Summary and Review of Stakeholder Responses: Costs and Benefits to Montana Customers

Prepared by Sonja Nowakowski, ETIC Staff
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Introduction

As outlined in Senate Joint Resolution No. 12, the Energy and Telecommunications Interim Committee (ETIC) is charged with determining whether Montana's current net metering policy, and the underlying rate design used by regulated utilities and cooperative utilities, leads to overcompensation or undercompensation, if at all, of net-metered customers. While rate design is the job of the Public Service Commission (PSC), the ETIC, as outlined in its work plan, is working toward a policy that ensures that Montana's net metering policy does not result in a misallocation of costs and benefits.

In June 2015, the ETIC sent Montana's regulated utilities, rural electric cooperatives, and the renewable energy industry a set of specific data requests. The ETIC in September 2015 got its first look at the analysis provided by stakeholders.

In analyzing the responses provided to the ETIC, there is little to no agreement among the stakeholders regarding whether net metering creates a cost shift between net-metered customers and customers who do not net meter. There is even less consensus on how to quantify the factors that are necessary to make a determination about cost shifting. A sampling of the responses:

- "NorthWestern has not determined that there are any significant tangible benefits of net metering on its system in its existing form." – NorthWestern Energy
- "Based on our initial analysis it is clear that the economic benefits of net metering far outweigh the revenue impact of net metering." – Montana Renewable Energy Association (MREA)
- "Net metering arrangements generally do not provide benefits to the system as a whole." – Montana-Dakota Utilities (MDU)
- "TASC strongly believes that it is premature for Montana to devote the resources necessary to develop a methodology to rigorously analyze the benefits and costs of net metering at this time." – The Alliance for Solar Choice (TASC)

The conflicting views are not unusual and are not unexpected in a review of net metering. Increased net metering reduces utility sales, and in many cases utilities are hesitant to fully recognize the benefits of net metering. The renewable energy industry recognizes benefits that a utility simply may not account for in an assessment of distributed generation.

The Interstate Renewable Energy Council, Inc. (IREC) has published a report that offers information on the methods used in 16 utility-specific studies related to distributed generation. The report outlines a standardized methodology for valuing generation. The report notes that recent studies of distributed generation or net metering vary based on the assumptions, parameters, and methodologies used. They

provide several examples. In Arizona a utility-funded study of net metering found a net solar value of less than 4 cents per kilowatt hour (kWh), and an industry-funded study in Arizona found a net solar value that exceeded 21 cents per kWh. Austin energy has valued solar at 12.8 cents per kWh – compared to a utility in San Antonio 80 miles away that has valued solar at 5.1 cents per kWh.

IREC finds that valuations in many cases may differ, but it makes recommendations in terms of valuation methodologies to consider. IREC notes that "one point of agreement is that distributed solar generation-related energy benefits are well accepted."[1] IREC also reached three major conclusions:

- ✓ Distributed generation primarily offsets combined-cycle natural gas facilities, and that is what should be reflected in avoided energy costs.
- ✓ Installations are predictable and should be part of utility forecasts for capacity needs. Distributed generation should be credited with capacity value upon interconnection.
- ✓ Societal benefits like job growth, health benefits, and environmental benefits should be included in valuations largely because those are many of the reasons net metering policies are enacted in the first place.

The summary of responses provided in this report is a snapshot of the information and detail provided to the ETIC in September 2015. The outcome of any analysis depends on the basic assumptions. Those assumptions were very different as discussed in the stakeholder responses, making an estimation of costs and benefits nearly impossible to forecast. ETIC members in January may want to discuss the direction SJ 12 takes as it begins to formulate a baseline for findings and recommendations on net metering.

ETIC members may want to discuss whether the committee can accurately determine whether net metering sets up a subsidy or a shift when there is such a significant disconnect in basic information. While additional questions may be asked of stakeholders, it is likely that stakeholders' fundamental positions on net metering may not change. The discussion, however, does not mean that the ETIC is unable to pursue the policy objectives outlined in SJ 12.

The ETIC may want to discuss if it should continue the discussion among stakeholders about the costs and benefits of net metering, or shift the focus of the discussion toward appropriate net metering policies and cost recovery. The stakeholder responses can provide a starting point for the ETIC, but members may discuss refocusing the study to a discussion of how best to encourage policy goals that the ETIC feels are appropriate and whether those goals impact a utility's ability to recover fixed costs (transmission and distribution) from all ratepayers.

[1] "A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation," Interstate Renewable Energy Council, Inc. Ràbago Energy, LLC, October 2013.

