Energy Credits Sold (RECS)	2013 Reported Incremental Cost of Compliance (\$)	2013 Reported Incremental Cost of Compliance (\$)	Remaining Anticipated Incremental Cost of Compliance (\$)	Total Plan Period Anticipated Incremental Cost of Compliance (Prior Years plus Anticipated) (\$)
Investor Owned Utilities:							
Alpena Power Company	14,957	0	0	1,506,729	786,196	2,025,000	4,317,925
Consumers Energy Company	2,737,756	0	0	32,768,171	22,200,000	463,000,000	517,968,171
Detroit Edison Company	2,889,117	46,983	759	110,330,136	56,603,819	474,585,385	641,519,340
Indiana Michigan Power Company	245,501	0	27,166	0	826,963	14,513,501	15,340,464
Northern States Power Company	27,666	0	2,225	0	0	0	0
Upper Peninsula Power Company	154,842	0	90,000	0	0	0	0
Wisconsin Public Service Corporation	72,500	0	45,280	0	0	0	0
Wisconsin Electric Power Co	121,658	0	0	153,495	1,395,855	10,082,847	11,631,997
	6,263,997	46,983	165,431	144,758,531	81,812,833	964,206,533	1,190,777,897
Rate Regulated Cooperatives:							
Cloverland Electric Cooperative	437,530	132,613	0	0	0	0	0
Midwest Energy Cooperative	18,809	0	0	0	0	0	0
Thumb Electric Cooperative	1,253	0	0	0	0	0	0
	457,592	132,613	0	0	0	0	0
Member Regulated Electric Cooperatives:							
Alger Delta Cooperative Electric Association	0	0	0	0	0	0	0
Bayfield Electric Cooperative	9	0	0	0	0	0	0
Cherryland Electric Cooperative	12,141	0	0	0	0	0	0
Great Lakes Energy Cooperative	44,262	0	0	0	0	0	0
Homeworks Tri-County Electric Cooperative	10,617	0	0	0	0	0	0
Ontonagon County Rural Electrification Association	2,638	0	0	0	0	0	0
Presque Isle Electric and Gas Co-op	7,804	0	0	0	0	0	0
	77,271	0	0	0	0	0	0
Municipally-Owned Electric Utilities:							
City of Bay City	18,952	0	0	594,868	275,726	0	870,594
City of Charlevoix	3,796	0	0	35,312	55,145	0	90,457
City of Crystal Falls	4,108	0	0	0	0	0	0
City of Dowagiac	1,300	0	0	7,146	0	0	7,146
City of Eaton Rapids	4,586	0	0	161,210	45,323	684,217	890,750
City of Escanaba	1,300	0	0	0	0	0	0
City of Gladstone	0	0	0	0	0	0	0
City of Harbor Springs	3,794	0	0	21,190	0	0	21,190
City of Hart Hydro	3,495	0	0	10,595	0	0	10,595
City of Norway	26,982	0	20,848	0	0	0	0
City of Petoskey	8,208	0	0	70,451	96,919	0	167,370
City of Portland	3,131	0	0	7,948	4,488	0	12,438
City of Subawing	2,527	0	0	0	7,830	433,541	441,371
