

Michigan Public Service Commission

Staff Interim Report on Net Metering Issues

Case No. U-15113

May 25, 2007

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Executive Summary

The Commission directed the Michigan Renewable Energy Program Ratemaking and Net Metering Committee to form a task force comprised of representatives from the Staff, utilities, and interested parties to work together to seek a new consensus and report to the Commission on a simplified approach to net metering for inverter based systems under 10 kW.¹ The task force report is due May 25, 2007. A second directive from the Commission was to establish a workgroup to develop faster and less complex interconnection procedures for 10 kW and under interconnection projects. A Staff report on the progress of this workgroup will be submitted by September 30, 2007.

Staff created a webpage for the Under 10 kW Net Metering & Interconnection Procedures Workgroup.² To simplify the administration of issues applicable to under 10 kW sized generators, both the net metering and interconnection topics are being covered on one webpage with one email list. Interested people may join the email list via a link on the workgroup webpage. Currently, the list has 65 email participants.

To initiate the process, Staff reviewed the net metering issues identified during the investigation and developed a draft net metering proposal with a simplified metering configuration. At the same time, Staff prepared a proposal for faster and less complex interconnection procedures. Written comments were requested by April 16, 2007. Fifteen parties filed comments including one combined set of comments from the regulated utilities. The Staff proposals and the filed comments are posted on the Under 10 kW Net Metering & Interconnection Procedures Workgroup webpage.

A public meeting was held at the Commission offices on May 2, 2007. This meeting focused on net metering issues. Interconnection procedures will be discussed at a future meeting. Twenty-two people attended the meeting in person and several people attended via teleconference. Staff presented its net metering proposal and both Detroit Edison and Consumers Energy presented proposals. Discussion was held throughout the meeting. During the meeting, Staff requested that Detroit Edison and Consumers Energy provide their proposals in writing and include sample bills by May 16, 2007.

Utilities have indicated a willingness to offer net metering programs that are similar to the Staff proposal, either as a replacement for or in addition to current net metering program offerings. Consumers Energy and Detroit Edison are continuing to work with Staff on their proposals. Once the proposals are completed, Staff will share them with the interested parties and work toward reaching a workgroup consensus.

Net Metering and interconnection procedures issues are closely intertwined. While progress is being made on these issues, Staff is requesting in this interim report that the Commission allow Staff to continue working on net metering issues in conjunction with interconnection issues. Final reports on both the net metering effort and interconnection procedures will be prepared for the Commission by September 30, 2007.

¹See p. 8 of the Order in Case No. U-15113 at <http://efile.mpsc.cis.state.mi.us/efile/docs/15113/0048.pdf>.

²See http://www.michigan.gov/mpsc/0,1607,7-159-16377_43420_45811-164471--,00.html for the Under 10 kW Net Metering & Interconnection Procedures Workgroup webpage.

Introduction

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. During the investigation, net metering issues were raised in both written comments and discussions at public meetings. As part of the investigation, a Staff Report on Utility Interconnection Issues was prepared and submitted to the Commission on January 31, 2007.³

On February 27, 2007, the Commission issued an Order in Case No. U-15113 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. Additionally, the Commission directed the Staff to establish a workgroup to develop faster and less complex interconnection procedures for 10 kW and under sized generator projects. The Staff report on interconnection procedures is due by September 30, 2007.⁴ The consensus agreement in Case No. U-14346 directs MREP to report annually to the Commission on net metering. The first of these net metering program reports is expected to be filed in the U-14346 electronic docket in June 2007.

A webpage was developed for the Under 10 kW Net Metering & Interconnection Procedures Workgroup.⁵ To simplify the administration of issues applicable to under 10 kW sized generators, the net metering and interconnection topics are being covered on one webpage with one email list. Interested people may join the email list via a link on the workgroup webpage. Currently, the list has 65 email participants.

