Montana Electric Cooperatives' Association
Touchstone Energy® Cooperative

NET METERING ANALYSIS

Response of Montana's Electric Cooperatives to Energy and Telecommunications Interim Committee Request for Information

Note of Explanation:
Shown below are each of the questions posed by the Committee followed by the summary response of Montana Electric Cooperatives' Association (MECA)to each of those questions with each question followed by the responses of individual electric cooperatives.

Question #1: Generally describe the specific implementing and administering net metering policy. Identify issues and concerns, if any, associated with implementing and administering the current level of net metering and how those issues and concerns could be addressed?

MECA Summary Response
As responses below indicate, significant costs can be incurred related to implementation of a net-metering program.

Many co-ops have interconnections of renewable-energy generators. As a percentage of their services, these numbers for a couple of co-ops are comparable with those of NorthWestern Energy. Although all co-ops have policies allowing net-metering, several of them do not have any net-metered members at this time.

Costs break down into four general categories:

1. Program set up and implementation in which net-metering policies are adopted to address everything from member requirements to linemen education of the impacts on the distribution system and their operation of it with renewable-energy generators interconnected. A series of IEEE 1547 standards have to be understood and interconnection standards developed;

2. The initial interconnection cost per installed net-metering system at the location of the electric service may be as low as a few hundred dollars or can be in the thousands, depending on the size and type of service as well as its proximity to the locations from which crews are dispatched. An electric cooperative with underground power lines in subdivisions may have different interconnection costs than one with overhead lines. This is because different equipment can be installed to isolate the net-metered generator when work is required on the lines.

   Interconnection at a large 400-amp service will be more costly than a small service, unless the small service has to be upgraded due to the size of the generation installed. For instance, the service itself or the transformer may have to be changed depending on the kW of generation installed.

There is a point at which changes to power lines will be required if a number of net-metered systems are installed on a small-capacity feeder line (common in rural areas). These changes would include but not be limited to installation of voltage regulators to sense reverse power flow. Also, studies of a power line may determine that adjustments in the settings of high- voltage breakers are required to ensure if a problem occurs on a line, the correct devices turn line segments off.

3. The monthly and annual administrative costs will vary co-op to co-op. A co-op with only a handful of net-metered accounts may be able to hand bill the few accounts with an hour or two of additional time each month. Other co-ops may have software that accommodates the net-metering on a monthly basis, requiring manual bookkeeping entries at the true-up period only. These costs include the billing system changes, which vary depending on software provider, number of net-metered systems and the metering system involved.

   With more saturation of net-metering, engineering studies on the need for additional upgrades of the protection system will be needed in the areas with the net metering as noted in the second category listed above. These studies are complex, using a computer simulation of the system. Simple simulations of the model may cost only a few hundred dollars but more complex modeling may cost in the thousands of dollars each.

4. One important aspect of a net-metering program is having staff very familiar with net metering who help the member considering net metering be fully educated.

Actions to address the concerns
Boards of trustees democratically elected by the members are the governing body of an individual electric co-op. It is critical that these boards retain the power to set rates, charges and policies, attempting to be fair with both the net-metered members and the non-net-metered member. Utilities by nature have very high investments in their utility systems. Costs of these investments must be fully recovered.

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. Communication is critical in these matters.

These members often fail to ask the co-op what is involved in interconnecting their generator, what has to be done at an electric service to accommodate the interconnection, or they fail to ascertain interconnection standards. At times, these individuals come to the co-op for the first time after an entire net-metered system has already been installed, requesting a meter from the co-op be installed. Often, it is only then that these people learn that the economics of the net-metered system, based on that specific co-op's rate structure, are very different than they assumed or were told. A solution to this communication problem would be to require all installers and prospective net metering members to first contact their co-op to discuss their specific installation prior to completing a transaction.

Question No. 1 Individual Co-op Responses

Big Flat Electric Cooperative

Big Flat is a very small rural electric cooperative. We have 1,090 members and 1,924 meters connected. Our service area extends from the Canadian Border to the Missouri River and from north of Hinsdale to north of Zurich. You could fit five or six Rhode Islands within our borders. Eighty four percent of our electric load is residential with six meters that serve the water plant at the former Zortman Gold mine. Because of our low density of 1.26 meters per mile and high cost of Operation and Maintenance, it is essential that we continue to provide the best service we can at the lowest price possible.

While Big Flat Electric offers net metering (10 kW and under), we have no current subscribers. We do offer off grid solar pumps for those members who are too far from the power line to supply water to their livestock.

As the manager of Big Flat Electric, my biggest concern with net metering would be the cost shift to those members who do not net meter. Bypassing the poles and wires charge causes undue pressure on our rates. Because our base charge is so high we have to rate base the balance. We currently charge $32.00/month base charge, when the actual charge to cover costs is more around $90.00. The balance of the difference is added into our rate, which is 0.98/cents per kWh. If we credit our net metering customers $0.98/cents per kWh, they are not only getting credit for the energy, but the O & M charges we have to put in our rat This will shift even more the O & M cost to the remaining members who do not net meter. Our poles and wires serve in the most severe weather Montana can throw at us. We have 40 degree below zero to 100 degrees above across the wind-swept plains of Montana. Just recently, I lost over 33 poles to 100 mph winds over the Fourth of July. Cost of repair and the cost to replace the poles will be close to $75,000. That is $1,000 per member that will be part of O & M.

Net metering customers desire to be hooked up to the grid for when the sun does not shine or the wind does not blow but feel they should use our poles and wires for free. That may work in a city or town where four or five meters are hooked up to one transformer but does not work in a system where meters are an average of 1.26 miles apart.

Other concerns center around safety when net metering devices could back feed into the transformer and energize the line during an outage. This could prove not only dangerous but fatal to lineman trying to restore power.

Fergus Electric Cooperative

Fergus has calculated the extra initial expense to install a net metering system to be $650.00 per installation. This includes the additional cost of the meter required to record energy traveling both ways, the engineering cost to provide the application and contract for net metering, inspection of the site to assure compliance with our interconnection policy and the installation of the net meter once all guidelines have been met. The customer is required to pay this cost difference prior to connection of the net meter. Presently our billing software is capable of monitoring net metering usage by recording energy delivered versus energy returned to our system, but we have to make adjustments annually as we "zero" out the balance. For this service, Fergus charges an additional $8.00/month in our base charge as an administration fee. We require the customer to install a separate disconnect between the generation system and the attachment to our system, providing a visual opening, including a weather-resistant placard identifying the location of that disconnect in case our line personnel need to isolate the generation system prior to working at that location.

We inform our line personnel of the location of any new net metering system monthly at our safety meetings and also identify their locations on our mapping system.

Flathead Electric Cooperative
A Net Metering policy had to be developed, written and approved. Changes in the existing Generation Interconnection Policy were reviewed and approved. Implementation planning discussions were required and ongoing policy review and administration will be required. Approximate Costs are allocated into three areas as follows:

- Implementation Costs = $15,000
- Annual Administration Costs = $1,600
- Per Installation Net Meter Costs = $160 ($50 Process Fee paid by member)

Issues and Concerns:

- The Cooperative currently supports net metering, but administrative costs associated with government requests and potential reporting requirements given new laws and regulations must be paid by our member-owners, including non-net metering members.

Glacier Electric Cooperative
General costs incurred when implementing and administering a net metering policy include member education, differences in billing such as software upgrades and data management, lineman education, location identification and mapping, line isolation during maintenance, and additional equipment and engineering costs to inspect and ensure system safety.

Goldenwest Electric Cooperative
Unknown. We do not have any net metered accounts.

Hill County Electric Cooperative
We do not have any additional examples of cost. These are all legitimate costs.

Lincoln Electric Cooperative
Concerns and Issues – These really revolve around subsidies and maintaining local control. LEC has been working hard to reduce any cross-subsidization between members. We have high pressures to keep from raising rates and to control costs. Cooperative like Lincoln Electric that are losing load because of the economy can ill afford to lose load because of disconnected energy policy. Subsidizing one energy type over another will only create an energy supply that is much more expensive and unresponsive to usage patterns of our members.

Cooperatives were built on the premise of local control. Our members dictate the direction and programs that they want the co-op to offer. Taking away that control so that a few companies can force them to subsidize the installation of their equipment so they can make money is totally contrary to the cooperative philosophy.

McCone Electric Cooperative
McCone Electric Cooperative will defer the question to those cooperatives that have net meters in place. If McCone Electric has an application for net metering we will be seeking input from experienced co-ops.

Mid-Yellowstone Electric Cooperative

Educating member requesting net metering: Est. Labor + Overhead	– 5 HR @ $ 82.54 =	$ 412.71
Educating linemen per year: Est. Labor + Overhead	- 2 HR @ $ 82.54 =	165.08
Linemen instruction: Est. Labor + Overhead per year	- 2 HR @ $ 58.03=	116.06

Check net metering is isolated during 1 outage: Est Labor + Overhead – 2 HR @ $ 68.81= $137.62

TOTAL EST. COSTS NOT INCLUDING BILLING, ETC NOR ACTUAL METER INSTALLATION **= $ 831.47**

Missoula Electric Cooperative

The cost of administering our net metering program includes the following:

- Engineering time spent discussing the installation with the member to determine feasibility, understand potential system impact, communicate requirements of the system including safety – approximately 1-3 hours per installation
- Billing clerk time includes specific review of all net-metered bills for errors or irregularities each month, communicating and educating members on the net-metering system, and review of annual true-up amounts if necessary – approx 2 hours per month for the entire system

NorVal Electric Cooperative

NorVal Electric is using one meter that allows us to read both incoming and outgoing kWh. We require a locking manual disconnect for the Distributive Generation (DG) systems. This is to isolate them from our system during emergencies. The cost associated with the net-metering is for our annual true-up and driving to locations to lock out the systems because for the most part they are at unoccupied locations. The other cost is to document the DG locations on our system maps.

When you have changes to your system you need to educate both employees and members. We are in the process of educating both. We are using safety meetings for the employees and our bi-monthly letter and a video that is be produced for the members.

Park Electric Cooperative

Here are some of the one-time costs caused by a net metered service above the cost of a traditional residential service. Specialized meters with a unique number are used for net metering ($0). Each meter must be programmed individually in order to read bi-directionally (27.40). There are three types of meters that qualify for the program so we must keep some of each on hand in order to accommodate these systems (added inventory). Obviously, we need to send a crew member to the location of the net metered service in order to inspect the service for proper operation and to install the new bi-directional meter ($168 + or -). We attach a red placard to the pole or meter base that says “GEN” as another means of identifying the location. Line workers are required to isolate themselves from any source of energy. That means extra precaution must be taken when working on a line that has a distributive generation system on it ($3). Line workers are required to identify all possible sources of energy, including distributive generation so we must update our maps to reflect these services. While almost all map updates are automatic through the work order system, in this case someone has to manually go into the mapping system to make these changes ($41.35). We update all crew members each time we add another net-meter to the system so they are aware of the locations of the energy sources ($166). It takes just a few minutes to change the rate class from residential to net metered ($0). This puts the total co-op investment at closer to $400 that we do not get compensated for at the time of interconnection. As far as I am aware, to date every one of the 21 net metered services we have has been installed on an existing service. That said, each of the expenses I have described thus far have been incurred every time we have connected a distributive generation system. These are approximate costs. Factors such as miles from the office to the service, complexity of the system and simply coordinating with the owner or installer to make sure someone shows up for the inspection can change these costs.

There is a considerable amount of time required each month to review each net metered account and calculate the bill ($13.83 per account per month). Once a year, on an annual date determined by the member, we need to review the billing system and manually “true up” each net metered account ($20.75).

Ravalli Electric Cooperative

Net metering requires the intervention of several specific employees in the work flow and processes that are otherwise automated. Net meters are a problem to read with REC’s AMI due to power line noise injected by the inverter. This noise can negatively impact other meters, which then requires a manual read for monthly billing. REC only has PV generators at this time and the process to reconcile kWh is a manual exercise. Specific costs are allocated to the net meter up front for known expenses but on going administrative costs are spread to general operational expense lines.

Net-metering costs per installation:
- Software system to manage net metering
- Difference in billing costs for net metering
- Costs for a regular service
- Costs of identifying the location of net-metered service
- Cost of installing additional equipment
- Cost of mapping net-metered system if different from others
- Cost to educate line personnel to work on the interconnections

Costs related to isolating net-metered service

Sun River Electric Cooperative

Sun River at present has 13 Co-Gen accounts with 12 of them net metered. The 12 net metered accounts have a combined capacity of 68.9 kW. No single generation source is greater than 10 kW.

In 2014, with the small number of net metered accounts, it was not cost-effective to update billing software to handle those few accounts, therefore, all net metered accounts were hand calculated each month. Hand calculation costs are passed on to the net metered consumer via an $8 per month additional charge.

Line personnel are informed of co-gen locations and must take extra time to ensure the customer generation is isolated prior to working on a line during an emergency.

Vigilante Electric Cooperative

With our old metering system, we had to install a different meter when a member planned to install some type of net metering system. The cost of those meters was ~ $500 plus labor. We billed the member for this expense. Our new metering system does not require a change in the meter to accommodate a net metering setup. I'm not aware of any additional equipment costs that we incurred to get this going. We have to hand bill the net-metered accounts, which creates the need for additional labor during billing.

Yellowstone Valley Electric Cooperative

Costs for the utility show up in several categories.

Education – Informing the members of the policies and procedures necessary to follow in order to interconnect to our system.

Interconnection – This involves several employees. Our engineers must review the customer application and meet with the installers and electrical contractors to ensure safety compliance.

Linemen – To install the service, which is to be netted against.

Administration – Sending and receiving application and other documents. Setting up a net-metered account on our customer service and billing system. Monitoring that account and ensuring accuracy (as this is a much different bill calculation than a traditional customer). Marking the location of the net-metered services on our GIS mapping system for the safety of our operational employees.

Miscellaneous – Yellowstone Valley Electric Cooperative, Inc. has a custom program for billing our net-metered accounts, which we bore the cost of. Frequent member call backs with a questions about usage, billing, banking of kWh's, etc.

<u>Question #2: What is your cooperative's current total annual cost of service and what amount is fixed and unresponsive to changes in your customer electricity use in the near term?</u>

MECA Summary Response

In terms of the total annual cost of service, the cost ranges from $3.2 million to $103.7 million with an average of $17 million per year.

Below is Table F-1, showing the numbers for each electric cooperative. These are prepared from co-ops' financial statements.

