

Michigan Public Service Commission  
*Net Metering & Solar Program Report  
For Calendar Year 2015*

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September 2016



**Michigan Public Service Commission**

This document is an annual report prepared by Staff from the Michigan Public Service Commission's Electric Reliability Division, Renewable Energy Section. The main source of the data provided is from reports filed by Michigan electric providers. Staff thanks all of the electric providers for their efforts to provide timely and accurate data and information used in preparing this report.

To stay informed about Michigan renewable energy activities, readers are invited to visit the Commission's Michigan Renewable Energy website, at <http://www.michigan.gov/renewables>.

## Net Metering & Solar Programs

The Michigan Public Service Commission Staff (MPSC Staff) issues an annual net metering report summarizing the information filed by electric providers pursuant to Rule 40 (3) of the Commission's Electric Interconnection and Net Metering Standards. This report also includes information describing solar photovoltaic (solar) programs offered by Michigan electric providers.

The net metering program, available to customers of Michigan's rate-regulated utilities and cooperatives, and alternative electric suppliers (AESs), has encouraged the development of on-site renewable energy electric generation projects to offset some or all of a customer's electric energy needs and reduce electric bills.

### Net Metering Data and Analysis

Customer participation in the net metering program increased from 1,840 customers and 1,947 installations<sup>1</sup> in 2014 to 2,155 customers and 2,289 installations in calendar year 2015.<sup>2</sup> At the end of 2015, the total capacity of net metering installations was approximately 17,065 kilowatts (kW), an increase of 2,855 kW from the previous calendar year. This represents a 20% increase in program size over 2014 but still represents only 0.019% of Michigan's total retail sales.<sup>3</sup>

Table 1 summarizes net metering customers and capacity by electric provider for all three size categories of net metering.<sup>4</sup> During this reporting period Alger Delta, Consumers Energy, DTE Electric, Great Lakes Energy, Indiana Michigan and Thumb Electric report a combined total of 44 customers participating in the Category 2 size range, which is an increase from 37 customers reported last year. Even with the growth in Category 2 projects, Category 1 projects still account for 79% of the total net metering program capacity. The state's two largest utilities, Consumers Energy and DTE Electric, host 83% of the statewide total net metering program capacity.

The Category 1 net metering program is available to customers until the program size reaches 0.5% of the electric provider's peak load during the previous year.<sup>5</sup> Consumers Energy and DTE Electric have 34 megawatts (MW) or 94% and 44 MW or 83% of space remaining, respectively. Table 2 shows peak load and program size information for each electric provider for Category 1 net metering. Participation in Category 2 and 3 net metering is still very low.

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<sup>1</sup> The number of net metering installations exceeds the number of net metering customers due to some customers having multiple installations.

<sup>2</sup> A complete list of net metering projects by utility, zip code, type and size is provided at the MPSC's Net Metering website [http://www.michigan.gov/documents/mpsc/2015\\_netmetering\\_projects\\_532534\\_7.pdf](http://www.michigan.gov/documents/mpsc/2015_netmetering_projects_532534_7.pdf)

<sup>3</sup> Calculation is based on the Energy Information Administration's 2014 retail sales data for Michigan and a 13% capacity factor. <http://www.eia.gov/electricity/state/michigan/>

<sup>4</sup> Category 1 Net Metering: Projects up to 20 kW incorporating IEEE 1547 certified inverters.

Category 2 Net Metering: Projects greater than 20 kW and no larger than 150 kW and non-inverter based 20 kW and under projects.

Category 3 Net Metering: Methane Digester projects up to 550 kW.

<sup>5</sup> UPPCO's Category 1 net metering program reached its program size cap was closed on July 22, 2016. <http://efile.mpsc.state.mi.us/efile/docs/15787/0235.pdf>

**Table 1: Net Metering Program Customer and Capacity Data**

Company	Category 1 Customers	Category 1 Nameplate Generation (kW)	Category 2 Customers	Category 2 Nameplate Generation (kW)	Category 3 Customers	Category 3 Nameplate Generation (kW)
Alger Delta	29	130	1	90		
Alpena	19	53				
Cherryland*	31	94				
Cloverland*	26	90				
Consumers Energy	380	2,205	21	1,654	1	190
DTE Electric	1,257	9,102	19	1,041		
Direct Energy	1	3				
Great Lakes Energy	83	416	1	52	1	400
Homeworks Tri-County	19	87				
Indiana Michigan (AEP)	33	160	1	52		
Midwest	22	106				
Ontonagon	22	105				
Presque Isle	21	90				
Thumb	18	155	1	40		
UPPCo	109	532				
We Energies	33	203				
WPSC	5	12				
Xcel	1	4				
<b>Total</b>	<b>2,109</b>	<b>13,546</b>	<b>44</b>	<b>2,929</b>	<b>2</b>	<b>590</b>
Alger Delta, Cherryland, Cloverland, Great Lakes, Ontonagon, Presque Isle and Tri-County are member-regulated cooperatives and are not required to offer net metering. *Cherryland and Cloverland data shown from previous reporting years.						
<a href="#">Source: 2015 Net Metering Reports Case U-15787</a>						