To initiate the process, Staff reviewed the net metering issues identified during the investigation and developed a draft net metering proposal. The Staff proposal was posted on the Under 10 kW Net Metering & Interconnection Procedures Workgroup webpage and written comments were requested by April 16, 2007. Net metering comments and issues are discussed in the report section entitled Summary of Net Metering Comments & Issues, on page 10.

Brief Net Metering History

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.⁶ Commission Staff, representatives of regulated utilities, and other interested parties worked

³See Staff Report on Utility Interconnection Issues, at <http://efile.mpsc.cis.state.mi.us/efile/docs/15113/0047.pdf>.

⁴See p. 8 of the Order in Case No. U-15113 at <http://efile.mpsc.cis.state.mi.us/efile/docs/15113/0048.pdf>.

⁵See http://www.michigan.gov/mpsc/0,1607,7-159-16377_43420_45811-164471--,00.html

⁶See 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.

cooperatively during late 2004 and early 2005 to develop a net metering proposal. A consensus agreement was approved by the Commission, with amendments, in a March 29, 2005 Order.⁷

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.⁸ 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.⁹

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 30.

Current Status of Michigan Net Metering Program

As of June 30, 2006 (the most recent net metering reporting period), 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.¹⁰

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.¹¹

Table 1 shows a summary of net metering installations for the three utilities with net metering customers. During this first year of the program, there have been some reported difficulties related to the timely completion of utility interconnection procedures. Utilities reported 7 pending net metering applications, as of June 2006.

⁷See 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>.

⁸The 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.

⁹ See <http://www.michigan.gov/netmetering>.

¹⁰ The 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.

¹¹ Prior 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.

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

Company	Number of Participating Customers (June 2006)	Net Metering Technology Types			
		Wind	Solar	Biomass	Hydro
Alger Delta Co-op	3	1	1		1
Ontonagon County REA	2 ¹		2 ¹		1 ¹
We Energies	3	1			2
Michigan Total	8	2	3		4
¹ One customer has both solar and wind installations.					

Michigan Net Metering Programs

Michigan utility net metering programs are not identical across 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.¹² Utilities have the option to track eligible costs that are not assigned directly to participating customers for future rate recovery. A Commission order would be needed, approving costs and assigning them to the rates paid by particular customer classes.

The term “net metering” can have different meanings to different people depending on the state net metering programs with which they have the most familiarity. Currently, according to the Interstate Renewable Energy Council, there are 41 states plus the District of Columbia with some form of net metering available.¹³

The consensus agreement offers utilities flexibility in billing options and provides for at least four different net metering billing methods. Below, Staff has explained the 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 bills filed as part of the U-15113 interconnection investigation.

¹²Eligible 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.

¹³See the national net metering map at

http://www.dsireusa.org/documents/SummaryMaps/Net_Metering_04_07.ppt.

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

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.¹⁴ The state's two largest utilities – Consumers Energy and Detroit Edison use 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 PSCR¹⁵ applied toward the sum of on-site generation utilized by the customer and NEG¹⁶)
2. Distribution Credit (multiplied by the on-site generation utilized by the customer)
3. Surcharge Credit – excluding PSCR¹⁷

The utility may opt to record the Distribution Credit as a net metering program cost for possible future recovery.

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

Billing Option 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 option can be accomplished using one bi-directional meter that separately records and reports both inflow and outflow quantities or two standard meters can be used, one

¹⁴Consumers 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.

¹⁵PSCR – Power Supply Cost Recovery.

¹⁶Generation 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.

¹⁷Detroit Edison provides a surcharge credit. Consumers Energy net metering customers are being billed for surcharges based on the customer's total site usage, which includes the energy generated and used on-site by the customer plus the energy delivered by the utility.

each for measuring inflow and outflow. NEG is carried forward to the next month in the same manner as Billing Option 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 Attachment A.

Billing Option 3 – Net Billing

Under this option, the customer bill is calculated using only the customer’s net electricity usage (inflow kWh minus outflow kWh). Metering for this option 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 option is commonly referred to as having a meter that “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 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. 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 Attachment A¹⁸.

