Regulatory and Policy Approaches to Compensating Net Metered Customers

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Introduction

As the Energy and Telecommunications Interim Committee (ETIC) moves forward with its study of net metering as outlined in Senate Joint Resolution No. 12 and discusses costs and benefits, the ETIC may want to keep in mind two pertinent questions:

- Is Montana's net metering policy equitable?
- Is Montana's net metering policy sustainable?

This report focuses on a discussion of various compensation policies for net-metered customers. Senate Joint Resolution No. 12 requests the ETIC conduct "a review of the methodologies for valuing power including power produced by the net metering facility and transferred to the utility and power produced by the utility and sold to the person net metering."

Under Montana's current net metering policy, customers are charged for the electricity that they consume or buy from the utility and credited for the kilowatt hours that they put back onto the grid through their generating system in excess of what they consume. Customers are credited at the full retail rate charged to the customer for consumption, with monthly bills netting the difference between how many kilowatt hours were produced and how many were consumed.

Under the 1999 net metering policy, there is an underlying agreement that the costs of net metering are in general equal to the benefits -- that the policy is equitable. The policy established that agreement with a caveat that if costs and benefits became unbalanced the Montana Public Service Commission (PSC) can exercise limited authority to properly address the use of different metering equipment. Renewable advocates and utilities, at the time, compromised to establish limits on the size of systems, to establish month-to-month carryover of credits, and to set annual termination of credits. Net-metered customers would be credited at the full retail rate.

During the 2015 Legislative session, many of the bills brought forward were concepts to increase net metering in Montana. The policy discussions before the 2015 Legislature, however, shifted to a discussion of costs and benefits. SJ 12 aims to address costs and benefits and requires a review of rate designs.

Compensation polices or rate designs can be mixed based on different circumstances. Some states and utilities have adopted policies that compensate net-metered customers

differently based on the size of a net-metered system, on credits carried forward over a month or a year, or on overall net metering caps. "For example, Minnesota determines net excess generation policies based on the capacity of the distributed generation system while New York differentiates net excess generation policies based on technology."[1] The information in this report is an overview of options, but it is not an exhaustive list of potential rate designs and other regulatory tools.

Incentives + Rate Design = Appropriately Shared Costs and Benefits

The questionnaires provided by the ETIC to stakeholders in June asked largely about costs and benefits. There is general agreement among stakeholders that the owners and operators of net metering facilities should provide reasonable, cost-based compensation for the utility services they use, while also being fairly compensated for the services they provide. Stakeholders appear to agree that net-metered customers should pay their fair share of grid costs and be compensated for their energy.

The agreement ends there. The renewable energy industry and the utilities are far apart on the calculations of net benefits and costs flowing between the utility, its net-metered customers, and its non-net-metered customers. The renewable energy industry provides a breakdown of costs and benefits that show net-metered customers are undercompensated. Utilities provide a breakdown of costs and benefits that show net-metered customers are overcompensated. An overview of the responses is included in a separate document.

This report attempts to bring the discussion back to the other side of the equation and focus on options for rate design. It is noteworthy, however, that the discussions before the 2015 Legislature were focused on the issue of increasing distributed generation, and the ETIC may wish to discuss the core question of whether Montana's current net metering policy, current rate design, or both are adequate before tackling appropriately shared costs and benefits. Many of the methodologies discussed in this report could be addressed in terms of policy set by legislation. However, in some examples, the actual compensation or rates may be determined by a ratemaking body, like the PSC exercising its authority. The ETIC may need to address the core question of how best to pay net-metered customers fairly for what they provide and how to ensure that one class of customers is not subsidizing another. The dollar amounts themselves, however, may be a matter of utility ratemaking.

I. Net Metering Rate-setting Tools

"Net metering" is a billing mechanism intended as an incentive for distributed, renewable generation. The underlying goal of the net-metered customer is to pay off the cost of installing and purchasing a system and to eventually profit from that system in terms of purchasing less electricity.