City of South Haven	4,447	0	0	7,719	0	0	7,719
City of St. Louis	1,926	0	0	27,818	18,044	0	45,862
City of Stephenson	634	0	0	0	0	0	0
City of Sturgis	13,594	0	0	12,051	0	0	12,051
City of Wakefield	263	0	0	0	0	0	0
Chelsea Dept of Electric & Water	2,472	0	0	113,875	40,026	16,369	170,270
Coldwater Board of Public Utilities	49,770	0	0	3,411	0	0	3,411
Crosswell Municipal Light & Power Dept	708	0	0	0	0	228,742	228,742
Daggett Electric Dept	120	0	0	1,905	0	0	1,905
Detroit Public Lighting Dep	0	0	0	28,302	0	0	28,302
Grand Haven Board of Light & Power	15,162	0	0	387,664	416,881	3,284,864	4,088,409
Hillsdale Board of Public Utilities	49,770	0	0	1,473	0	0	1,473
Holland Board of Public Works	92,460	0	0	6,352,628	0	0	6,352,628
Lansing Board of Water & Light	94,760	0	442	6,360,649	1,835,130	51,047,333	59,233,112
Lowell Light & Power	5,747	0	0	101,377	149,852	4,886,876	5,137,905
Marquette Board of Light & Power	26,957	0	0	42,175	0	1,262,194	1,304,369
Marshall Electric Dept	49,770	0	0	7,185	0	0	7,185
Negaunee Dept of Public Works	0	0	0	0	0	0	0
Newberry Water & Light Board	15,613	0	0	2,173,289	0	0	2,173,289
Niles Utility Dept	5,158	0	0	7,529	0	0	7,529
Traverse City Light & Power	35,470	0	0	0	0	0	0
Union City Electric Dept	49,770	0	0	506	0	0	506
Wyandotte Dept of Municipal Service	7,574	0	0	138,219	128,290	0	266,509
Village of Baraga	0	0	0	0	0	0	0
Village of Clinton	49,770	0	0	269	0	0	269
Village of L'Anse	0	0	0	0	0	0	0
Village of Paw Paw	817	0	0	2,505	0	0	2,505
Zeeland Board of Public Works	8,438	0	0	1,105	0	0	1,105
	464,287	0	21,090	16,670,376	3,073,454	61,844,136	81,587,966
Combined Annual Report:							
Alternative Electric Suppliers (AES):							
CMS ERM Michigan LLC							
Commerce Energy Inc							
Constellation NowEnergy Inc							
Direct Energy Business LLC							
FirstEnergy Solutions Corp							
Geacel Energy of Illinois, Inc.							
Integrus Energy Services Inc							
Midamerican Energy Company							
Noble Americas Energy Solutions LLC f/k/a Sempra							
Energy Solutions LLC							
Spartan Renewable Energy Inc							
UP Power Marketing LLC							
Wolverine Power Marketing Cooperative Inc							
	913,306	439	121,703	0	0	0	0
Totals:	8,176,433	180,035	308,224	161,428,907	84,886,287	1,026,050,669	1,272,365,862