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.

Net Metering Task Force Proposals

MPSC Staff DRAFT Proposal for Simplified Net Metering Program for Inverter-Based Systems 10 kW or Less

1. All inverters that comply with the following codes and standards shall be considered pre-certified, with no additional testing or certifications required:

¹⁸Staff 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.

- a. UL 1741 Inverters, Converters and Controllers for Use in Independent Power Systems.
 - b. IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems and IEEE 1547.1 Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.
2. No later than 45 days after the Commission approves this consensus, all utilities shall provide, and keep continuously updated on the utility's website, a listing of inverter models that are pre-certified for use with installations of systems sized 10 kW and less. The inverters listed must be generally considered suitable for connection with the distribution system and a detailed review of the inverter's engineering design, characteristics, or suitability shall not be necessary to approve its use or installation by a project developer. A utility's list may reference or incorporate by reference inverters certified by a recognized national testing laboratory. A utility may either provide a list of all specific inverters that it considers pre-certified, or a utility may simply provide a statement indicating that all inverters that are UL 1741 listed shall be considered pre-certified.
3. If any additional interconnection equipment shall be required in specific circumstances, such as disconnects or monitoring equipment, each item of equipment shall be specified and included in the utility's pre-certified equipment listing on its website.
4. Net metering customers will pay a minimum amount each month to cover an appropriate portion of customer-based fixed charges. This minimum monthly fixed charge will be the only contribution made by net metering customers to utility customer-based, fixed, and variable distribution costs. This minimum bill amount will be established by the Commission for each utility. Each utility shall provide its proposed net metering rate information and draft tariff sheets for each eligible rate class based on this methodology not later than 30 days after the Commission approves this consensus.

All other charges for net metering customers shall be paid through the utility's variable energy charge rate, according to the customer's net metered use, after accounting for net excess generation, if any, as described in paragraph 6.

5. A rule change to R480.3605 will be sought to allow meters to reverse register (that is, to spin backward). R480.3605 presently reads as follows:

R 460.3605 Metering electrical quantities.

(3) Metering facilities located at any point where energy may flow in either direction and where the quantities measured are used for billing purposes shall consist of meters equipped with ratchets or other devices to prevent reverse registration and shall be so connected as to separately meter the energy flow in each direction.

6. Net metering for these customers can then utilize the simplest single-meter approach, where customer net excess generation is credited either on a per kWh basis, or at the same retail price as the customer pays for energy received from the utility. Utilities shall be strongly encouraged to use the least expensive meter available, such as an electromechanical, energy-only meter.

Net metering customers will pay for their metered utility service on a per kWh basis, including only variable energy charges. The customer credit per kWh for net excess generation shall be based on the retail price paid by the customer, including all energy and power supply cost recovery charges.

7. If a participating utility seeks additional metering data to assist with utility planning needs or for the evaluation of the net metering program, then with customer approval the utility could be allowed to install and operate additional meters, but all costs associated with the additional meters would not be the responsibility of the net metering customer.
8. At the end of a net metering year, the utility will carry the customer's net excess generation forward to the next year or issue a check to the customer with the net excess generation valued at the utility's average annual avoided cost rate for the year.¹⁹ If a customer moves outside the utility's service territory, any remaining net excess generation balance is payable to the customer at the utility's last annual average annual avoided cost rate.

Fifteen parties filed comments including one set of comments from the regulated utilities.

A public meeting was held at the Commission offices on May 2, 2007. Twenty-two people attended the meeting in person and several people attended via teleconference. Staff presented its net metering proposal and then both Detroit Edison and Consumers Energy presented proposals. Discussion was held throughout the meeting.

During the meeting, Staff requested that Detroit Edison and Consumers Energy provide their proposals in writing and include sample bills for the task force to review by May 16, 2007. Both proposals are summarized below.

