

Michigan Renewable Energy Program

Net Metering Program Report for the year ended June 30, 2006

to the Michigan Public Service Commission

October 1, 2007

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Introduction and History of Michigan Net Metering Program

In its May 18, 2004 Order in Case No. U-12915, the Commission directed Staff to work with the newly created Michigan Renewable Energy Program (MREP) Ratemaking & Net Metering committee to develop a statewide net metering proposal for the Commission's consideration.¹ Commission Staff, representatives of regulated utilities, and other interested parties worked cooperatively during late 2004 and early 2005 to develop a net metering proposal. A consensus agreement reached between Staff and the utilities regulated by the Commission was approved by the Commission, with amendments, in an Order dated March 29, 2005.²

The net metering program is for customers with generator capacity sized under 30 kW. A utility may voluntarily set its limit to under 150 kW; however, all Michigan utility net metering tariffs currently set the size limit at under 30 kW.³ A second size limit requirement is that a customer's generator must be sized to meet the customer's needs. The intent is for the net metering program to assist the customer in meeting their own power and energy requirements, but net metering is not intended for customers who expect to make money through the sale of electricity. A third size limit is for the combined capacity of all net metered generators on any utility's system, not to exceed either 100 kW or 0.1% of the utility's peak system demand, whichever is greater.

Each utility filed net metering tariff sheets within 30 days of the Order. Net Metering tariff sheets for each utility are available on the Commission's website.⁴

The Consensus Agreement requires utilities to report net metering data annually to the MPSC MREP Staff by September 30 of each year to cover the 12-month period ending June 30⁵. Staff is directed to include net metering data and status reports in each year's MREP Annual Report to the Commission. This report covers the time period of July 1, 2005 through June 30, 2006.

Staff thanks all of the utilities for their efforts to provide the data and information that was used in preparing this report.

¹See the Order at <http://efile.mpsc.cis.state.mi.us/efile/docs/12915/0136.pdf>. Net metering is an accounting mechanism whereby retail electric utility customers who generate a portion or all of their own retail electricity needs are billed for generation (or energy) by their electric utility for only their net energy consumption during each billing period. Net energy consumption during a billing period is defined as the amount of energy delivered by the utility and used by the customer, minus the amount of energy, if any, generated by the retail customer and delivered to the utility at the location of the eligible unit.

²See the consensus agreement at <http://efile.mpsc.cis.state.mi.us/efile/docs/14346/0001.pdf> and March 29, 2005 Commission Order at <http://efile.mpsc.cis.state.mi.us/efile/docs/14346/0031.pdf>.

³The consensus agreement provides for multi-state utilities presently offering net metering in Michigan and other states through filed tariffs to continue those offerings in their present form, as compliance with the consensus. We Energies and Xcel Energy notified the Commission they will continue providing net metering service under existing tariffs.

⁴See <http://www.michigan.gov/netmetering>.

⁵See utility net metering reports at <http://efile.mpsc.cis.state.mi.us/efile/viewcase.php?casenum=14346>.

Current Status of Michigan Net Metering Program

As of June 30, 2006, Michigan had 8 customers participating in net metering. All but two of these customers began net metering well before 2005, under special arrangements with their utilities.⁶

Most utilities are reporting increased numbers of customer inquiries about net metering, and on that basis the utilities believe interest in the program is growing. Commission Staff has also received an increase in the number of net metering inquiries.⁷

Table 1 shows a summary of net metering installations for each utility. Also, because the program was only recently started and there have been some reported difficulties related to the timely completion of utility interconnection procedures, Table 1 includes a column to show the 7 reported pending applications, as of June 2006.