Michigan Retail Sales (MWh): 103,284,102
 Michigan Estimated Renewable Energy %: 7.9%

(Based on Appendix B Retail Sales Total)

Source: PA 295 Annual Reports:
http://www.michigan.gov/mssc/0,4639,7-169-16393_53570-240179--,00.html
 *AES totals are aggregated

Michigan's Solar Programs

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

Experimental Advanced Renewable Program

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

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

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

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

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

Appendix D – Michigan's Solar Programs

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

SolarCurrents

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

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

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

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

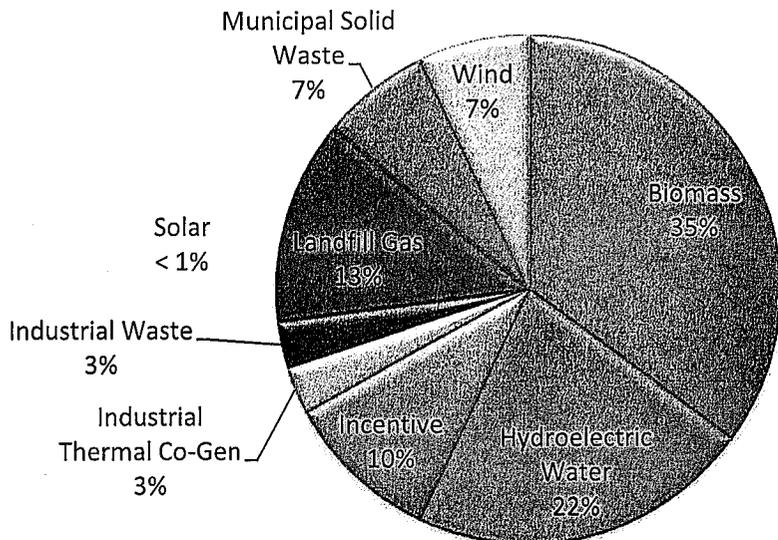
Appendix D – Michigan's Solar Programs

Community Solar

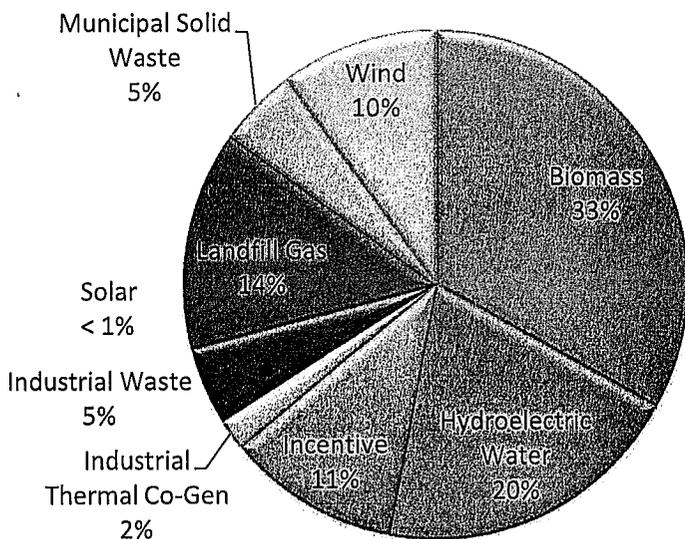
Cherryland Electric Cooperative and Traverse City Light & Power are the first electric providers in Michigan to offer a joint community solar program – Solar Up North (SUN) Alliance Program. The framework for this program comes from the energy optimization standard of Act 295 as opposed to net metering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

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

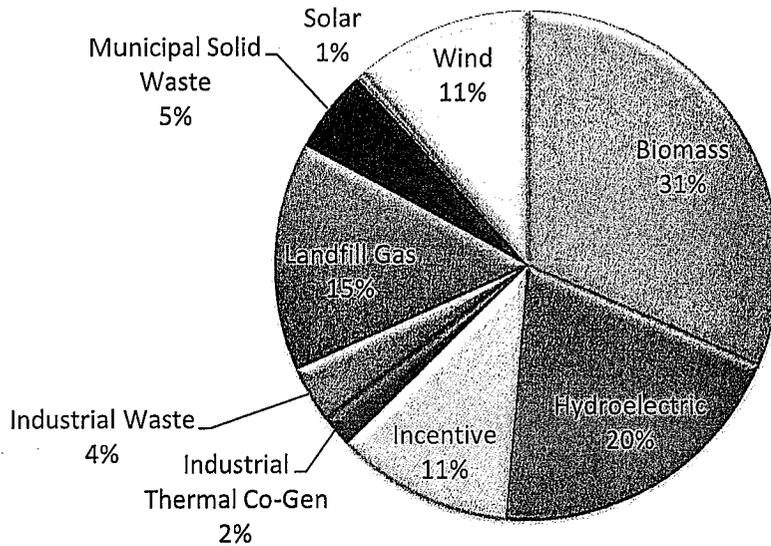
MIRECS 2009 Vintage Energy Credits 5,256,722 Total Credits