[1] http://www.ncsl.org/research/energy/net-metering-policy-overview-and-state-legislative-updates

Owners of net-metered systems are credited for the electricity they produce but don't use, or in other words their net usage. The customer pays the net total of electricity used from the utility minus electricity put back on the grid. A key issue related to net metering is the rate the utility pays for the electricity to the net-metered customer.

A. Retail Rate

While there are a number of variations, customers under net metered billing are most often reimbursed for their electricity at the full retail rate. In Montana, generation is credited to net-metered customers at the retail rate.

Retail electricity rates include the wholesale cost of electricity and the costs of planning and maintaining the electrical grid. Some entities argue that when net-metered customers receive the full retail price for their electricity, they are not paying the utility for the use of the transmission grid and the services required to provide all customers with reliable electricity. These entities contend that with retail rates, those costs are shifted onto their neighbors who do not net meter.

Others argue that the full retail rate is appropriate based on the benefits net metering provides to the overall system

Retail Rate Example

Montana, like many other states, uses retail rates to compensate net-metered customers. The law, however, applies only to NorthWestern Energy, although a PSC tariff extends aspects of the policy in general to Montana-Dakota Utilities (MDU).

B. Avoided Cost Rate

The use of avoided cost for net metering is often discussed in conjunction with policies that determine how long customers can roll over or maintain credits for excess net-metered energy -- an incentive included in many net metering policies. In Montana, and as it applies to NorthWestern Energy customers, on “January 1, April 1, July 1, or October 1 of each year, as designated by the customer-generator as the beginning date of a 12-month billing period, any remaining unused kilowatt-hour credit accumulated during the previous 12 months must be granted to the electricity supplier, without any compensation to the customer-generator”, in accordance with 69-8-603, MCA.

During the 2015 session, bills proposed to address portions of this issue. House Bill No. 188 continued to credit excess generation at the retail rate; however, it extended the carryover to 24 months, as opposed to 12 months.

Avoided cost means the cost at which the utility would either generate the power itself or purchase it from another source. For residential net-metered customers, some states and utilities reconcile excess energy annually by multiplying excess kWh remaining by the "avoided cost of energy". The determined amount is applied to a net-metered customer's account as a monetary credit. "Each state uses a different specific calculation to set

avoided-cost rates -- for example, reflecting market characteristics and whether it is a long-run or short-run avoided cost."[2]

Senate Bill No. 343 from the 2015 Legislative session proposed establishing criteria for determining the value of overall electricity produced and delivered by customer-generators and public utilities using avoided cost. Net-metered customers would be placed in a separate rate class. Electricity produced by the customer-generator would be valued at NorthWestern's avoided cost, short-term energy rate, as determined by the PSC. The PSC was directed to base the avoided cost on the certified life expectancy of the net-metered system, with certification coming from the manufacturer of the net-metered system. The net-metered customer also would be subject to a monthly service charge (similar to a minimum monthly bill or a fixed customer charge as discussed below) that was established by the commission.

Avoided Cost Rate Example

North Dakota reconciles excess generation monthly at avoided cost. Investor-owned utilities offer net metering to customers with nameplate capacities of up to 100 kW. Any net excess generation is purchased by the utility at the utility's avoided cost rate, based on North Dakota Public Utility Commission findings. Customers retain title to renewable energy credits (RECs), except for the case of excess generation, when the utility becomes the title owner of RECs created, with compensation to the customer.[3] In North Dakota, MDU generally determines avoided energy costs based on the system marginal energy cost that is projected for the next 10 years escalated by 0.06% annually.

C. Demand Charges

A demand charge is aimed at more equitably charging each customer for the service required from the grid closer to that customer's true cost of service. To address the cost of service associated with a net-metered customer's distribution system, some utilities have proposed a basic load capacity charge per kW for residential net metering customers and small commercial net metering customers. "Demand charges are based on maximum electrical demand over time. If electricity were water, demand charges would be based on the size of the pipe, not on how much water flows through it. High demand charges, particularly those calculated over periods of months or years, significantly undermine the economics of commercial solar systems." [4] A demand charge is usually calculated as a rate applied to the maximum amount of energy required by the net-metered customer in a month.

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[2]"Ratemaking, Solar Value and Solar Net Energy Metering -- A Primer", Solar Electric Power Association.