NorthWestern Energy Questionnaire

Overall Summary of Response

NorthWestern Energy approached its response to the questionnaires largely by assessing net-metered generators as they would any other electricity supplier. A fundamental question about NorthWestern's approach, which the ETIC may wish to discuss, is whether net-metered generation should more appropriately be examined in terms of demand response, or assessed as a resource that reduces demand and generates avoided costs.

NorthWestern, in general, reports that net metering reduces the volume of electricity a customer uses but does not reduce the customer's demand for electricity to meet the customer's peak load. By the close of 2014, there were 1,407 net-metered installations on NorthWestern Energy's system. Residential net-metered customers generated an estimated 4,701,111 kWh of electricity in 2014. All 1,407 net-metered customers generated 7,008,364 kWh of electricity in 2014.

NorthWestern reports the costs of net metering to be $1,274,063 and the benefits to be $46,215.

Costs of Net Metering

$1,274,063

NorthWestern Energy finds that 8.72 cents/kWh of the utility's price for delivered power (78.5%) is made up of fixed costs. For every kWh of electricity net metered, that amount is shifted to other customers. A house net metering 750 kWh per month would shift $65.48 per month or $785.76 per year to other customers. The only fixed utility charge is $5.25 monthly service charged – amounting to about 4.6% of total utility revenue. For the 2013-2014 tracker year (July 2013-June 2014) NorthWestern Energy estimates lost revenues from net-metered residential and commercial customers' electricity use and demand at $110,000.

Regulating Services

Regulating service for net-metered customers on NorthWestern's system is estimated at 1 megawatt (MW). Based on 2014 costs for the Dave Gates Generating Station and imbalance charges incurred by the utility, each MW of active regulation service cost customers about $415,000. Net metering capacity is small, so need for regulation is limited. The company finds that it is unclear what the future holds and additional study of regulating services is needed, but in the future net metering must pay its fair and proportionate share of regulation charges, according to the company.

Supply Services

Net-metered power is 50% more expensive than the utility's current portfolio supply price and between 300% and 400% more expensive than what the utility purchases in the market today, according to NorthWestern Energy, although there is limited data to support the numbers. The current delivered cost of power is 11.12 cents/kWh versus a market price of about 2.2 cents/kWh during the first half of 2015, according to the utility. The company provides the example that if the utility is long on power, it is purchasing power at 11.12 cents and selling it onto the market at 2 to 4 cents. If the utility is short on power, the utility, by having net-metered power on the system, forgoes the opportunity to purchase

power at lower rates. The utility estimates that its customers have paid an additional $1.9 million in excess power costs from having net-metered power on the system between 1999 and 2014.

Costs Based on Increase in Size

Cost Shift by Amount of Installed Net-Metered Generating Capacity[A]	
5,623 kW[B]	$645,026
10,000 kW	$1,147,122
25,000 kW	$2,867,805
50,000 kW	$5,735,610
100,000 kW	$11,471,220
250,000 kW	$28,678,050
500,000 kW	$57,356,100
[A]Assumes solar PV with 15% capacity factor, 78.5% fixed costs, and fixed cost per kWh at 8.73 cents	
[B]On system at end of 2014	

Benefits of Net Metering

$46,215

NorthWestern Energy does not find any significant benefits of net metering to its system. “Parties who believe that net metering provides measurable benefits to NorthWestern’s Montana electric customers and operations should provide the calculation methodology and demonstrate what those benefits are, using Montana specific data.”

Avoided Costs

NorthWestern finds that because net-metered power is unmonitored, it can’t be used in a beneficial manner. The utility needs peak and super-peaking resources and would require information about the amount of net-metered power coming onto the grid in order to adjust power supplies elsewhere on the system to avoid line losses associated with the power. The utility also raises concerns about the lower voltage of net-metered systems leading to greater line losses. Avoided transmission and distribution and operation and maintenance are zero, according to the utility, because circuits are sized to meet expected loads. In terms of pollution control, because the utility doesn’t know when net metering will be on the system, it can’t reschedule or avoid scheduling power from Colstrip 4.

Remitted Funds and Bonneville Power Administration Exchange Credits

In 2014, 199 net-metered customers had excess energy credits that were remitted to the utility. The credits remitted were 184,743 kWh of power with a market value of $20,543. For residential customers, 178 customers turned back power at 156,077 kWh of power with a value of $17,356. Twenty-one commercial entities returned energy credits for 28,666 kWh of power.

NorthWestern does find that net-metered power displaced utility power, and the net-metered customers did not receive the benefit of the BPA exchange credit. In 2014, when the credit amount was above average, the estimated value of the credit that residential net-metered customers did not claim was $25,668.