Table F-1 – Total Cost of Service & Fixed Costs - Montana's Electric Cooperatives

Total cost of Service of individual cooperatives	Cost of power; fixed and variable	Fixed cost unrelated to Electricity itself	Percent Fixed cost unrelated to Electricity itself		fixed cost including the cost of capacity portion of power at 50% assuming NM does not reduce Peak	percent fixed cost with power Capacity costs included
3,290,434	1,241,697	2,048,737	62.26%		2,669,586	81%
23,268,504	16,866,562	6,401,942	27.51%		14,835,223	64%
15,181,839	6,586,149	8,595,690	56.62%		11,888,765	78%
12,729,149	7,502,440	5,226,709	41.06%		8,977,929	71%
19,961,151	12,758,786	7,202,365	36.08%		13,581,758	68%
8,460,533	3,742,034	4,718,499	55.77%		6,589,516	78%
19,213,570	8,675,155	10,538,415	54.85%		14,875,993	77%
27,756,800	11,830,595	15,926,205	57.38%		21,841,503	79%
12,420,714	5,889,153	6,531,561	52.59%		9,476,138	76%
4,115,681	2,111,740	2,003,941	48.69%		3,059,811	74%
11,167,230	6,449,995	4,717,235	42.24%		7,942,233	71%

Total Cost of Service & Fixed Costs - Montana's Electric Cooperatives (Table F-1 cont.)						
Total cost of Service of individual cooperatives	Cost of power; fixed and variable	Fixed cost unrelated to Electricity itself	Percent Fixed cost unrelated to Electricity itself		fixed cost including the cost of capacity portion of power at 50% assuming NM does not reduce Peak	percent fixed cost with power Capacity costs included
10,025,003	5,104,084	4,920,919	49.09%		7,472,961	75%
25,628,239	10,131,315	15,496,924	60.47%		20,562,582	80%
103,723,987	59,284,701	44,439,286	42.84%		74,081,637	71%
3,796,476	2,085,924	1,710,552	45.06%		2,753,514	73%
9,343,106	4,858,756	4,484,350	48.00%		6,913,728	74%
6,892,524	4,270,749	2,621,775	38.04%		4,757,150	69%
3,682,329	2,080,889	1,601,440	43.49%		2,641,885	72%
7,236,085	2,693,719	4,542,366	62.77%		5,889,226	81%
13,259,899	9,094,005	4,165,894	31.42%		8,712,897	66%
13,763,171	7,110,598	6,652,573	48.34%		10,207,872	74%
9,634,429	4,329,120	5,305,309	55.07%		7,469,869	78%
11,552,092	5,631,882	5,920,210	51.25%		8,736,151	76%

There are fixed costs of the system with the costs for the poles and wires being the largest single fixed cost. Many fixed costs are also embedded in the power supply (electricity) charge, including the cost of transmission to transmit power from the generator to the co-op as well as the cost of the actual electricity. The cost of integrating all the generation is also embedded in the wholesale power costs. These costs are based on the peak use of electricity each month. Alternatively, some generation costs are based on a rolling 12-month average. Either way, unless a generator is on during peak times these costs remain and are fixed.

Average fixed costs for co-op utility systems (not related to the electricity or power supply itself) account for 48 percent of total costs. Depending on the co-op, these fixed costs range from 28 percent to 63 percent.

The portion of fixed cost of wholesale power and transmission to the co-op has an even wider range. However, a conservative estimate is that 50 percent of the power supply charge is comprised of fixed costs. If a net-metered service no longer used capacity from the co-op (co-op's power supply at peak periods when the net metered generation is not producing) this percentage would drop.

Typically, however, that is not the case as it would require full battery storage. Total fixed cost if capacity needs of the net metered customer remain unchanged, is closer to 70 percent of all costs.

As an example, for the one third of the state's electric cooperatives served by Central Montana Electric Power Cooperative, the energy kWh that a net-metered generator may produce would offset less than half the cost of its wholesale power. The capacity needs, generation and transmission would remain and have to be paid for.

<u>Question No. 2 Individual Co-op Responses</u>

Big Flat Electric Cooperative
Total cost of service for 2014 was $3,290,434 (Include purchased power). Fixed cost was $ 2,048.737.

Fergus Electric Cooperative
Fergus Electric's Total Cost of Electric Service (Form 7 – Line 20) is $23,268,504.00.

Our Cost of Purchased Power (Form 7 – Line 3) is $16,866,562.00. The fixed amount unresponsive to changes in our customer usage is the difference - $6,401,942.00 – (27.51%).

Flathead Electric Cooperative
$103,723,987 total cost of service and $43,963,026 total fixed costs.

Glacier Electric Cooperative
$8,595,690 or 57%

Goldenwest Electric Cooperative
Total annual cost $3,796,476 – 100%
Fixed costs - $1,710,552 – 45%

Hill County Electric Cooperative
$5,226, 709 is the annual cost for 2014

Lincoln Electric Cooperative
LEC's monthly residential Cost Of Service (COS) without capacity fixed costs figured in is $49.71 or $596.52 per year per service. If the fixed cost of capacity is added in the total monthly COS is $66.30 or $795.60 yearly per service.

Marias River Electric Cooperative
$4,152,556

McCone Electric Cooperative
<u>$ 8,460,533 100% Total cost of Electric Service</u>

$ 4,718,499	56%	Fixed costs with no energy sales
$ 3,742,034	44%	Variable cost of purchase power

Mid-Yellowstone Electric Cooperative
2014 COST OF SERVICE = $3,682,329. FIXED COSTS $1,601,440.

Missoula Electric Cooperative
Part A. Line 20 $19,213,570
Part A Line 3 <u>8,675,155</u>
$10,538,415 or 54.8%

NorVal Electric Cooperative
Fixed and Unresponsive Costs: $4,542,366

Park Electric Cooperative
$4,165,245.

Ravalli Electric Cooperative
Total annual cost of service =$12,420,714
Total power Cost = $5,889,153
Total amount unresponsive =$12,420,714 - $5,889,153 = $6,531,561

Sun River Electric Cooperative
Cost of purchased power in 2014 was $4,329,120 and our O&M expense was $5,305,309. Purchased power is 45% of our annual cost of service and O&M expense is 55%.

Vigilante Electric Cooperative
Total current annual cost of service and the portion that is fixed:

Total Annual Cost	$11,552,093
Fixed Costs	$ 5,920,211

Yellowstone Valley Electric Cooperative
Cost of Electric Service is $11,787,792 excluding the cost of purchased power. This is the amount that is fixed and unresponsive to the amount of electricity our members use. As a percent, this is 37.7% of the total cost of electric service.

Question #3: What is your cooperative's total current annual revenue from fixed charges that are unresponsive to changes in your customer's electricity use in the near term and what amount is from variable charges?

MECA Summary Response

For residential services, which comprise an average of 74 percent of all co-op services (48 percent to 95 percent) we have the data co-op by co-op. Although co-ops' financial statements do not show the split between fixed and variable revenue for all rate classes, we at MECA do have a breakdown on a separate spreadsheet for fixed and variable charges related to the residential rate class. A much higher percentage of services are residential in rural areas than in cities where commercial and industrial typically comprise higher percentages.

Please refer to Table F-2 below to see the co-op by co-op numbers for their residential class prepared from the financial statements and rate structures of each co-op.

The average fixed revenue from residential service monthly fixed charges is 22 percent. The fixed revenue for residential services ranges from 8.3 percent to 31 percent. Some of the individual cooperatives did break out the data to provide data for total or individual classes.

Table F-2

Montana Rural Electric Cooperatives
Net-Metering Cost Shift Potential

Numbers derived from annual financial reports of each co-op to demonstrate the portion of each kWh charge that recovers fixed costs. The cost of the power itself has been subtracted from this charge. It is based on 1,000 kWh per month fully netted out			
Revenue per kWh to recover fixed cost per kWh (1st block)	* Monthly cost shift to other member customers (from the kWh unit charge) - per net-metered service if 1,000 kWh normal usage is netted -	**Dollars if 50% of wholesale power is for kW capacity (assumes the service requires the same capacity as prior to net metering, which it would be in winter months.)	*Potential cost shift per month per net-metered service if average 1,000 kWh/ Month
0.0591	$59.10	$19.45	$78.55
0.0528	$52.80	$35.75	$88.55
0.039	$39.00	$17.50	$56.50
0.0383	$38.30	$28.35	$66.65
0.0188	$18.80	$26.10	$44.90
0.0617	$61.70	$22.90	$84.60
0.0321	$32.10	$18.45	$50.55
0.0332	$33.20	$20.75	$53.95
0.0273	$27.06	$18.45	$45.51
0.0414	$41.40	$26.30	$67.70
0.0428	$42.80	$34.20	$77.00
0.0421	$42.10	$35.10	$77.20
0.05826	$58.26	$34.85	$93.11
0.03967	$39.67	$17.30	$56.97
0.01946	$24.92	$19.95	$44.87
0.0413	$41.30	$26.85	$68.15
0.0261	$26.10	$19.70	$45.80
0.02245	$22.45	$23.00	$45.45
0.0586	$58.60	$35.20	$93.80
0.0662	$66.20	$21.90	$88.10
0.031	$31.00	$27.50	$58.50
0.04	$40.00	$25.00	$65.00
0.0448	$44.80	$22.95	$67.75
0.024	$24.00	$16.50	$40.50
Average	$40.24	$24.75	$64.99
Range	$18.80 - $66.20	**Range**	$40.50 - $93.80

* Rate structures vary with over half of the co-ops having the same per kWh charge for all kWh. all but two co-ops have the same per unit kWh charge for the first 1,000 kWh per month. The two co-ops have the charge for the fixed cost factored into the cost shift numbers.

** This takes the average cost of power, to the extent residential has a lower load factor, the power costs would be higher. This will vary greatly from co-op to co-op if a co-op has high load factor commercial or industrial loads.

Question No. 3 Individual Co-op Responses

Big Flat Electric Cooperative
Annual revenue from fixed charges is $697,187. Amount from variable charges is $2,731,952.

Fergus Electric Cooperative
Fergus Electric only has residential net metering. The average number of customers in this class for 2014 was 5,934 times our base charge of $32.50/ month = $192,855.00 X 12 months = $2,314,260.00. This is the fixed charge that is unresponsive to changes in the customer's usage.

Flathead Electric Cooperative
$20,614,748 total current annual revenue from fixed charges and $84,500,204 from variable charges.

Glacier Electric Cooperative
Revenue from fixed charges is $2,961,300; from variable is $12,364,400.

Goldenwest Electric Cooperative
Revenue from fixed charges is $382,812; from variable is $3,564,411.

Lincoln Electric Cooperative

Forecasted 2015 Revenue
Residential - $1,879,141
Small Commercial - $223,416
Irrigation - $37,920
Large Commercial - $37,460
Industrial - $15,960
Total - $2,193,897

Marias River Electric Cooperative
$649,000

McCone Electric Cooperative

Total Revenue	$8,852,168	100%
Fixed Charges	$1,899,360	21%
Variable Charges	$6,952,808	79%

Mid-Yellowstone Electric Cooperative
ANN. REV. FROM FIXED CHARGES = $794,061, VARIABLE REV. = $3,189,550.

Missoula Electric Cooperative

	Total Revenue	Fixed Revenue	
Residential	14,693,143	3,952,104	26.8%
Commercial	3,725,306	571,104	15.3%
Industrial	981,846	6,480	7.9%
Irrigation	520,936	182,340	35.0%
Other Revenue	217,023	217,023	100.0%

Note: The above fixed revenue totals are based upon estimates using average customers served and average base cost of service by rate class. Other revenue includes fees, pole rentals, and other non-energy sales.

NorVal Electric Cooperative
See attached, "NorVal Exhibit A", P. 84.

Park Electric Cooperative
$2,014,007*
*This does not include non-operating revenue. Non-operating revenue totaled $629,867. About 68% of that is G&T capital credits that have been allocated but not paid.

Ravalli Electric Cooperative
Total annual Revenue from fixed charges = $3,697,444
Total variable charges =$9,156,505

Sun River Electric Cooperative
Total annual electric revenue in 2014 was $9,880,885 of which $2,063,894 was derived from base charges.

Vigilante Electric Cooperative
Total current annual revenue from fixed charges and what is variable:

	Fixed	Variable
Residential	$1,516,152	$5,540,642
Seasonal	794,022	347,051
Irrigation	770,000	$2,523,836
Commercial	139,022	408,591

Yellowstone Valley Electric Cooperative
Total Annual Revenue for 2014 was $32,928,754. Total Annual Revenue from fixed charges is $4,641,840. This is for all rate classes. The non-electric revenue is $230,255, which is not part of the $4,641,840 figure.

<u>Question #4: What is the distribution of residential and commercial (by rate class) customer annual energy use, average annual non-coincident peak demand and average annual coincident peak demand? Where within these distributions, do residential and commercial (by rate class) net metering customers fall, on average?</u>

<u>MECA Summary Response</u>
Please refer to the Table F-3 below for Central Montana peaks versus coincident peaks. The annual coincident and non-coincident peaks represent different data from co-op to co-op. In most cases, the data does not show the peak of an individual load. Rather, it is the peak of an entire distribution system. When the term coincident is used it needs a definition of what the load is coincident with. For example, if an individual service is compared to the coincident peak of a transmission system it is very different than if it is coincident with loads of a substation or power supplier. For example, for the 1/3 of Montana co-ops served by Central Montana Electric Power Cooperative the CP is that of the load for all the co-ops at the highest use in the one-half-hour period each month. The peak load column shown in Table F-3 is the highest use in the one-half-hour usage period of each month of each individual co-op individually so that if you add up the highest-use period for each individual co-op served by Central that will be Central's peak. Although Table F-3 shows only Central Montana co-ops, the time of peak for power supply would be similar for most of Montana's electric cooperatives. Because all co-ops do not peak at the identical time, the coincident peak is lower. It would take

high-tech meters and communication from the service at a given net-metered installation to establish the CP with any other location.

Of great importance to the discussion is what month and time of day the highest peaks and CP occurs. This is important because the highest peak use determines what capacity a distribution system and transmission system and traditional generation has to have the capacity to supply needs.

The times stated are the hour or half-hour ending time. So a time that shows a peak at 7 a.m., represents the loads from 6:30 to 7:00. The relevance to net metering is whether a net metering generator is reducing the peak. In other words, is the net metering generator supplying power at that time or drawing from the grid to supply all or part of the net-metered service? Please note that 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' residential or commercial metering provides data to determine coincident peak. Generally, CP data is limited to substations, large areas of power supply or industrial customers.