**Table 2: Net Metering Program Capacity  
 Rate Regulated Electric Providers  
 Category 1: 20 kW and Under**

Company	No. of Customers	2014 In-State Peak Load (MW)	Cap 0.5% of 2014 Peak (kW)	Current Nameplate Generation (kW)	Space Remaining (kW)	% Remaining
<b>Alpena</b>	<b>19</b>	<b>57</b>	<b>285</b>	<b>53</b>	<b>232</b>	<b>81</b>
<b>Consumers Energy</b>	<b>380</b>	<b>7,231</b>	<b>36,153</b>	<b>2,205</b>	<b>33,948</b>	<b>94</b>
<b>DTE Electric</b>	<b>1,257</b>	<b>10,660</b>	<b>53,300</b>	<b>9,102</b>	<b>44,198</b>	<b>83</b>
<b>Indiana Michigan</b>	<b>33</b>	<b>854</b>	<b>4,270</b>	<b>160</b>	<b>4,110</b>	<b>96</b>
<b>Thumb</b>	<b>18</b>	<b>35</b>	<b>176</b>	<b>155</b>	<b>21</b>	<b>12</b>
<b>Uppco<sup>6</sup></b>	<b>109</b>	<b>130</b>	<b>650</b>	<b>532</b>	<b>118</b>	<b>18</b>
<b>We Energies</b>	<b>33</b>	<b>253</b>	<b>1,264</b>	<b>203</b>	<b>1,061</b>	<b>84</b>
<b>WPSC</b>	<b>5</b>	<b>42</b>	<b>212</b>	<b>12</b>	<b>200</b>	<b>94</b>
<b>Xcel</b>	<b>1</b>	<b>26</b>	<b>132</b>	<b>4</b>	<b>128</b>	<b>97</b>

**Table 3: Net Metering Program Capacity  
 Rate Regulated Electric Providers  
 Category 2: >20 kW – 150 kW**

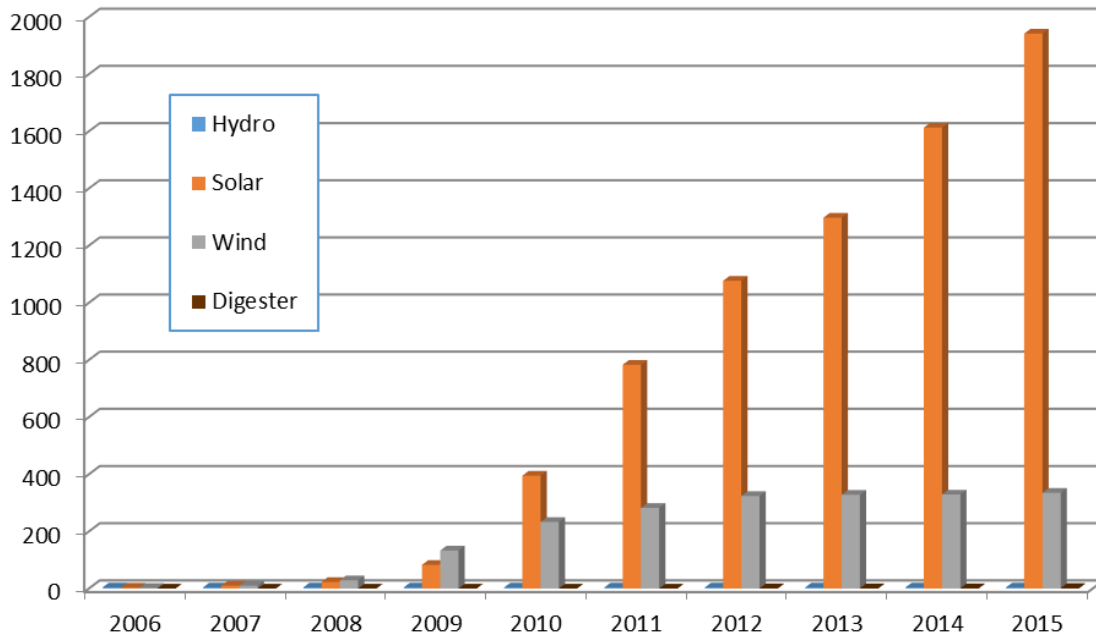
Company	No. of Customers	2014 In-State Peak Load (MW)	Cap 0.25% of 2014 Peak (kW)	Current Nameplate Generation (kW)	Space Remaining (kW)	% Remaining
<b>Consumers Energy</b>	<b>21</b>	<b>7,231</b>	<b>18,076</b>	<b>1,654</b>	<b>16,422</b>	<b>91</b>
<b>DTE Electric</b>	<b>19</b>	<b>10,660</b>	<b>26,650</b>	<b>1,041</b>	<b>25,609</b>	<b>96</b>
<b>Indiana Michigan</b>	<b>1</b>	<b>854</b>	<b>2,135</b>	<b>52</b>	<b>2,083</b>	<b>98</b>
<b>Thumb</b>	<b>1</b>	<b>35</b>	<b>88</b>	<b>40</b>	<b>48</b>	<b>55</b>

Table 2 & 3 Source: [2015 Net Metering Reports Case U-15787](http://www.mpsc.state.mi.us/efile/docs/15787/0235.pdf)