Cost Shift or Subsidy

NorthWestern sampled 174 residential net metering customers in an effort to address the cost shift discussion. Prior to net metering, those customers used an average of 152,216 kWh of electricity per month or 875 kWh per customer per month. After net metering, the sample households purchased an average of 91,194 kWh of utility power per month or about 524 kWh per customer per month. The net-metered customers reduced usage by 351 kWh and saved $39.03 per month or $468 per year. Of that amount, $30.66 per month or $368 per year was for fixed costs that were shifted to other customers, according to NorthWestern.

NorthWestern sampled 51 commercial net metering customers. Prior to installing net-metered systems, those customers used an average of 489,538 kWh of electricity per month or 9,599 kWh per customer per month. With net metering, they purchased an average of 466,790 kWh and used 9,153 kWh per month, reducing their monthly usage by 446 kWh and saving them $49.60 per month, or $595 per year. Of that amount, $38.94 per month or $467 per year was for fixed charges that were shifted to other customers, according to NorthWestern.

Based on the sampling and its overall analysis, NorthWestern pins a cost shift for an average residential customer between $30.66 per month (based on actual sample) and $65.48 per month (based on overall). Ultimately, using estimated production based on the capacity of net metering at the end of 2014, NorthWestern finds that 5,623 kW of installed capacity shifted $645,026 to other customers. The utility used a 15% capacity factor, 78.5% fixed utility costs, and a fixed cost per kWh of 8.73 cents.

Policy Points of Note

NorthWestern opposes increasing the cap on net metering unless a different rate design is used, specifically for commercial net metered-customers. NorthWestern notes some caveats. For residential customers, the company states "increasing the current kilowatt net metering cap to any greater size will have a minute effect on the number of residential customers already capable of net metering." The utility's concern is that increasing the cap will lead to aggregation, in which a household leases a share of the system from a developer.

NorthWestern Energy finds that if the cap was raised to 1 MW, then 7,832 commercial customers could meter their full load, as could 15 industrial customers and 322 irrigation customers. At 5 MW that number drops to 274 commercial customers, 22 industrial customers, and no irrigation customers. "Increasing the net metering cap without reforming the cost shifting mechanisms inherent under Montana's current net metering statute would be fraught with peril for Montana residential and small commercial electric customers, who would end up subsidizing the electric bill of some of the largest and most successful corporate enterprises in this country."

The utility opposes community net metering. The company has determined that a single 5,000 kW community net-metered system would cause a cost shift of $573,561 per year at 2015 rates.

NorthWestern Energy policy and regulatory requests

In its response, the utility states that it would prefer a policy requiring net-metered systems to be connected to the utility, allowing the utility to measure net-metered power and schedule it.

In terms of rate design, NorthWestern suggests that net-metered customers be assigned to their own customer class. Within that class, the net-metered customer would be charged for the fixed costs of all energy received from the utility and the variable costs of any power received from the utility. Excess power produced by the net-metered customer would be netted at the appropriate value of the power against the variable charges for electricity charged by the utility.

As an alternative, they suggest establishment of a separate customer class for residential net-metered customers, with those customers charged a monthly service fee covering the utility's fixed costs. The utility notes that such an approach is problematic for commercial customers, and they suggest a series of monthly charges based on usage for commercial net-metered customers. NorthWestern does not establish or suggest a dollar amount for the monthly service fees.

Montana Renewable Energy Association (MREA) Questionnaire

Overall Summary of Response

MREA's examination of the costs and benefits of net metering is not based on net-metered generation as a supply resource, but instead is based on a resource that displaces energy the utility would otherwise produce or buy on the market. They measure the value of the energy based on hourly time of production over the course of a year. In general, the energy benefit of solar is based on the generation displaced when PV electricity is supplied to the grid. MREA approached the questionnaire by using hourly production data from the National Renewable Energy Laboratory's PVWatts Calculator. They used default system parameters and a Helena address for weather data.

There is a fundamental difference in how NorthWestern and MREA approached the study. NorthWestern doesn't generally track the benefits of displaced energy, noting that because net-metered power is unmonitored, it can't be used in a beneficial manner. Internet-connected monitoring systems range in cost from $200 for a residential system to $1,000 for a large commercial array, according to MREA. In general, added costs would be $670 for materials and labor. Small residential system would see in increase an installed cost of 3.7%.

MREA based its review on a total of 1,388 net-metered systems, with residential systems generating 4,450,078 kWh, commercial generating 2,256,725 kWh, and a total of 6,706,803 kWh of net-metered generation on NorthWestern Energy's system.

MREA finds that the economic benefits of net metering outweigh the revenue impact of net metering. Ultimately, MREA came up with the costs of net metering to be $80,094 and the benefits to be $83,522.