Table F-3

Central Montana peaks - nearly 1/3 of MT coops		Date and Time of Peak of CP
	Peak	
Coincident Peak	161326	1/5/14
Peak	170684	18:30
Coincident Peak	166261	2/6/14
Peak	179526	7:30
Coincident Peak	152163	3/1/14
Peak	169105	19:00
Coincident Peak	116966	2/4/15
Peak	133789	7:30
Coincident Peak	107371	5/28/15
Peak	132861	18:00
Coincident Peak	108459	6/12/15
Peak	136810	22:00
Coincident Peak	144962	7/10/15
Peak	176215	18:30
Coincident Peak	147103	8/12/15
Peak	163690	17:30
Coincident Peak	111545	9/25/15
Peak	130905	20:00
Coincident Peak	109517	10/28/15
Peak	124518	7:30
Coincident Peak	151609	11/13/15
Peak	167547	7:00
Coincident Peak	157231	12/30/15
Peak	172958	19:30

Peak times for NorthWestern Energy Transmission , shown on their wholesale billing statements, are similar – as shown in the Table F-4 below:

Table F-4

NORTHWESTERN ENERGY TRANSMISSION 2014 MONTHLY PEAK (The highest use time)	
MONTH	PEAK HOUR ENDING TIME
JAN	7:00 PM
FEB	8:00 AM
MAR	8:00 PM
APR	8:00 AM
MAY	6:00 PM
JUN	5:00 PM
JUL	5:00 PM
AUG	5:00 PM
SEP	5:00 PM
OCT	8:00 AM
NOV	7:00 PM
DEC	7:00 PM

Question No. 4 Individual Co-op Responses

Big Flat Electric Cooperative

Residential: 18,077,395 kWhs
Commercial: 8,053,642 kWhs
Average coincident peak (with Central MT G&T): 4770
Average annual peak: 5331
Net metering would most likely occur in residential class.

Fergus Electric Cooperative

In 2014, Fergus sold 225,170,880 kWh across all classes. Our residential sales were 60,298,228 kWh's (26.78%). All of our net meters are residential. Fergus is billed on non-coincident peak demand so we do not have an accurate daily and hourly record of our peaks, but historically our residential peak demand occurs between 7 AM – 9 AM and 5 PM – 7 PM daily.

Flathead Electric Cooperative

	RES	SGS	MGS	LGS	XGS	IND	IRR
Annual kWh	720,357,435	176,752,479	72,142,129	135,010,411	55,386,580	256,055,200	3,871,939
Average NCP	533,826	73,085	21,038	36,280	12,693	56,705	5,013
Average CP	132,392	30,295	11,844	21,126	7,716	41,015	990

Flathead Electric has 30 RES and 9 SGS net-metered systems.

Glacier Electric Cooperative

For 2014, 40% of Glacier Electric kWh sales were residential. The winter peak KW from BPA was 35,850. Nearly ***all*** winter peak times were 7:00 ***a***m. The summer peak KW from BPA was 24,950 KW with most peaks set mid afternoon 2:00 to 4:00 pm. Glacier Electric is a **WINTER** peaking system.

Goldenwest Electric Cooperative

$34,983,448 annual energy use.

Hill County Electric Cooperative

See attached, "Hill County Exhibit A," P. 79.

Lincoln Electric Cooperative

LEC does not have demand data on residential customers and we do not have any commercial DG projects.

Actual 2014 usage
Residential – 78,088,855
Small Commercial – 12,924,806
Irrigation – 587,250
Large Commercial – 13,449,247
Industrial – 8,529,771

We are billed on our system peak not the coincidental peak of our supplier.

2014
Jan – 29.514 MW 7 am 1/06/14
Feb – 38.047 MW 7 am 2/06/14
Mar – 31.148 MW 8 am 3/02/14
Apr – 19.442 MW 7 am 4/02/14
May – 15.286 MW 6 am 5/12/14
Jun – 14.459 MW 8 am 6/18/14
Jul – 13.372 MW 12 pm 7/17/14
Aug – 13.294 MW 5 pm 8/07/14
Sep – 16.478 MW 7 am 9/11/14
Oct – 17.908 MW 7 am 10/28/14
Nov – 28.705 MW 7 am 11/04/14
Dec – 35.636 MW 8 am 12/30/14

Marias River Electric Cooperative

See attachment.

McCone Electric Cooperative

	Meters	kWh	CP	Non-CP
Residential and Stock Well	4,618	10,944	n/a	n/a
All Commercial	597	39,809	n/a	n/a

Net Metering	0	0

Mid-Yellowstone Electric Cooperative
RESIDENTIAL = 15,590,540 KWH SALES. ONE NET METERING RESIDENCE INCLUDED.
NO COINCIDENT OR NON-COINCIDENT PEAK INFO. AVAILABLE.

Missoula Electric Cooperative

Missoula Electric Cooperative
2014 Monthly System Peaks

1/6/2014	07:00	44,158.74
2/6/2014	07:00	54,294.50
3/1/2014	18:00	45,838.66
4/14/2014	07:00	34,712.81
5/12/2014	07:00	31,498.53
6/11/2014	19:00	29,015.39
7/29/2014	18:00	36,892.31
8/6/2014	18:00	35,677.49
9/12/2014	07:00	31,050.85
10/28/2014	07:00	46,480.57
12/30/2014	18:00	51,282.58

NorVal Electric Cooperative
See attached “NorVal Exhibit B,” P. 85.

Park Electric Cooperative

		KW	CM CP Time
JAN	CP	23673	5-Jan
	Peak	28648.0769	1830
FEB	CP	32872	6-Feb
	Peak	34656	730
MAR	CP	25630	1-Mar
	Peak	31511	1900
APR	CP	23010	4-Feb
	Peak	25015	730
MAY	CP	19325	28-May
	Peak	24071	1800

June	CP	22560	12-Jun
	Peak	27058	2200
July	CP	22850	10-Jul
	Peak	27528	1830
August	CP	22421	12-Aug
	Peak	26281	1730
September	CP	18445	25-Sep
	Peak	22777	2000
October	CP	22332	28-Oct
	Peak	23553	730
November	CP	29628	13-Nov
	Peak	31372	700
December	CP	30623	30-Dec
	Peak	33061	1930

The average residential service uses 1,143 kWh per month.
The average commercial service uses 7,536 kWh per month.
Because we have has so many new net meter installations in the last couple of years we are unable to calculate a monthly average. Some have not been on long enough to establish a 12 month average. There is also the fact that a large number of these services are serving non-typical vacation homes that have very sporadic usage.

Ravalli Electric Cooperative
Non-Coincident sales to end consumer.
Residential 126,192,858 kWh's 1208 / month, 14406 kW, 84% of total,
Commercial 10,285,642 kWh's 2234/month, 1174 kW, 7% of total, no commercial net meter
Total 149,512,954 kWh's, 1265 / month, average demand 17068 kW

Average annual monthly peak:
28,319 Average monthly peak kW

Coincident peak (CP):
27,735 average monthly peak kW

Your time and day of maximum seasonal peak winter:
Your time and day of maximum seasonal peak summer:
Your time and day of maximum CP winter: **February 6, 2014, 8:00 a.m.**
Your time and day of maximum CP summer: **July 29, 2014, 6:00 p.m.**

Sun River Electric Cooperative
There is no 2014 data available regarding actual demand by residential or commercial accounts. A rough approximation of demand can be made by considering energy usage. The average Sun

River residential consumer uses 968.7 kWh's per month. The average net metering consumer uses 1358 KWHs per month and generates 247 kWh's per month for a net usage of 1111 kWh's. Sun River has no commercial net metering accounts. Sun River's system in 2014 had an average (non-weighted) coincident peak of 91.58%.

Vigilante Electric Cooperative

Distribution of residential and commercial annual energy use:
All of our 7 net-metered accounts at the end of 2014 were located in the Residential Rate Class

Residential	95,689,361
Seasonal	4,638,412
Irrigation	47,039,434
Commercial	8,483,050

Non-Coincident Peak June 39,440

We are a summer peaking system due to the significant amount of irrigation load.

Yellowstone Valley Electric Cooperative

Annual Energy Use is as follows:

Residential -	195,702,681 kWh	75.0%
Irrigation -	6,017,267 kWh	2.31%
Small Comm. -	23,826,029 kWh	9.13%
Large Comm. -	35,226,234 kWh	13.50%
Public Lighting -	138,417 kWh	.0005%

Peaks are as follows:

January – Coincident Peak 58,062 kW
Peak 61,119 KW — Time – January 5 18:30
February – Coincident Peak 59,858 kW
Peak 66,003 KW — Time - February 6 7:30
March - Coincident Peak 59,348 kW
Peak 61,194 kW — Time - March 1 19:00
April – Coincident Peak 40,241 kW
Peak 48,475 kW — Time – April 4 7:30
May – Coincident Peak 39,869 kW
Peak 44,302 kW — Time – May 28 18:00
June – Coincident Peak 30,295 kW
Peak 44,500 kW — Time – June 12 22:00
July – Coincident Peak 58,455 kW
Peak 63,488 kW — Time – July 10 18:30
August – Coincident Peak 59,309 kW
Peak 62,884 kW — Time – Aug 12 17:30
September – Coincident Peak 40,601 kW
Peak 46,716 kW — Time - Sept 25 20:00
October – Coincident Peak 34,828 kW
Peak 40,453 kW — Time – Oct 28 7:30
November - Coincident Peak 51,646 kW
Peak 58,336 kW — Time - Nov 13 7:00
December – Coincident Peak 56,790 kW
Peak 60,502 kW — Time – Dec 30 19:30

All net meter customers, to this point, are in the residential sector.

<u>Question #5: For 2014, what was the impact on cooperative revenue of the reductions in residential and commercial electricity use and demand identified in</u>

questions 10-15? Describe how the revenue impact affects the bills of other residential and commercial customers, including the magnitude of any bill impacts.

MECA Summary Response

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. In part, this is because some of those co-ops with a higher saturation of net metered installations recover more of the fixed costs from the net-metered customer that would otherwise be bypassed, thereby reducing the cost shifts.

Co-ops generally have not offered net metering of a scale for commercial accounts. The issue is both one of fairness between net-metered and non-net-metered members and of even greater importance is the impact when the numbers of net-metered customers becomes a higher percentage and cost shifts create a significant impact. If net-metered systems are installed under the assumption these customers will receive the benefit of the cost shifts and later, when the overall impacts of net metering require elimination of the cost shifts, those who counted on benefiting from the cost shift will have made investment decisions based on receiving the benefit of the cost shift and will feel economically harmed if these cost shift benefits are no longer available. If they are grandfathered in and others are not offered the same subsidy, those who are not grandfathered in are not treated fairly. To avoid either inequity, many co-ops believe it is best to minimize cost shifts, allowing these decisions to be made based on the economics that are longer term.

In regards to the decreased demands, because residential members are not billed for demand, the information is not always available or even relevant. The relevant aspect is the demand the net-metered service places on the system at the annual peak demand times. This is typically before the sun rises and after it sets. At the peak time in the majority of cases, no detailed analysis is needed to know solar net-metered customers will be fully dependent on supply from the grid and traditional generation. As some co-op data indicates, for owners of some net-metered systems, their demand for co-op power has actually increased after installation of these systems while the kWh component of the power bill – the only part billed to the net meterer – decreases.

Question No. 5 Individual Co-op Responses

Big Flat Electric Cooperative

As earlier stated, Big Flat Electric offers but does not have any net metered meters. That being said, if we did, the impact would be on the fixed charge and a small amount on the energy charge.

Fergus Electric Cooperative

Fergus Electric currently has 12 net metered accounts. This is not a significant impact to the bills of our other residential customers. But if there were a large increase in new net metered accounts, Fergus would have to rework our rate structure to pass along more of the fixed costs to the net metered accounts.

Flathead Electric Cooperative
Impact to annual gross revenue due to net-metered consumer owned generation: -$2,489 revenue reduction (-$65.49 per consumer). The rate impact (subsidy) within the Residential rate class is $0.00001 per kWh OR $0.01 per month. Fourteen net-metered accounts with Photo-Voltaic generation were analyzed. The fourteen accounts were selected on the basis of a minimum of one year's worth of consumption history both pre and post installation. The relationship between kWh reduction and generation size was analyzed and yielded a consistent, reliable result. It was determined that, to date, there was an average of 1,013 annual kWh per kW of generation in reduced energy consumption. This amount was applied to all connected generation to determine the total reduction in consumption.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
We do have a 2014 number. We do not typically track what they generate for themselves.

Lincoln Electric Cooperative
As of yet we only have 13 net metered services and they are all residential.

McCone Electric Cooperative
There are no net meters on McCone Electric's system

Mid-Yellowstone Electric Cooperative
REVENUE LESS POWER COST COMPONENT = $.0704 PER KWH.
KWH GENERATED BY OUR ONE NET METERED SERVICE = 8,957 KWH.
THEREFORE, LOST REVENUE = $8,957 X $.0704 = $630.57

IF WE GOT 100 NET METERED RESIDENTIAL SERVICES OF THE SAME SIZE 7.2KW, OUR LOST REVENUE WOULD BE ABOUT $63,000 WHICH WOULD REQUIRE A 2.75% RATE INCREASE ON RESIDENTIAL.

Missoula Electric Cooperative
Current impacts (2014) to MEC are insignificant.

Park Electric Cooperative
As stated in question 4, large vacation homes have been the biggest change. When no one is there, some are producing more than they are using. On homes that are occupied full time there has been very little impact to total monthly sales. This is partially due to the fact that less than .4% of our members are participating. If the growth we have seen in net metering in recent years continues I fear the impact on Park Electric could be devastating. We have no way to know for certain but I suspect our load factor would be absolutely terrible if we had a participation rate of 10% or more.

Sun River Electric Cooperative
There has been a relatively slow growth in net metered accounts in recent years.

Vigilante Electric Cooperative
The met-metered accounts do not have individual meters on just the generator so we do not know how many kWh's were generated and thus lost by VEC. The portion of generation greater than that used by the individual systems equates to lost revenue of $465.07 for 2014. This was strictly the kWh that was generated by the member greater than the member's usage and

therefore not billed by VEC. We do not currently bill for demand on the residential rate class members.

Yellowstone Valley Electric Cooperative
At this point in time, the impacts on other members are minimal as we only have 9 net meter customers out of 18,467 meters installed. However, there is an emphasis on this type of service and interest is most definitely on the rise. As the number of net meter installs increase, the subsidy by traditional customers will increase. The net meter customer utilizes a retail rate of exchange and yet still uses the poles, wires and personnel of the co-op to serve them. Additionally, the peak usage by the net meter customers is invariably the same as before the generation was installed at their residence. The extreme cold or hot times see them set the same peak.

Question #6: Is all or part of a cooperative's revenue impact or customer bill impact a subsidy? If so describe the basis for determine that the impact is a subsidy.

Big Flat Electric Cooperative
Whenever the cost incurred is not picked up by those that caused the cost, the bill or revenue is picked up by others, therefore, the subsidy. Whenever the poles and wires cost is used by those who do not pay for it, the cost is passed on to those who do.