[3]ND Admin. Code 69-09-07

[4]http://www.seia.org/policy/distributed-solar/utility-rate-structure

Prior to agreeing to eliminate proposed net metering tariffs from its rate case before the Montana PSC, MDU proposed a new demand charge on electric customers who own or lease net-metered systems. It would have imposed a residential demand rate of $1.50/kW of billed demand. Small commercial customers also would have paid a demand charge based on the applicable rate under their existing tariff. The billed demand was calculated based on the customer's maximum 15-minute demand in the current month.[5]

The Alliance for Solar Choice (TASC), prior to the stipulation, requested intervener status in the MDU rate case. In the request, TASC raises concern about the demand charges undermining the market for customer-sited generation. Their motion also states, "These charges may also violate federal law and regulations governing treatment of customers that use on-site distributed generation to meet part of their electric power supply. The Public Utilities Regulatory Policy Act (PURPA) also prohibits electric utilities, which includes Montana-Dakota Utilities, from discriminating in electric utility rates charged to customers with on-site solar generators that meet Federal Energy Regulatory Commission eligibility requirements..."[6]

On November 18, 2015, TASC and MDU reached an agreement to narrow the scope of MDU's proposed rate filing and eliminate proposed tariff revisions relating to a proposed demand charge for residential net metering customers.

Demand Charges Example

In February 2015, Arizona's Salt River Project (a public power utility) added a seasonal, inclining block demand charge to future net-metered PV customers. Under the plan, new net-metered customers pay a fixed monthly service fee based on the size of their service and a demand charge based on the customer's maximum energy use during peak electricity times. The fixed charge is about $50 a month on average for a new solar installation. Energy charges per kWh are lower under the customer generation plan than under standard residential rates.[7] Solar City (a large rooftop solar installation company) in June 2015 filed a lawsuit related to the Salt River Project rates, claiming the new pricing plan is anticompetitive.[8]

[5]Docket No. D2015.6.51, Application of Montana-Dakota Utilities Co. for Authority to Establish Increased Rates for Electric Service in the State of Montana.

[6]Docket No. D2015.6.51, Motion to Intervene of the Alliance for Solar Choice.

[7] http://www.srpnet.com/prices/priceprocess/customergenerated.aspx

[8] SolarCity Corp. v. Salt River Project Agricultural Improvement and Power District, Case No. 2:15-cv-00374 (U.S.D.Ct. Ariz. 2015)

D. Fixed Customer Charges

A fixed charge for net-metered customers is implemented in an effort to recover the fixed infrastructure costs are not tied to volumetric usage. To remove the transmission and distribution components, for example, from the retail rate paid to net metering customers, some utilities may allow retail rates for excess generation but increase a monthly service charge for residential net metering customers and for small commercial net metering customers. "There are currently 48 to 50 rate cases that propose some kind of new increased residential fixed charge designed to make up for infrastructure costs not being met by existing rates, said Rusty Haynes, a Policy Manager at EQ Research."[9]

MDU's request before the PSC includes an increase in fixed charges for customers. MDU proposes to increase the basic service charge for residential customers from $0.18 per day to $0.25 per day. The stipulation between MDU and TASC, however, states that MDU will not seek to create a new rate class for net-metered customers or seek to apply any charges against net-metered customers that are different from those applicable to other customers in the same rate class.

Fixed charges are generally low and designed to strictly cover direct customer costs. Utilities generally are paid for supply and infrastructure based on the amount of electricity customers use. Some utilities are decreasing variable charges and increasing fixed charges, providing revenue that doesn't fluctuate based on kWh sales. Utilities argue that such a system is appropriate because the majority of their costs are fixed costs. Opponents say that fixed charges reduce incentives for energy efficiency and penalize those who use less energy or have invested in net metering systems.