MREA at the September 11 ETIC meeting updated its findings to include an exported solar energy value at 2014 Mid-C average prices, as opposed to a solar time of production premium. They also updated costs using lost revenue due to net metering. Using the updated figures, MREA estimated total benefits at $150,874 and total ratepayer costs at $112,683.

Costs of Net Metering

$80,094 (first response)
$112,683 (September 11 response)
The primary cost to ratepayers is the lost transmission and distribution revenue portion of the credits net-metered customers receive on their bills, according to MREA. Residential customers in 2014 exported about 1,579,377 kWh to the grid in exchange for bill credits. About 64% of the total solar production was consumed behind the meter. Commercial customers exported nothing to the grid.

By using a solar time of production premium, MREA captured the difference between solar production valued at the standard energy supply rate and solar production valued at the energy supply rate with a time of use adjustor factored in.

In MREA's September 11 response they use lost revenue due to net metering (fixed transmission and distribution and supply costs) using the 2013-2014 NorthWestern Energy tracker.

Net Metering Ratepayer Impacts, 2014: Costs		
		September 11 Updated
Residential solar lost T&D revenue	$59,781	$110,000 (Lost revenue based on 2013-2014 tracker)
Commercial solar lost T&D revenue	$0	
Residential wind/hydro lost T&D revenue	$10,363	
Commercial wind/hydro lost T&D revenue	$7,266	
Integration Costs	$2,683	$2,683
Total	**$80,094**	**$112,683**

Regulating Services

MREA's calculations are based on an Idaho Power analysis for solar, which calculated it would spend 40 cents per megawatt hour of production to cover integration of the variable resource. MREA applied the rate to the total annual output of net metering systems to arrive at $2,683.

Supply Services

MREA's calculations assume that "a utility does not shift lost energy supply costs to other ratepayers because the utility is able to re-sell the energy value of exported kilowatt hours to neighboring customer or on the market, or they are able to reduce expensive peak load generation, with no net impact on other ratepayers."

Costs Based on Increase in Size

MREA provided information on the typical installed solar PV system costs based on system size and installed costs on preincentive and postincentive. They also provided the price per watt in Montana compared to national data. The price per watt in Montana is slightly less than the national, and the price per watt begins to drop, based on national data, for systems greater than 100 kW.

System size range	Price per watt, Montana[A]	Price per watt, National[B]
0 to 5 kW	$3.65	$3.71
>5 to 10 kW	$3.32	$3.71
>10 to 50 kW	$3.27	$3.71
>50 to 100 kW	$3.27	$3.71
>100 to 500 kW		$2.54
>500 to 1,000 kW		$2.54
>1,000 to 5,000 kW		$2.54
>5,000 kW		$1.95
[A] Montana Alternative Energy Revolving Loan Program, DEQ for FY 2105 net metering solar PV installations (sample of 24 systems)		
[B]"Photovoltaic System Pricing Trends: Historical, Recent, and Near-Term Projections," SunShot, US Department of Energy, Feldman, 2014 edition.		

Benefits of Net Metering

$83,522 (First response)
$150,874 (September 11 response)
The initial amount included only calculated the solar time of production premium, avoided transmission and distribution line losses, and unclaimed BPA residential exchange credits. MREA did not include avoided hazardous and criteria air pollutant control costs, excess net metering production sacrificed to NorthWestern (the utility did include this in its analysis of benefits), avoided transmission and distribution system capacity, operations and maintenance, avoided load following, regulation and frequency response, avoided power plant operations and maintenance costs, avoided fuel price hedging costs, avoided generation capacity investments or purchases, or avoided renewable energy standard compliance costs. "The benefit is not quantified in our preliminary analysis but should be accounted for by a full cost benefit study."

MREA also provides details on benefits that extend beyond rate impacts. They find that net metering systems installed to date have a net monetary value of about $19.7 million. They determined bill savings, installation sales revenue, increased residential property values, and the value of avoided carbon dioxide emissions. They netted out income tax credits and universal system benefits (USB) allocations. "The Legislature should account for this economic benefit by expanding Montana's net metering statute and extending the law to cover other utilities with the goals of 1) making private investments in solar more affordable and accessible to a broader base of Montana residents and businesses, 2) widening the economic development impact already demonstrated by this industry."

In its September 11 update, MREA provided exported solar value at 2014 Mid-C average prices. They also used the exported wind/hydro energy value. They amount used was $0.038/kWh. They also updated avoided transmission and distribution line losses slightly downward for residential customers. Increased BPA credits and excess production was also added.