Fergus Electric Cooperative
Fergus has a customer density of 1 member/mile of powerline. Our fixed charges are supplemented by our kWh sales as we are a very rural utility system. If we were to charge the full cost of service as a base charge to each of our members, our base charge would nearly double. This is extremely unfair to the farms and ranches that have multiple accounts in arid areas to seasonally water their livestock. With the net metered accounts decreasing our kWh sales, this will impact our rate structure by increasing either the rates or the base charge for everyone unless we pass those increases along to the net metered accounts to offset these losses.

Flathead Electric Cooperative
Flathead Electric's basic charge is $9.87 lower than the COSA indicated fixed amount, and the energy rate is $0.00873 higher than the COSA indicated variable amount. Accounting for the impact to revenue due to the loss of consumption on this basis, the total net impact was determined to be a subsidy for the 39 installations.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
Some of HCE's fixed costs are recovered in its energy charge. Approximately 50% of that charge is used to recover fixed costs.

Lincoln Electric Cooperative
Lincoln Electric has a seasonal rate. During the summer LEC has to sell 926.79 KWh to each service to break even on the cost to serve that customer. During the winter months LEC must sell 1,276.92 KWh. All services that use less than those amounts during those seasons are being subsidized by other members. This is according to our 2015 COSA.

McCone Electric Cooperative
There are no rate subsidies at McCone.

Mid-Yellowstone Electric Cooperative
NO. NONE OF LOST REVENUE IS A SUBSIDY.

Missoula Electric Cooperative

Partly yes – to the extent that our current rate structure fails to fully recover the fixed cost of providing service; any fixed cost recover that is dependent upon consumption will be impacted by net-metering. Additionally, the net-metering customer is using the cooperative distribution system to deliver excess generation to load, thereby benefiting from the poles and wires that are not being fully recovered through the rate.

NorVal Electric Cooperative

This is a philosophical and rate question. Our present rates have a nominal base charge and the remainder of the fixed and variable charges are in the kWh rate. The idea is the more you use the system the more you pay and vice versa. You can make the argument that there is some subsidy transfer but to determine much is hard to determine. To correct this issue, I think a different rate structure would solve most of the DG issue.

Park Electric Cooperative

Each rate class has some subsidy within it. There is no way to avoid that. Residential and commercial consumers that use very little are being subsidized by those using more kWh than the average. The most abnormal rate class we have when it comes to subsidies is the irrigation rate. Very dry years that create large usage in this class can produce margins for the co-op. It could be argued that in very wet years with low usage the other rate classes are subsidizing irrigation. We look at it as over five years or so, irrigation subsidizes its self and stands on its own without any contribution to margins for the co-op.

Ravalli Electric Cooperative

Monthly fixed charges are calibrated based on the value of the plant required to serve a particular rate class. Fixed charges do not recover all expenses associated with maintaining that plant so the energy charge has to cover the balance and net meters use less than they would have absent their own generation. The subsidy is: If there were a large number of net meters it would diminish the cash flow for maintenance under the current rate structure.

Sun River Electric Cooperative

All net metered installations are subsidized by others, whether by taxpayers or fellow cooperative members. At present, the capacity required to serve any residential consumer (a fixed cost) is mainly recovered through the energy charge, which is variable. A net metered consumer is allowed to subtract the energy generated from the energy actually drawn from the system, thereby bypassing a portion of the capacity charge.

Vigilante Electric Cooperative

Our base charges do not cover the entire fixed cost portion of our rates. We rely on member electric kWh usage to make up the difference between our base charges and our fixed costs. Our base charge is $22/month and our fixed costs for the residential rate class are near $45/month.

Yellowstone Valley Electric Cooperative

Almost all of the impact is a subsidy. The net metered services are have not had any real effect on lowering the amount of power (both kWh and kW) that our co-op purchases and yet these net meter customers still set the same peak they always have (pre-generation install) in extreme weather. As an example, customers with solar generation are not producing on the crystal clear winter nights that see below zero temperatures. These customers are just as reliant on our system as they ever have been, yet get a retail rate of exchange when they do produce power.

Question #6: Is all or part of a cooperative's revenue impact or customer bill impact a subsidy? If so describe the basis for determine that the impact is a subsidy.

MECA Summary Response

Co-ops answered this clearly. Thus, our summary is brief. 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. We believe that consumers not paying for the costs to serve them are being subsidized.

It is not difficult to establish the amount of the kWh charge that recovers revenue for fixed charges related to each co-op's utility system – that is, unless the net-metered customer installs battery storage to supply power at all peak times the net-metered generator is not producing power.

On the power supply cost side, the capacity in kW at the peak time in most cases is over half the cost of the power supply. Again, if a net-metered customer does not have battery storage capability, the net-metered customer is contributing to the capacity needs and costs nearly every month if it's a solar system. Netting out the kWh eliminates the net-metered customer's payment for any of these costs they create. That cost is then shifted to other consumers, creating the subsidy.

Question No. 6 Individual Co-op Responses

Big Flat Electric Cooperative

Whenever the cost incurred is not picked up by those that caused the cost, the bill or revenue is picked up by others, therefore, the subsidy. Whenever the poles and wires cost is used by those who do not pay for it, the cost is passed on to those who do.

Fergus Electric Cooperative

Fergus has a customer density of 1 member/mile of powerline. Our fixed charges are supplemented by our kWh sales as we are a very rural utility system. If we were to charge the full cost of service as a base charge to each of our members, our base charge would nearly double. This is extremely unfair to the farms and ranches that have multiple accounts in arid areas to seasonally water their livestock. With the net metered accounts decreasing our kWh sales, this will impact our rate structure by increasing either the rates or the base charge for everyone unless we pass those increases along to the net metered accounts to offset these losses.

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Goldenwest Electric Cooperative

Not applicable.

Hill County Electric Cooperative

Some of HCE's fixed costs are recovered in its energy charge. Approximately 50% of that charge is used to recover fixed costs.

Lincoln Electric Cooperative

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1,276.92 KWh. All services that use less than those amounts during those seasons are being subsidized by other members. This is according to our 2015 COSA.

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There are no rate subsidies at McCone

Mid-Yellowstone Electric Cooperative
NO. NONE OF LOST REVENUE IS A SUBSIDY.

Missoula Electric Cooperative
Partly yes – to the extent that our current rate structure fails to fully recover the fixed cost of providing service; any fixed cost recover that is dependent upon consumption will be impacted by net-metering. Additionally, the net-metering customer is using the cooperative distribution system to deliver excess generation to load, thereby benefiting from the poles and wires that are not being fully recovered through the rate.

NorVal Electric Cooperative
This is a philosophical and rate question. Our present rates have a nominal base charge and the remainder of the fixed and variable charges are in the kWh rate. The idea is the more you use the system the more you pay and vice versa. You can make the argument that there is some subsidy transfer but to determine much is hard to determine. To correct this issue, I think a different rate structure would solve most of the DG issue.

Park Electric Cooperative
Each rate class has some subsidy within it. There is no way to avoid that. Residential and commercial consumers that use very little are being subsidized by those using more kWh than the average. The most abnormal rate class we have when it comes to subsidies is the irrigation rate. Very dry years that create large usage in this class can produce margins for the co-op. It could be argued that in very wet years with low usage the other rate classes are subsidizing irrigation. We look at it as over five years or so, irrigation subsidizes its self and stands on its own without any contribution to margins for the co-op.

Ravalli Electric Cooperative
Monthly fixed charges are calibrated based on the value of the plant required to serve a particular rate class. Fixed charges do not recover all expenses associated with maintaining that plant so the energy charge has to cover the balance and net meters use less than they would have absent their own generation. The subsidy is: If there were a large number of net meters it would diminish the cash flow for maintenance under the current rate structure.

Sun River Electric Cooperative
All net metered installations are subsidized by others, whether by taxpayers or fellow cooperative members. At present, the capacity required to serve any residential consumer (a fixed cost) is mainly recovered through the energy charge, which is variable. A net metered consumer is allowed to subtract the energy generated from the energy actually drawn from the system, thereby bypassing a portion of the capacity charge.

Vigilante Electric Cooperative
Our base charges do not cover the entire fixed cost portion of our rates. We rely on member electric kWh usage to make up the difference between our base charges and our fixed costs. Our base charge is $22/month and our fixed costs for the residential rate class are near $45/month.

Yellowstone Valley Electric Cooperative
Almost all of the impact is a subsidy. The net metered services are have not had any real effect on lowering the amount of power (both kWh and kW) that our co-op purchases and yet these net

meter customers still set the same peak they always have (pre-generation install) in extreme weather. As an example, customers with solar generation are not producing on the crystal clear winter nights that see below zero temperatures. These customers are just as reliant on our system as they ever have been, yet get a retail rate of exchange when they do produce power.

Question #7: In your opinion, are cooperative revenue and customer bill impacts from net metering distinguishable from the impacts from other activities that change customer electricity use and demand and result in potential cost shifts, such as upgrades to building structures and equipment and, if so, why?

MECA Summary Response

What separates the net-metering impacts from other activities such as energy efficiency is the load at peak times and the fluctuations in loads. The net-metered generation fluctuates up and down and, at times, uses just as much capacity from the full grid as prior to the net-metering generation. However, in most cases energy efficiency reduces the amount of capacity the "grid" has to supply. Net metering does not reduce the capacity of grid or system needed and used by the net-metered customer in Montana co-op areas based on the times nearly all of our annual peaks occur.

The impact of the ups and downs on traditional power supply will be discussed in answers to other questions.

Question No. 7 Individual Co-op Responses

Big Flat Electric Cooperative

Impacts from net metering are a direct impact to fixed cost. For example, if a pole is struck by lightning, I have no choice but to replace the pole and fix the service. Putting in new carpet in our office or buying equipment is a choice that could be done at any time. Consumers would know in an instant if they lost power and want it fixed as soon as possible. My carpet in the office, no so much.

Fergus Electric Cooperative

Our residential customer revenues have seen very little change for the past several years. We are primarily small rural farm and ranch residential and their usages change very little from year to year. There have been some improvements through energy conservation at these sites, but these improvements have had very little impact on our residential sales. We only have 12 net metered accounts so their revenue impact has not been significant to our revenues. A larger number of net meters will begin to show an impact as most of the members utilizing net metering seem to be from rural retired customers who have more economic means to install the systems and not the small ranch or farm that will bear the brunt of the cost.

Flathead Electric Cooperative

Yes. There is a difference between net metering and energy efficiency measures. Residential lighting energy efficiency measures typically reduce load during the non-daylight hours, while commercial lighting energy efficiency measures typically reduce load during the operating hours of the business implementing the measure. Other energy efficiency measures can reduce load through the entire 24-hour period. Solar PV net-metering installations only produce power during daylight hours. The impact on peak load reductions will be different seasonally, with some peak reduction due to solar in the summer but little contribution to winter peak in the early morning. Wind has very little contribution during peak periods.

Glacier Electric Cooperative
Energy conservation activities result in a decrease in the use of infrastructure while net metering results in an increase in the use of infrastructure.

Glacier Electric offers energy conservation rebate programs that change electricity use and demand, but these programs are created and administered by our power supplier Bonneville Power Administration. Glacier Electric must pay for these programs whether or not we participate in them.

Lincoln Electric Cooperative
In many cases they are indistinguishable but depending on the collective size of a system or systems on a given feeder it may require an upgrade or rebuild of the feeder to handle the increase in energy flow. Currently we do not have any systems of that size. The difference in your example of lowering kWh use with energy efficiency vs. DG is that energy efficiency does not back feed power into the system.

McCone Electric Cooperative
Because utilities are recovering fixed costs through the energy (kWh) charges, the impact of energy reduction is spread across all rate classes. A cost shift occurs when consumers are paid retail rates for production of energy that is in excess of their needs.

Mid-Yellowstone Electric Cooperative
YES, THEY ARE DIFFERENT. WHEN NET METERING INSTALLATIONS ARE NOT GENERATING DUE TO LACK OF WIND OR LACK OF SUNSHINE, COOPERATIVE MUST SUPPLY 100% OF ELECTRIC LOAD. THIS REDUCES THE MONTHLY LOAD FACTOR AND DRIVES UP THE COST OF PURCHASED POWER.

NorVal Electric Cooperative
At this time, we have only three DG units on our system. Yes it takes a little bit of time to true up each year. The larger money cost is when an outage occurs to go and lock out the DG units because they are in uninhabited areas for most of the time. On our system this could easily take one hour each way for each occurrence.

Park Electric Cooperative
Allowing members to net meter without charging the full cost of the interconnection is the first example of how cost shifts have already taken place. When anyone reduces their bill by producing their own electricity, cost shifts have occurred. Conservation is the only way to reduce a bill without a cost shift. We are a winter-peaking system. Normally distributive generation systems are not producing when those peaks occur. When a utility signs an “All Requirements” power supply contract, they agree to purchase all the power they need from that supplier. We can reduce what we need through conservation efforts. We cannot generate our own power. I feel that if we are expected to do our very best to supply the required power each of our members’ needs when they need it, we should not be expected to purchase power from them when they feel like selling it to us. Normally they are in a position to deliver power to our system when we are purchasing the least expensive power of the day, which is a cost shift.

Ravalli Electric Cooperative
Ravalli Electric Co-op pays as part of their monthly power bill funds for energy efficient measures. REC is able to apply for reimbursement of these costs by submitting projects designated and approved by BPA. By installing those measures the individual are helping the co-op to get reimbursed for the energy efficiency funds that were paid to BPA as part of RECs power bill.

Sun River Electric Cooperative

Revenue impacts attributable to net metering are absolutely distinguishable since those impacts can be calculated at each installation. This is not the case with energy conservation type reductions.

Vigilante Electric Cooperative

Member generation differs greatly from member conservation projects for several reasons. First is for the safety aspect for cooperative personnel working not only on the member's service but also on outages in the service area. The other major difference would be working with members on problems that arise as the complexity of the service and generator adds to the service. If a co-op is only dealing with an energy efficiency project there would not be a separate source to work through as well. There is also additional billing information required for a net metered account. Conservation measures are on continuously. However net-metered DG sources are only there during the times the generator is operating.

Yellowstone Valley Electric Cooperative

It is distinguishable from energy conservation measures. As stated in question 6, the net meter customers are just as reliant on our system after the installation of the generation as they were before. However, residents that install energy efficient measures, such has ground source heat pumps or weatherization products, can see measurable differences in their usage and the peak amount of energy needed in extreme temperatures. The customer that had electric resistance heat will indeed see a measurable difference in their usage and their subsequent bill after installing energy efficient heating, such as a ground source heating pump.