Detroit Edison Proposal

Detroit Edison proposed adding an additional option for 10 kW and under net metering customers. This new option would allow net metering customers to choose a single bi-directional meter instead of the current three-meter option. Some generators are located quite a distance from the house (such as a wind turbine) where the 3 meters are placed. One drawback to the current three meter system is that generators are sometimes installed at a location that is remote from the existing utility meter, and that could necessitate expensive wiring for the customer, to connect the generator to a meter socket at the location required by the utility.

¹⁹A utility's "avoided cost rate" is already determined by the Commission through its regular rate setting processes.

Customers who select this new option would pay a monthly fixed charge equivalent to their share of distribution costs based on past usage. Only power supply costs would be left in the kWh metered rate. The bi-directional meter would register and record both inflow and outflow. The kWh net metering credit would be approximately equal to the kWh charge. Detroit Edison does not want meters to reverse register.

Highlights of Detroit Edison's Net Metering Proposal

- Will be offered in addition to current three meter option.
- A single bi-directional meter will be used to record both inflow and outflow data.
- The cost for this meter will be rolled into the rate base. Net metering customers would not be responsible for paying for the meter upgrade.
- No charge would be assessed for Detroit Edison to visit the home and replace the meter.
- No charge would be assessed for Detroit Edison to witness testing of the system.
- The customer may choose the ending month for their net metering year. The customer would choose the month where they are most likely to have the lowest balance of net excess generation credits. (Net excess generation credits, if any, would be credited to the utility at the end of the net metering year, as they are in the current program.)

Consumers Energy Proposal

Consumers Energy presented a proposal similar to Detroit Edison's.

Highlights of Consumers Energy's Net Metering Proposal

Consumers Energy proposes the following for less than 10kW Net Metering generators that are IEEE 1547 and UL compliant:

- A single bidirectional meter which eliminates the requirement for customer to install a generation meter and lowers the incremental metering costs. Customers will have the option to purchase and install a generation meter, but it will not be used for billing purposes.
- The bidirectional meter will measure energy provided by Consumers Energy (input) and separately measure the customer's excess on-site generation sent back to the electric grid (outflow). This configuration is compliant with existing metering standards and maintains data on energy provided by the utility for use in PSCR process.
- The typical incremental cost for a residential customer is approximately \$420 and may be paid by the net metering participant in one of 3 ways (to prevent subsidization by other utility customers as stated in the Net Metering Consensus Agreement);
 1. a single payment up-front,
 2. in 12 equal installments on the customer's electric bills, or
 3. a flat monthly charge that is determined by applying an appropriate fixed rate charge to the incremental cost (which would result in a perpetual charge of roughly \$4 per month for a typical residential net metering participant.)
- Continuous carry-over of Net Excess Generation (NEG) credits - which eliminates setting the customer NEG balance to zero at the end of the program year.

- A monthly fixed distribution charge based on the customer's average kWh monthly consumption using the most recent 12-month history prior to net metering. Consumers will review and modify the average kWh consumption used for purposes of determining the distribution charge if the customer has a verifiable change in their connected electric load.
- Consumers Energy proposes to continue to inspect and test each installation to ensure it properly de-energizes from a de-energized circuit through the period covered by the Consensus Agreement. The customer will be responsible for this cost.
- The Net Metering customer is provided NEG credit for (1) Power Supply (energy charges) and (2) Power Supply Cost Recovery (or PSCR) at the same rates as specified in the customer's tariff. Customer credits for Power Supply and PSCR will be applied up to the amount charged on the customer's current monthly bill for those items.
- Consumers Energy will streamline the application process for projects of this size and improve customer program materials for the Net Metering Program.

