



# Distributed Generation Program Report

For Calendar Year 2017

October 15, 2018

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

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

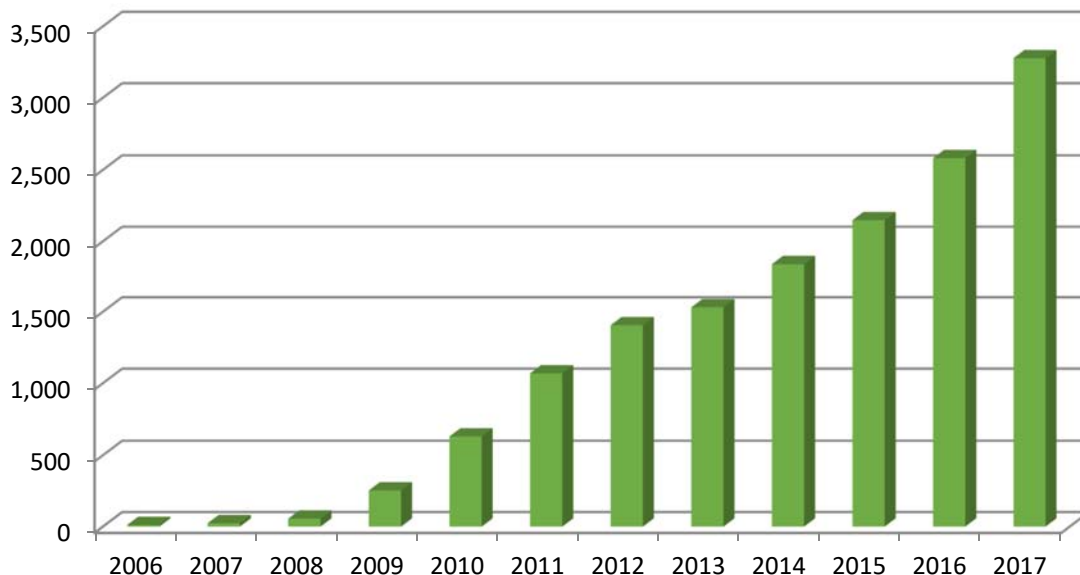
## Executive Summary

The Distributed Generation Program (DG Program) enables Michigan's utility and alternative electric supplier customers to install on-site renewable energy electric generation projects to meet some or all of their electric energy needs and reduce their electric bills. The project size is limited such that the annual generation does not exceed the customer's electricity consumption for the previous 12 months. The customer reduces electricity purchases from the utility by using their generated electricity "behind the meter" and receives a credit for excess generation.

This report is based on DG Program electric provider annual reports for calendar year 2017 and Michigan Public Service Commission (Commission) activities relating to the DG Program through August 2018.

Customer participation in the DG Program increased from 2,582 customers and 2,684<sup>1</sup> installations in 2016 to 3,277 customers and 3,427 installations in calendar year 2017.<sup>2</sup> At the end of 2017, the total capacity of DG Program installations was approximately 29,571 kilowatts (kW), an increase of 35% over the previous calendar year. As shown below, program participation has increased each year from 2006 through 2017.

**Michigan Distributed Generation Program Customers**



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

<sup>2</sup> A complete list of DG Projects by utility, ZIP code, type and size is provided at the MPSC's DG Program website [https://www.michigan.gov/documents/mpsc/2017\\_Data\\_from\\_Reports\\_631339\\_7.pdf](https://www.michigan.gov/documents/mpsc/2017_Data_from_Reports_631339_7.pdf)

During 2017 and 2018, the Commission continued the implementation process of the new DG Program as required by 2016 Public Act 341 and 342. The Commission issued an order on July 12, 2017 finding that the net metering program shall continue as the DG Program until the new DG Program tariffs are approved as part of a utility's rate case.<sup>3</sup> Existing net metering customers and new customers who enter the DG Program during this interim period may continue to net meter for 10 years from the date of their enrollment.

The *Report on the MPSC Staff Study to Develop a Cost of Service-Based Distributed Generation Program Tariff* was issued on February 21, 2018.<sup>4</sup> The study recommended a conceptual tariff based on a new approach called the Inflow/Outflow billing mechanism. The Commission issued an order on April 18, 2018 directing all utilities to include the proposed Inflow/Outflow tariff in any post-June 1, 2018 rate case filings.<sup>5</sup> A utility may also file a DG Program tariff proposal of its own design. The new distributed generation tariff will go into effect at the conclusion of each utility's rate case.

DTE Electric is the first utility to file a rate case which includes the DG Program tariff. Rate cases are required, by law, to conclude within 10 months of the filing date. DTE Electric's rate case was filed on July 6, 2018 with an order due in early May 2019.<sup>6</sup>

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<sup>3</sup> [https://www.michigan.gov/documents/mpsc/u-18383\\_7-12-17\\_579158\\_7.pdf](https://www.michigan.gov/documents/mpsc/u-18383_7-12-17_579158_7.pdf)

<sup>4</sup> [https://www.michigan.gov/documents/mpsc/MPSC\\_Staff\\_DG\\_Report\\_with\\_Appendices\\_614779\\_7.pdf](https://www.michigan.gov/documents/mpsc/MPSC_Staff_DG_Report_with_Appendices_614779_7.pdf)

<sup>5</sup> [https://www.michigan.gov/documents/mpsc/U-18383\\_4-18-18\\_620947\\_7.pdf](https://www.michigan.gov/documents/mpsc/U-18383_4-18-18_620947_7.pdf)

<sup>6</sup> MPSC Case No. U-20162: <https://mi-psc.force.com/s/case/500t0000009hEHeAAM/in-the-matter-of-the-application-of-dte-electric-company-for-authority-to-increase-its-rates-amend-its-rate-schedules-and-rules-governing-the-distribution-and-supply-of-electric-energy-and-for-miscellaneous-accounting-authority>

## Introduction

The Michigan Public Service Commission (Commission) Staff (MPSC Staff) annually issues a distributed generation program (DG Program) 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 is based on DG Program electric provider annual reports for calendar year 2017 and Commission activities relating to the DG Program through August 2018.

The DG Program enables Michigan's utility and alternative electric supplier customers to install on-site renewable energy electric generation projects to meet some or all of their electric energy needs and reduce their electric bills. The project size is limited such that the annual generation does not exceed the customer's electricity consumption for the previous 12 months. The customer reduces electricity purchases from the utility by using their generated electricity "behind the meter" and receives a credit for excess generation.

DG projects are grouped into size categories with differing billing, metering and interconnection requirements.