Avoided Costs

MREA focused on solar net metering that displaces energy the utility would otherwise produce or buy on the market. The value of the energy is based on hourly time of production over the course of the year. For residential customers, MREA notes that the line loss rate is 8.5% and systemwide, the average line loss rate is 7.5%. They applied the residential rate to residential production and the systemwide average to commercial production. They found avoided transmission and distribution line losses from residential customers to be $41,380 and $16,758 for commercial. In the September 11 analysis, residential was updated to $30,021 using residential production behind the meter as opposed to total residential production. MREA also notes that net metering reduces utility electricity sales, thus reducing how much renewable energy NorthWestern must buy to comply with the Renewable Portfolio Standard.

Remitted Funds and Bonneville Power Administration Exchange Credits

MREA finds that because net metering customers buy less energy from the utility, the credits that would have been ascribed to net-metered customers are instead distributed to other customers in terms of a higher rate credit. They determined the credit to be a benefit of $9,043 to other customers. NorthWestern determined a higher number but agrees that this is a benefit to other customers.

NorthWestern used the BPA credit from 2014, which was significantly higher than other years. MREA used the credit as of August 2015, which is more consistent with the average amount. In the September 11 analysis, MREA updated the BPA credit to match NorthWestern's and also factored in the credits sacrificed ($25,668 and $20,543) in determining benefits.

Cost Shift or Subsidy

MREA finds that net metering customers provide a net benefit to nonparticipating ratepayers on NorthWestern Energy's system. They find a net benefit of $3,428 or a shift of about $2.47. The analysis is a snapshot and does not account for the lifetime ratepayer impacts of net metering systems. The dollar amount also does not capture any societal benefits, including the value of avoided carbon dioxide emissions. MREA notes that cost shifts are inherent through utility ratemaking and are accepted as a matter of public policy; for example, rural customers cost more to serve than urban customers. In the updated, September 11 response, the shift as pegged at $38,191, with benefits outweighing costs.

Policy Points of Note

On the subject of costs and benefits, MREA finds that "a thorough analysis of the benefits and costs of net metering should combine a ratepayer impact measure and societal cost test." MREA notes that Montana's net metering policy includes a statement that "it is in the public interest to promote net metering."

MREA also finds that the current policy, with retail rates provided, is understandable, easy to account for, and a "reasonably fair valuation" of the benefits provided. "The hallmark of net metering policies, including Montana's law, is the guarantee of a one-to-one credit for excess production."

MREA policy and regulatory requests

To attract and meet the demands of businesses that are interested in net metering, MREA recommends updating the net metering cap to, at a minimum, the median of other state caps or 400 kW. Accounting for broader economic costs and benefits of net metering with a societal cost test, not just the costs and benefits of net metering as they affect the utility bills of customers who do not net meter, is also needed for an accurate analysis.

Extending Montana's net metering policy to other regulated utilities and rural electric cooperatives would guarantee a fair credit for generation and would provide consistency.

Montana Dakota Utilities (MDU) Questionnaire

Overall Summary of Response

Of the four net-metered customers on MDU's system, two are residential and two are general service customers. Only the two general service customers provided energy credited back to future bills. Fixed costs represent 68% of the total cost of service for MDU. The utility collects 5.4% on a pure fixed cost basis and 20.2% is collected through a demand charge component that is billed based on the measured maximum demand in a 15-minute period each month as currently applicable to general service customers.

Prior to a stipulation agreement with The Alliance for Solar Choice (TASC), in 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. MDU's request before the PSC also includes an increase in fixed charges for all customers. MDU is proposing to increase the basic service charge for residential customers from $0.18 per day to $0.25 per day. On November 18, 2015, TASC and MDU agreed to narrow MDU's proposed rate filing and to eliminate proposals related to a proposed demand charge for net-metered customers.

Costs of Net Metering

Because there are only four net-metered customers on MDU's system, specific costs cannot be identified. MDU also does not install separate metering for a customer-generator. MDU, however, is concerned that if larger generators are allowed to net meter or the cap is increased, cost shifts would be exacerbated.

Supply Services

Fixed costs are not avoidable, according to MDU. The utility provides a standby service to net-metered customers. Distributed generation allows the avoidance of supply-related capacity only if it is generated during MDU's monthly coincident peak. If system requirements were to be reduced, the net-metered customer would need to be curtailed during periods of power balance. Due to the location of net metered facilities at the end of transmission and distribution system lines, loss savings are minimal, if they exist at all, according to the utility.

Costs Based on Increase in Size

"The concerns with net metering would only be exacerbated by increasing the number of customers and size of the generation allowed under a net metering scheme."