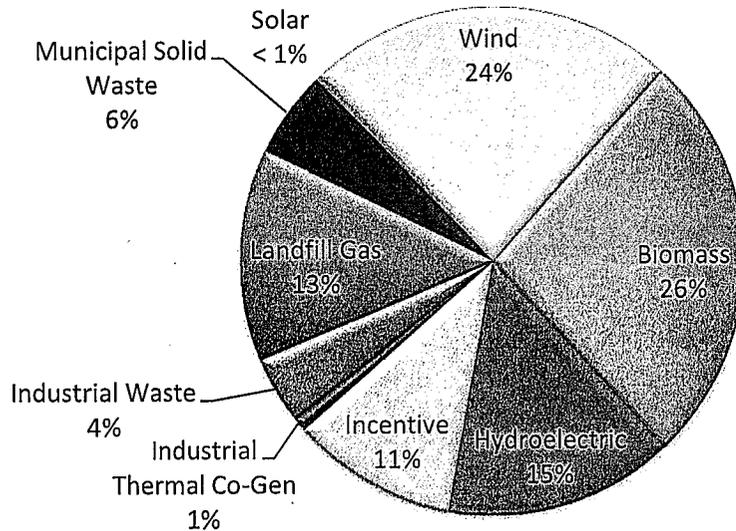
MIRECS 2010 Vintage Energy Credits 5,109,511 Total Credits



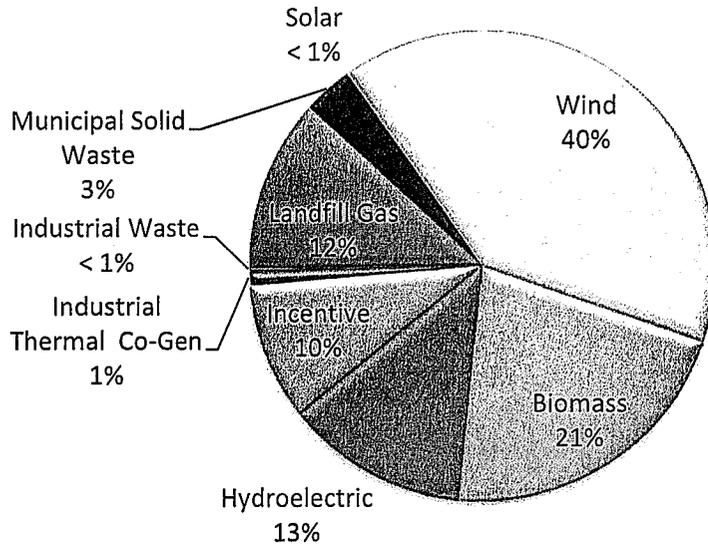
MIRECS 2011 Vintage Energy Credits 5,404,910 Total Credits



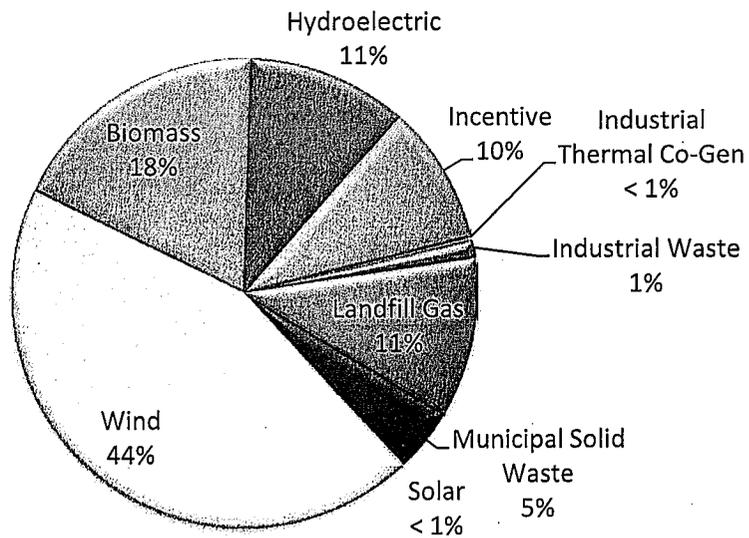
MIRECS 2012 Vintage Energy Credits 6,587,139 Total Credits



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



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



*Not all data has been reported for 2014.