### Category 1: DG Program for projects 20 kW and under (certified equipment) – Net Metering

The DG Program is available to any customer meeting the generator size requirements (20 kW and under) and using an Underwriters Laboratory (UL) 1741 certified inverter. Typically, residential customers would fit within this size category.

The DG Program for these types of projects features:

- Billing based on net usage.
- A credit equal to the full retail rate for all excess kWh.
- Use of the customer's existing meter if it is capable of measuring and recording the flow of energy in both directions.
- A generator meter available at cost, if requested by the customer. (The generator meter is for the customer's benefit. Utilities are not obligated to read a customer's generator meter.)
- Use of an inverter certified by a nationally recognized testing laboratory to IEEE 1547 testing standards and in compliance with UL 1741. The inverter manufacturer will be able to produce proof of this certification.
- A maximum DG Program and interconnection application processing fee of \$100. Customers pay all interconnection costs.
- DG Program credits for excess generation carry forward indefinitely.

### **Category 2: DG Program for projects over 20 kW up to 150 kW – Modified Net Metering**

This DG Program category is available to any customer meeting the renewable generator size requirements. Typically, these would be commercial, industrial, or institutional customers.

The DG Program for these types of projects features:

- Customers who pay the full retail rate for electricity deliveries from their electric provider and receive the generation portion of the retail rate or a wholesale rate for deliveries of excess generation to the grid.
- No charge for the engineering review for interconnection.
- Customers pay all interconnection costs (combined \$100 interconnection and DG Program application fee), distribution study fees and any required distribution system upgrade costs.
- Customers are not subject to standby charges.

### **Category 3: Limited to Methane Digesters over 150 kW up to 550 kW - Modified Net Metering**

- Same as Category 2, except that customers are subject to standby charges.



## Distributed Generation Program Data

Customer participation in the DG Program increased from 2,582 customers and 2,684<sup>7</sup> installations in 2016 to 3,277 customers and 3,427 installations in calendar year 2017.<sup>8</sup> At the end of 2017, the total capacity of DG Program installations was approximately 29,571 kilowatts (kW), an increase of 7,683 kW from the previous calendar year. Although this represents a 35% increase in program size over 2017, it still is only 0.032% of Michigan's total retail electricity sales.<sup>9</sup>

Table 1 summarizes DG Program customers and capacity by electric provider for all three size categories of the DG Program.<sup>10</sup> The Category 1 DG Program is available to customers until the program size reaches 0.5% of the electric provider's average in-state peak load for the preceding five calendar years.<sup>11</sup> Consumers Energy and DTE Electric have 32 megawatts (MW) or 84% and 42 MW or 78% of Category 1 program space remaining, respectively. Tables 2 and 3 show peak load and program size information for each rate regulated electric provider for Category 1 and Category 2, respectively. Category 3 DG Program has limited participation with only two current customers.

During this reporting period Alger Delta Cooperative Electric Association, Consumers Energy, DTE Electric Company, Great Lakes Energy Cooperative, HomeWorks Tri-County Electric Cooperative, Indiana Michigan Power Company, Thumb Electric Cooperative and Upper Peninsula Power Company (UPPCO) reported a combined total of 107 customers participating in the Category 2 size range, which is an increase from 72 customers reported last year. Even with the growth in Category 2 projects, Category 1 projects still account for 72% of the total DG Program installed capacity. The state's two largest utilities, Consumers Energy and DTE Electric, host 84% of the statewide total DG Program capacity. Ninety-three percent of DG program participants have installed solar projects and the remaining are wind turbine or hydroelectric projects.

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<sup>7</sup> The number of DG Program installations exceeds the number of DG Program customers due to some customers having multiple installations.

<sup>8</sup> A complete list of DG Projects by utility, ZIP code, type and size is provided at the MPSC's DG Program website [www.michigan.gov/documents/mpsc/2017\\_Data\\_from\\_Reports1\\_631652\\_7.pdf](http://www.michigan.gov/documents/mpsc/2017_Data_from_Reports1_631652_7.pdf)

<sup>9</sup> The Energy Information Administration reports 2016 retail sales of 104,467,813 MWh for Michigan. See Michigan Electricity Profile: <https://www.eia.gov/electricity/state/michigan/>. A 13% capacity factor was assumed for the DG Program generators.

<sup>10</sup> Category 1: Projects up to 20 kW incorporating IEEE 1547 certified inverters. Category 2: Projects greater than 20 kW and no larger than 150 kW and non-inverter based 20 kW and under projects. Category 3: Methane Digester projects up to 550 kW.

<sup>11</sup> UPPCO's Category 1 DG Program reached its program size cap and was closed on July 22, 2016. <https://mi-psc.force.com/s/filing/a00t0000005pZWIAAM/u157870235>

**Table 1: Distributed Generation Program Customer and Capacity Data**

Company	Category 1 Customers	Category 1 Nameplate Capacity (kW)	Category 2 Customers	Category 2 Nameplate Capacity (kW)	Category 3 Customers	Category 3 Nameplate Capacity (kW)
Alger Delta*	33	155	1	90		
Alpena	21	76				
Cherryland*	31	94				
Cloverland	32	113				
Constellation**	2					
Consumers Energy	873	5,967	65	5,334	1	190
DTE Electric	1,675	11,841	30	1,757		
Direct Energy	2	7				
Great Lakes Energy	125	707	2	125	1	400
Homeworks Tri-County	28	216	3	153		
Indiana Michigan	68	470	1	52		
Midwest	27	152				
Ontonagon	31	150				
Presque Isle*	22	93				
Thumb*	19	161	1	40		
UPPCo	132	734	4	196		
UMERC	44	279				
Xcel	3	19				
<b>Total</b>	<b>3,168</b>	<b>21,234</b>	<b>107</b>	<b>7,747</b>	<b>2</b>	<b>590</b>

Alger Delta, Cherryland, Cloverland, Great Lakes, Homeworks Tri-County, Midwest, Ontonagon, Presque Isle and Thumb are member-regulated cooperatives and not required to offer the DG Program.

\*Alger Delta, Cherryland, Presque Isle and Thumb data is from previous reporting years.

\*\*Constellation New Energy will provide more data at a later date.