Benefits of Net Metering

Net metering arrangements generally do not provide benefits to the system as a whole, according to the utility.

Avoided Costs

MDU doesn't believe there are any avoided costs from its net-metered customers because they are not considered in its power purchasing and scheduling. MDU does not quantify any avoided costs.

Cost Shift or Subsidy

Net metering constitutes an unfair subsidy and provides incentives for developments that are not necessarily aligned with the purported benefits of distributed generation, according to the utility. MDU finds two primary reasons for its position that net metering is a subsidy: it decouples the amount a net-metered customer pays for the services provided by the utility from the customer's actual use of the system, and it requires net-metered customers to be paid the full retail rate for energy produced, while net-metered generation replaces power that can be purchased for a much lower cost from other sources. The utility notes that the cost shift from net metering is different from a cost shift from energy efficiency. Net metering does not result in reduced demand on the system, but energy efficiency through permanent changes has the potential to reduce demand.

In its docket before the PSC, the pending residential energy charge is about $0.096 per kWh on an annual average basis. The current avoided energy cost rate is $0.038 per kWh for energy delivered during on-peak hours and $0.027 per kWh for energy delivered during off-peak hours.

Policy Points of Note

MDU finds that bill crediting and rate forms providing for fixed cost recovery can address the issue of costs and benefits. They discuss the potential of a bill credit with the customer continuing to pay for all energy consumed and the utility paying the net-metered customer its avoided cost for all of the generation supplied to serve the customer and the amount above the customer's use that is delivered to the system.

MDU will continue to offer net metering based on federal requirements and will operate under a tariff established by the Montana PSC. The utility notes that its customer numbers, size, load, and transmission requirements are significantly different from NorthWestern's. "It is appropriate, therefore, to allow the MPSC to continue regulation of MDU's net-metering standards without extension of the existing Montana net-metering statutes."

MDU policy and regulatory requests

MDU does not want to be included in Montana's legislative net metering policy and will continue to operate under its tariff.

MDU supports a bill credit concept that allows for fixed cost recovery and recognizes the concept would require that a net-metered customer be metered or tracked to appropriately measure energy provided by the generator each month. MDU, however, at this time does not plan to meter generators.

The Alliance for Solar Choice (TASC) Questionnaire

Overall Summary of Response

Montana's renewable industry and net metering programs are in their infancy. It is premature to conduct a rigorous analysis of costs and benefits, according to TASC. Utilities should incorporate customer-sited PV adoption rates into their planning processes and adjust investments accordingly. Once the industry has matured, an independent consultant or the PSC should conduct an analysis.

Costs Based on Increase in Size

In a review of PV systems based on a national study, across all systems in the data sample, the median price was $4.30/W for residential systems, $3.90/W for nonresidential systems up to 500 kW, and $2.80 for nonresidential systems greater than 500 kW. TASC review found that the incremental installed cost of a separate production meter can be as high as $900. They note that in Montana the cost would be specific to individual utilities.

Benefits of Net Metering

TASC finds that net-metered systems provide numerous forms of value not only to customers who install them, but also to the grid, other customers, and broader society. "TASC strongly believes that it is premature for Montana to devote the resources necessary to develop a methodology to rigorously analyze the benefits and costs of net metering at this time." Once Montana's net-metered industry has matured, an unbiased examination by the PSC or an independent consultant should be conducted.

Avoided Costs

"It is important to recognize that distributed PV systems provide considerably more value than a utility's avoided-cost rate."

Cost Shift or Subsidy

TASC finds that every credible cost-benefit study that has been conducted in other states concluded that the benefits provided by net metering are worth more than the compensation received by net-metered customers or are approximately equal. "TASC does not believe that net metering constitutes a subsidy, and there is no credible, unbiased evidence that supports this conclusion in Montana."

Policy Points of Note

Most states require utilities that offer net metering to file periodic reports that describe the status of their programs. TASC also finds that it would be counterproductive to establish an arbitrary system capacity threshold above which a production meter would be required and the value of a customer's excess kilowatt-hour credits would be ended. TASC believes it would be more appropriate for Montana's policymakers to consider the potential uses and benefits of smart inverters at a future time, after technologies and Montana's renewable industry have matured.

TASC policy and regulatory requests

Utilities in Montana should be required to incorporate customer-sited PV adoption rates into their planning processes and toadjust investments accordingly. To promote efficiency and uniformity, TASC believes that Montana should extend its net metering policy to all rural electric cooperatives and all regulated utilities.