Summary of Net Metering Comments & Issues

Equipment/UL Certification

The issue of UL certification and what it means to utilities and customers is still unresolved, particularly in the area of anti-islanding. Anti-islanding is defined as the protective function which prevents distributed electrical generating equipment from exporting electrical energy, when connected to a utility's de-energized electrical system. Customers, developers and installers point out that if an inverter has been UL 1741 certified, it has been tested to meet the anti-islanding requirements of IEEE 1547 and they claim that for these inverters, utilities should simply allow interconnection with no further evaluation. The utilities explained that each generator installation must be evaluated for its IEEE 1547 compliance, and this includes both the UL 1741 testing laboratory certification and IEEE 1547 site specific compliance. Site specific compliance includes a check that the generator capacity is less than 25% of the minimum load of the line section. If the generator does not pass this test, then the utility will need to do further evaluation.

For one such interconnection that Staff has been working on with the utility, inverter manufacturer, and installer, the further evaluation included requesting copies of the UL 1741 anti-islanding test report for the inverter. However, this information is considered confidential and proprietary by the inverter manufacturer. This particular interconnection has been delayed for a few months while this issue is being resolved.

The Interconnection Procedures (U-14088), Technical Requirements section on page 3 of the document states that the IEEE Std. 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems, is adopted and being incorporated as a reference.²⁰

Commenters believe that equipment that is tested and listed under UL 1741 should be considered safe, with no further requirements for additional equipment or testing required. There is a

²⁰See Interconnection Procedures document at http://www.michigan.gov/documents/mpsc/under30_174064_7.pdf.

general consensus on the part of Michigan solar photovoltaic (PV) installers that a simple verification of the manufacturer's UL listing should be sufficient for a utility's interconnection procedure, at least for 10 kW and under, inverter-based net metering installations.

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 option chosen by a customer's utility, meters other than the customer's current meter can be required. Meters and billing options are discussed above. Based on net metering inquiries/complaints received by the Staff, these metering costs can be in the range of \$450 to \$600. Some customers who qualify for net metering have thusfar opted not to participate in the program due to these metering charges.

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

Insurance is another issue that has been raised by participants of this workgroup. Some utilities are requiring that net metering customers carry a certain level of insurance as part of the terms of the Interconnection & Operating Agreement the customer must sign prior to commencing operation.

Reverse Registration of Meters

The consensus agreement does not require that utilities offer customers the option to allow the meter to reverse register (that is, to spin backward). However, some utilities prefer this type of net metering system.

A rule change to the current MPSC Rule 480.3605 will be sought to allow meters to reverse register. R480.3605 presently reads as follows:

R 460.3605 Metering electrical quantities.

(3) Metering facilities located at any point where energy may flow in either direction and where the quantities measured are used for billing purposes shall consist of meters equipped with ratchets or other devices to prevent reverse registration and shall be so connected as to separately meter the energy flow in each direction.

The current proposal is to keep the language in subsection (3) above and insert a new subsection (4) to address net metering. The current subsections (4) and (5) would be renumbered to become (5) and (6). The proposed new subsection (4) language is:

(4) An energy meter may reverse register where used to measure net energy quantities for billing purposes under a net metering tariff or similar arrangement where customer generated energy is delivered to the utility.

Rates and Incentives

The Commission noted in the May 29, 2005 Order approving the consensus agreement that the most successful net metering programs in other states offer the most customer incentives. During the Commission's interconnection investigation in Case No. U-15113, many members of the public said they want to receive more than the utility's retail price of generation as a net

metering credit. They contend that a higher price is fair compensation for net metering customers, because renewable energy generators are providing clean power on the utility's distribution system without incurring transmission line losses that inevitably occur when power is generated at a central station coal or nuclear plant. Additionally, they point out that solar photovoltaic installations will be generating electricity during times of peak electricity demand, when the value to the utility is typically highest. On the other hand, this power is variable, and cannot be scheduled in advance, and the quantity provided by any one net metering customer is very small, in comparison to a utility's total load. The Commission Order discusses the incentive situation:

“Although not as significant as some state programs, an incentive is offered in the consensus agreement in the form of the mechanism of net metering itself, which provides net metering customers a built-in buyer for the excess power that they generate without incurring transmission or distribution costs, and obviates the need for any storage capacity to be purchased or maintained by the net metering customer.” p. 6