[Source: 2017 Electric Provider Annual DG Reports Case U-15787](#)

**Table 2: Distributed Generation Program Size Details  
Rate Regulated Electric Providers  
Category 1: 20 kW and Under**

Company	No. of Customers	In-State Peak Load (5-Year Avg) (kW)	Category 1 Cap 0.5% of Peak Load (kW)	Current Participating Nameplate Capacity (kW)	Space Remaining (kW)	% Remaining
<b>Alpena</b>	<b>21</b>	<b>64,400</b>	<b>322</b>	<b>76</b>	<b>246</b>	<b>76%</b>
<b>Consumers Energy</b>	<b>873</b>	<b>7,624,200</b>	<b>38,121</b>	<b>5,967</b>	<b>32,154</b>	<b>84%</b>
<b>DTE Electric</b>	<b>1,675</b>	<b>10,994,400</b>	<b>54,972</b>	<b>11,841</b>	<b>43,130</b>	<b>78%</b>
<b>Indiana Michigan</b>	<b>68</b>	<b>831,400</b>	<b>4,157</b>	<b>470</b>	<b>3,687</b>	<b>89%</b>
<b>UMERC</b>	<b>44</b>	<b>110,902<sup>12</sup></b>	<b>555</b>	<b>279</b>	<b>275</b>	<b>49%</b>
<b>UPPCo<sup>13</sup></b>	<b>132</b>	<b>108,000</b>	<b>540</b>	<b>734</b>	<b>0</b>	<b>0%</b>
<b>Xcel</b>	<b>3</b>	<b>28,120</b>	<b>141</b>	<b>19</b>	<b>122</b>	<b>86%</b>

Source: 2017 Electric Provider Annual DG Reports Case U-15787

<sup>12</sup> UMERC is a new utility and its in-state peak load is based on 2017 data only.

<sup>13</sup>UPPCO's Category 1 net metering program reached its program size cap was closed on July 22, 2016. <https://mi-psc.force.com/s/filing/a00t0000005pZWIAAM/u157870235>

**Table 3: Distributed Generation Program Size Details**  
**Rate Regulated Electric Providers**  
**Category 2: >20 kW to 150 kW**

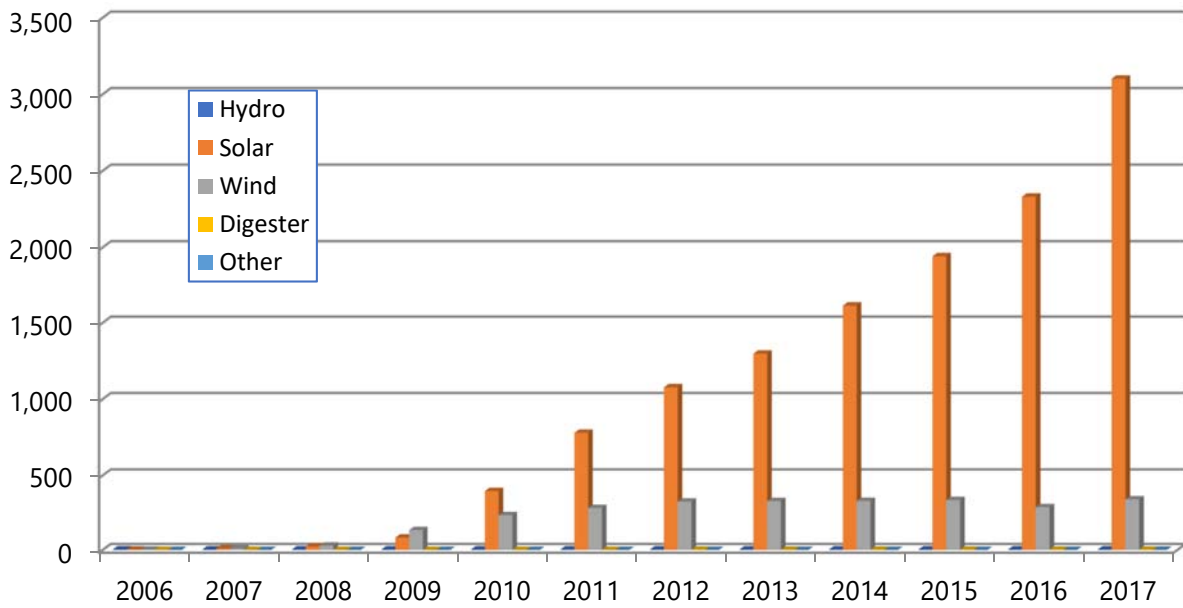
Company	No. of Customers	In-State Peak Load (5-Year Avg) (kW)	Category 2 Cap 0.25% of Peak Load (kW)	Current Participating Nameplate Capacity (kW)	Space Remaining (kW)	% Remaining
<b>Alpena</b>	<b>0</b>	<b>64,400</b>	<b>161</b>	<b>0</b>	<b>161</b>	<b>100%</b>
<b>Consumers Energy</b>	<b>65</b>	<b>7,624,200</b>	<b>19,061</b>	<b>5,334</b>	<b>13,727</b>	<b>72%</b>
<b>DTE Electric</b>	<b>30</b>	<b>10,994,400</b>	<b>27,486</b>	<b>1,757</b>	<b>25,729</b>	<b>93%</b>
<b>Indiana Michigan</b>	<b>1</b>	<b>831,400</b>	<b>2,078</b>	<b>52</b>	<b>2,026</b>	<b>97%</b>
<b>UMERC</b>	<b>0</b>	<b>110,902<sup>14</sup></b>	<b>277</b>	<b>0</b>	<b>277</b>	<b>100%</b>
<b>UPPCo</b>	<b>4</b>	<b>108,000</b>	<b>270</b>	<b>196</b>	<b>74</b>	<b>27%</b>
<b>Xcel</b>	<b>0</b>	<b>28,120</b>	<b>70</b>	<b>0</b>	<b>70</b>	<b>100%</b>

[Source: 2017 Electric Provider Annual DG Reports Case U-15787](#)