Montana Electric Cooperatives' Association (MECA) Questionnaire

Overall Summary of Response

The total rate Montana rural electric cooperatives charge residential members ranges from around 6 cents to 16 cents, but the variable portion that is displaced by power produced with net-metered generators is generally under 3 cents. The netting of kWh's at full retail rates would shift the costs above generally 3.2 cents per kWh, to other members. This allows co-ops to come close to determining the cost shifts net metering brings under current rates. Some co-ops allow cost shifts with net-metered members, letting them fully net their production against the retail rate. Other co-ops reduce the cost shifts.

As a snapshot of the number of net-metered generators on various cooperative systems: Big Flat Electric Cooperative does not have any meters that are net metered; Fergus Electric serves 12 net-metered accounts; Flathead Electric has 39 net-metered systems, including 34 solar PV systems and 5 wind systems; Ravalli Electric Cooperative has 12 net-metered residential solar systems with an installed capacity of 73.42 kW; Vigilante had 12 net-metered accounts at the end of 2014; and Yellowstone Valley Electric Cooperative reported 13 total systems installed.

In terms of the total annual cost of service for rural cooperatives, the cost ranges from $3.2 million to $103.7 million with an average of $17 million per year. Average fixed costs for co-op utility systems account for 48% of total costs. Depending on the co-op, fixed costs range from 28% to 63%. The average fixed revenue from residential service monthly fixed charges is 22%. The fixed revenue for residential services ranges from 8.3% to 31%.

Costs of Net Metering

Implementation costs include program setup, which can include linemen education, and a review of the impacts on the distribution system and their operation. Initial interconnection costs per installed net-metered system at the location may be as low as a few hundred dollars or as high as thousands of dollars, depending on the size and location, according to MECA. Monthly and annual administrative costs vary from co-op to co-op. With more saturation of net metering, engineering studies on the need for additional upgrades to provide for protection of the system will be needed.

Fergus Electric has calculated the extra initial expense to install a net metering system to be $650 per installation. The customer is required to pay the cost difference prior to connection of the net meter. Fergus also charges an additional $8/month in base charge as an administration fee. Sun River Electric Cooperative also charges an $8 per month additional charge for additional administration. Vigilante previously charged a net metering customer $500 for installation, but they have since updated their system and no longer charge the fee.

Regulating Services

MECA finds the need for load following and regulation increases with variable generation, such as that provided by net metering. Ramping of generation levels due to the variable characteristics of net-metered generation also increases, not decreases, operations and maintenance costs.

Supply Services

MECA provides an example for the one-third of the state's electric cooperatives served by Central Montana Electric Power Cooperative, noting that the energy kWh that a net-metered generator may produce would offset less than half the cost of its wholesale power.

For most co-ops the highest peaks occur in the winter and the time of peak occurs prior to sunrise or after sunset. Few, if any, co-ops with residential or commercial net metering provide data to determine coincident peak. Highest peak use determines what capacity a distribution system, transmission system, or traditional generation has to have to supply needs. Net metering does not reduce the capacity needed and used by the net-metered customer in Montana co-op areas based on the times most annual peaks occur, according to MECA.

Costs Based on Increase in Size

MECA finds that increasing the cap on residential net metering would affect only large consumers and would increase cost shifts in proportion to the size of the installation. In addition, service lines and transformers also could require upgrades. The cooperatives find that the impact of a single 100 kW generator would range from $3,294 per year to $11,598 per 100 kW installed, depending on which co-op in which the interconnection was located. For a 1,000 kW net-metered generator, the cost shifts increase to a range of $32,940 to $115,980 per year per installation. "Put in another perspective, for four of the 25 co-ops this cost shift impact of a 1,000 kW installation at a single location would be equivalent to about 2.5% of the co-ops total annual revenue." If the fixed cost of power supply was added, the total cost shift could rise to an annual cost shift impact of from $92,000 to $164,338.

Benefits of Net Metering

"Unless net-metered customers have battery backup sufficient to provide their electricity needs when their generation is not producing power, there are no benefits of net metering to the co-op and non-net-metered customers to quantify."

Fergus Electric noted that based on its 12 net-metered customers, they see no advantage or disadvantage to their membership. Flathead Electric Cooperative noted a benefit to the net metering member in the retail rate less the cost to the member of their own installation. The benefits to other members of the cooperative include avoided power supply costs, less any fixed costs determined through a cost-of-service study, that are collected in the variable charge within the per-kWh-credit at the retail rate. Flathead also noted that the primary benefit of net metering is the avoided energy cost of equivalent power supply. There also could be some shared benefit from line loss by having a source of generation closer to load. Lincoln Electric Cooperative noted few benefits, with the main benefit being to the net-metered customer.