Question #8: What are the pros and cons of extending Montana's net metering policy to apply to rural electric cooperatives? If it is appropriate to treat rural electric cooperatives differently from regulated utilities, is it appropriate to treat all rural electric cooperatives the same in terms of net metering requirements?

MECA Summary Response

There are no pros to electric co-ops or their non-net metering members of extending Montana's net metering policy to include electric cooperatives. Each co-op offers net metering that their governing bodies approved and which factor in the unique aspects of their systems.

The characteristics of each cooperative are different. Several co-ops serve less than one member per mile of line. Others have several members per mile of line whereas larger non-cooperative utilities can have 20 services per mile of line. These customer density levels equate to costs to serve. They are per-kWh costs that net metering would shift, ranging from 1.9 cents to 6.6 cents per kWh for our electric co-ops in Montana. The power supply costs and the portion for capacity vary as well. There is no one-size-fits-all policy that works.

As we read it, the existing Montana net metering law would create cost shifts in all net-metering cases. The result with the wide variance of costs shifted per kWh is that some co-ops would see cost shifts much greater than others per connected net-metered service. This wide variance of impacts based on the cost shift in a specific example applied to all co-ops is shown in Table F-5 below. Table F-5 makes clear the magnitude of difference at one co-op compared to others.

Table F-5

Total cost of Service of individual cooperatives	Cost of power; fixed and variable	Fixed cost unrelated to Electricity itself	Percent Fixed cost unrelated to Electricity itself		fixed cost including the cost of capacity portion of power at 50% assuming NM does not reduce Peak	percent fixed cost with power Capacity costs included
3,290,434	1,241,697	2,048,737	62.26%		2,669,586	81%
23,268,504	16,866,562	6,401,942	27.51%		14,835,223	64%
15,181,839	6,586,149	8,595,690	56.62%		11,888,765	78%
12,729,149	7,502,440	5,226,709	41.06%		8,977,929	71%
19,961,151	12,758,786	7,202,365	36.08%		13,581,758	68%
8,460,533	3,742,034	4,718,499	55.77%		6,589,516	78%
19,213,570	8,675,155	10,538,415	54.85%		14,875,993	77%
27,756,800	11,830,595	15,926,205	57.38%		21,841,503	79%
12,420,714	5,889,153	6,531,561	52.59%		9,476,138	76%
4,115,681	2,111,740	2,003,941	48.69%		3,059,811	74%
11,167,230	6,449,995	4,717,235	42.24%		7,942,233	71%
31,243,569	19,455,777	11,787,792	37.73%		21,515,681	69%
10,025,003	5,104,084	4,920,919	49.09%		7,472,961	75%
25,628,239	10,131,315	15,496,924	60.47%		20,562,582	80%
103,723,987	59,284,701	44,439,286	42.84%		74,081,637	71%
3,796,476	2,085,924	1,710,552	45.06%		2,753,514	73%
9,343,106	4,858,756	4,484,350	48.00%		6,913,728	74%
6,892,524	4,270,749	2,621,775	38.04%		4,757,150	69%
3,682,329	2,080,889	1,601,440	43.49%		2,641,885	72%
7,236,085	2,693,719	4,542,366	62.77%		5,889,226	81%
13,259,899	9,094,005	4,165,894	31.42%		8,712,897	66%
13,763,171	7,110,598	6,652,573	48.34%		10,207,872	74%
9,634,429	4,329,120	5,305,309	55.07%		7,469,869	78%
11,552,092	5,631,882	5,920,210	51.25%		8,736,151	76%

<u>Question No. 8 Individual Co-op Responses</u>

Big Flat Electric Cooperative

Pros: Members have a feel-good attitude. Big Flat Electric does have a net metering policy for those members that desire to net meter.

Cons: Those who net meter bypass the fixed charges which must be paid by those who do not net meter.

Rural electric co-ops do not serve the "cream of the crop" members as investor-owned utilities do in the cities and populated areas. Our service area is not even considered rural, it is considered frontier because of its low density. Members of Big Flat have to travel 200 miles to a hospital or large city. Our roads are not paved and, more often than not, Mother Nature is not very kind to those of us who depend on water when it doesn't rain. Don't you think we have enough challenges without having further regulation? The members of a co-op are the ones who own the co-op and elect the Directors that serve on a Board. We are a non-profit organization that works very hard to provide affordable electricity at a price our members can afford. It is most appropriate to treat rural electric co-ops different, because we are different.

Fergus Electric Cooperative

Fergus Electric has voluntarily followed the previous guidelines for net metering on Montana. We allow up to 25 kW of on-site generation to be net metered. Due to our service territory being primarily small rural farms and ranches, a lot of our membership does not have the up-front economic ability to purchase and operate an alternative generation system. The rural population is aging and in circumstances where the next generation can take on the responsibilities of the farm or ranch, most of their efforts are tied up in operating the farm or ranch and they rely on Fergus Electric to provide their energy needs. They are able to express their concerns to the cooperative through a locally elected Board of Directors who work with them in the farm and ranch community and have a pulse of their wants and needs. Without fail, the primary cause of concern is the increasing cost of electricity that is vital to their operation whether it is power to a seasonal stock well to water livestock, a shop for equipment maintenance, irrigation, or air dryers for their grain. The rising cost of operating is staggering and is forcing many small farms and ranches to sell because they cannot afford to make a living like their families before them. The experience with our current net metering customers shows they are recently retired and have the resources available to invest in on-site generation and view their generation as an investment in the future. Most have expressed to me that they know that there is a long pay-back (if ever) for their system but they feel good about generating their own electricity. Fergus Electric offers net metering but we are very mindful of any additional economic burdens being placed on our membership that could impact our already declining rural farm and ranch operations.

Flathead Electric Cooperative

Flathead Electric is locally controlled and operated by a Board elected by the member-owners. Because the Board is elected, they constantly seek, listen to and implement the wishes of the member-owners. Thus, Flathead Electric currently supports net metering installations as requested by our member-owners and continues to weigh the benefits and costs to all of our member-owners. Mandates could reduce the locally controlled Board's ability to accommodate new net metering installations in a rate-equitable fashion.

Glacier Electric Cooperative

It is not appropriate to treat rural electric cooperatives the same as regulated utilities primarily because of meter density. One meter of a rural electric cooperative can easily require more miles of line than a "city or large town" utility. Those extended miles are much more exposed to the weather extremes of Montana and sometimes require additional "strength" in particularly windy areas. While windy may sound like a perfect place for wind generation, there can be too much wind. Glacier Electric has seen private wind mills have to be rebuilt because they blew over and flying objects causing holes in solar panels. The wind extremes of Glacier Electric can be destructive to current generation options.

Goldenwest Electric Cooperative

Each REC should be treated separately – each is different – keep control local – Kalispell does not equal Wibaux.

Hill County Electric Cooperative

HCE is a true rural electric cooperative therefore does not have the ability to spread unrecovered costs across a dense urban customer base as does NorthWestern Energy.

Lincoln Electric Cooperative

There are NO “pros” to extending Montana’s net metering policy to apply to rural electric cooperatives. The whole cooperative business model is a success because of LOCAL policy setting and control. The entire idea of a Board of Directors/Trustees who are elected by the membership ensures that the members of the cooperative have a voice and a decision in the direction and accomplishment of the utility.

Likewise, treating each cooperative the same in terms of net metering requirements is not a good idea. As all the cooperatives do follow the same type of business model and structure, each has its own challenges. From environmental to political to economical to load size and customer density, each cooperative faces individual challenges, and triumphs over these challenges because of its local control and leadership.

McCone Electric Cooperative

Establishing policies that will result in uniform desired outcomes, when applied to all Montana utilities, is an unrealistic endeavor. Size matters.

Based on the most recent data available, at 0.67 members per mile of line, McCone Electric Cooperative has the third lowest concentration of members of the 25 electric cooperatives serving Montana. The state average for cooperatives is 2.71 members per mile of line. Municipals and investor-owned utilities have even higher concentration of consumers per mile of line.

Assuming similar maintenance cost per mile of line throughout the state means that each McCone Electric Cooperative member’s cost for system maintenance is four times greater than the state cooperative average. McCone Electric Cooperative currently has a monthly fixed charge of $30, which only covers 21% of the cost of serving our members. McCone Electric Cooperative recovers fixed costs through the energy portion of the bill.

Applying the net metering policy to cooperatives where members “receive "credit" at retail rates for the electricity put back on the system” would result in extreme cost shifts to those members that can least afford it.

Locally elected board members are accountable to and have the best understanding of the needs of their fellow electric cooperative members. Local boards set rates that are in the best financial interest of both the cooperative and all members. Local boards report to Main Street not Wall Street.

Mid-Yellowstone Electric Cooperative

YES, IT IS APPROPRIATE TO TREAT ELECTRIC COOPERATIVES DIFFERENTLY. THEY ARE GOVERNED BY THEIR MEMBERS. ALSO, ELECTRIC COOPERATIVES ARE TYPICALLY MUCH SMALLER THAN INVESTOR-OWNED UTILITIES. YES, ALL COOPERATIVES NEED TO BE TREATED THE SAME. COOPERATIVES ARE A HOMOGENEOUS GROUP AND WORK TOGETHER FOR COMMON ISSUES.

Missoula Electric Cooperative

Whether large or small, Montana’s electric cooperatives are governed by those we serve. That is the basis for democratic local control. This system of control enables electric cooperatives to be responsive to the wants and needs of our local communities. Each Montana cooperative is different –our varying density proves this, and for that reason a one-size-fits-all approach to net-metering is not workable.

NorVal Electric Cooperative

The electric cooperatives have been autonomous for many years. We have self-governed during that time. For the most part, this has been very success. As with any business, you have good and bad examples and this is not just associated with cooperatives. For every good and bad example you have for a cooperative you will have for private, municipal, and public systems. At this point in time, NorVal feels the system is not broke and does not need to be fixed.

The cooperative way is to treat all cooperative members the same if at all possible. This does not necessarily mean the rates are the same but each member should have the same rights.

Park Electric Cooperative

The only pro I can see in extending Montana's net metering policy to apply to rural electric cooperatives is that the wealthy people who can afford a distributive generation system would be able to afford it even more by forcing co-ops to increase rates to a point that makes the system affordable. The cons include the fact that the rest of the co-op members would be required to pay for those systems through higher rates. There is also the fact that power quality would either go down or the utility will be required to buy more equipment to clean it up, passing that cost on to the rate payers. The members of the co-op should be the ones that make a decision on what type of power they want. It is the way it has been done for over 75 years here and it has proven to be a wonderful business model for a group of people that enjoy the fact that they own and govern the utility that serves them.

Ravalli Electric Cooperative

Since each co-op is different in geographic size, membership, and socio-economic values each co-op should be treated differently. One size does not fit all in the state of Montana. There is too vast of a difference from say a Flathead Electric Co-op to Goldenwest Electric. Flathead has 5 times the membership of Ravalli and their density is 10.35 members per mile of line versus .59 for Goldenwest! Our systems were built and designed for the energy to flow to the source to the consumer. Arbitrarily changing this could have negative operational and monetary impacts.

Each rural electric cooperative has a democratically elected board of directors for their membership to represent them and run their co-op. Trust should be placed in them.

Sun River Electric Cooperative

It is not appropriate to treat all electric cooperatives the same, because each cooperative is a separate and distinct company with separate and distinct capabilities. For instance, a 50 kW generator placed in a high-density residential area might work well, but would not work at all when placed at the end of a 15 mile long single phase distribution line. This "one size fits all" approach does not always work in the real world. The state might as well dictate, say, one price for a gallon of gasoline, statewide, without regard to transportation cost, economies of scale, etc.

Vigilante Electric Cooperative

We currently have and follow net-metering policies. These policies were developed by the member elected Board of Trustees who are also members. They are inherently concerned with the local community and the entire member group. Having state legislators take away that control does not seem proper.

Yellowstone Valley Electric Cooperative

First and foremost cooperatives have and continue to operate under the principle of "one member one vote" producing the kind of hands-on local control that our members find both efficient and effective. Our governance makes us who we are. Co-ops serve areas that for-profit utilities wouldn't touch as they deemed it would not produce the profits their stockholders desire. We found a way to provide the service on a not-for profit basis that continues to help rural America thrive. Many areas we serve are some of the lowest income per capita in the state. Additionally, the density of many co-ops is one or two meters per mile. The miles of line needed to provide a net meter customer don't go away when they decide to install generation such as solar or wind. Those miles of line still need maintenance and still have to be repaired during storms or other outages. Simply put, our cost operation is MUCH higher than that of for-profit utilities due to the nature of our customer base. Forcing co-ops to adhere to the net-metering policy of the for-profit utilities would simply raise costs for all co-op members.

Question #9: Provide a distribution of net metering systems by installed capacity, by customer class on cooperatives' systems.

MECA Summary Response
[Nothing to add to member data.]

Question No. 9 Individual Co-op Responses

Big Flat Electric Cooperative
Big Flat Electric does not have any meters that are net metered.

Fergus Electric Cooperative
Fergus Electric currently serves 12 net metered accounts.
We have 2 wind generation systems totaling 17.4 kW (1 – 10 kW, 1 - 7.4 kW). (Residential)
We have 9 residential solar systems totaling 77.9 kW (from 4.5 kW to 15.8 kW). (Residential)
We have 1 solar system for irrigation (25 kW). (Irrigation)

Flathead Electric Cooperative
See attached, "Flathead Electric Exhibit A," P. 78, Net Metering Q9 net meter list.
Summary: 39 systems, 34 PV, 5 Wind, 36 members, 30 Residential, 9 General Service.

Goldenwest Electric Cooperative
None.

Hill County Electric Cooperative
RC11 (Residential) landfill – 6.9kW; RC11 (Residential) crabtree – 5.2 kW; HCE owned solar – 5.2 KW to learn

Lincoln Electric Cooperative
Please refer to data in attached, "Lincoln Electric Exhibit 1," P. 80.

McCone Electric Cooperative
There are no net meters on McCone Electric's system.

Mid-Yellowstone Electric Cooperative
MID-YELLOWSTONE HAS ONE NET METERING INSTALLATION: WIND: 7.2 KW.