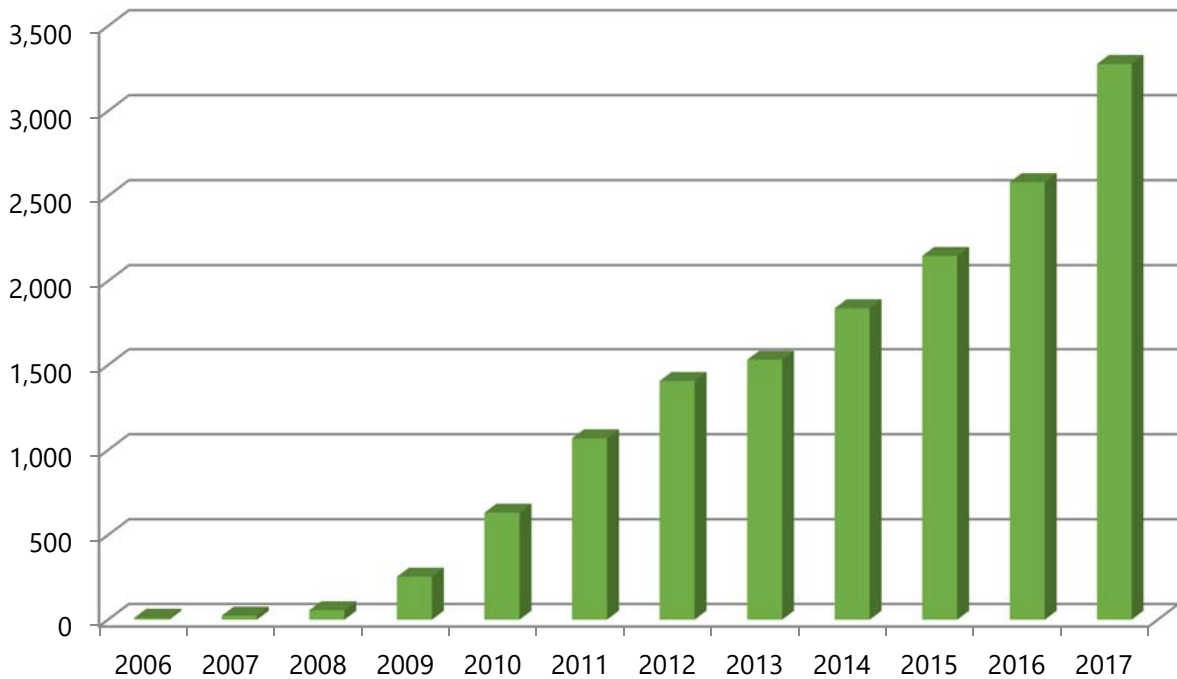
<sup>14</sup> UMERC is a new utility and its in-state peak load is based on 2017 data only.

Figures 1 through 3 show DG Program participation information.

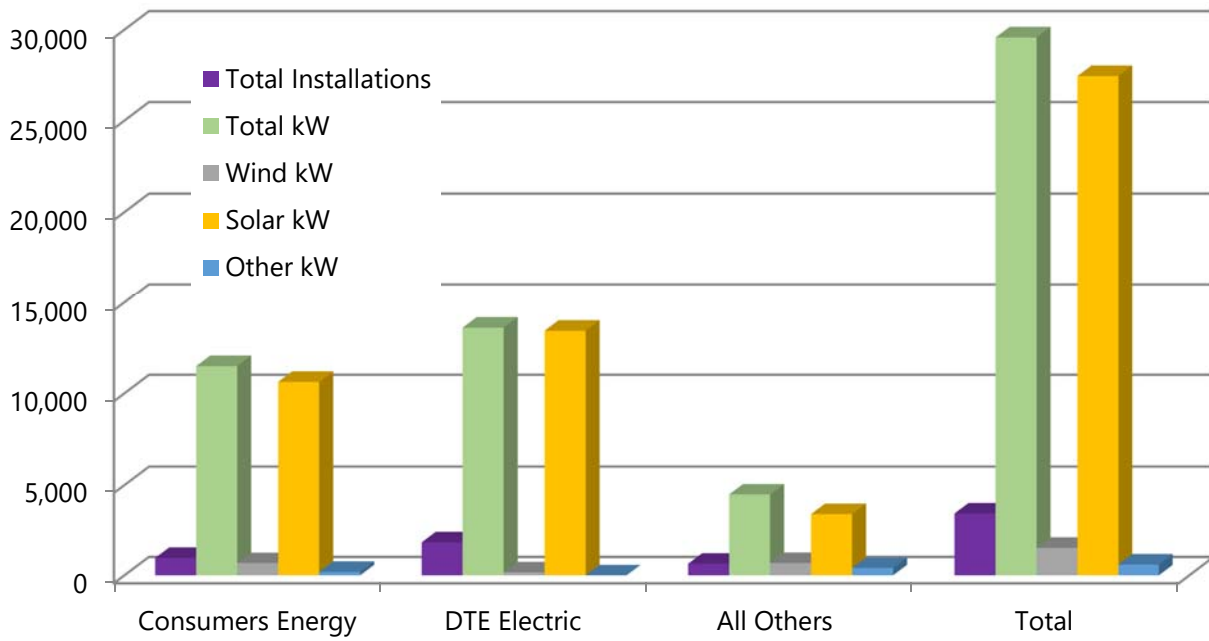
**Figure 1: Michigan Distributed Generation Program Installations by Technology**