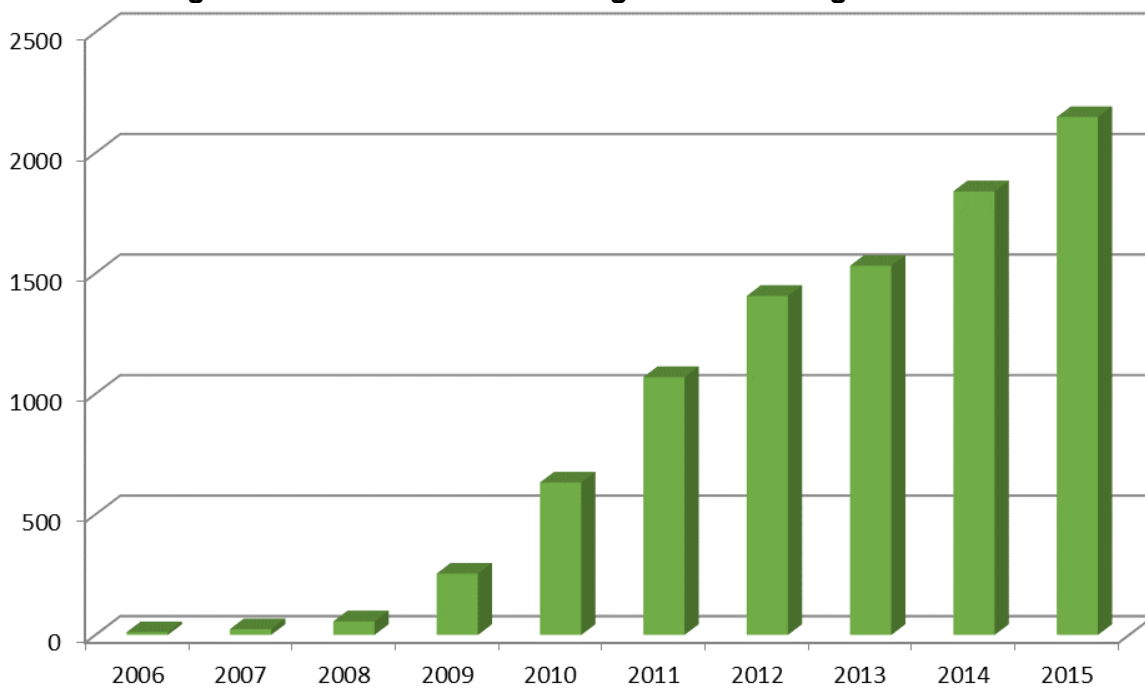
<sup>6</sup>UPPCO's Category 1 net metering program reached its program size cap was closed on July 22, 2016.  
<http://efile.mpsc.state.mi.us/efile/docs/15787/0235.pdf>

Figures 1 through 4 show net metering program growth and participation information. Maps showing location information, based on zip code and county, for total net metering customers, solar net metering and wind net metering are displayed in Figures 5-7. Figures 8 through 10 show a histogram illustration of net metering generation projects.

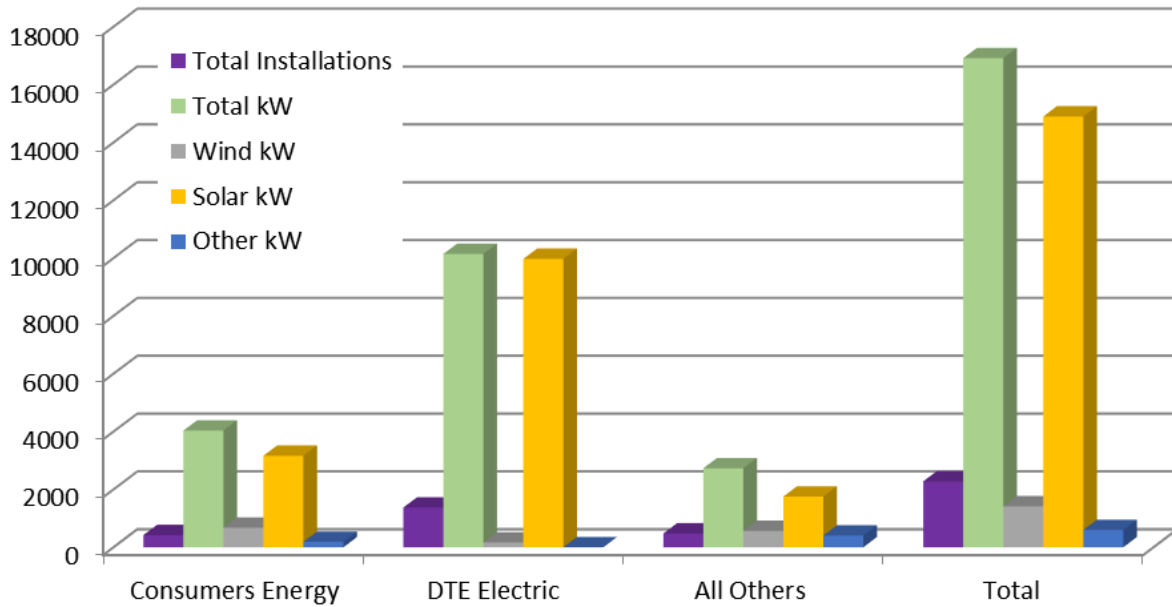
**Figure 1: Number of Michigan Net Metering Installations by Technology**



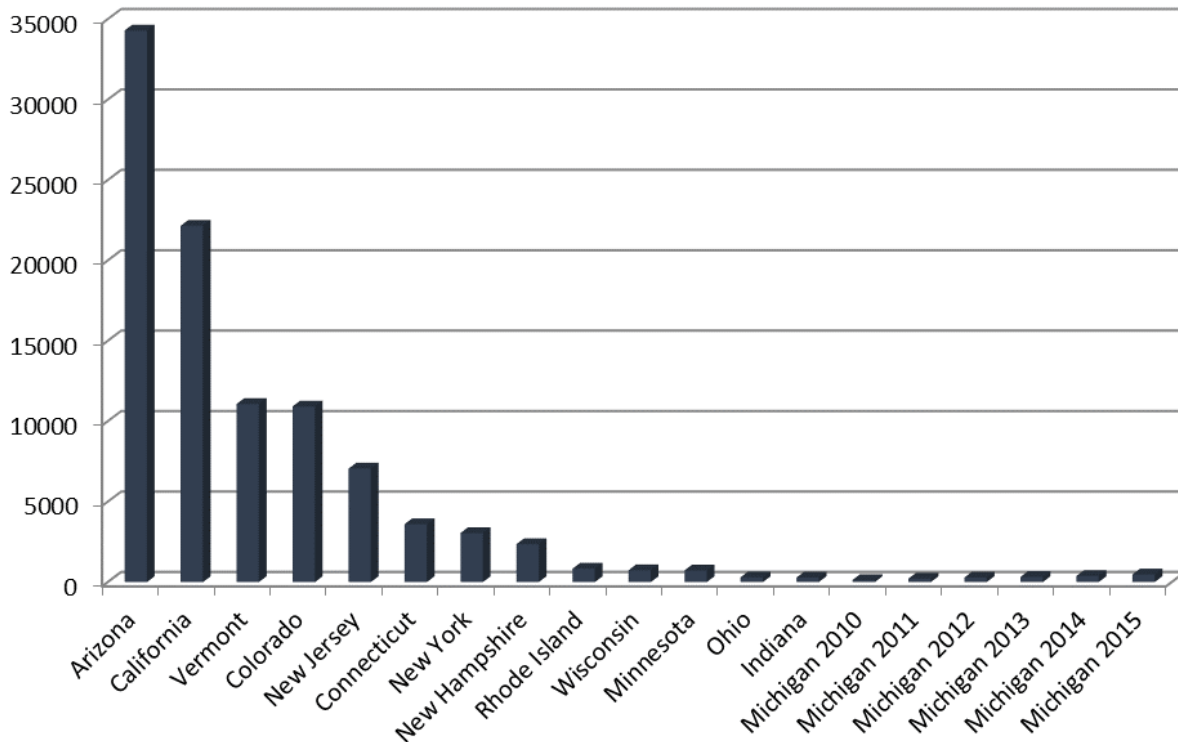
**Figure 2: Number of Total Michigan Net Metering Customers**