Appendix F- Contract Summary

Consumers Energy- Contracts								
Map Key	Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
	Experimental Advanced Renewable Program Phases 10-15	1193.7 kW	Non-Residential \$0.199-0.209 Residential \$0.243-0.249	Up to 15 Years	Solar	Unsolicited	05/02/2014	Varies
32	Barton Malow Company	Construction	\$59.00/MWh	20 Years	Wind	04/25/2013	09/10/2013	12/31/2014
	General Electric Company	62 1.7-100 1.7 MW				10/2/2012	06/28/2013	
	ABB Transformers	2- 34.5KV to 345KV transformers				02/27/2013	09/10/2013	
28	Blissfield Wind (Beebe Wind)	Unchanged	Unchanged	20 Years	Wind	Amendment	01/26/2012	12/31/2012
2	Heritage Garden Wind Farm I	20 MW	Unchanged	20 Years	Wind	Amendment	01/26/2012	12/31/2012
3	Heritage Stoney Corners Wind Farm II	Unchanged	Unchanged	20 Years	Wind	Amendment	01/26/2012	1/1/2012
3	Heritage Stoney Corners Wind Farm I (Phase 3)	8.35 MW	\$106.20 MWh	20 Years	Wind	Result of Amendments	01/26/2012	1/1/2012
4	Experimental Advanced Renewable Program	987.7 kW	Commercial \$0.375/KWh Residential \$0.525/KWh	12 Years	Solar	Unsolicited	05/10/2011	Varies
1	Vestas-American Wind Technology	56 V100 1.8 MW Turbines	\$110.00/MWh	20 Years	Wind	1/15/2010	12/2/2010	12/31/2012
	White Construction, Inc. U-15805 edocket files # 251-256	Installation and construction				7/23/2010		
	GE Prolec Transformers, Inc.	2-125 KV transformers				7/27/2009		
2	Heritage Garden Wind Farm I	28.6 MW	\$106.20 MWh	20 Years	Wind	Unsolicited	11/19/2010	1/1/2012
3	Heritage Stoney Corners Wind Farm II	12.3 MW	\$98.50 MWh	20 Years	Wind	Unsolicited	11/19/2010	1/1/2012
4	Experimental Advanced Renewable Program	Commercial 836.6 kW Residential 200.1 kW	Commercial \$0.45/KWh Residential \$0.65/KWh	12 Years	Solar	Unsolicited	12/21/2010	5/1/2010
5	Scenic View Dairy**	0.35 MW	\$83.07/MWh	63 Months	Anaerobic	Unsolicited	10/26/2010	7/29/2010
6	Blissfield Wind (Now Beebe Wind)	81 MW	\$100.88/MWh	20 Years	Wind	5/7/2009	7/27/2010	12/31/2012
7	Harvest II Wind	59.4 MW	\$98.38/MWh	20 Years	Wind	5/7/2009	7/27/2010	12/31/2012
8	Michigan Wind 2	90 MW	\$94.00/MWh	20 Years	Wind	5/7/2009	7/27/2010	6/30/2012
9	WM Renewable Energy - Pine Tree Acres	12.8 MW	\$98.75/MWh	20 Years	Landfill Gas	5/7/2009	7/27/2010	6/30/2012
10	WM Renewable Energy - Northern Oaks Landfill	1.6 MW	\$122.39/MWh	20 Years	Landfill Gas	1/29/2009	10/13/2009	11/11/2010
11	NANR – Lennon	1.6 MW	\$137.27/MWh	20 Years	Landfill Gas	1/29/2009	10/13/2009	12/31/2010
12	Elk Rapids Hydro Electric** 1	0.7 MW	\$121.31/MWh	10 Years	Hydro	1/29/2009	10/13/2009	7/11/2009
13	Zeeland**	1.6 MW	\$122.20/MWh	7 Years	Landfill Gas	1/29/2009	10/13/2009	7/11/2009
14	Freemont Community Digester	3.1 MW	\$139.35/MWh	20 Years	Anaerobic	1/29/2009	10/13/2009	11/11/2012
15	Scenic View Dairy** 1, 2	0.82 MW	\$138.17/MWh	7 Years	Anaerobic	1/29/2009	10/13/2009	7/11/2009
	Total	502.99 MW						

* Per MWh prices represent levelized costs. ** Pre-existing projects prior to 2008 PA 295 - The commercial operation date would refer to the effective date of the contract.