Table 2 contains further details about each net metering installation, including the location (by zip code), starting date, and technology type and size, where known.⁸

The consensus agreement defines net excess generation (NEG) as representing the amount of electric generation by the customer, beyond the customer's own metered usage, which is delivered to the utility during a billing period. Net metering customers are credited for NEG at the utility's retail price of generation. NEG credits, if any, are carried over from month to month, limited to a 12-billing-month cycle. At the end of each 12-billing-month cycle, cumulative NEG credits, if any, are retained by the utility and the customer's credit is reset to zero. A utility may voluntarily propose a program where customers are awarded a cash payment for NEG. Some Michigan utilities handle monthly NEG credits in this manner. For those utilities, customer NEG credits do not accumulate. The value of NEG credits retained by the utility, if any, will be used to offset costs associated with the utility's operation of the net metering program. For this reporting period, no utility showed any NEG credits accumulated at the end of the 12-billing-month cycle. There may have been months during the 12-billing-month cycle where customers put more energy out onto the grid than the utility delivered for their use, resulting in the creation of NEG credits for that month, but by the end of the 12-month cycle, all NEG credits had been used by the net metered customers.

The reporting requirements listed in the consensus agreement direct utilities to report "total NEG by technology type and cumulative total for each utility's program (at the end of each 12-billing-month cycle)." Staff believes the consensus agreement provides for both monthly NEG and cumulative NEG values to be reported, by technology type (i.e., wind, solar, etc.), and Staff intends to work with Michigan utilities to obtain and report these data in future net metering program reports to the Commission.

⁶The three We Energies participating customers indicated in Table 1 have been net metering since the 1980s. Ontonagon Rural Electric Association has one customer that began net metering around 1999.

⁷Prior to 2007, Commission Staff did not have a specific tracking mechanism for net metering inquiries. Codes were established for this purpose in early 2007, so that the Commission's Service Quality Inquiries data tracking system now includes specific codes for net metering and interconnection. Staff will track and report net metering inquiries in future reports.

⁸For the net metering program, the consensus agreement (p. 9) provides that Michigan utility companies will not disclose to the MPSC data that would identify specific customers (such as name, address, or utility account number), unless the utility "has previously obtained the customer's consent." Customers who wish to share information about their net metering experiences and perhaps participate in either research projects or the development of case study reports are invited to contact MPSC Staff by calling the Commission's Service Quality toll-free number, (800) 292-9555 or by email to: baldwinj2@michigan.gov.

Table 1: Net Metering Summary by Utility, Year Ended June 30, 2006

Company	Number of Participating Customers	Net Metering Technology Types				Number of Applications Pending (June 2006)
		Wind	Solar	Biomass	Hydro	
Alger Delta Co-op	3	1	1		1	Unknown
Alpena Power						1
American Electric (Indiana Michigan) Power Co.						Unknown
Cherryland Electric Co-op						0
Cloverland Electric Co-op						1
Consumers Energy						2
Detroit Edison						2
Edison Sault						0
Great Lakes Energy Co-op						0
Midwest Energy Co-op						0
Ontonagon County REA	2 ¹		2 ¹		1 ¹	Unknown
Presque Isle Electric & Gas Co-op						Unknown
Thumb Electric Co-op						0
Tri-County Electric Co-op						0
Upper Peninsula Power Co.						1
We Energies	3	1			2	Unknown
Wisconsin Public Service Corp.						Unknown
Xcel Energy						Unknown
Michigan Total	8	2	3		4	7
¹ One customer has both solar and wind installations.						

Table 2: Active Michigan Net Metering Installations as of June 2006

Company	Zip Code	Start Date	Technology Type and Size
Alger Delta	49821	Unknown	Hydro, Unknown Size
Alger Delta	49806	Unknown	Wind, Unknown Size
Alger Delta	49821	August 2005	Solar, 2 kW
Ontonagon County REA	49930	Approximately 1999	Hydro & Solar, 10 kW combined
Ontonagon County REA	49913	June 2006	Solar, 10 kW
We Energies	49886	April 1986	Hydro, 2.5 kW
We Energies	49801	November 1983	Hydro, 2.5 kW
We Energies	49896	May 1980	Wind, 1.8 kW

Michigan Net Metering Programs

The term “net metering” can have different meanings to different people, depending on the state net metering programs they are most familiar with. Currently, according to the Interstate Renewable Energy Council, there are 42 states plus the District of Columbia with some form of net metering available.⁹ There are significant variations among the state programs, though, and sometimes even among different utilities in the same state. Michigan utility net metering programs are not identical at all utilities.