**Figure 3: 2015 Net Metering Program - Installed Capacity (kW) & Number of Customers**

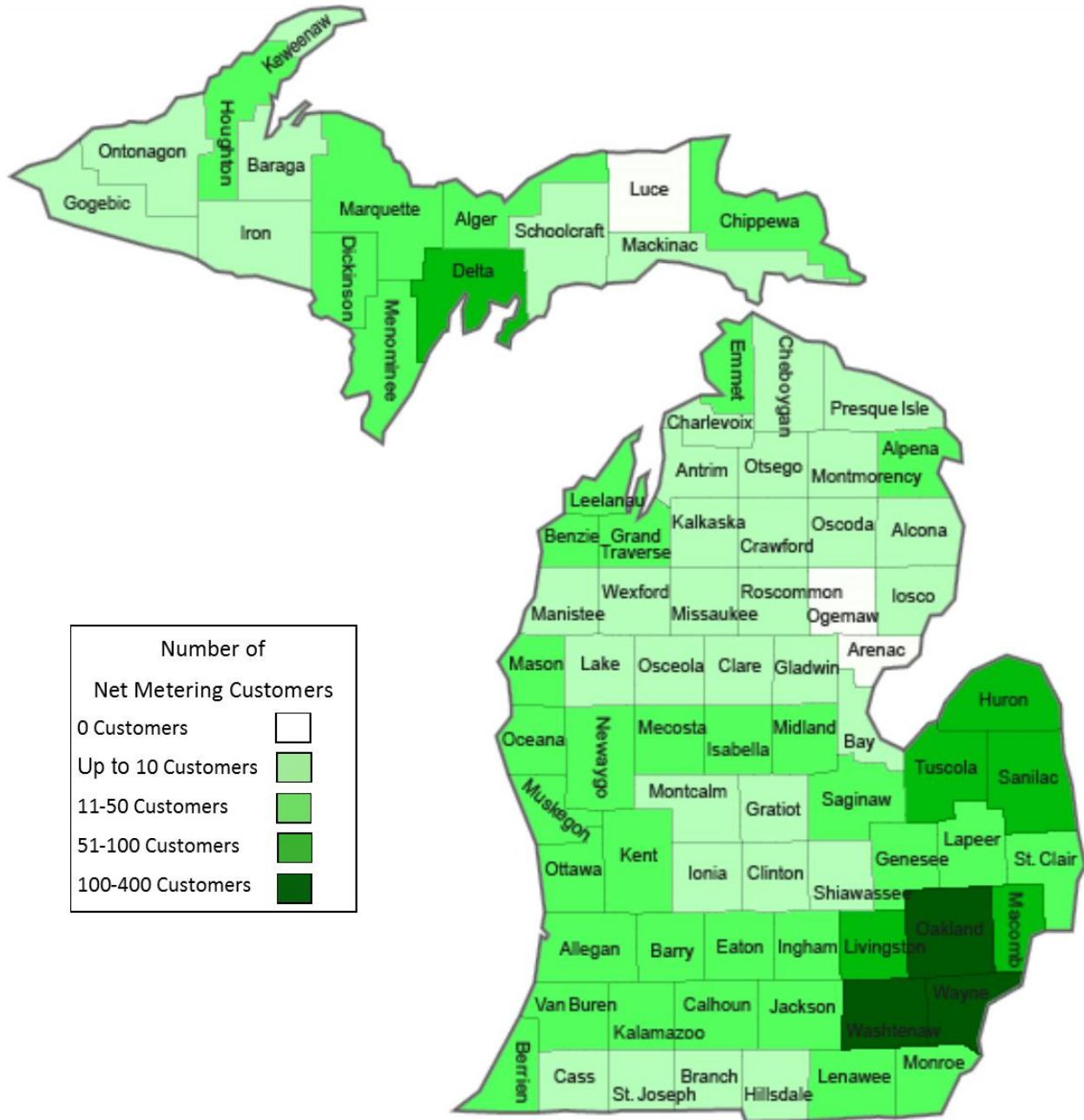


**Figure 4: 2014 Net Metering Customers per Million Total Utility Customers – Select States**



Source: <http://www.eia.gov/cneaf/electricity/page/eia861.html> 2014 EIA Data

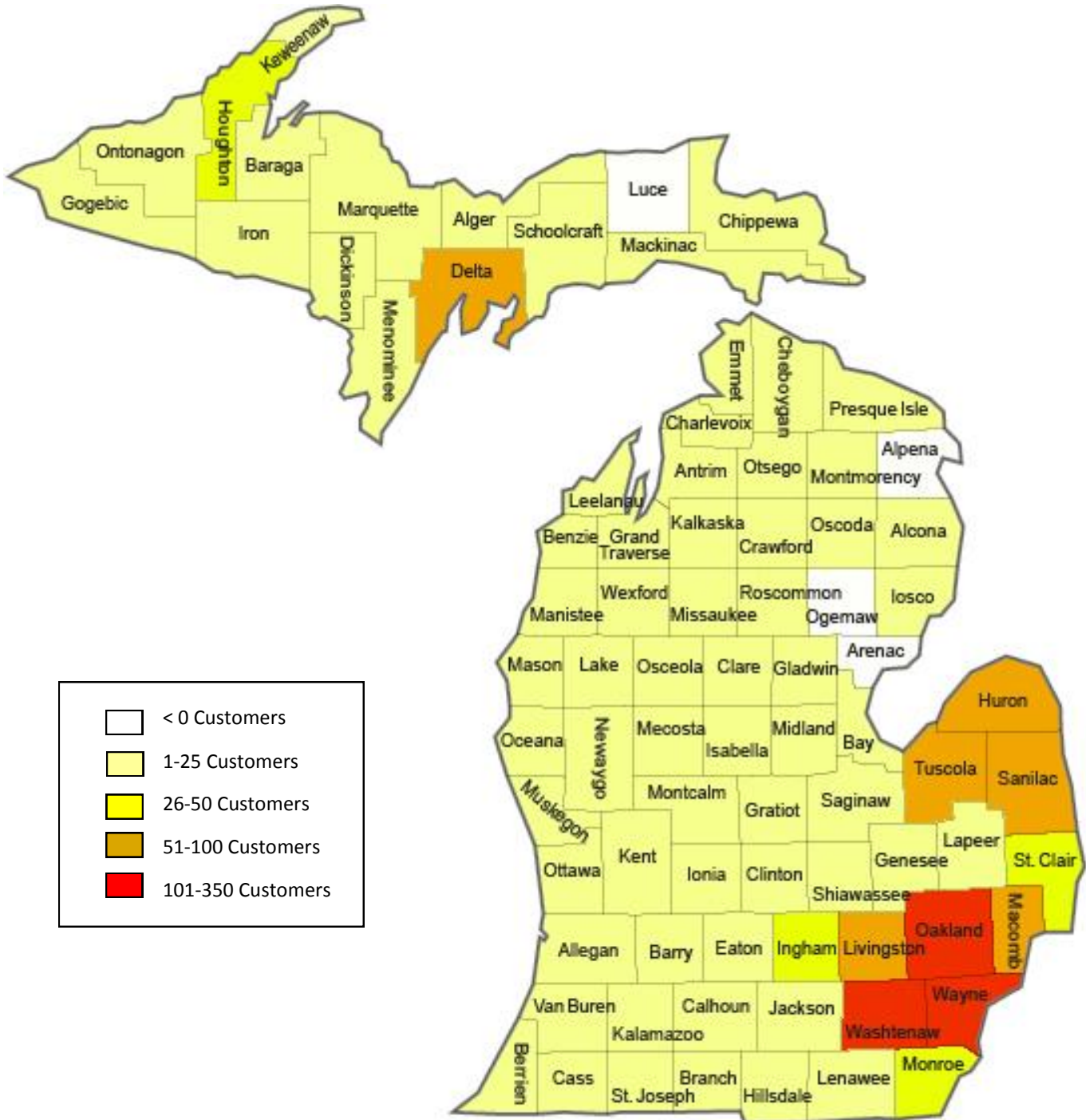
**Figure 5: 2015 Summary of Michigan Net Metering Customers By County**



Source: Zip codes of participating net metering customers are provided to MPSC Staff by Michigan electric providers. Customer identification information (name, address, account number, etc.) is confidential and protected from disclosure.