**Figure 2: Total Michigan Distributed Generation Program Customers**



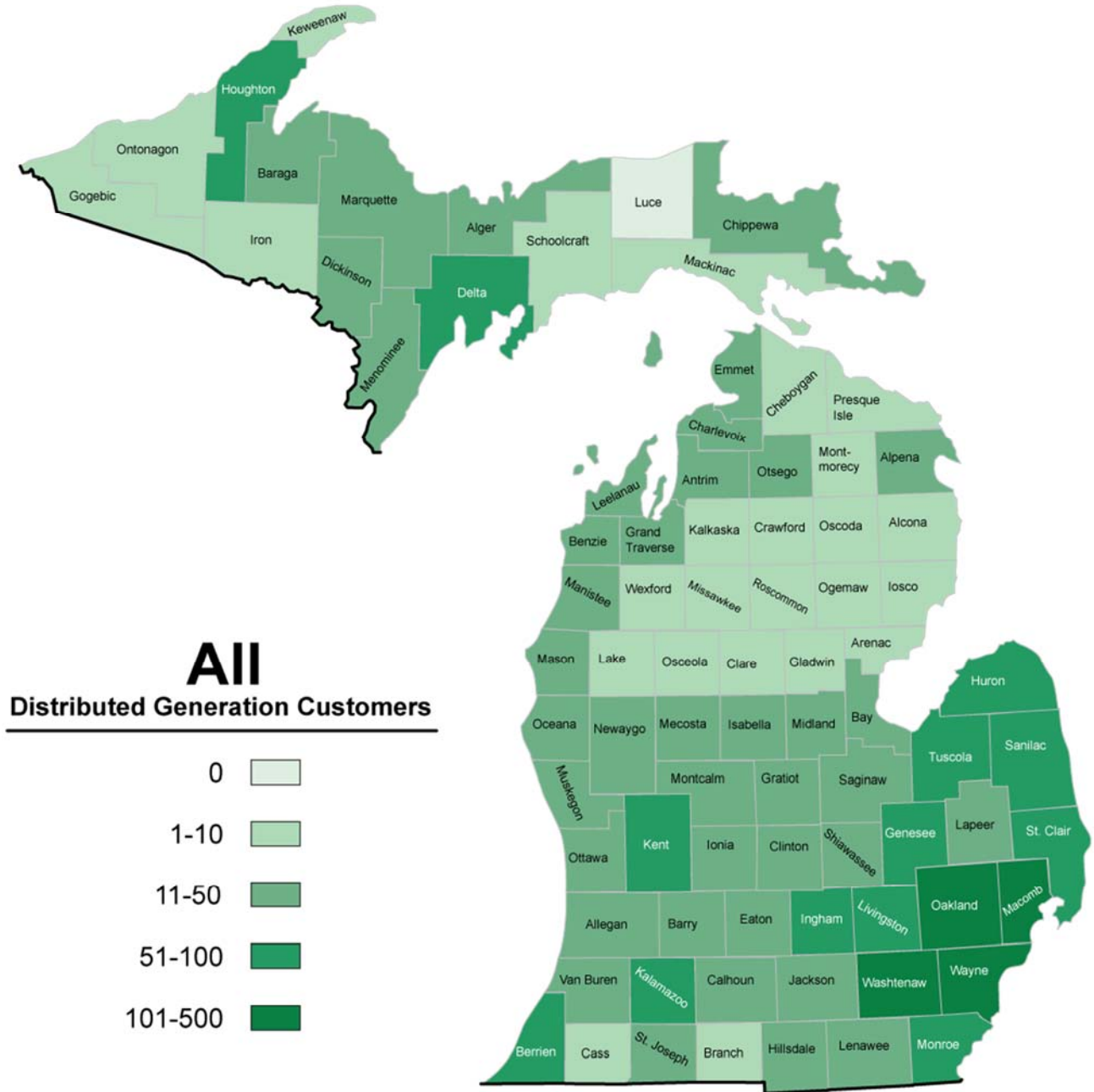
**Figure 3: Nameplate Capacity (kW) & Number of Installations**



Maps showing location information, based on ZIP code and county, for the total DG Program, solar only and wind only customers are displayed in Figures 4-6.

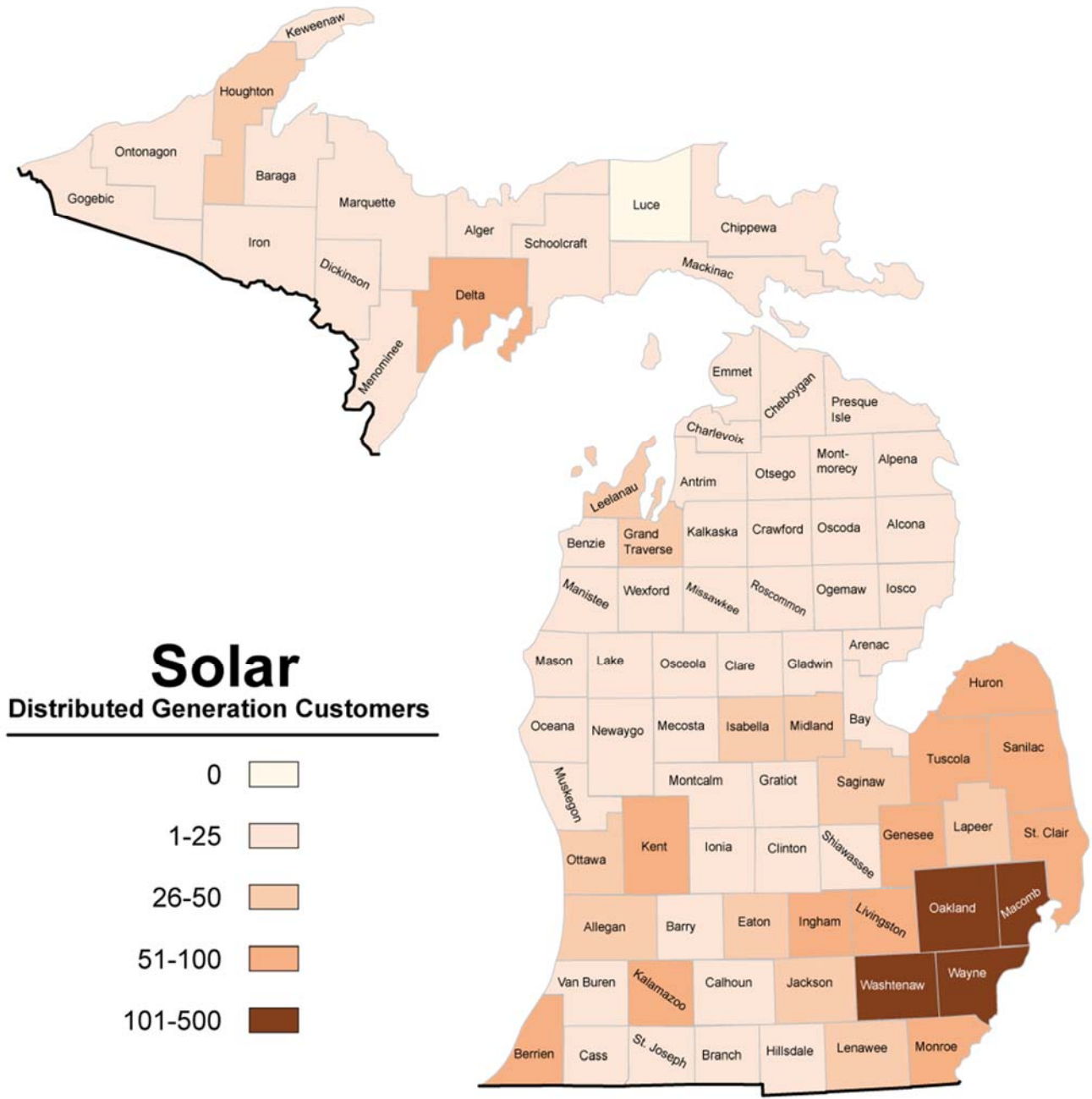
**Figure 4: Distributed Generation Program Customers by County**

Source: ZIP codes of participating 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 5: Solar Distributed Generation Program Customers by County**