Fixed Customer Charge Example

The Public Service Commission of Wisconsin in 2014 approved an increase in fixed customer charge for all We Energies customers. The fixed charges were increased from $9 to $16. The variable rate for usage was reduced from $0.139 per kWh to $0.1349 per kWh. The Wisconsin Public Utilities Commission found that there was a significant misalignment between fixed costs and fixed charges. "The Commission finds that the most equitable result is to better align facilities charges with the fixed costs to serve a customer so that, as best as can be determined in a reasonable regulatory environment, members in a class pay for their fair share of the cost of service."[10] Customers with solar systems also were required to pay an additional $3.80 per kilowatt per month. Existing solar customers would be grandfathered into the new rate plan, with no new rates applied for 10 years. New customers would pay

[9]"A good rate design is hard to find: Experts push utility-solar compromise", Utility Dive, Herman K. Trabish, September 2015.

[10]Docket 5-UR-107, Public Service Commission of Wisconsin, Application of Wisconsin Electric Power Company and Wisconsin Gas, We Energies, for Authority to Adjust Electric, Natural Gas, and Steam Rates, Final Decision, December 23, 2014.

new rates. RENEW Wisconsin and TASC filed a lawsuit in January 2015 to overturn the new fees. The lawsuit claims discrimination against solar and low-usage customers.

E. Other Rate Design Options

Other potential rate design options include:

- Establishment of a new rate group for net-metered customers, where a regulatory authority establishes a separate tariff for net-metered customers that reflects their usage characteristics;
- Three-part rates allowing a utility to collect a customer charge, a demand or capacity charge, and a volumetric charge;
- Two-way rates allowing each party, a utility, and a net-metered customer to be compensated for the services they offer to each other; and
- Time-of-use pricing, which includes a varied rate based on different time periods, allowing for potential cost savings by shifting usage off-peak. Time-of-use pricing generally requires the use of smart meters.

Example of Other Options

In 2015, NV Energy in Nevada filed a request with its utility commission that includes a three-part rate design. It includes a net metering rate and an optional time-of-use net metering rate. The rates include a monthly basic service charge, a demand charge, and an energy charge. "According to NV Energy, the basic service charge is a fixed fee that reflects the costs associated with back-office systems, software, meters, employees and services provided to net-metering customers. The demand charge reflects the bidirectional use of the grid and the investment NV Energy has to make in transmission, distribution and generating units to provide reliable service to its customers. The energy charge reflects the volume of energy used by the customer and varies based on consumption."[11] In late August, the Public Utilities Commission of Nevada voted to not adjust rates for net-metered customers through 2015 and not to implement the three-part rates at this time.

II. Alternatives to "Traditional" Net Metering Rate Design

As the debate about net metering heats up across the U.S., utilities and the renewable energy industry are examining other options to appropriately compensate net-metered customers. The alternative is a significant shift from net metering and retail rates. "The negative and polarizing tone of the state-by-state struggle over net metering leaves little room for an honest evaluation of the problem, or the development of a simple, yet comprehensive long-term solution. For example, the solar industry frequently glosses over the fact that net metering can, at times, result in cost shifts. In addition, utility consternation over the 'cost shift' of net metering is clearly selective in nature – nearly all utilities offer large discounts to industrial or low-income customers, or allow customers to avoid paying for the true cost of electricity supply on peak. All of these cost shifts are

[11] http://www.greentechmedia.com/articles/read/Solar-Net-Metering-Conflict-Flares-up-Again-in-Nevada

effectively financed by other ratepayers, and are much larger than the 'subsidy' for net metering."[12]

Some entities argue that net metering is a stable and simple model. Others argue that utilities are fighting to limit net metering policies, and while some of their claims are political, it may be appropriate to revisit overall compensation policies. "Net metering offers the additional benefit of administrative simplicity. A single meter capable of sensing energy flow in both directions can be used. No separate calculation is required for the cost or value of the solar generation. Traditional net metering also creates some problems. First, simple netting of energy assigns a retail value to local solar energy (at least up to the point of consumption during the netting period), but that value is not necessarily representative of the true value of solar."[13]

A. Value-of-Solar

A value-of-solar tariff is a departure from traditional net metering. It is more complex than net metering, in which a meter simply spins backwards. "A value-of solar tariff clarifies how much energy is sold in each direction (customer to utility and utility to customer) and at what rate the energy is valued."[14]

In general, customers purchase their energy at the utility's retail rate, but customer-generators are compensated for their energy generation at a separate "value-of-solar" rate that is based on dollars per kWh. The rate is intended to capture the benefits of net metering to stakeholders net the costs. The tariff typically relies on a value-of-solar calculation that is annually updated and captures the value of net metering to the utility for a unit of customer-generated energy. It is a break-even value for the net-metered resource. Value-of-solar tariffs also include a netting process, so a utility can recover its costs for serving the customer-generator before applying a credit for the power produced.