Staff notes that the current Michigan program provides some incentive to net metering customers by using the full retail power supply charge as a credit for NEG. Without extensive calculations of the specific time periods when NEG is delivered to the grid, however, it is not possible to determine the utility's exact avoided cost for the energy delivered by a specific net metered customer or net metering customers in general.²¹

Currently, for most of the billing options, the kWh charge for electricity from the utility is not equal to the kWh credit for customer generation going out on the grid. This difference is due to the distribution component of the kWh charge, because net generation provided by these net metering facilities does not eliminate the need for the investment in distribution equipment made by the utility in order to serve the customer. Using two different kWh rates, however – one for customer usage and another for NEG credits – necessitates the use of quite complex metering and billing protocols. The consensus agreement does provide, though, for the application of a fixed monthly charge to provide compensation for fixed distribution costs. This option is described above as billing option 4. Under this billing option, the customer's monthly fixed distribution costs would be separated from their charges for variable energy use. This sets the kWh charge roughly equal to the generation portion of the retail rate. When the kWh charge is equal to the kWh net metering credit, simplified and less costly metering can be used to bill the customer. The meter can reverse register or “spin backwards.” Staff believes that customer satisfaction with net metering will increase when the kWh net metering credit is equal to the kWh charge for electricity.

Treatment of Net Excess Generation (NEG)

Under Michigan's present net metering program, 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

²¹ The MREP Solar Committee is working with the Great Lakes Renewable Energy Association to complete a sample analysis for a representative solar photovoltaic system interconnected and operated in net metering fashion. That report will be made public as soon as it is completed.

for NEG. No cumulative NEG credits were reported for any net metering customer for the last net metering year, ending June 2006.

Granting NEG credits to the utility is an incentive to the customer to size the generator not to exceed their self-service needs. The value of the NEG credits retained by the utility is intended to be used to offset costs associated with the utility's operation of the net metering program.

Separate Net Metering Category for 10 kW and under, inverter based systems

A list of interconnection applications received by each utility was provided as part of the interconnection investigation.²² Almost all (20 out of 22 applications, through November 2006) in the under 30 kW size category were for generators sized 10 kW and under (see Table 2). The Federal Energy Regulatory Commission (FERC), Interstate Renewable Energy Council (IREC) and several other states have interconnection procedures for this category of generators.^{23, 24, 25, 26} One of the recommendations from the interconnection investigation is to develop faster and less complex interconnection procedures for these generators. It makes sense to have a corresponding net metering size category. The Commission commented on this type of program structure in the March 29, 2005 order approving the consensus agreement in Case No. U-14346:

The Commission encourages utilities to review the public comments received and consider offering net metering for the smallest solar photovoltaic and wind energy systems that will meet as many of the expressed concerns as possible. For example, one set of net metering tariff rules might apply to photovoltaic systems up to 5 kW and wind generators up to 25 kW, and different rules might apply to larger systems. p. 4

Conclusion

Progress toward reaching a new consensus on net metering is being made; however, more time is needed for the task force to continue its work. At the May 2, 2007 net metering meeting both Consumers Energy and Detroit Edison presented proposals for net metering programs that are substantially in line with the Staff net metering proposal. There is general agreement that the large degree of flexibility in the net metering consensus agreement allows utilities to offer net metering tariffs similar to what the Staff proposed.

Utilities have indicated a willingness to offer net metering programs that are similar to the Staff proposal, either as a replacement or in addition to current net metering program offerings.

²²See the Staff Report on Utility Interconnection dated January 31, 2007 at

<http://efile.mpdc.cis.state.mi.us/efile/docs/15113/0047.pdf>.

²³See FERC Small Generator Interconnection Procedures at

http://www.midwestiso.org/publish/Document/3e2d0_106c60936d4_-73cb0a48324a?rev=4

²⁴See IREC Model Generator Interconnection Procedures at <http://www.irecusa.org/index.php?id=87>.