In the May 29, 2005 Order, the Commission noted that the consensus agreement provides enough of a framework so that all of the programs will be substantially similar. The foundation for the consensus agreement is that each utility will be allowed to recover from its customers all costs associated with its net metering program. The consensus agreement allows utilities to design their net metering programs to assign all eligible program costs to participating customers.¹⁰ Utilities have the option to track eligible costs that are not assigned directly to participating customers for future rate recovery. Before any new costs can be assigned, however, a Commission order would be needed, approving costs and assigning them to the rates paid by particular customer classes.

The consensus agreement offers utilities flexibility in billing methods and provides for at least four different net metering billing methods. Below, Staff has explained four billing methods available to utilities under the consensus agreement. Staff has attempted to prepare a complete listing of possible billing methods; however, there may be billing methods and slight variations that were inadvertently missed. The information used to compile the Michigan utility net metering billing method descriptions is from utility tariff sheets and sample bill calculations filed as part of the U-15113 interconnection investigation.

Staff believes that all Michigan utilities are currently using billing methods 1, 2, and 3 and that no utility is using billing method 4. In general, each utility uses one billing method for all of its net metering customers. However, whether a customer has three-phase or single-phase service may impact available

⁹See the national net metering map at http://www.dsireusa.org/documents/SummaryMaps/NetMetering_Map.ppt.

¹⁰Eligible costs specifically identified in the Consensus Agreement (pp. 3-4, 5) can include program operating costs, transmission and distribution costs attributable to the net metering customer, above-market costs, if any, of generation credits provided to net metered customers, and additional meter costs.

metering and billing methods. The utility's selection of a billing method could depend, at least to some extent, on intricacies of its computerized billing system and its rate structure; especially whether, and the extent to which, some or all fixed distribution charges are recovered through a fixed monthly service charge as opposed to a volumetric energy charge.

Billing Method 1 – Customer Site Usage

This billing method determines the customer's total site usage. Total site usage is the sum of electricity delivered by the utility and the portion of on-site generation utilized by the customer. The total site usage quantity is either directly measured or calculated. Metering must be installed to determine the customer's total on-site generation output, electricity deliveries from the utility (inflow), and customer generation delivered to the utility (outflow). The necessary data can be gathered using 2 or 3 meters.¹¹ The state's two largest utilities – Consumers Energy and Detroit Edison – use variations of this billing method.

The bill is calculated based on the customer's total site usage. Then the following credits are calculated and applied to the bill:

1. Generation Credit (Power Supply and PSCR¹² applied toward the sum of on-site generation utilized by the customer and NEG credits applied to current month's bill¹³)
2. Distribution Credit¹⁴ (multiplied by the on-site generation utilized by the customer)
3. Surcharge Credit – for certain surcharges¹⁵

The utility may opt to record the Distribution Credit, Surcharge Credit, and the above market price value of the Generation Credit (if any) as net metering program costs that may be eligible for rate recovery, if the Commission so authorizes in a future rate proceeding.

Detailed sample net metering calculations for Consumers Energy and Detroit Edison are provided in Appendix A.

Billing Method 2 – Utility Deliveries

Bills are calculated based on the electricity delivered by the utility (inflow). Net metering credits are given for the customer's generation deliveries to the utility (outflow) and are usually valued at the generation portion of the retail electricity rate including the PSCR factor. On customer bills, Michigan utilities typically term this generation portion, "Power Supply Charge." Metering for this method can be

¹¹Consumers Energy generally uses a bi-directional meter that records both inflow and outflow and a standard meter on the generator, and the Company has been billing net metering customers approximately \$477 for the two extra meters. Detroit Edison generally uses three standard meters to determine the customer's total generation output, inflow, and outflow, and the Company has been billing the net metering customer approximately \$60 for the meters; payable in 12 monthly payments of \$5 each. In addition to the meter charges from the utility, the customer is responsible for charges associated with their installation of extra meter sockets and associated wiring.

¹²PSCR – Power Supply Cost Recovery.