Missoula Electric Cooperative:

LOC #1320-11-4190-01
Mtr#20091, Solar System, in service 6/2009
Disconnect on side of garage with tag on meter ped

LOC #1420-09-1282-01
Mtr#7714525, Wind Turbine, in service 7/20/2009
Disconnect adjacent to meter in front of house

LOC #1521-17-6301-01
Mtr#7758417, Solar System, in service 9/16/2009
Disconnect adjacent to meter by garage

LOC #1117-27-5780-01
Mtr#79579476, 9.88 kW Solar System, in service 12/2/2010
Disconnect adjacent to meter on NW side of garage

LOC #1523-02-5781-01
Mtr#79579478, 3 kW Solar System, in service 16/27/11
Disconnect located on side of barn

LOC #1512-33-3604-01
Mtr#78301950, 1.02 kW Solar System, in service 6/27/2011
Disconnect adjacent to meter on pole

LOC #1916-35-8681-01
Mtr#11144624, 2.35 kW Solar System, in service
11/28/2011
Disconnect on side of garage within site of meter

LOC #1410-32-7480-01
Mtr#12394895, 6 kW Solar System w/Inverter & Batteries
In service 12/22/2011, Disconnect in shed adjacent to meter

LOC #1420-28-6504-01
Mtr#12196868, 5.6 kW Solar System w/Inverter,
COMMERICIAL
In service 3/16/2012, Disconnect adjacent to meter

LOC #1320-17-4486-01
Mtr#78301949, 3.2 kW Solar System w/Inverter
In service 5/31/2012, Disconnect in barn

LOC #1320-04-1306-01
Mtr#12382917, 7.6 kW Solar System w/Inverter
In service 9/25/2012, Disconnect in shop

LOC #1512-24-3381-01
Mtr#11632224, 9 kW Solar System w/Inverter
In service 12/17/2012, Disconnect on shed 20 feet from
meter

LOC #1320-09-2782-01

Mtr#12382918, 2.3 kW Solar System w/Inverter
In service 1/29/13, Disconnect on fence 50 feet north of pedestal

LOC #1623-28-8880-01

Mtr#11632225, 9 kW Solar System w/Inverter

In service 3/8/2013, Disconnect to the left of the meter

LOC #1520-22-7681-01

Mtr#12382916, 8 kW Solar System w/Inverter

In service 6/10/2013, Disconnect on pedestal

LOC #1523-12-2382-01

Mtr#1373369, 1.25 kW Solar System w/Inverter

In service 9/10/2013, Disconnect on south wall of house

LOC #1320-18-8785-01

Mtr#14028262, 4.5 kW Solar System w/Inverter

In service 5/12/2014, Disconnect at 400 amp pedestal

LOC #1916-20-2481-01

Mtr#76322701 8 kW Solar System w/Inverter

In service 6/9/2014, Disconnect at meter location

LOC #1320-15-7585-01

Mtr#200078 5 kW Solar System w/Inverter
In service 6/9/2014, Disconnect barn/shop 100 feet north of pedestal

LOC #1523-20-3381-01

Mtr#13733771 6 kW Solar System w/Inverter

In service 11/12/2014, Disconnect in meter pedestal

LOC #1511-21-4581-01

Mtr#14974559, Cls 320, 6 kW Solar System w/Inverter

In service 2/12/2015, Disconnect in meter pedestal

LOC #1512-21-1701

Mtr#77012920, 5 kW Solar System w/Inverter
In service 7/23/2015, Disconnect at meter base

NorVal Electric Cooperative
1 wind generator 3,700watts residential
2 solar generators 2,000 watts each unit 3 phase commercial

Park Electric Cooperative
We have 4 net metered services on 400 amp services, we have 2 on 320 amp services and 15 on 200 amp services. All of the distributive generation systems are under 10 kW. The distributive generation systems range in size from .2 kW to 9.6 kW.

Ravalli Electric Cooperative
REC has 12 net-metered residential solar systems with an installed capacity of 73.42 kW. We have 2 more solar net-metered systems pending. Our systems are broken down as follows: One – 1.5 kW, Two – 2.0 kW, Five – 3.2 kW, One – 4.1 kW, One – 4.7 kW, One 7.8 kW, and One – 20 kW.

Sun River Electric Cooperative
See attached, "Sun River Electric Exhibit A," P. 86.

Vigilante Electric Cooperative
We had 7 net-metered accounts at the end of 2014. They were all in the Residential Rate Class. They range in capacity from 1 kW to 10 kW.

Yellowstone Valley Electric Cooperative
Yellowstone Valley Electric Cooperative, Inc. currently has the following net-metered systems installed:

- 13 Total Systems Installed
- 13 Connected to Residential Services
- 0 Connected to Commercial Services
- 4 Wind Systems
- 8 Solar Systems
- 1 Hybrid System (wind & solar)
- 38 KW Wind
- 55 KW Solar

The 13 systems break down as follows:

1. 2.0 KW Wind
2. 1.8 KW Wind and 1.2 KW Solar
3. 1.8 KW Wind
4. 7.5 KW Solar
5. 10.0 KW Wind
6. 4.0 KW Solar
7. 11.4 KW Solar
8. 4.0 KW Solar
9. 4.0 KW Wind
10. 10.0 KW Solar
11. 15.0 KW Solar
12. 5 KW Solar
13. 4 KW Solar

Question #10: Based on residential net metering systems in a rural electric cooperative's service area, for each month of the year, what is the average electricity use (kWh) per net-metered customer before and after netting out electricity produced by the customers' generators? Separate this information for solar, wind, and other generators. If net metering does not provide this, provide information based on modeling (including an explanation of assumptions) and outline steps cooperatives are taking to acquire actual usage information.

MECA Summary Response
[Nothing to add to member data.]

Question No. 10 Individual Co-op Responses

Big Flat Electric Cooperative
Does not apply.

Fergus Electric Cooperative
Fergus Electric does not have this information available. Our metering system only records energy delivered to the customer and energy delivered back to our system. The generation of electricity is used by the customer first and does not pass through the meter back to our system. For our 10 solar installations, the customers are generally generating more electricity than they use in the long summer days and we allow them to "bank" the excess electricity produced to use it in the shorter winter days. We balance out all of our net metered accounts on April 1 of each year and if the customer has any kWh's left in their bank it is granted back to the cooperative. We do not purchase any excess energy remaining. (we had one customer who granted back energy in their first year).

Flathead Electric Cooperative

	Residential PV average Net-Metering kWh	Residential PV average kWh consumption
Jan	1,802	1,982
Feb	1,793	2,036
Mar	1,625	1,990
Apr	1,055	1,500
May	646	1,194
Jun	399	972
Jul	433	1,043
Aug	496	1,065
Sep	517	942
Oct	502	828
Nov	790	959
Dec	1,319	1,443

We do not have sufficient information to evaluate Wind or other systems

Glacier Electric Cooperative

Glacier Electric currently has 3 residential net metered accounts. There are 2 10 kW wind sites. One averages 7.79 kW each month and nets 0 kWh usage. The other average 5.2 kW and nets 1200 kWh each month. The 3rd net-metered account is solar, which averages 3 kW and shows Glacier Electric kWh power usage in all winter months. Summer months they apparently generated enough. With our current metering systems, we only know the "net" usage.

Goldenwest Electric Cooperative

Not applicable.

Hill County Electric Cooperative

We do not know or track this information.

Lincoln Electric Cooperative

Unfortunately the way the services are metered we do not have any way of tracking what the service is actually using in total energy. We track the results of what is delivered to the service by LEC and what is purchased back by LEC. I have included the meter reading results for the 13 current accounts that are net metered. (See attached, "Lincoln Electric Exhibit 1," P. 80.)

McCone Electric Cooperative

There are no net meters on McCone Electric's system.

Mid-Yellowstone Electric Cooperative

BEFORE NET METERING THE RESIDENCE USED 18,940 KWH ANNUALLY.

Missoula Electric Cooperative

See attached, "Missoula Electric Exhibit A," P. 82.

Park Electric Cooperative

Solar Averages

	Avg Before	Avg After Netting
January	1977	1785
February	1322	1138
March	1266	912
April	1019	649
May	857	465
June	687	321
July	1109	799
August	1017	737
September	831	493
October	876	595
November	1419	1190
December	1666	1473

Wind Averages

	Avg Before	Avg After Netting
January	1344	1284
February	912	824
March	988	935
April	896	826

May	796	757
June	587	545
July	759	716
August	587	553
September	545	495
October	534	412
November	996	875
December	1066	983

Hydro Average

	Avg Before	Avg After Netting
January	6240	6240
February	4280	4280
March	6160	6160
April	3280	3080
May	2040	2040
June	2200	2200
July	1320	0
August	280	0
September	1680	0
October	480	0
November	4000	3400
December	5240	5240

AFTER NET METERING THE RESIDENCE USED 9,983 KWH ANNUALLY FOR A LOSS OF 8,957 KWH.

Ravalli Electric Cooperative

Sites below are all solar applications:

Site #1's data is an average of 4 years of monitoring of a 2.8 kW system

Site #2's data is an average of 5 years of monitoring, house was off grid and was designed for solar, and it is a 3.2 kW system

Site #3's data is an average of 5 years of monitor; it is a millionaire's house, it is a 7.8 kW system

Site #4's data is an average of 2 years of monitoring; it is a 2.8 kW system

Site #5's data is only one year of monitoring; it is a millionaire's house, it is a 20 kW system

Site #6's data is only one year of monitoring, it is a solar installer's house, it is a 3.2 kW system, notified the co-op they are increasing the system size in 2015

Site#7's data is an average of 2 years of monitoring; it is a 4.7 kW system

Site#8's data is an average of 3 years of monitoring; it is a 4.1 kW system

In the table below Sent: is the kWh Ravalli Electric Co-op sent to the member with a solar system each month. Rcvd: is the kWh received from the member's solar system each month. Billed: is the kWh Ravalli Electric Co-op billed to the member each month after the generation was netted against what was sent to the member. As you can see no member with a solar system on "average" uses all the "netted" kWh they generate. Ravalli Electric Co-op's distribution system is used as a "battery" for members with a solar system.

Site	kWh	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Avg.
1	Sent	1805	1984	1723	1160	878	779	618	637	644	679	1018	1781	1142

	Rcvd	20	25	42	107	133	156	163	180	173	114	105	26	104
	Billed	1786	1964	1681	1077	768	651	485	506	506	595	936	1758	1059
2	Sent	310	277	215	160	170	180	214	386	378	328	251	319	266
	Rcvd	112	154	123	183	217	249	231	229	211	154	193	138	183
	Billed	199	122	93	-24	-47	-69	-17	157	167	174	58	181	83
3	Sent	8430	8350	7200	6530	6280	5770	5710	6250	6040	5770	6610	8410	6779
	Rcvd	0	0	10	0	10	30	10	20	10	10	20	0	10
	Billed	8430	8350	7190	6530	6270	5740	5700	6230	6030	5760	6590	8410	6769
4	Sent	3777	3729	1947	1142	2116	2785	2168	2143	2317	2464	3814	6490	2908
	Rcvd	0	0	15	83	32	4	24	9	17	6	0	0	16
	Billed	377	3729	1932	1059	2084	2781	2144	2134	2300	2458	3814	6490	2892
5	Sent	4670	3400	3880	1600	1240	1560	1760	2640	2240	2400	2920	32400	60720
	Rcvd	640	520	240	1640	1720	1840	1320	1600	1080	1000	520	0	12120
	Billed	4000	2880	3640	-40	-480	-280	440	1040	1160	1400	2400	32400	48600
6	Sent	5414	5001	4695	5212	3285	3608	1879	3201	2676	2937	3506	4534	3829
	Rcvd	0	0	0	0	21	60	242	0	0	0	0	00	27
	Billed	5414	5001	4695	5212	3264	3548	1637	3201	2676	2937	3506	4534	3802
7	Sent	2464	2362	1767	1086	787	479	421	437	370	426	797	1597	1082
	Rcvd	136	190	192	486	532	554	538	640	528	424	366	208	399
	Billed	2382	2172	1576	601	255	-75	-118	-203	-158	2	432	1386	683
8	Sent	1282	1364	1161	982	771	554	446	450	484	639	798	1201	744
	Rcvd	39	38	31	148	192	286	308	312	300	199	100	32	166
	Billed	1244	1326	1130	834	575	267	139	137	184	440	698	1169	581

Southeast Electric Cooperative

SECO has only one residential customer using net metering at this time. Although usage was abnormally low before the net metering installation, usage has been reduced by as much as 60% or more.This is shown by actual meter readings.

Sun River Electric Cooperative

See attachment "Monthly Comparison", “Sun River Electric Exhibit B,” P. 87.

Vigilante Electric Cooperative

	1 Wind/ Solar	2 Solar	3 Solar	4 Solar	5 Solar	6 Solar	7 Wind	
Avg Usage Before	2060	2561	935	5319	5144	2036	2434	
Avg Usage After		1489	2549	931	5313	5119	1975	2432

We do not have metering on the generation source so we do not know if the usage increased at these accounts.

Yellowstone Valley Electric Cooperative

Before and after average usage per net-metered service:
Average Solar Usage – 2,200 kWh/month <u>after net-metered</u>
Average Usage – 1,800 kWh/month <u>before net-metered</u>

	kWh Before		kWh After	
January	3600		3600	
February		2700		4300
March	2000		3500	
April		2000		2700
May		1100		1300
June		800		300
July		1100		500

August	2000		1400	
Sept.		1100		1300
Oct.		900		1100
Nov.		1900		2200
Dec.		2300		4000

Before and After average demand:
Average Solar Demand – 17.25 KW After net-metered
Average Demand – 14.5 KW before ne-metered

	KW Before	KW After
January	17	21
February	14	22
March	15	24
April	14	22
May	18	17
June	10	15
July	7	15
Aug	15	9
Sept	7	8
Oct	15	15
Nov	23	18
Dec	19	21

Question #11: How does average use per residential net-metered customer before and after netting out electricity produced by customers' generators compare to average electricity use by residential customers that do not net meter?

MECA Summary Response
[Nothing to add to member data.]

Question No.11 Individual Co-op Responses

Big Flat Electric Cooperative
Does not apply to our co-op.

Fergus Electric Cooperative
Fergus Electric's residential average usage is 847kWh's per month. Most of our net metered accounts used more than the average prior to net metering. As shown above, the solar net metered customers now generate most, if not all, of their usage in the summer months and then require Fergus to deliver their energy in the winter months. We are a winter peaking utility so we see no benefit.

Flathead Electric Cooperative

	Consumers	Net Metering Annual Average kWh	Class Annual Average kWh	Difference
Residential	30	11,032	13,771	(2,739)

Glacier Electric Cooperative
With the current metering system, usage is unknown. One of the wind net metering sites and the solar net metering sites are high end homes or sites.

Goldenwest Electric Cooperative
Not applicable to our cooperative.

Hill County Electric Cooperative
We do not know or track this information.

Lincoln Electric Cooperative
Please refer to data in attached, "Lincoln Electric Exhibit 1," P. 80.