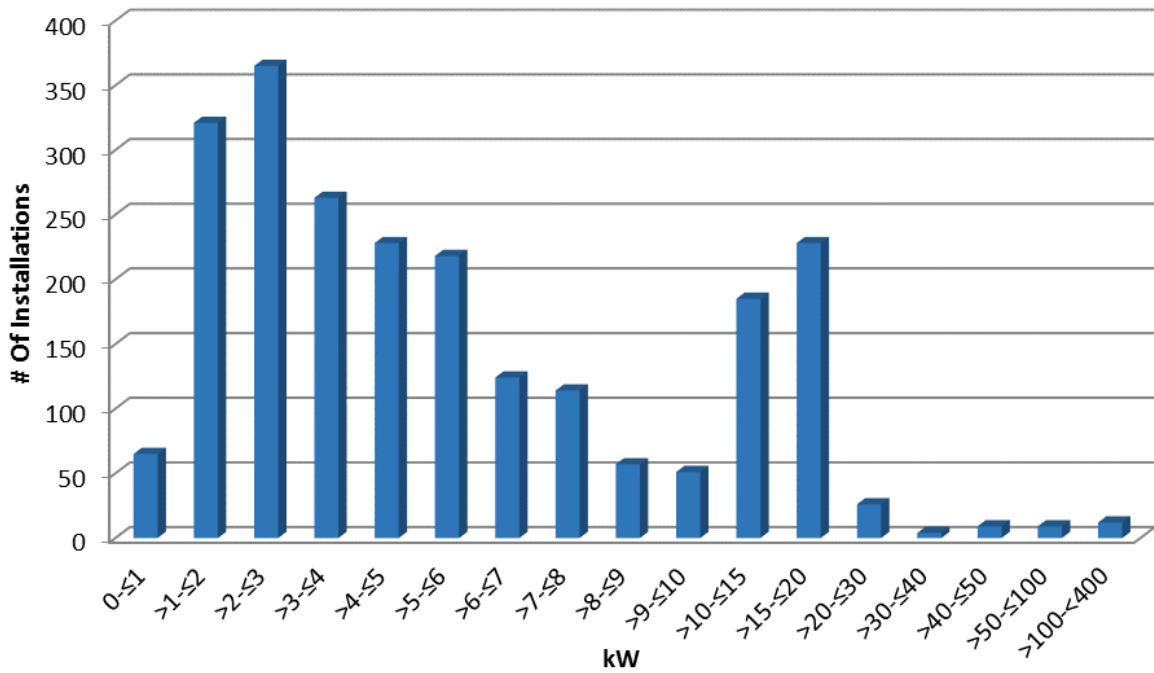


**Figure 6: 2015 Summary of Michigan Solar Net Metering Customers By County**

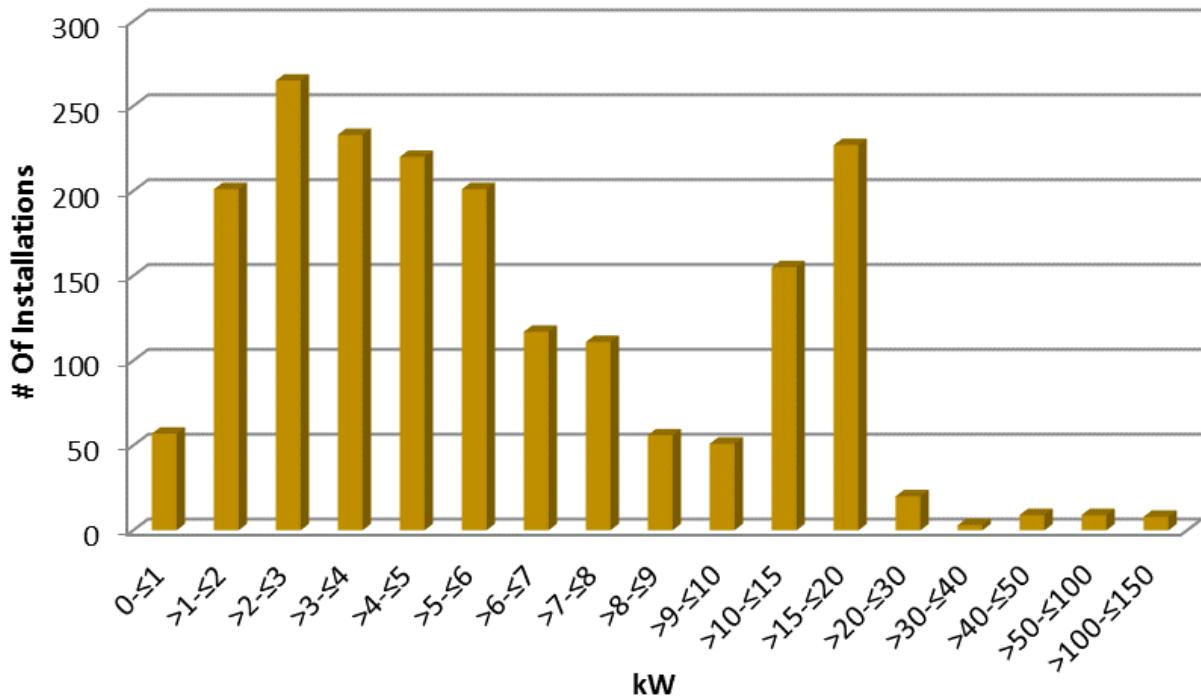




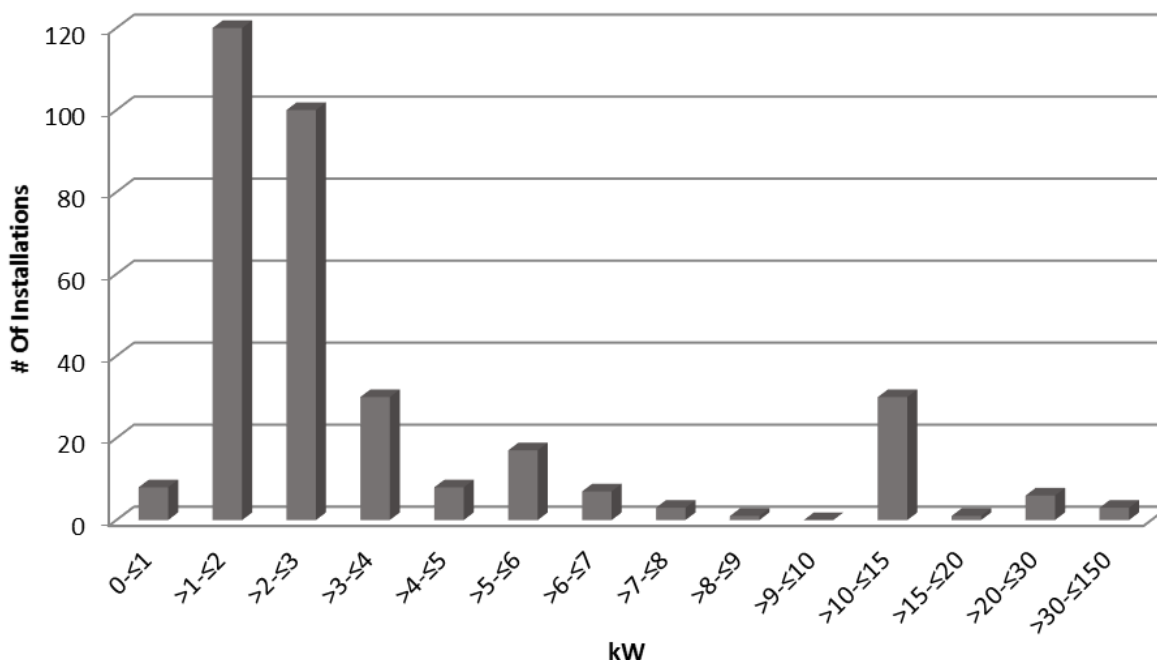
**Figure 8: Histogram of 2015 Total Net Metering Installations by Capacity Size**



**Figure 9: Histogram of 2015 Solar Net Metering Installations by Capacity Size**



**Figure 10: Histogram of 2015 Wind Net Metering Installations by Capacity Size**



### Michigan's Solar Programs

Solar has quickly become Michigan's largest share of net metering installations. In response to this demand from customers, Consumers Energy and DTE Electric developed programs that allow customers to install solar with greater transparency with respect to system payback through long term contracts. Both Companies' programs are fully subscribed. Consumers Energy and DTE Electric continued the process of interconnecting participating customers as they installed their projects through 2015.