¹³Generation quantities in excess of the current monthly site usage will be carried over as NEG on a month-to-month basis until the end of the annual net metering billing cycle when any cumulative NEG quantities are granted to the utility. NEG quantities are the sum of the customer's generation in excess of the customer's current month on-site usage and the previous month NEG balance, if any.

¹⁴Detroit Edison calls this "Program Credit." For Detroit Edison net metering customers, this credit is equivalent to the distribution charges (per kWh) multiplied by the on-site generation utilized by the customer, in the month it is generated.

¹⁵Detroit Edison provides a surcharge credit to reflect distribution-related surcharges applicable to the company's Program Credit (see footnote 14). Consumers Energy net metering customers are billed for surcharges based on the customer's total site usage, which applies surcharges to both the energy generated and used on-site by the customer and the energy delivered by the utility.

accomplished using one bi-directional meter that separately records and reports both inflow and outflow quantities or two standard meters can be used, one each for measuring inflow and outflow. NEG is carried forward to the next month in the same manner as Billing Method 1. Utilities opting for this simplified method are most likely not able to track program costs for lost distribution revenue for the portion of customer generation utilized on site.

For sample bill calculations using this billing method, please refer to the sample UPPCo bill included in Appendix A.

Billing Method 3 – Net Billing

Under this method, the customer bill is calculated using only the customer's net electricity usage (inflow kWh minus outflow kWh). Metering for this method could include an electronic meter programmed to calculate the customer's monthly net energy usage, a single bi-directional meter capable of recording inflow and outflow numbers, two standard meters for measuring inflow and outflow, or a single standard meter that spins and records energy flows in both directions, inflow and outflow. This latter metering method is commonly referred to as having a meter that reverse registers or "spins backwards." Under this method, NEG would not necessarily accumulate. If the customer's rate schedule provides for a monthly customer charge, the customer will most likely be responsible for paying that full charge, as a minimum monthly payment, even if their net usage for the month is zero or negative. Under this billing and metering scenario, customers are receiving the full retail rate (including both generation and distribution) for generation they export to the grid.

This appears to be the simplest billing method with the lowest administrative burden to the utility.¹⁶ Utilities opting for this simplified method are not keeping track of lost distribution revenue for the portion of customer generation utilized on site.

For sample bill calculations using this billing method, please refer to the sample We Energies bill included in Appendix A¹⁷.

Billing Option 4 – Fixed Monthly Charge

No Michigan utility is currently using this method; however, the consensus agreement provides for utilities to recover transmission, distribution and other eligible costs through a separate rate charge designed to assure that the utility recovers approximately the same share of fixed transmission and distribution costs it would have received from the customer, absent net metering.

Additional Net Metering Costs

Almost all Michigan net metering tariffs require the net metering customer to pay for meters used for net metering. Depending on the billing method chosen by a customer's utility, meters other than the customer's current meter are usually required. Meters and billing methods are discussed above. Based on net metering inquiries/complaints received by the Staff, these metering costs can be as high as \$450 to \$600. These amounts represent charges from the utility for meters, including installation. In some

¹⁶The utility administrative burden could vary significantly, depending on details of the utility's computerized billing system. Detroit Edison indicates its billing system would require computer programming changes for this billing method to be implemented for its customers.

¹⁷Staff notes that the We Energies net metering program was already in place prior to the consensus agreement. The consensus agreement provides for multi-state utilities presently offering net metering in Michigan and other states through filed tariffs to continue those offerings in their present form as compliance with the agreement.

Michigan utility programs, the customer also faces charges associated with the placement and wiring of meter sockets, ready to accept a second (outflow) and sometimes a third meter (generation). Some customers who otherwise would qualify for net metering have thus far opted not to participate in the program due to these metering charges.

In the foreseeable future, both Consumers Energy and Detroit Edison are planning to install upgraded, digital, “smart meters” for every residential customer. According to Detroit Edison, the new meters will be capable of functioning as bi-directional meters. It is expected that the new meters chosen by Consumers Energy will also have this capability. Because both utilities are planning to commence “smart meter” programs, meter upgrade costs should be minimized. Any relevant ratemaking issues can be addressed in the utility’s rate case. The new meters are likely to be capable of recording additional data that will be helpful for net metering program evaluation, too, such as time of use and time of excess generation delivery to the electric grid.