Appendix F- Contract Summary

DTE Electric Company : Contracts								
Map Key	Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
	General Electric Company	1.7MW-100 model turbines up to 100 MW				2/17/2014		
	Aristeo Construction Company	Installation and construction	\$47/MWh - \$53/MWh	Company Owned "Meade Wind"	Wind	6/20/2014	12/18/2014	12/31/2015
	Rudolf Libbe, Inc	750 kW						
	Inovateus Solar, LLC	504 kW	\$3,741/kW	Company Owned	Solar	09/28/2012	7/8/2014	04/2015
33	Big Turtle Wind Farm, LLC	20 MW	\$53/MWh	20 Years	Wind	Unsolicited	09/24/2013	Expected 2014
31	Pheasant Run Wind, LLC	74.8 MW	Up to \$49.25/MWh	20 Years	Wind	Unsolicited	5/17/2013	12/31/2014
31	Pheasant Run Wind II, LLC "Brookfield"	74.8 MW	Up to \$49.25/MWh	Company Owned	Wind	Unsolicited	5/17/2013	12/31/2014
16	SolarCurrents Phase II	0.5 MW Non-Residential 1.5 MW Residential	\$0.13/W \$0.02/kWh \$0.20/W \$0.03/kWh	Through 8/31/2029	Solar	Unsolicited	11/16/2012	Varies
29	Tuscola Wind II, LLC	100 MW	\$49.25/MWh***	20 Years	Wind	5/3/2012	10/31/2012	12/31/2013
	General Electric Company	1.6MW-100 model turbines up to 110 MW				10/12/2011		
30	Barton Malow Company	Installation and construction	\$52.50/MWh	Company Owned "Echo Wind"	Wind	4/17/2012	9/11/2012	12/31/2013
24	Michigan Waste Energy, Inc.	Up to 65,000 RECs/Year	\$7.00/REC	13 Years	Incinerator	Unsolicited	12/6/2011	1991
16	Nova Consultants, Inc.	Solar EPC	Up to \$48 Million			2/28/2011		
16	McNaughton-McKay Electric Company	Supply up to 12 MW of Modules	Up to \$24 Million	Company Owned	Solar	3/24/2011	11/10/2011	12/31/2015
16	Inovateus Solar, LLC	Supply up to 12MW						
	General Electric Company	Up to 69 1.6MW-100 Turbines	\$61-\$64/MWh	Company Owned "Thumb Wind"	Wind	3/9/2011	9/13/2011	12/31/2012
27	Barton Malow Company	Installation and construction				5/6/2011		
25	Tuscola Bay Wind, LLC	120 MW	Up to \$60.90/MWh	20 Years	Wind	11/18/2010	8/25/2011	10/31/2012
20	L'Anse Warden Electric Company	110,374 RECs	\$11.98 (Average of 4 REC/ACEC Contracts)	Amendment Acquiring Vintage RECs	Biomass	8/18/2009	8/25/2011	7/1/2010
18	Gratiot County Wind	12.8 MW additional	Unchanged from original contract	Company Owned	Wind	Amendment	5/10/2011	12/31/2012
16	Nova Consultants	Unchanged from original contract	Unchanged from original contract	Company Owned	Solar	Extension	12/21/2010	12/31/2011
17	Blue Water Renewables - Smiths Creek Landfill	3.2 MW	\$99.00/MWh	20 Years	Landfill	Unsolicited	1/20/2011	12/31/2011
18	Gratiot County Wind	110.4 MW 89.6 MW Company Owned	\$91.43/MWh Up to \$94.43/MWh	20 Years	Wind	8/18/2009	9/14/2010	05/1/2012 03/31/2012
19	WM Renewable Energy - Eagle Valley Landfill	3.2 MW		20 years	Landfill	8/18/2009	8/10/2010	6/1/2011
20	L'Anse Warden Electric Company	17 MW	Combined average price of \$98.94/MWh	20 years	Biomass	8/18/2009	8/10/2010	7/1/2010