Consumers Energy, DTE Electric and other electric providers have built or are in the development phase of community solar projects that allow customers to realize the benefits of solar without the upfront cost or on-going maintenance associated with self generation. During 2013, Cherryland Electric Cooperative and Traverse City Light & Power implemented Michigan's first community solar program. Tri-County Electric's Solar Garden Program began in 2014. Consumers Energy's Community Solar Program was approved by the Commission in May 2015.<sup>7</sup>

### Experimental Advanced Renewable Program

Consumers Energy's original Experimental Advanced Renewable Program (EARP) was approved by the Commission in 2009. The maximum program size was 2 MW (2,000 kW) with 1,500 kW reserved for commercial projects and the remaining 500 kW allotted to residential projects. In June 2011, the company announced that the program had become fully subscribed

<sup>7</sup> <http://efile.mpsc.state.mi.us/efile/docs/17752/0037.pdf>

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. The Company now expects to be able to fund a total of 7 MW in aggregate.

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

The 5 MWs of capacity under the expanded program were split between residential and non-residential customers and were awarded in phases pertaining to the respective customer class. The price was 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 offered a \$0.001 per kWh bonus for systems constructed using both Michigan labor and Michigan materials. As of January 2015, the offer price was fixed at \$0.240 per kWh for all new residential participants, and \$0.199 per kWh for all new non-residential participants.

A system's size was limited to the customer's annual electricity use, similar to the net-metering program. This was 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 continued to add new participants until the approved budget was filled in July 2015. Agreements have 15 year terms or will expire at the end of the Renewable Energy Plan period in 2029, whichever comes first.

Consumers Energy awarded agreements through 35 Phases<sup>8</sup>. Of these phases 18 have been residential phases, 11 have been non-residential with the remainder of the 35 being from the first 2 phases and the developer program. At the end of 2015, Consumers Energy had a total of approximately 7 MW of solar capacity participating or under construction as part of the EARP with 4.4 MW operational. As of July 31, 2016 the EARP program has 6.8 MW participating or under construction with 5.5 MW operational. Table 4 shows the progression of Consumers Energy's program and the most recent average retail rates for the Company.

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<sup>8</sup> <https://www.consumersenergy.com/content.aspx?id=4847>

**Table 4: Consumers Energy EARP Summary**

<b>Consumers Energy Experimental Advanced Renewable Program (EARP)</b>		
	Program Rate \$ per kWh	Average Retail Rate* \$ per kWh
<b>EARP Phase 1: 1 MW Offered in 2009</b>		
Residential	\$0.650	Residential (@500 kWh per Month)  \$0.1497
Commercial	\$0.450	
<b>EARP Phase 2: 1 MW Offered in 2010</b>		
Residential	\$0.525	Small Commercial (@5,000 kWh per Month)  \$0.1412
Commercial	\$0.375	
<b>EARP Expanded: Up to 5 MW Offered from 2011 - 2016</b>		
Residential	\$0.240 - \$0.259	
Commercial	\$0.199	
*Source MPSC Comparison of Average Rates: <a href="http://www.dleg.state.mi.us/mpsc/electric/download/rates1.pdf">http://www.dleg.state.mi.us/mpsc/electric/download/rates1.pdf</a>		

SolarCurrents

DTE Electric’s SolarCurrents pilot program initially included a 5 MW customer-owned program and a 15 MW company-owned program. In May 2011, DTE Electric announced that the customer-owned program was fully subscribed. On December 20, 2011, the Commission ordered MPSC Staff to convene a collaborative to explore opportunities for the continuation of the customer-owned SolarCurrents program. Pursuant to the collaborative, the company filed an application for a 2 MW expansion on October 8, 2012 and the Commission approved the application on November 16, 2012, which increased the SolarCurrents Program to 22 MW.

The 5 MW Phase 1 customer-owned SolarCurrents program provided an up-front renewable energy credit (REC)[2] payment equal to \$2.40 per Watt of installed solar PV which is approximately half of the total system cost. The company will purchase the remaining RECs through a monthly payment/on-bill credit equal to \$0.11 per kWh for 20 years. System size is limited by the customer’s annual electricity use or by the 20 kW size cap (whichever is smaller).

Phase 2 provides for an up-front purchase of approximately 30% of the RECs the company anticipates will be generated over the life of the system. The remaining RECs will be purchased via monthly bill credits based on actual generation. This purchase is done through \$0.02 (for non-residential customers) and \$0.03 (for residential customers) per kWh payments starting on the agreement execution date and ending on August 31, 2029, for a maximum term of 16 years. The company accepted applications for the 2 MW Phase 2 program from residential and non-residential customers through four 500 kW tranches. The agreements were awarded using random selection events starting in January 2013 with the last offering awarded in August 2014. As of December 31, 2015, the company has contracted for 5,030 kW from 589 customers representing full participation for Phase 1 of SolarCurrents and commissioned the remaining



projects for Phase 2 of the program. SolarCurrents Phase 2 is represented by 242 projects representing 1.7 MW. Table 5 shows the progression of DTE Electric’s pilot program and the most recent average retail rates for the Company.