It should be understood, however, that the meter capabilities alone will not necessarily ensure that net metering can be accommodated at no incremental charges to the net metering customer. In addition to the meters themselves, the utility automatic metering infrastructure (AMI) will have to be capable of interrogating the meters, obtaining required readings, and translating those readings into billing determinants. One net-metering customer of a cooperative utility, for example, was charged \$650 for an AMI meter that could automatically record and report both inflow and outflow.

One utility mentions that each net metering installation is inspected and tested by utility staff. The customer is responsible for this cost. The time necessary to complete these tasks is usually about 2 hours. The customer is billed approximately \$70/hour or \$140 total.

Net Metering Task Force

On October 24, 2006, the Commission commenced an investigation into the interconnection of independent power producers with a utility’s system in Case No. U-15113.¹⁸ During the investigation, net metering issues were raised in both written comments and discussions at public meetings. The Commission Staff issued the Staff Report on Utility Interconnection Issues on January 31, 2007. The report included a recommendation to seek a new consensus on a simplified net metering approach for inverter based systems less than 10 kW.¹⁹

The Commission issued an Order on February 27, 2007, which included directing the Michigan Renewable Energy Program Ratemaking and Net Metering Committee to form a task force comprised of representatives from MPSC Staff, utilities, and interested parties to seek a new consensus and report to the Commission within 90 days on a simplified approach for net metering for inverter based systems smaller than 10 kW.

¹⁸For associated documents, see <http://efile.mpsc.cis.state.mi.us/efile/viewcase.php?casenum=15113>.

¹⁹An inverter is a device used to convert the direct current electricity produced by small-scale renewable energy systems into alternating current electricity. Inverters also incorporate software and hardware to manage the operation of on-site generating equipment in parallel operation with the utility grid, and provide for equipment protection and safety in the event of a grid failure. See <http://www.sandia.gov/SAI/Balanceofsystems.htm> and <http://www.sandia.gov/pv/docs/glossary.htm#Anchor1> to learn more about inverters.

It is anticipated that the Net Metering Task Force will further investigate the following issues applicable to inverter based systems smaller than 10 kW: (1) Pre-certified equipment issues; (2) Customer meter costs and charges; (3) Rates; and (4) Complex customer billing.

The Staff Interim Report on Net Metering Issues was completed on May 25, 2007.²⁰ The final report is due by September 30, 2007.

Conclusion

There has been little experience to date with Michigan's net metering program due to low customer participation. The consensus agreement provides for the MREP Collaborative to prepare a Michigan Net Metering Evaluation Report for the Commission after the fourth year of the program, in 2009. However, as part of the ongoing interconnection investigation in Case No. U-15113, net metering issues are currently being examined and recommendations for a simplified approach to net metering for 10 kW and under sized net metering systems will be included in the report due by September 30, 2007.

The overall result of the current net metering program is that utilities and customers now have a regulated process in place to safely interconnect with the utility and, by net metering, a small number of Michigan electric utility customers have been able to reduce their electric bills.

²⁰See document number [0050](http://efile.mpsc.cis.state.mi.us/efile/viewcase.php?casenum=15113), at <http://efile.mpsc.cis.state.mi.us/efile/viewcase.php?casenum=15113>.

Consumers Energy billing determinants and sample bill:

Net Metering Billing Determinants			
Rate B - Rate Code 010			
	kWhs		
Energy supplied by CECO (inflow)	366		
Customer supply to grid (outflow)	50		
Customer generator output	100		
Total Customer Consumption	416		
Net Excess Generation Credits Carried	100		
CURRENT BILL			
Rate 010 - Current Rates			
ELECTRIC POWER SUPPLY CHARGES	<u>kWhs</u>	<u>Rate</u>	<u>Amount</u>
KWH CHARGE - ENERGY	416	0.062992	\$26.20
POWER SUPPLY COST RECOVERY	416	0.015890	\$6.61
ELECTRIC DELIVERY CHARGES			
ELECTRIC CUSTOMER CHARGE			\$8.00
ELECTRIC DISTRIBUTION CHARGE	416	0.032925	\$13.70
NUCLEAR DECOMMISSIONING	416	0.000185	\$0.08
ECC IMPLEMENTATION	416	0.000901	\$0.37
SECURITY RECOVERY FACTOR	416	0.000256	\$0.11
REGULATORY ASSET RECOVERY	416	0.001600	\$0.67
SECURITIZATION CHARGE	416	0.001265	\$0.53
SECURITIZATION TAX CHARGE	416	0.000456	\$0.19
Total billing before Net Metering Credits			\$56.46
NET METERING CREDITS			
Power Supply Credit *	200	0.062992	\$12.60
PSCR Credit	200	0.015890	\$3.18
Distribution Credit **	50	0.032925	\$1.65
NEG Carried Forward	0		
Total billing after Net Metering Credits			\$39.03
Sales Tax @ 6%			\$2.34
TOTAL ELECTRIC BILLING			\$41.37

Detroit Edison billing determinants:

Billing Determinants Base Residential Rate	
Billing Determinant (BD) Name	How the Determinant is typically determined
Base Rate	
first 17 kWh/day of consumption	$17 * (\text{end date} - \text{start date})$ not greater than total delivered power
excess consumption over 17 kWh/day	$(\text{Inflow} + \text{Generator} - \text{Outflow}) - 17 * (\text{end date} - \text{start date})$ not less than zero
Consumption for Power Supply surcharges	
Consumption for Power Supply Cost Recovery Factor (PSCR)	
Consumption for Delivery Charge	
Consumption for Energy Delivery Surcharges	
	the billing determinant calculation for these four charges is the same (Inflow+Generator-Outflow)
Rider 16 Net Metering Credits	
first 17 kWh/day of consumption Eligible for credit	$17 * (\text{end date} - \text{start date})$ not greater than total delivered power
excess consumption over 17 kWh/day Eligible for credit	(Net Electric Generation delivered back to site - Generator - Outflow - 17 * (end date - start date))
Total Rider 16 Generation Eligible for Credit	(Net Electric Generation delivered back to site + Generator - Outflow)
Consumption Eligible for the Delivery Surcharge Credit	Generation Utilized in current billing period which equals (Generator - Outflow)
Consumption Eligible for the Generation Surcharge Credit	(Net Electric Generation delivered back to site + Generator - Outflow)
Consumption Eligible for the Program Credit	Generation Utilized in current billing period which equals (Generator - Outflow)

UPPCO Net Metering

Assumptions		
Customer Onsite Generation	400	kWh
Customer Home Consumption	900	kWh
Customer Generation Delivered to Company	100	kWh
Customer Purchases from Company	600	kWh

Billing - UPPCO Residential Customer- A-1

Distribution Charges	Units	Rate	Charge	
Customer Charge	1	\$ 8.00	\$ 8.00	
Energy Charge	600	\$0.06074	36.44	
				\$ 44.44
Power Supply Charges				
Energy Charge	600	\$0.07120	42.72	
PSCR	600	\$0.00240	(1.44)	
				\$ 41.28
Net Metering - Credit				
Energy Charge	100	\$0.07120	\$ 7.12	
PSCR	100	\$0.00240	(0.24)	
				\$ (6.88)
Net Customer Payment				\$ 78.84

Attachments to Electric Utility Responses in Case No. U-15113

We Energies sample calculation showing determinants and typical bill:

Typical Net Metered Customer Bill

kWh Delivered to Customer:	700
kWh Delivered to Utility:	250
Difference:	450

Customer Retail Energy Rate:		Billed Amount
Distribution Charges:		
Facilities Charge:	\$ 9.60	\$9.60
Delivery Charge/kWh:	\$ 0.0389	\$17.51
Power Supply Charges:		
Non-space heating/kWh:	\$ 0.0381	\$17.15
PSCR/kWh:	\$0.01958	\$8.81
Sales Tax @ 4%:		\$2.12
		\$55.18
		Total Bill