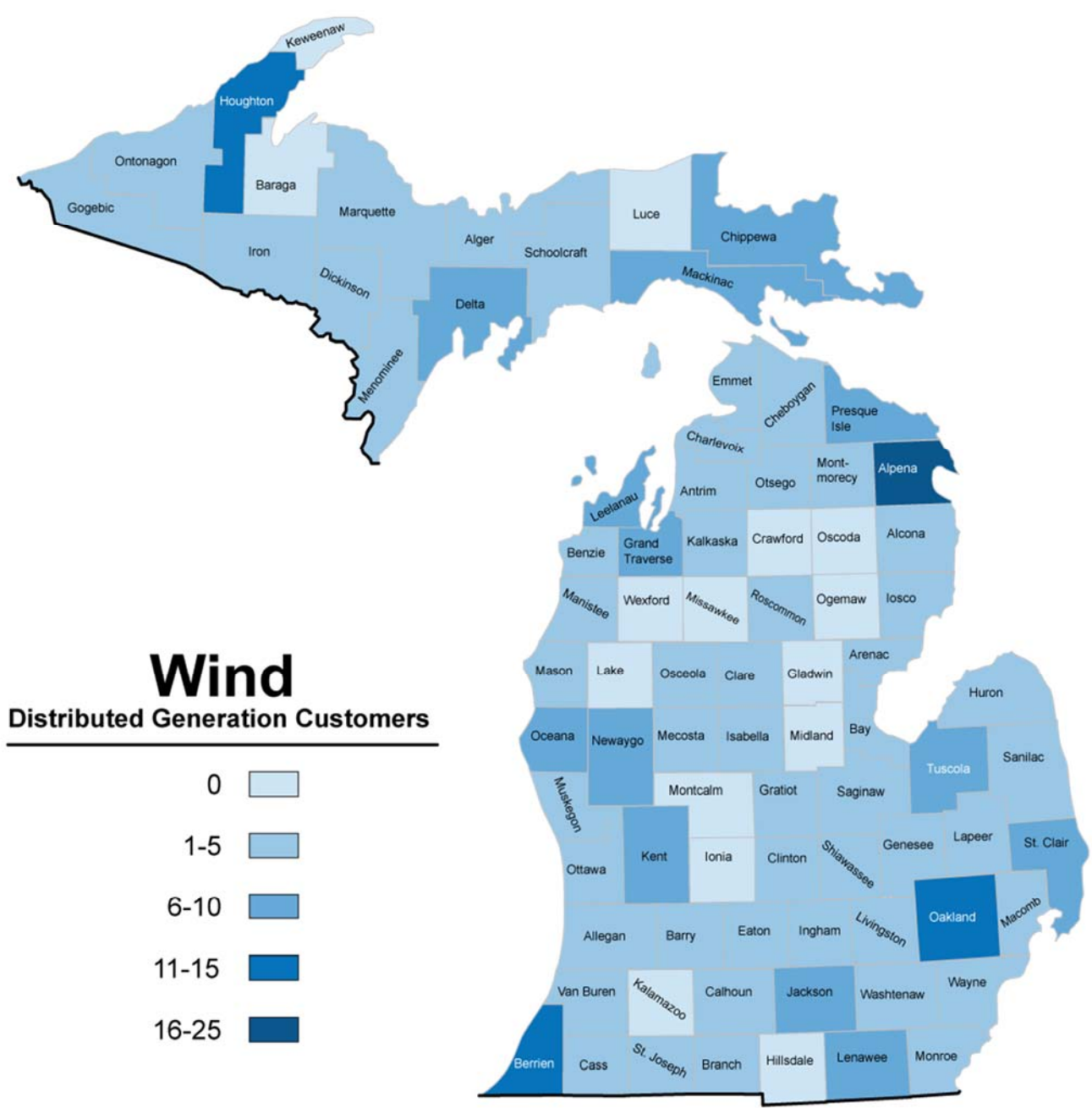
Source: ZIP codes of participating customers are provided to MPSC Staff by Michigan electric providers. Customer identification information (name, address, account number, etc.) is confidential and protected from disclosure.





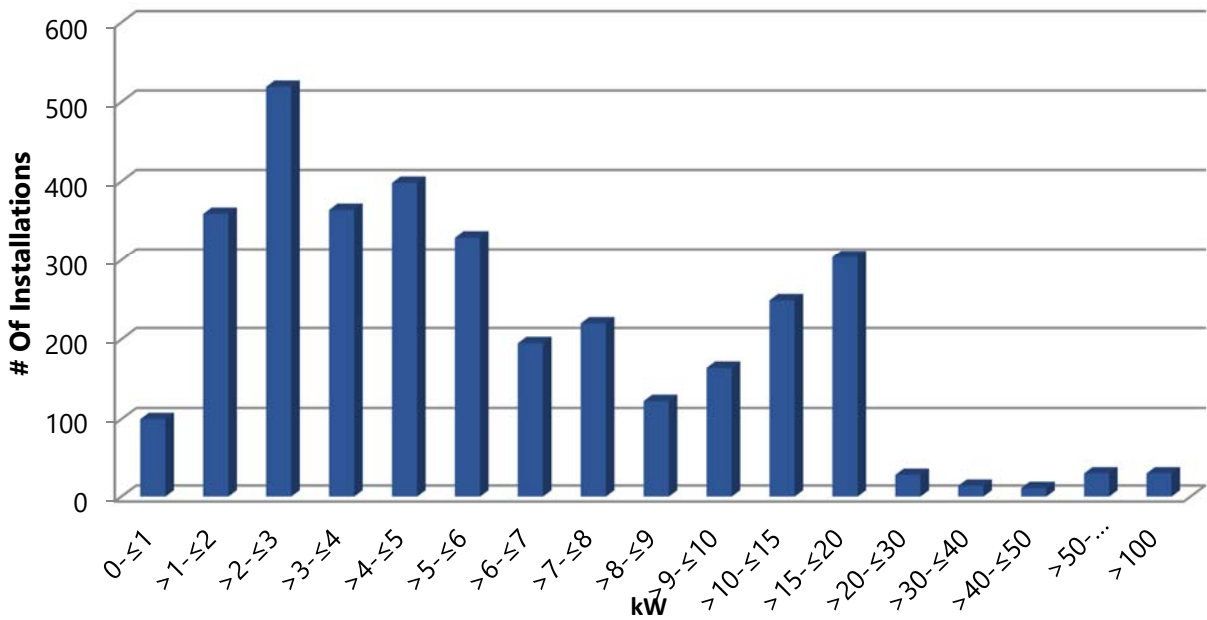
**Figure 6: Wind Distributed Generation Program Customers by County**