**Table 5: DTE Electric SolarCurrents Program Summary**

<b>DTE Electric Customer-Owned SolarCurrents Program</b>			
	Program Rate \$ per kWh	Up Front REC Payment \$ per kW of Installed Solar	Average Retail Rate* \$ per kWh
<b>Phase 1: 5 MW Offered from 2009 - 2011</b>			Residential (@500 kWh per Month)  \$0.1551
Residential	\$0.110	\$2.40	
<b>Phase 2: 2 MW Offered from 2012 - 2015</b>			Small Commercial (@5,000 kWh per Month)  \$0.1275
Residential	\$0.030	30% of total REC Value	
Non-Residential	\$0.020	30% of total REC Value	
*Source MPSC Comparison of Average Rates: <a href="http://www.dleg.state.mi.us/mpsc/electric/download/rates1.pdf">http://www.dleg.state.mi.us/mpsc/electric/download/rates1.pdf</a>			

DTE Electric’s company-owned SolarCurrents program includes solar photovoltaic projects ranging from 60 kW to 1,949 kW that are either located on DTE Energy property or on customer premises. Customers selected to host a solar project receive a one-time, upfront construction payment to cover any inconvenience during installation in addition to an annual easement payment for the life of the installation. Pursuant to two separate competitive solicitations, the company contracted with Nova Consultants, Rudolph Libbe, and Inovateus Solar, LLC to construct the solar generating facilities. The panels will be provided by either McNaughton-McKay Electric Company or Inovatus Solar, LLC. Currently, 26 projects are complete totaling 14.2 MW of solar PV capacity. An additional two projects are under construction totaling approximately 1.7 MW of capacity. The final two projects are expected to be placed in service prior to December 31, 2016 and will conclude the company-owned SolarCurrents pilot program with 15.9 MW, exceeding the program’s 15.0 MW target.

Community Solar

Cherryland Electric Cooperative and Traverse City Light & Power are the first electric providers in Michigan to offer a joint community solar program – Solar Up North (SUN) Alliance Program. The framework for this program comes from the energy optimization standard of Act 295 as opposed to net metering or the renewable energy standard. Cherryland Electric

Cooperative members and Traverse City Light & Power customers can purchase solar shares for a one time investment of \$470.00 each. The participants receive a \$75.00 Energy Optimization rebate per panel. The electric providers use the wholesale electric market prices to determine the amount of monthly bill credit to provide to the participants. It is estimated that the credit will be an average of \$2.00 per month. This amount will be based on total monthly array output and will vary based on weather conditions. The community solar program has been very successful and is continuing to grow. As of July 2013, one hundred thirty six shares had been purchased.<sup>9</sup>

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

On May 14, 2015 the Commission approved Consumers Energy's application to add up to ten MW of Community Solar to its renewable energy plan. On March 29, 2016 the Commission approved an application for contracts related to the Solar Gardens program and the construction contract for the three MW project to be located at Grand Valley State University (GVSU). On July 22, 2016 the Commission approved a construction contract for one MW of solar at Western Michigan University campus. Consumers Energy's Community Solar program, referred to as Solar Gardens, is the first community solar program offered by a rate regulated utility in Michigan. Participants will purchase half kW blocks up to their annual usage and receive a bill credit based on market energy and capacity prices, adjusted upward for line loss, based on a pro rata share of their subscription elections over the 25 year term. Customers can purchase their subscriptions via four options: upfront payment of \$1,339; three year monthly payments of \$42 per month; seven year monthly payments of \$21 per month; or, 25 year monthly payments of \$10 per month.<sup>10</sup> As of July 31, 2016, the Solar Gardens program is 58.2% subscribed.

In late 2015, Lansing Board of Water announced it will develop a community solar program in which customers can lease 300 watt panels for \$399. The lease term is 25 years and customers receive a credit on their bills based on the prorated amount of solar energy the customer has purchased.<sup>11</sup>

### **MPSC Staff's 2015 Solar Estimate**

Each year MPSC Staff compiles an estimate of installed solar in Michigan based on utility reporting and publicly available information. The 2015 estimate is shown in Table 6. The amount of installed solar grew from 27,197 kW at the end of 2014 to 36,118 kW in 2015 representing a 33% increase. There is currently significant solar project construction happening in Michigan and the 2016 report is expected to show a marked increase in installed solar.

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<sup>9</sup> See A Guidebook for Community Solar Programs in Michigan Communities <http://glrea.org/>

<sup>10</sup> <https://www.consumersenergy.com/content.aspx?id=8210>

<sup>11</sup> <https://www.lbwl.com/About-the-BWL/News/Community-Solar-Parks-to-be-Developed-in-Cities-of-East-Lansing-and-Lansing/>



**Table 6: MPSC Staff’s Estimate – 2015 Michigan Installed Solar<sup>12</sup>**

Program	Number of Installations	Total Solar Installed Capacity kW
Experimental Advanced Renewable Program (Consumers Energy’s Earp)	236	5,500
Solar Net Metering (includes DTE Electric’s SolarCurrents customer-owned projects)	1,946	14,948
SolarCurrents (DTE Electric-owned projects)	26	14,200
IKEA-Canton Store	1	1,220
Lansing Board of Water & Light	3	177
Cherryland/Traverse City Light & Power Community Solar	1	52
Tri-County Homeworks Community Solar	1	21
<b>Total</b>	<b>2,214</b>	<b>36,118 kW</b>
Consumers Energy EARP, DTE Electric SolarCurrents (both customer and company owned) and Cherryland/Traverse City Light & Power data was provided by the companies. IKEA January 27, 2016 company press release: <a href="http://www.ikea.com/us/en/about_ikea/newsitem/012716_pr-IKEA-Canton-solar">http://www.ikea.com/us/en/about_ikea/newsitem/012716_pr-IKEA-Canton-solar</a>		

<sup>12</sup> The data reflected in the table includes solar projects that were operational during 2015. Consumers Energy’s Solar Gardens program and DTE Electric’s proposed voluntary renewable energy program began generating during 2016 and will be included in next year’s report.