Utilities are often supportive of value-of-solar tariffs, noting an ability to separate the amount of power generated by a net-metered customer from the amount of electricity consumed. The tariff also can include utility-specific costs and benefits. Concerns about value-of-solar tariffs are that arriving at a "value" and determining a fair compensation rate can be challenging. In addition, when rates are revisited annually there is a level of uncertainty for customer-generators.

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[12] "The Minimum Bill: A First Step to Fair Utility Rates in a Distributed Energy Age", PV Solar Report, Jim Kennerly.

[13] http://www.solarindustrymag.com/issues/SI1302/FEAT_04_The%20Value%20Of%20Solar.html

[14] http://www.nrel.gov/tech_deployment/state_local_governments/basics_value-of-solar_tariffs.html

Example of Value-of-Solar

Value-of-solar tariffs are used in Austin, Texas, and in Minnesota. Austin Energy established a value-of-solar tariff by considering loss savings, energy savings, generation capacity savings, fuel price hedge value, transmission and distribution capacity savings, and environmental benefits. The utility worked with Clean Power Research, a company that provides software and data services to the energy industry. The tariff has ranged from 12.8 cents per kWh of customer generation to 10.7 cents per kWh. Credits are also carried over by month, and at the end of the year unused credits are applied to offset a power supply adjustment.[15] A customer is billed for total consumption and receives a credit for the customer's energy production at the value-of-solar rate. If production is greater than consumption, the customer gets a credit that is rolled into the next billing period.

B. Buy All-Sell All or Feed-In Tariff

A feed-in tariff is similar to a value-of-solar approach and also can include aspects of avoided cost. Feed-in tariffs require one extra power meter in order to measure outflow of electricity from a customer-generator's home. With two meters or a smart bidirectional meter, electricity consumption and electricity generation are measured and priced separately.

In some instances a utility provides services to a net-metered customer at retail rates but purchases net metering energy generation from customer-generators at avoided cost or wholesale rates. Determining the rate at which the utility purchases net-metered energy can be controversial. The rate can be based on avoided cost, or wholesale rates, or can be more comparable to a value-of-solar amount. With a feed-in tariff, some owners of distributed generation can be subject to an income tax on the amount received from utilities. In addition, renewable advocates raise concerns that it can put federal investment tax credits used by the owners of renewable generation at risk.

Utilities often support a feed-in tariff because it allows them to retain sales and revenue. They pass on all the costs associated with purchasing electricity to the customer- generator through the rate.

Example of Feed-In Tariff

In North Carolina, customers can use either net metering or a feed-in tariff. Duke Energy Carolinas offers two net metering options, two sell-all options, and an option for parallel generation. For those who select the buy all-sell all option, participants sell their power under a Cogeneration and Small Power Producer tariff, which offers an avoided cost rate for power sold to Duke Energy. Participants also have options in choosing a tariff based on which hours are categorized as on-peak and off-peak and on the rates offered for on-peak and off-peak energy. In addition

[15] http://austinenergy.com/wps/portal/ae/rates/residential-rates/residential-solar-energy-rate

to the avoided cost rate, participants receive a "premium" for the power they produce, due to its renewable attributes. This premium is $0.06 per kWh and is paid for only 5 years.[16]

C. Minimum Monthly Billing

Minimum bills create a baseline bill that all customers pay for up to a certain threshold of monthly usage. A minimum charge also can be structured to maintain the full value of net metering by carrying over credits displaced by the minimum charge in high-production months to lower-production winter time.