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

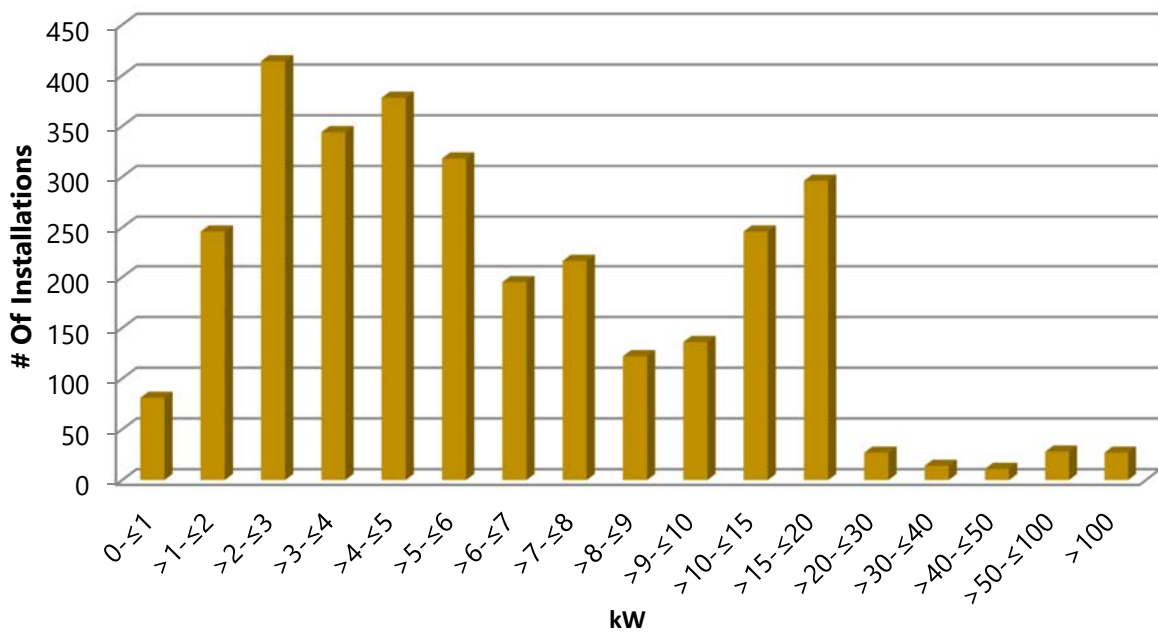


Figures 7 through 9 show a histogram breakdown of DG Program project sizes.

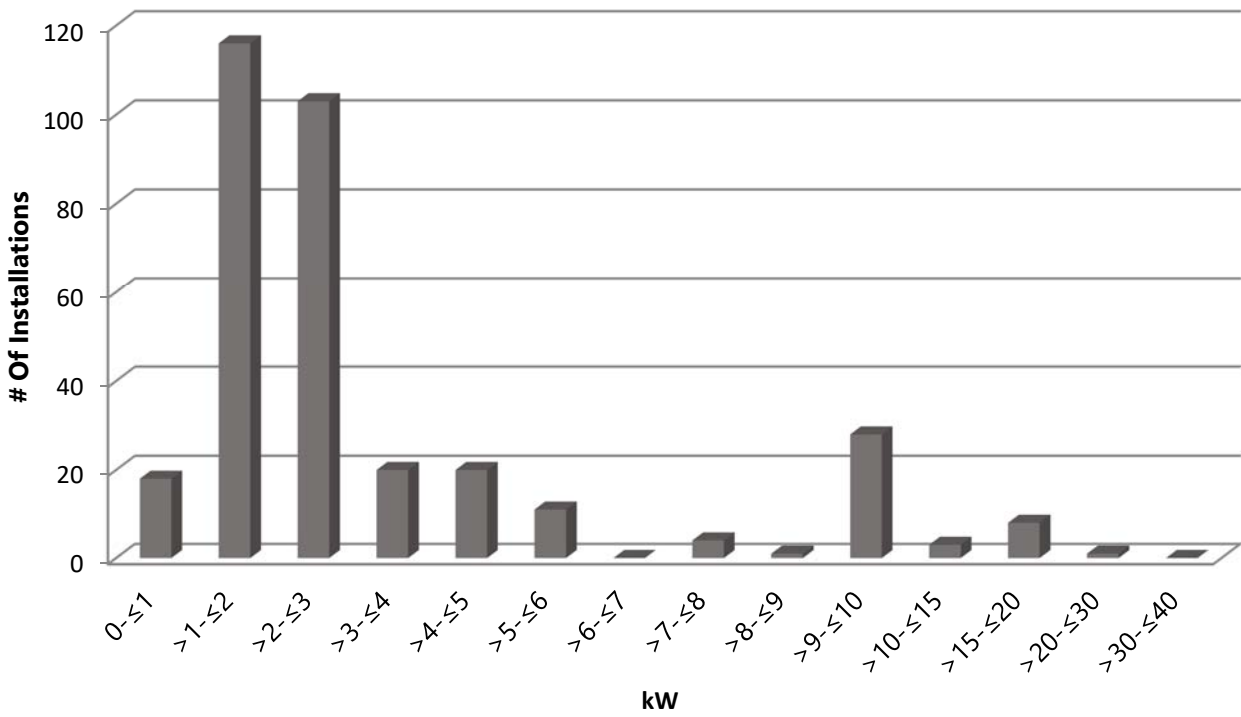
**Figure 7: Histogram of All Distributed Generation Program Installations by Project Size**



**Figure 8: Histogram of Solar Distributed Generation Program Installations by Project Size**



**Figure 9: Histogram of Wind Distributed Generation Program Installations by Project Size**



## Distributed Generation Program Implementation

2016 PA 341 and 342, signed by Governor Snyder in 2016, provide for the Commission to implement a new DG Program. The Commission issued an order on July 12, 2017 finding that the net metering program shall continue as the DG Program until the new DG Program tariffs are approved as part of a utility's rate case.<sup>15</sup> Existing net metering customers and new customers who enter the DG Program during this interim period may continue to net meter under the legacy net metering program for 10 years from the date of their enrollment.

The *Report on the MPSC Staff Study to Develop a Cost of Service-Based Distributed Generation Program Tariff* was issued on February 21, 2018.<sup>16</sup> The study recommended a conceptual tariff based on a new approach called the Inflow/Outflow billing mechanism. The method separates power inflows from power outflows, relying on two distinct and independent sets of meter data to establish consistent and appropriate cost-of-service allocators and billing determinants, rather than netting the two as is done for net metering. This is a fundamental attribute of the Inflow/Outflow billing method. The Commission issued an order on April 18, 2018 directing all utilities to include a DG Program tariff based on the inflow/outflow tariff proposed by Staff in any post-June 1, 2018 rate case filings.<sup>17</sup> A utility may also file a DG Program tariff proposal of its own design. The new distributed generation tariff will go into effect at the conclusion of each utility's rate case.