Avoided Costs

The cost of energy from traditional supply is the same every hour of the day for the majority of Montana electric cooperatives. Capacity costs avoided by solar power production are zero during most months and minimal in others, according to MECA. Both transmission and distribution lines also have to be built

with enough capacity for times of peak power demand. Net-metered generation cannot be relied on during peaks to provide any capacity to meet demand, according to MECA.

Remitted Funds and Bonneville Power Administration Exchange Credits

Few net-metered customers fail to use all credits prior to true up. The value of a credit to the co-op would equate to less than 3 cents each and, although few, they may decrease the cost shift by a small amount for the few customers who may not use all their credits, according to the cooperatives. The residential exchange does not benefit any co-op.

Yellowstone Valley noted that of the 13 net-metered customers, only 2 have produced more than they use. Lincoln Electric noted that of the 13 net metered accounts, only 1 has produced excess kWh that were donated.

Cost Shift or Subsidy

On a per-kWh cost basis, net metering shifts costs ranging from 1.9 cents to 6.6 cents per kWh for electric co-ops in Montana, according to MECA.

"Some of the cooperatives provided comprehensive data of the effect of the net-metered installations they have in place, and the co-ops have not disputed that at the present level of saturation of net-metered customers, the impact of the cost shift although significant on a per-service basis, is not significant on a co-op wide basis." However, it should be noted that because co-ops are not-for-profit utilities, if net-metered customers bypass their payment of fixed costs for the co-op facilities they continue to use, it is shifted to non-net-metered customers, resulting in a subsidy, according to MECA.

If a co-op is allowed to recover fixed costs, both those of the co-op and those embedded in power supply, the cost shift is mitigated at the local level, assuming the system can handle the amount of power generated without upgrades.

Policy Points of Note

MECA notes that it is imperative that elected cooperative boards retain their power to set rates, charges, and policies related to net metering in order to be fair to both net-metered customers and non-net-metered customers. "A frustration electric co-ops face is with members who move forward with purchase or installation of net-metered systems without first contacting the co-op." If upgrades to a system are needed to accommodate net-metered customers, those prospective customers should be responsible for all related costs unless it is a unique situation in which the investment is justified.

MECA sees no pros to extending Montana's net metering policy to include rural electric cooperatives.

MECA policy and regulatory requests

Requiring installers and prospective net-metered customers to begin a dialogue with the co-op early in the process would allow all involved to know and understand requirements and costs prior to an installation. Addressing the issue of who pays for utility system upgrades on a given feeder line or substation that result from multiple generators interconnecting to that line also could be needed.

Renewable Northwest Questionnaire

Overall Summary of Response

When quantifying the benefits of net metering, it is important to recognize the different perspectives from which they can be considered. “A robust, comprehensive solar resource value investigation should consider each of these diverse perspectives.”

Costs Based on Increase in Size

Residential systems are typically below 10 kW, with the Solar Energy Industries Association (SEIA) reporting a turnkey installation cost of $3.46/W in the first quarter of 2015. SEIA also notes that the size and type of systems installed are driven by a combination of factors, including the available solar resource, power prices, and state policy.

Benefits of Net Metering

Net metering studies and solar resource value investigations typically include avoided energy impacts. The ability of solar to reduce or defer the costs of building power plants is based on its capacity value, which allows it to defer investments in generation capacity. Distributed solar provides value by avoiding line losses that would otherwise be incurred. Distributed solar relieves the requirement to supply some load at a particular location, effectively reducing or deferring the need for additional transmission and distribution capacity. Net metering also contributes to reliability, resiliency, and emergency preparedness. Market price response, ancillary service, grid support, and fuel price hedging also should be considered.

The contributions net-metered systems provide in terms of economic development, avoided environmental compliance costs, and environmental externalities also need to be considered. For example, a 2013 Rocky Mountain Institute survey of 16 solar resource value studies reported that 11 of the 16 investigations examined environmental attributes when considering the benefits of net metering and solar.

Avoided Costs

Ratemaking based solely on utility avoided costs should be reserved for U.S. Public Utilities Regulatory Policies Act 1978 (PURPA) qualifying facilities that are designed to generate bulk power and export it to the grid.

Cost Shift or Subsidy

“The extent to which net-metered customers are subsidizing non-participating customers, or vice-versa, depends upon the balance between the various elements that make up the solar resource value.” Renewable Northwest also notes that a significant level of net metering penetration is needed before meaningful cross-subsidization can be perceived.

Policy Points of Note

Montana’s net metering policy should be extended to rural electric cooperatives and all regulated utilities. However, differences in distribution system geometries should be taken into account when considering interconnections procedures. Cl0099 5345sleb