Appendix F- Contract Summary

DTE Electric Company : Contracts								
Map Key	Seller	Quantity	Cost	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
21	Boyce Hydro**	Firm 210,000 RECs w/additional 112,000 RECs dependent on generation	\$7.75/ REC	7 Years	Hydro	12/23/2009	4/27/2010	3/16/2010
16	Nova Consultants	Up to 3 MW	Up to \$18 Million	Company Owned	Solar	11/23/2009	3/2/2010	12/31/2010
22	Heritage Sustainable Energy Stoney Corners Wind Farm	12.2 MW	Unchanged from original contract	20 Years	Wind	Unsolicited	12/1/2009	1/1/2011
23	UPPCO**	Firm 500,000 RECs	Combined average price of \$12.46/REC	7 Years	Hydro	12/23/2009	12/1/2009	10/1/2009
Not Shown	Sterling Planet**	Firm 2,500,000 RECs		10 Years	MISC	12/23/2009	12/1/2009	10/1/2009
22	Heritage Sustainable Energy Stoney Corners Wind Farm	14 MW	\$116.00/MWh	20 Years	Wind	Unsolicited	4/30/2009	12/21/2009
	Total	989.4 MW						
<p>* Per MWh prices represent levelized costs. ** Pre-existing projects prior to 2008 PA 295 - The commercial operation date would refer to the effective date of the contract. ***Staff calculated levelized cost, does not include gross-up for taxes.</p>								

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

Appendix G - Requests for Proposal (RFP) Summary

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

* All=Any Renewable Energy Resource defined by 2008 PA 295; REC=Renewable Energy Credit; ACEC=Advanced Cleaner Energy Credit
 ** CEREC=Capacity, Energy, and Renewable Energy Attributes