DTE Electric is the first utility to file a rate case which includes the DG Program tariff. Rate cases are required, by law, to conclude within 10 months of the filing date. DTE Electric's rate case was filed on July 6, 2018 with an order due in early May 2019.<sup>18</sup>

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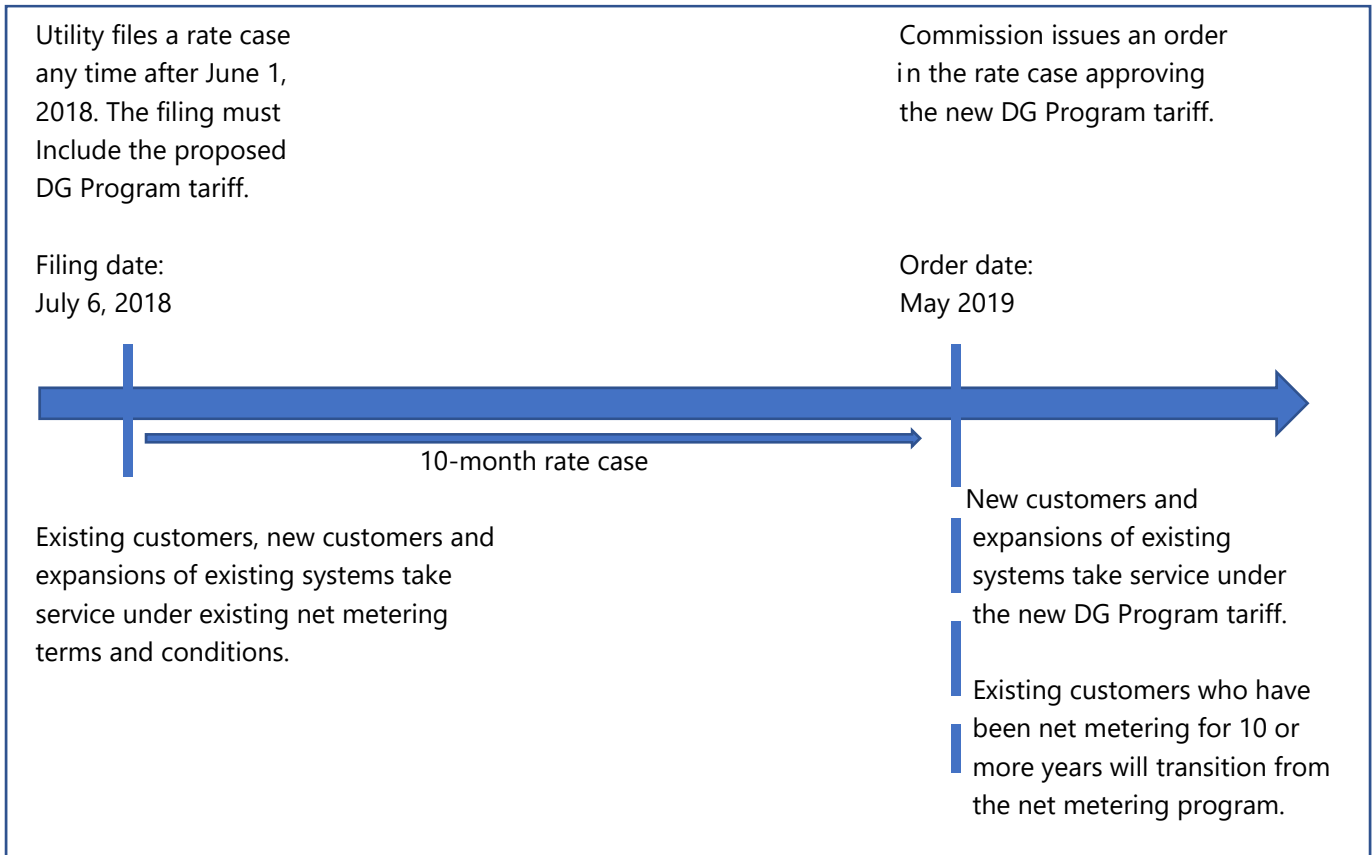
<sup>15</sup> [https://www.michigan.gov/documents/mpsc/u-18383\\_7-12-17\\_579158\\_7.pdf](https://www.michigan.gov/documents/mpsc/u-18383_7-12-17_579158_7.pdf)

<sup>16</sup> [https://www.michigan.gov/documents/mpsc/MPSC\\_Staff\\_DG\\_Report\\_with\\_Appendices\\_614779\\_7.pdf](https://www.michigan.gov/documents/mpsc/MPSC_Staff_DG_Report_with_Appendices_614779_7.pdf)

<sup>17</sup> [https://www.michigan.gov/documents/mpsc/U-18383\\_4-18-18\\_620947\\_7.pdf](https://www.michigan.gov/documents/mpsc/U-18383_4-18-18_620947_7.pdf)

<sup>18</sup> MPSC Case No. U-20162: <https://mi-psc.force.com/s/case/500t0000009hEHeAAM/in-the-matter-of-the-application-of-dte-electric-company-for-authority-to-increase-its-rates-amend-its-rate-schedules-and-rules-governing-the-distribution-and-supply-of-electric-energy-and-for-miscellaneous-accounting-authority>

**Figure 10: DTE Electric Distributed Generation Program Tariff Implementation Example**



## Conclusion

The DG Program size increased 35% during 2017 to 29,571 kW with nearly 700 customers added. While the program continues to grow, it still represents only 0.032% of Michigan's total retail electricity sales. While there are a small number of wind turbine projects, 93 percent of DG program participants have installed solar projects.

The Commission is continuing the process of implementing the DG Program as required by 2016 PA 341 and 342. A Commission order was issued on April 18, 2018 directing all utility rate case filings to include a DG Program tariff based on the Inflow/Outflow tariff proposed by Staff. It also provided the option to propose an additional tariff in any post-June 1, 2018 rate case filings. DTE Electric is the first utility to file a rate case which includes the DG Program tariff. 2016 Public Act 341 requires utility rate cases to conclude within 10 months of the filing date. [DTE Electric's rate case](#) was filed on July 6, 2018 with an order due in early May 2019. It is likely that the first DG Program tariff approved will set the stage for the general methodology of the DG program going forward.