GTM Research is the leading expert on the minimum monthly billing concept. They conclude that it offers electric utilities a level of certainty that customers will pay at least the minimum bill charge each month, which meets a utility's need to plan and cover fixed costs. With an appropriately established minimum bill, the renewable energy industry also is assured that net metering remains intact and the economics of projects are "minimally" impacted.

GTM Research finds that the minimum bill concept, while similar to a fixed-charge, has only one-third of the impact of the equivalent fixed charge. They explain the billing method as follows:

- If the net energy use is positive, bill for the net energy use at the volumetric electricity rate.
- If the net energy use is negative, bill the customer for zero kWh used and calculate the excess net metering credit. The customer pays the minimum bill charge for the month and carries over any excess net metering credit.
- For the next month in which net energy use is positive, apply any net metering credits down to the minimum bill charge. Carry over any remaining net metering credits.[17]

Advocates of minimum billing note that it is even more effective when paired with decoupling and time-of-use pricing.

Example of Minimum Monthly Billing

Massachusetts House Bill 4185 is compromise legislation based on an agreement between renewable advocates, utilities, and regulators. It includes a minimum bill approach. The legislation includes a number of changes in net metering incentives, such as removing a statutory cap on net metering.

"With a hypothetical $10 minimum bill, an NStar customer with a 6.3-kilowatt rooftop solar system, a $0.1733 per kilowatt-hour retail electricity rate, and a $7 per month fixed

[16]https://www.duke-energy.com/generate-your-own-power/nc-rate-options-tariffs.asp

[17]http://www.greentechmedia.com/articles/read/why-the-massachusetts-net-metering-compromise-could-be-a-model-for-other-st

distribution charge, would pay $434.77 per year while the same customer, with a $10 monthly fixed charge, would pay $458.77 per year."[18]

D. Decoupling

Decoupling separates a regulated utility's profits from its total electric or gas sales, so a utility isn't incentivized to sell more electricity or gas. Decoupling is a mechanism used to encourage regulated utilities to support energy efficiency for their customers, but it also can be a tool for incentivizing net metering. With decoupling, utility revenue is established based on an amount needed to cover established costs. Rates are allowed to change with consumption to meet the revenue target. "If utilities' incentives are changed to encourage them to conserve energy rather than sell it in ever-increasing amounts, they become free to encourage energy efficiency improvements and on-site generation among their customers, while continuing to earn healthy profits for their shareholders. When rates are decoupled from profits, utilities and customers are incentivized to work together to conserve energy and build new generation assets as efficiently as possible. Under those conditions, often the best choice for new generation is distributed generation like solar."[19]

In February 2014, the Natural Resources Defense Council, a leading environmental organization, and the Edison Electric Institute issued a joint statement focused on decoupling utilities' revenues from the volume of electricity sold. NRDC's support is based on pursuing distributed generation and energy efficiency. From a utility perspective, decoupling can limit the losses a utility incurs due to reduced sales and can stabilize shareholders' returns. Balanced decoupling policies do not shift all fixed cost recovery out of variable unit rates and into fixed monthly or meter charges. Under decoupling, "true-up" adjustments are generally very small, and often caps are included to minimize the magnitude of adjustments. A review of decoupling in Montana is included in a separate report.

Example of Decoupling

Pacific Gas and Electric Company in California decouples rates. Every 3 years, the California Public Utility Commission determines PG&E's authorized revenue requirement through a general rate case. The rate regulation mechanism compares authorized revenues plus annual attrition adjustments with nonweather-adjusted actual revenues and annually reconciles overcollections or undercollections. Revenue requirements are determined separately by the commission for electric distribution, gas distribution, and public purpose programs.[20]

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[18]http://www.utilitydive.com/news/is-a-minimum-bill-the-answer-to-heated-net-metering-battles/290266/

[19]http://www.seia.org/policy/distributed-solar/utility-rate-structure

[20]"Decoupling Case Studies: Revenue Regulation Implementation in Six States," Regulatory Assistance Project (RAP), Migden-Ostrander, J., Watson, B., Lamont, D., and Sedano, R., July 2014, http://www.raponline.org/document/download/id/7209. Cl0099 5345slec