²⁵See California Interconnection Rules Summary at

http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive_Code=CA21R&Search=TableType&type=Interconnection&CurrentPageID=7&EE=1&RE=1.

²⁶See Colorado Interconnection Rules Summary at

http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive_Code=CO28R&Search=TableType&type=Interconnection&CurrentPageID=7&EE=1&RE=1.

Utilities are working on proposals and Staff is reviewing the proposals submitted by Consumers Energy and Detroit Edison on May 16, 2007. Once the proposals are completed, Staff will share them with the interested parties and work toward reaching a workgroup consensus.

Net Metering and interconnection procedures issues are closely intertwined. While progress is being made on both of these issues, Staff is requesting in this interim report that the Commission allow Staff to continue working on net metering issues in conjunction with the interconnection issues. Final reports will be prepared for the Commission by September 30, 2007.

Table 2: Summary of Interconnection Projects by Utility

Regulated Utility	Number of Completed or Pending Projects	10 kW and under	>10 kW to under 30 kW	30 kW to under 150 kW	150 kW to under 750 kW	750 kW to under 2 MW	2 MW and greater
Alger Delta Co-op	1	1					
Alpena Power	2	1	1				
American Electric (Indiana Michigan) Power Co.	0						
Cherryland Electric Co-op	0						
Cloverland Electric Co-op	1	1					
Consumers Energy	22	6			2	9	5
Detroit Edison	21 ¹	7 ¹			1 ¹		
Edison Sault	0						
Great Lakes Energy Co-op	1		1				
Midwest Energy Co-op	0						
Ontonagon County REA	2 ²	2 ²					
Presque Isle Electric & Gas Co-op	0						
Thumb Electric Co-op	0						
Tri-County Electric Co-op	0						
Upper Peninsula Power Co.	3	1			1		1
We Energies ⁶	2	1				1	
Wisconsin Public Service Corp.	0						
Xcel Energy	0						
Total	55	20	2	0	4	10	6

¹ At least 7 interconnections are 10 kW and under and one is the three 65 kW wind turbines (195 kW total) installed at Laker Schools. Detroit Edison has not reported the generator sizes for the remaining interconnections in its service territory.

² Installed pre-2004.

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 $(\text{Inflow} + \text{Generator} - \text{Outflow})$
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	$(\text{Net Electric Generation delivered back to site} - \text{Generator} - \text{Outflow} - 17 * (\text{end date} - \text{start date}))$
Total Rider 16 Generation Eligible for Credit	$(\text{Net Electric Generation delivered back to site} + \text{Generator} - \text{Outflow})$
Consumption Eligible for the Delivery Surcharge Credit	Generation Utilized in current billing period which equals $(\text{Generator} - \text{Outflow})$
Consumption Eligible for the Generation Surcharge Credit	$(\text{Net Electric Generation delivered back to site} + \text{Generator} - \text{Outflow})$
Consumption Eligible for the Program Credit	Generation Utilized in current billing period which equals $(\text{Generator} - \text{Outflow})$

Detroit Edison sample bill calculation:

The billing determinants are calculated from the metered values for inflow, outflow and generation										
metered value = (meter reading at the end of the period - meter reading at the beginning of the period) * a meter constant										
Rider 16 Net Metering Requires keeping track of energy generated and sent to the utility This is called Net Electric Generation or NEG								NEG = outflow		
NEG balance = the summation of NEG less what has been delivered back to the site by the electric utility										
NEG delivered back to the site by the electric utility is the lesser of (the site requirement not supplied by the generator) or (the NEG balance)										
For the example that follows the beginning NEG balance is				80	Generation Utilized on site = (Generator-Outflow) is				951	all meter constants are one.
the site requirement not supplied by the generator is				86	The previous month's bill of \$10.38 was paid in full				meter costs were paid up front	
Detail Charges										
1234 Ang Street AngTown, MI, 48xxx-xxxx						Current Billing Information				
Detroit Edison Residential Electric Service Current						Service Period	7-Nov-06	-	6-Dec-06	
						Days Billed	29			
Power Supply Charges						Inflow Meter Number	9999991			
Energy Charge	first 17kwh/day	493	KWH @	0.04531	\$	22.34	Meter Reading	394	Act 480 Act	
Energy Charge	excess over 17 kwh/day	544	KWH @	0.05941	\$	32.32	KWH delivered 86			
Power Supply Surcharges*		1037	KWH @	0.002274	\$	2.36	Generator Meter Number	9999992		
Power Supply Cost Recovery Factor (PSCR)		1037	KWH @	0.00545	\$	5.65	Meter Reading	522	Act 1550 Act	
Delivery Charges						KWH generated 1028				
Delivery Charge		1037	KWH @	0.04284	\$	44.43	Outflow Meter Number	9999993		
Energy Delivery Surcharges**		1037	KWH @	0.006232	\$	6.46	Meter Reading	273	Act 350 Act	
Residential Michigan Sales Tax			@	4%	\$	4.54	KWH Net Excess Generation 77			
Total Detroit Edison Current Charges						KWH Usage (Inflow-Generator-Outflow) 1037				
Before Rider 16 Net Metering Credits						\$ 118.10				
Site Usage History - Average per day										
Total Electric Generation		Current Month	1028	KWH	12 mo. cycle	4270	KWH	Current Month	Last Month	Last Year
Net Electric Generation Beginning balance ***		80	KWH		682	KWH	KWH Usage	35.76	37.69	33.81
Net Electric Generation returned to site		80	KWH		695	KWH	Change	-5%	6%	
Net Electric Generation delivered to DECo		77	KWH							
Net Electric Generation Ending balance ***		77	KWH							
Generation Utilized in current billing period (Generator-Outflow)		951	KWH		3575	KWH				
Generation Credit (Net Electric Generation returned to site+Generator-Outflow)		1031	KWH							
NEG transferred to DECo ***		0	KWH		NEG set to Zero in month with	1-Aug	consumption			
Rider 16 Net Metering Credits						Summary of Charges				
Power Supply Energy Charge Credit first 17 kwh/day		493	KWH @	0.04531	\$	22.34	Account Balance	November 7, 2006	\$ 10.38	
Power Supply Energy Charge Credit excess over 17 kwh/day		538	KWH @	0.05941	\$	31.96	Payment Received	Thank	\$ (10.38)	
Power Supply Cost Recovery Factor Credit		1031	KWH @	0.002274	\$	2.34	Balance Prior to Current	\$ -		
Delivery Portion of the Surcharge Credit						Current Charges				
Power Supply Portion of the Surcharge Credit		951	KWH @	0.006232	\$	5.93	Detroit Edison Residential Electric	\$ 118.10		
Program Credit		1031	KWH @	0.002274	\$	2.34	Detroit Edison Net Metering Credit	\$ (109.89)		
Total Rider 16 Net Metering Credits						Total Current Charges				
Residential Michigan Sales Tax adjustment		951	KWH @	0.04284	\$	40.74	Account Balance	December 6, 2006	\$ 8.21	
Total Rider 16 Net Metering Credits						\$ 109.89				
* Power supply surcharges include Regulatory Asset Recovery Surcharges (RARS)										
**Delivery Surcharges include Nuclear Decommissioning Surcharge (NDS), Securitization Bond Charge (SBC), Securitization Bond Tax Charge (SBTC), Choice Implementation Surcharge (CIS), and a Rate Reduction Credit (RRC)										
*** Net Electric Generation beginning balance Set to 0 after billing period with 1-Aug consumption										
In the example provided above the customer would have paid \$118.10 for electric power without his on site generation and the net metering rider. The net metering rider provides credits totalling \$109.89. Consequently the customers net bill is \$8.21.										

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