Mid-Yellowstone Electric Cooperative
WHILE THE **NET METERED CUSTOMER USED 47.3% LESS KWH** THAN BEFORE, OUR **OTHER RESIDENTIAL** CUSTOMERS ANNUAL USAGE INCREASED FROM 13,491 KWH TO 14,489 KWH FOR AN INCREASED USAGE OF **7.4 % MORE KWH**

Missoula Electric Cooperative
Average annual use before and after – see attached, "Missoula Electric Exhibit A," P. 82. Average annual consumption for the 15 residential accounts with full year history is 27032, compared to just over 12,000 for the average residential customer of MEC.

Park Electric Cooperative
Monthly Average Small Residential Usage: 873 kWh
Monthly Average Small Net Meter Before Netting: 1028 kWh*
Monthly Average Small Net Meter After Netting: 780 kWh*
Monthly Average Large Residential Usage: 3,707 kWh
Monthly Average Large Net Meter Before Netting: 2,548 kWh*
Monthly Average Large Net Meter After Netting: 2,204 kWh*
*Kilowatt hours generated by the net meter customer that are used by the net meter customer are not reflected in these numbers.

Ravalli Electric Cooperative
Ravalli Electric Co-op's average residential use is; 1208 kWh a month or 14496 a year. Based on the data above for net-metered systems it should be noted that member's with kW systems less than 5 kW and with modest socio-economic status use less than RECs average residential member. Larger net-metered systems on members houses with unlimited resources use considerably high kWh on average per month and are more a for status than contributing to REC's system energy efficiency.

Southeast Electric Cooperative
The single net metering customer had an average usage of less than 300 kWh per month. The usage with net metering is less than 100 kWh/mo. This compares to 1,000 kWh/mo., of other residential customers.

Sun River Electric Cooperative
The average net metering consumer, on a monthly basis, purchases 40% more kWh's than a non-net metered consumer. After netting out the generation, the net metered consumer still purchases about 15% more energy than a non-net metered consumer.

Yellowstone Valley Electric Cooperative
See the figures in question number 10. It appears as though average usage and demand increase. Thus the customer is not less reliant on the utility plant but more reliant. The mindset of the net metered customer appears to be to add more load in order to take advantage of the retail exchange as much as possible.

Question #12: Based on the commercial net metering systems in a cooperative's service area, for each month of the year, what is the average electricity use per net-metered customer before and after netting out electricity produced by the customers' generators? Separate this information for solar, wind, and other generators and by specific commercial customer rate classes. If net metering does not provide this, provide information based on modeling (including an explanation of assumptions) and outline steps the cooperative is taking to acquire actual usage information.

MECA Summary Response
[Nothing to add to member data.]

Question No.12 Individual Co-op Responses

Big Flat Electric Cooperative
Does not apply to our cooperative.

Fergus Electric Cooperative
Fergus Electric does not have any commercial net metered accounts.

Flathead Electric Cooperative

	Commercial PV average Net-Metering kWh	Commercial PV average kWh consumption
Jan	3,762	3,894
Feb	3,943	4,114
Mar	3,304	3,573
Apr	3,106	3,630
May	2,838	3,493
Jun	2,806	3,481
Jul	2,883	3,602
Aug	3,641	4,312
Sep	3,520	4,021
Oct	3,170	3,554
Nov	3,843	4,042
Dec	3,849	3,996

We do not have sufficient information to evaluate Wind or other installations.

Glacier Electric Cooperative
Glacier Electric currently has 3 commercial net metered accounts. There is one site that has both wind (10 kW) and solar (10 kW) with one meter. It averages 39.2 kW each month and nets 17000 kWh usage. There is approximately twice the usage in winter months (22000 kWh) compared to summer months (11000 kWh). The other two sites are solar. One is currently for sale and was not in full operation for the majority of 2014. Therefore, 2014 data would not be a good representation of the site. The last is a solar site (22.8 kW) and averages 40.8 kW and nets 12000 kWh each month. Their usage is fairly flat year around. With our current metering systems, we only know the "net" usage.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
We do not have commercial net metering.

Lincoln Electric Cooperative
This is not applicable to LEC.

McCone Electric Cooperative
There are no net meters on McCone Electric's system

Mid-Yellowstone Electric Cooperative
WE HAVE NO COMMERCIAL NET METERS.

Missoula Electric Cooperative
See attached, "Missoula Electric Exhibit B," P. 83.

Park Electric Cooperative
This does not apply to our cooperative.

Ravalli Electric Cooperative
REC does not have any commercial net metered accounts.

Sun River Electric Cooperative
Sun River has no commercial net metered installations.

Vigilante Electric Cooperative
VEC does not have any commercial net-metered accounts. A 50 kW net-metered account would simply be a greater subsidy by the remaining members with our current rate structure.

Yellowstone Valley Electric Cooperative
No **commercial** net-meter systems installed. No data available.

Question 13: How does average use per commercial net-metered customer before and after netting out electricity produced by customers' generators compare to average electricity use by commercial customers in the same rate class that do not net meter?

MECA Summary Response
[Nothing to add to member data.]

Question No.13 Individual Co-op Responses

Big Flat Electric Cooperative
Does not apply.

Fergus Electric Cooperative
Fergus does not have any commercial net metered accounts.

Flathead Electric Cooperative

Consumers	Net Metering Annual	Class Annual Average kWh	Difference

		Average kWh		
Commercial	8	37,947	18,709	19,238

Glacier Electric Cooperative
With the current metering system, usage is unknown. The combination site is a governmental site. The large solar system is on a school building.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
We do not have commercial net metering.

Lincoln Electric Cooperative
This is not applicable to LEC

McCone Electric Cooperative
There are no net meters on McCone Electric's system.

Mid-Yellowstone Electric Cooperative
WE HAVE NO COMMERCIAL NET METERS.

Missoula Electric Cooperative
Average annual use before and after – see Exhibit B. The average annual consumption for commercial accounts at MEC is 32,187

Park Electric Cooperative
Not applicable.

Ravalli Electric Cooperative
REC does not have any commercial net metered accounts.

Sun River Electric Cooperative
Sun River has no commercial net metered installations.

Vigilante Electric Cooperative
VEC does not have any commercial net-metered accounts.

Yellowstone Valley Electric Cooperative
No **commercial** net-meter systems installed. No data available.

Question 14: Based on the commercial net metering systems in a cooperative's service area, for each month of the year, what is the average electricity demand (KW) per net-metered customer before and after netting out electricity produced by the customers' generators? Separate this information for solar, wind, and other generators and by specific commercial customer rate classes. If net metering does not provide this, provide information based on modeling (including an explanation of assumptions) and outline steps the cooperative is taking to acquire actual usage information.

MECA Summary Response
[Nothing to add to member data.]

Question No.14 Individual Co-op Responses

Big Flat Electric Cooperative
Does not apply.

Fergus Electric Cooperative
Fergus does not have any commercial net metered accounts.

Flathead Electric Cooperative

	Commercial PV average Net-Metering kW/month	Commercial PV average kW/month
Jan	14.60	15.01
Feb	16.51	17.16
Mar	13.26	14.79
Apr	12.13	13.00
May	10.21	10.58
Jun	8.87	8.85
Jul	9.21	9.84
Aug	10.19	10.25
Sep	11.53	11.66
Oct	11.33	11.57
Nov	13.63	14.26
Dec	13.43	13.26

We do not have sufficient information to evaluate Wind or other systems.

Glacier Electric Cooperative
Please see question 12 response.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative.
Do not have commercial net metering.

Lincoln Electric Cooperative
Not applicable to LEC.

McCone Electric Cooperative
There are no net meters on McCone Electric's system.

Mid-Yellowstone Electric Cooperative
WE HAVE NO COMMERCIAL NET METERS.

Missoula Electric Cooperative
No KW demand information available.

Park Electric Cooperative
Not applicable.

Ravalli Electric Cooperative
REC does not have any commercial net metered accounts.

Sun River Electric Cooperative
Sun River has no commercial net metered installations.

Vigilante Electric Cooperative
VEC does not have any commercial net-metered accounts.

Yellowstone Valley Electric Cooperative
No **commercial** net-meter systems installed. No data available.

Question 15: How does average demand per net-metered commercial customer before and after netting out electricity produced by customers' generators compare to average electricity demand by commercial customers in the same rate class that do not net meter?

MECA Summary Response
[Nothing to add to member data.]

Question No.15 Individual Co-op Responses

Big Flat Electric Cooperative
Does not apply.

Fergus Electric Cooperative
Fergus does not have any commercial net metered accounts.

Flathead Electric Cooperative

	Consumers	Net Metering Annual Average kW	Class Annual Average kW	Difference
Commercial	8	13.9 kW/month	6.5 kW/month	7.4 kW/month

Glacier Electric Cooperative
Please see question 13 response.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
Do not have commercial net metering.

Lincoln Electric Cooperative
Not applicable to LEC.

Mid-Yellowstone Electric Cooperative
WE HAVE NO COMMERCIAL NET METERS

Missoula Electric Cooperative
No kW demand information available.

Park Electric Cooperative
Not applicable.

Ravalli Electric Cooperative
REC does not have any commercial net metered accounts.

Southeast Electric Cooperative
SECO has no commercial customers using net-metering.

Sun River Electric Cooperative
Sun River has no commercial net metered installations.

Vigilante Electric Cooperative
VEC does not have any commercial net-metered accounts

Yellowstone Valley Electric Cooperative
No **commercial** net-meter systems installed. No data available.

Question #16: Describe how increasing a net metering cap to 100 kW to 1000 kW and 5,000 kW would likely impact residential net metering trends in a cooperative's service area and associated cooperative revenue and customer bill impact:

MECA Summary Response
Merely increasing the cap on only residential net metering would affect only large, or very large residential consumers and would increase cost shifts in proportion to how large the installation. In those cases, the entire service and transformer could have to be upgraded if they install enough solar to net out their consumption. If, however, there was a community solar option or any other change that would allow multiple services to be involved in a single 100 kW or 1000 kW installation, the impact would be significant. If a 100 kW net metering generator was installed and enough residential services netted against its output and if the solar had a 20 percent annual production factor it could produce 175,200 kWh of electricity annually. (This is calculated as follows: 8,760 hours in a year X 100 kW generator capacity X .2 production factor).

Based on the fixed cost per kWh as shown in the chart in answer to Question 8 the impact of a single 100 kW would range from $3,294 per year to $11,598 per 100 kW installed, depending on which co-op the interconnection is located. For a 1,000 kW net-metered generator, the cost shifts in this example would 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 percent of the co-op's total annual revenue. If the fixed cost of power supply is added the total cost shift for the 1,000 kW in the above example could rise to an annual cost shift impact of from $92,000 to $164,338, depending on the co-op. When producing, a 1,000 kW net-metering generator's output would exceed total electricity use by customers at many if not most of the co-op substations during light load times. This would likely require significant line upgrades and cause the power to flow back onto transmission lines, which are commonly not owned by electric cooperatives.

A generator size of 1,000 kW is larger than any load the average co-op has and, during light loads, at 1:30 a.m., about half of their substations have well under 1,000 kW of load at the entire substation. The peak load in some months for about half of the co-op substations and transmission line connections in an area from the Bob Marshall Wilderness going east along the Hi-Line to Wolf Point, which is over a 400-mile by 150-mile swath of Montana, are under 1,000 kW and, at low load times of year, a fraction thereof.

Question No.16 Individual Co-op Responses

Big Flat Electric Cooperative
If operating and maintenance cost are assigned to each kW (capacity), then increasing the kW increases that portion of cost that has to be picked up by the remaining members.

Fergus Electric Cooperative
Fergus Electric's distribution system is designed to deliver electricity to the rural farm and ranch community. It is not designed to handle customer generated loads in the 1000 kW and 5000 kW scenarios. There would be significant costs associated with that type of generation just as there is for energy delivery at those levels. Our members cannot afford the costs that it would take to upgrade our system to handle generation at those levels, therefore the generator would be responsible for any costs of upgrades as they would for delivery at those levels. Depending on the location of a 100 kW generator, we may or may not be able to handle the load on our system. An example would be on the end of a long single-phase line. Our system may need upgrades to deliver that level of load during times of low or no generation from the customer. Overbuilding a system adds more expense for all of our members and the generator is the only one benefitting but they are not supporting their share of the costs involved.

Flathead Electric Cooperative
The current trend at Flathead Electric is 4 - 5 new systems per year with the average size of 4.1 kW. Due to Flathead Electric's relatively large size compared to other Co-ops in the state, the current trend will not have large impacts to cooperative revenue or customer bills. However, a significant increase in size or quantity of net metering installations would require Flathead Electric to reassess our current policies and rates.

Flathead Electric differentiates between net metering, which offsets a load behind the meter, versus a net billing agreement whereby generation offsets aggregated loads that are connected to separate meters. Net billing (meter aggregation) agreements are a power purchase agreement and not considered net metering.

Flathead Electric's policy allows net metering up to 10kW without Board approval. Any potential system over 10kW will be applied under our Generation Interconnection Policy and subject to the requirements including an engineering feasibly study, power purchase agreement and interconnection agreement. All Generation Interconnection systems must be approved by the Board. To date, three Net Metering projects over 10 kW have been brought to and approved by the Board.

Goldenwest Electric Cooperative
Unknown as we don't have any.

Hill County Electric Cooperative
The effect would be a significant cost shift of fixed costs – not reasonable.

Lincoln Electric Cooperative
The first question that should be asked and answered regarding these metering caps is will the cooperatives allow AGGREGATE installations and metering. Net metering at LEC was only intended to allow members to install distributed generation to help offset energy usage. When numbers of 1,000 kW to 5,000 kW of renewable distributed generation start surfacing, then this really becomes Qualified Facility (QF) discussions. Therefore issues such as system balancing, phasing and coordination become significant issues. For instance, if one large QF were to approach a cooperative about installing a generation site, then that QF would ultimately be responsible for any system upgrades and/or changes. If net metering customers were allowed to install numerous aggregated systems across a utility over a long span of time, who upgrades the distribution system? Most likely this burden would be the cooperatives, or ultimately the members.

Mid-Yellowstone Electric Cooperative
MYE'S DISTRIBUTION SUBSTATIONS RANGE FROM 450 KVA TO 5,000 KVA. EVEN ONE NET METERING SERVICE OF 100KW ON OUR 450 KVA DISTRIBUTION SUBSTATION WOULD CAUSE VOLTAGE STABILITY ISSUES.

Missoula Electric Cooperative
Generators of this size on residential applications are unlikely.

NorVal Electric Cooperative
There needs to be a lot of work done to determine what issues these increases will cause. Such as, is the distribution large enough to handle the load? Will the regulation and protection relays handle the 2-way load? If these are not sufficient enough to handle the new loads, who pays to correct the issues?

Park Electric Cooperative
First of all, generation of that size is not used for "net metering". It is used to sell to someone else. Net metering is a way for private individuals to produce electricity for their own use. Very few homes or ranches use 100 kW all the time let alone a megawatt or more. To be allowed to produce power at that level that individual should be considered a utility and fall under the same regulations and safety codes (NESC) as we do.