Appendix G - Requests for Proposal (RFP) Summary

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

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

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

Appendix G - Requests for Proposal (RFP) Summary

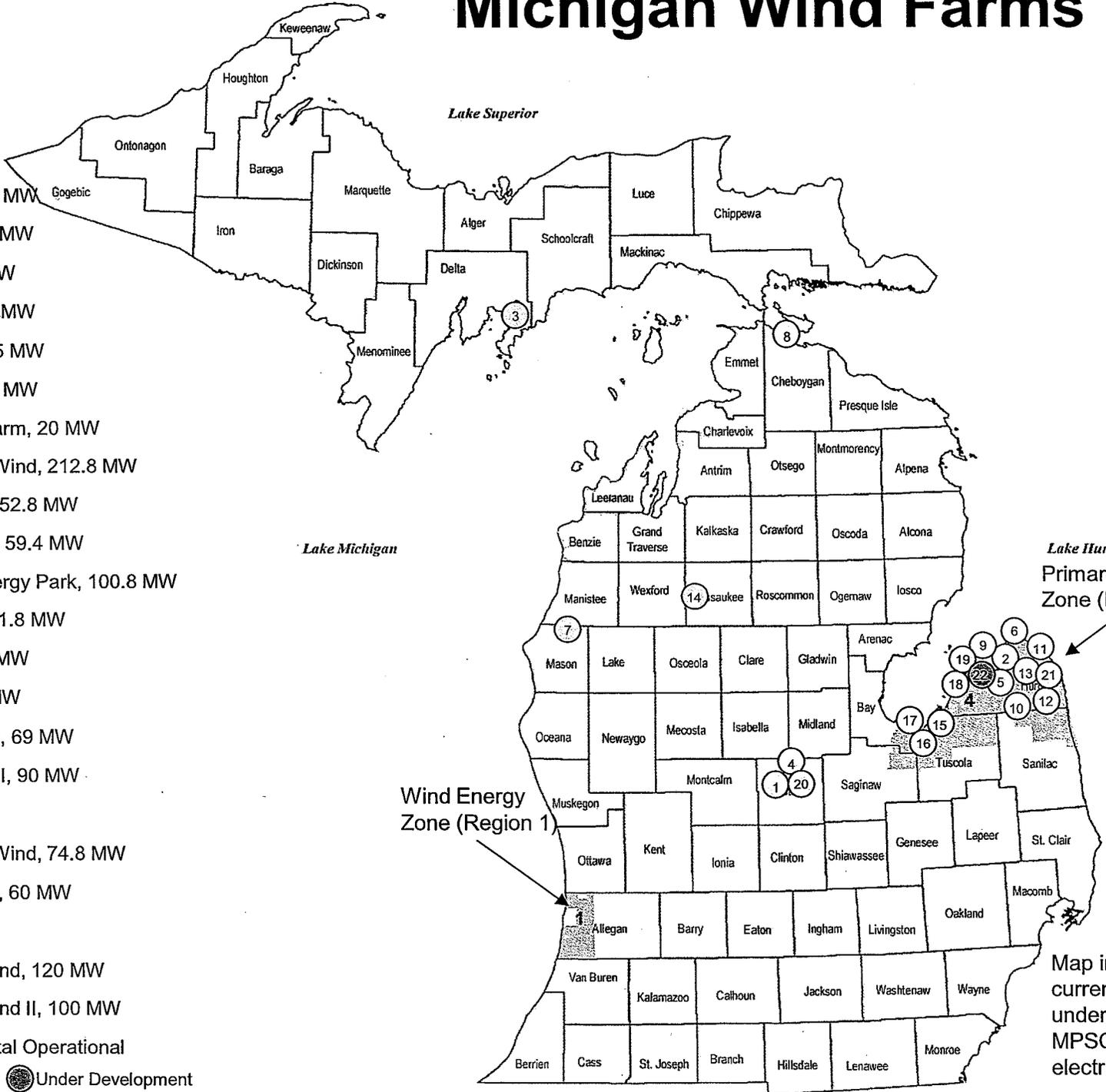
8/18/2009	RFP	Requested CEREC**	106 MW by 12/31/2011	No	All	35 Proposals/ 21 Suppliers
5/22/2009	RFI	Request for Information for the Joint Development of Wind Farms	N/A	Yes	Wind	155 Registered 27 Responses
12/23/2008	RFP	Requested RECs* and ACECs* Without the Associated Energy	250,000 RECs*/Year	No	All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

* All=Any Renewable Energy Resource defined by 2008 PA 295; REC=Renewable Energy Credit; ACEC=Advanced Cleaner Energy Credit
 ** CEREC=Capacity, Energy, and Renewable Energy Attributes

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

Michigan Wind Farms

- ① Beebe Wind, 81 MW
 - ②② Meade, 100.3 MW
 - ③ Garden Wind Farm, 20 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
 - ⑫ Minden, 32 MW
 - ⑬ Tuscola Bay Wind, 120 MW
 - ⑭ Stoney Corners, 60 MW
 - ⑮ Sigel, 64 MW
 - ⑯ Brookfield, 74.8 MW
 - ⑰ Tuscola Bay Wind II, 100 MW
 - ⑱ Pheasant Run Wind, 74.8 MW
 - ⑲ Crosswinds, 105 MW
 - ⑳ Beebe 1B, 50.4 MW
 - ㉑ Big Turtle, 20 MW
 - ㉒ Beebe Wind, 81 MW
- 1523.7 MW Total Operational
- Currently Operational ● Under Development



Lake Huron
Primary Wind Energy
Zone (Region 4)

Wind Energy
Zone (Region 1)

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

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