If members are allowed to produce power in the 100 kW and higher range, that would mean they would have the ability to supply the maximum demand for a typical house hold. However, they would not be able to regulate when they produce that power. If the maximum production is occurring when the utility does not need it, and no distributive generation is occurring when the utility is experiencing its highest demand, it only magnifies the negative effects high demand has on the co-op's wholesale power bill.
The local effect is that we would not be able to recover our fixed cost in the same manner we do now. We would be forced to more than double our existing base rate of $23 in order to collect those costs.
Another consideration on a large distributive generation system is the concept of allowing a person to aggregate several services an individual may have. In doing so, that individual is using the co-op's lines, transformers, protective devices and other equipment to do so. If this is allowed, that person is given free use of the co-op's equipment while the co-op is required to maintain it. The expense of maintaining our equipment is our second highest cost with only wholesale power cost higher. That is not fair for the co-op or the other co-op members that would end up picking up those costs in their rates.

Ravalli Electric Cooperative
80% of REC's load is residential. Extending the cap on net metering to 100kW or larger would be for a commercial or for profit. Our present rate structure would have to change substantially to recover avoided costs of these large net metering accounts so as the contribution toward the

infrastructure required by them is not paid by the normal residential member. We presently would allow the larger renewable interconnection, but not connected as a net meter. Sizes of this magnitude would not be for residential use unless it was for the mansions owned as second homes in the valley.

Sun River Electric Cooperative

Sun River's net metering cap is set at 10 kW and is sufficiently large to handle almost all co-gen requests. Increasing the cap to 100 kW would require all new requests to go through an engineering study to determine the feasibility of a co-gen located at that point, and to determine what system changes would be required to accommodate the installation. Increasing the cap to 1000 kW would require substantial substation upgrades at any location. Increasing the cap to 5000 kW would require a dedicated substation. To illustrate that point, of the 14 distribution substations owned by Sun River, NOT ONE substation has EVER been loaded to 5,000 kW.

Vigilante Electric Cooperative

Increasing a net metering cap seems to be contradictive of the spirit of the agreement. Our average residential service would draw approximately 7.5 kW. Net metering is to offset some of the usage for the member. Increasing the cap above that number would not be net metering, it would be member generation. I believe all co-ops have a separate set of rules for this size of generation, which would be at a negotiated rate. Aggregating meters would be nothing more than a greater subsidy. The generators would simply use more plant at no cost.

Yellowstone Valley Electric Cooperative

From the data listed above, the impact of increasing net metering caps would be two fold. First, it's apparent the consumer is comfortable adding more load to their service as they net-meter. This allows them the ability to maximize their ability to net, at retail, against a strong usage, which in turn would incent them to produce or generate even more. However, the net effect for the utility is a customer with just as high usage and just as high demand as before the net metering began. Basically, the customer is allowed a retail exchange for their generation and yet is as reliant on the utility as ever.

The second impact would be a very likely increase in community generation projects. This would be a large generator 100kW or larger being installed by a resident or perhaps even a third party with the intent of having a group of consumers net against it. Most consumers would likely not be interested in the investment associated with a large generator, however third parties would be interested. This would pit the consumer against the utility in the expectation that they would be allowed the retail exchange as they net their usage against whatever amount they agreed to accept from the community generator. The overall impact would be the same – a consumer just as reliant on the utility as before, getting a retail exchange, with a third party making a profit off of both the consumer and utility.

Question #17: Describe how increasing a net metering cap to 100 kW, 1,000 kW, 5,000 kW would likely impact commercial net metering in a cooperative's service area by customer class, and associated cooperative revenue and customer bill impacts.

MECA Summary Response

Conservatively calculated, about 90 percent of all co-op services and, at some cooperatives, nearly 100 percent are smaller than 100 kW. As noted in Question 16, allowing a community approach to net metering could have impacts of the same magnitude as described in Question 16. To some degree it depends on which commercial consumers participated in net metering with the higher cap. That is because larger commercial services tend to be demand metered resulting in less fixed cost recovery in their kWh rate. For these customers, a substantial amount of their utility bill is based on the capacity of the utility system and generation they use from the system. This demand or capacity need and resulting charge is unlikely to change because the services would remain 100 percent dependent on the grid much of the time.

Question No.17 Individual Co-op Responses

Big Flat Electric Cooperative
Answer is the same as question #16.

Fergus Electric Cooperative
Fergus Electric's distribution system is designed to deliver electricity to the rural farm and ranch community. It is not designed to handle customer generated loads in the 1000 kW and 5000 kW scenarios. There would be significant costs associated with that type of generation just as there is for energy delivery at those levels. Our members cannot afford the costs that it would take to upgrade our system to handle generation at those levels, therefore the generator would be responsible for any costs of upgrades as they would for delivery at those levels. Depending on the location of a 100 kW generator, we may or may not be able to handle the load on our system. An example would be on the end of a long single phase line. Our system may need upgrades to deliver that level of load during times of low or no generation from the customer. Overbuilding a system adds more expense for all of our members and the generator is the only one benefitting but they are not supporting their share of the costs involved.

Flathead Electric Cooperative
Same answer as 16 above. Flathead Electric views this as a net metering issue and not a power purchase or net billing issue.

Goldenwest Electric Cooperative
Unknown as we don't have any.

Hill County Electric Cooperative
No commercial metering – this would be devastating to a small rural electric cooperative in the amount of cost shift.

Lincoln Electric Cooperative
Not applicable to LEC.

Mid-Yellowstone Electric Cooperative
WE HAVE NO COMMERCIAL NET METERS.

Missoula Electric Cooperative
The cost to serve commercial accounts is already under-recovering. By increasing the allowable cap will even compound the problem. One potential upside is that many commercial accounts are operating during the mid-day when distributed generation, particularly solar, are producing, thereby possibly contributing to overall peak reductions.

NorVal Electric Cooperative
There needs to be a lot of work done to determine what issues these increases will cause. Such as, is the distribution large enough to handle the load? Will the regulation and protection relays handle the 2-way load? If these are not sufficient enough to handle the new loads, who pays to correct the issues? We need to make sure that all systems are employee and member safe, there is a cost to this.

Park Electric Cooperative
We don't allow commercial net metering. If we did we would face the same issues that we do with residential service.

Ravalli Electric Cooperative
We presently do not have a commercial net metering account. The answer to question 16 applies here also.

Sun River Electric Cooperative
See our answer to question 16.

Vigilante Electric Cooperative
VEC does not have any commercial net-metered accounts to provide data.

Yellowstone Valley Electric Cooperative
No commercial net-meter consumers. However the effects would be the same as in question 16.

Question #18: Identify issues and concerns if any, associated with increasing a net metering cap to 100 kW, 1,000 kW, and 5,000 kW and how those issues and concerns could be addressed:

MECA Summary Response
Cost shift – If the co-op is allowed to recover fixed costs, both of the co-op and those embedded in power supply, the cost shift is mitigated at the local level so long as the system itself can handle the amount of power generated without upgrades. This concern is addressed if the net-metered customers pay the upfront cost of any upgrades to the system that are required to absorb the power this concern is addressed. The lion's share of impacts would then be covered. Operational costs related to changed operating procedures for the line personnel would remain an issue, however.

Practical limits - There is a point on any distribution line that reverse power flow becomes a problem, ranging from harmonics and power quality to changes in regulators. If energy supply being injected onto the power line is substantial, the flow of power could exceed the loads on the lines, causing it to flow back onto transmission lines owned by others. This creates problems that may be addressed through greater investment and amended contracts with the transmission owners. However, these upgrades or changes will come at a price. In Montana, this could involve Bonneville Power (BPA), Western Area Power (WAPA), NorthWestern Energy, the Midcontinent Independent System Operators (MISO) or the Southwest Power Pool (SPP), depending on the location of the interconnections.

BPA and WAPA have set standards that require transmission consideration for any generation interconnects for sizes over 100 or 150 kW. NorthWestern Energy has requested notification for larger generation interconnections. Although we are unaware of the exact size at which NWE notification is required, we have understood that it would be of a similar size. Generation of 1,000 kW and 5,000 kW would require upgrades to the systems of nearly every co-op with very limited exceptions. For a 5,000 kW generator, the needed upgrades would be significant and power from those generators would create backflow to others' transmission systems.

The only solution for co-ops involved in these situations would be to require the prospective net-metered customer to be responsible for all related costs – that is, unless the cooperative has a unique situation that would justify the cooperative invest in some of the cost. An example of this situation would be if a cooperative, for unrelated reasons, had already decided an upgrade of the substation or lines to be interconnected with by the generator was needed, regardless of whether the generator was interconnected.

Question No.18 Individual Co-op Responses

Big Flat Electric Cooperative
When you increase net metering to the amount stated 100 kW, 1,000 kW, 5,000 kW on the member's side of the meter, you are dealing with some serious and dangerous conditions. There is not only exposure to the member but to lineman who may be servicing the line during an outage. Those levels potentially could cause severe damage to the co-op's line if not operated correctly. You could have reverse power flow and potential operating issues.

Fergus Electric Cooperative
Fergus Electric's distribution system is designed to deliver electricity to the rural farm and ranch community. It is not designed to handle customer generated loads in the 1000 kW and 5000 kW scenarios. There would be significant costs associated with that type of generation just as there is for energy delivery at those levels. Our members cannot afford the costs that it would take to upgrade our system to handle generation at those levels, therefore the generator would be responsible for any costs of upgrades as they would for delivery at those levels. Depending on the location of a 100 kW generator, we may or may not be able to handle the load on our system. An example would be on the end of a long single phase line. Our system may need upgrades to deliver that level of load during times of low or no generation from the customer. Overbuilding a system adds more expense for all of our members and the generator is the only one benefitting but they are not supporting their share of the costs involved.

Flathead Electric Cooperative
Flathead Electric's current policy allows for simplified net metering treatment for all installations up to 10 kW and for installations from 11 kW to 199 kW with Board approval. To date, the Board has approved all net metering interconnection requests. Installations over 200 kW require integration with the Bulk Transmission System under Bonneville Power Administration jurisdiction. Flathead Electric's load following contract with Bonneville does not allow for integration of non-PURPA Qualifying resources over 1000 kW for net metering.

Goldenwest Electric Cooperative
Unknown as we don't have any.

Hill County Electric Cooperative
As previously noted for a small rural electric cooperative the affects would be significant to non-net-metered accounts.

Lincoln Electric Cooperative
See our response in Question 16.

McCone Electric Cooperative
Net metered distributed generation (DG) should be sized to the contiguous load they serve. Once consumers' DG systems exceed their load or serve non-contiguous loads, they become an unregulated utility. Large DG system should be required to enter into power purchase agreement's (PPA's) with the generation and transmission utility they are connected to. Crediting large net metered DG systems retail rates essentially transfers all the profits and none of the costs of the legacy system they are using to distribute excess energy.

Mid-Yellowstone Electric Cooperative
See our answer to question 16.

Missoula Electric Cooperative
See our answer in prior question.

NorVal Electric Cooperative
There needs to be a lot of work done to determine what issues these increases will cause. Such as, is the distribution large enough to handle the load? Will the regulation and protection relays handle the 2-way load? If these are not sufficient enough to handle the new loads, who pays to correct the issues? We need to make sure that all systems are employee and member safe, there is a cost to this.

Park Electric Cooperative
I believe that allowing private individuals to construct systems of 100 kW, 1,000 kW and 5,000 kW in size would create an extreme safety hazard. To allow private individuals without more than a basic understanding of electricity to have control of enough power to run a hospital or a big box store is asking for trouble. Keep in mind that because they cannot use all of the electricity they generate it must be pushed back through the utility's distribution voltage lines to get to their neighbors. Without supervision or control of that generation, the utility is at the mercy of someone without knowledge of what their system is doing at all times or what is the condition of the co-op system. I would have great concern for the safety of line personnel and the general public if this were allowed.

Ravalli Electric Cooperative
We do not have loads of 1000kW or 5000kW. Our infrastructure would not support loads of this size without a substantial rebuild. Net metering of this size would be larger than most of our circuits out of the majority of our substation.

Sun River Electric Cooperative
In addition to the response to question 16, let's be clear that virtually any co-gen project can be accommodated given sufficient funding for system improvements.

Vigilante Electric Cooperative
Most cooperatives are generally rural delivery for farms and ranches. A 100 kW service would be in the top ten percent for size of service for our cooperative and 1000 kW and 5000 kW would be much larger than any service that exists on our lines. Facilities studies for smaller systems can be done in house with exists engineering personnel where these larger facilities would require much more design and engineering data probably done through an engineering firm. IEEE 1547 specifically addresses the amount of DG sources on an electric system. In some cases, 100 kW of DG on a feeder would create additional engineering concerns that would have to be dealt with.

Yellowstone Valley Electric Cooperative
Issues and concerns are addressed in question 16. One of the consequences could be the utility changing its rate design to capture the demand for all consumers, not just commercial accounts. By charging demand, the net-meter customer then continues to pay for the equal or greater impact they have on the utility. They would still be allowed to net against their usage on a kWh basis, but their demand would also become a larger part of their rate. As previously discussed,

the net-metered customer is just as, if not more, reliant on the utility system, especially through demand, post net-metering as compared to pre-net-metering.

Question #19: Identify potential operating issues associated with expanding net metering and provide suggestions for how cooperatives could address these issues.

MECA Summary Response

A major operating issue pertains to the requirement that, prior to performing work on a power line that needs to be de-energized, a line crew must first verify, visually, that the line is disconnected from all potential sources of energy. For customer generators interconnected to this power line, line workers must be able to visually observe the line is open at the point of interconnection.

One way to mitigate for this requirement would be to establish more points of disconnect or switches that can be opened and be verified as visually open, on the power line. Few of these points exist . This is because they are expensive, require maintenance and are more likely to fail than a line without switches. More switches would minimize the time required for line personnel to establish the open point.

However, costs for these disconnects can exceed $1,000 per switch and, as noted, can create ongoing maintenance issues. Thus, they may only be warranted for situations such as those involving river crossings in which a line crew's work site is located across the river from a customer's generator. In these cases, a crew may have to travel considerable distances of perhaps 40 miles or more from their work site to isolate the customer's generator from the line that needs to be de-energized before line work can commence.

Requiring installers and prospective net-metered customers to begin dialogue with the co-op early in the process allows all involved to know the requirements and costs prior to an installation. Absent this knowledge, the co-op and the installer may find themselves having to make multiple trips to the service site to make necessary changes.

It also may be necessary to address the issue of who pays for utility system upgrades on a given feeder line or substation that are needed as a result of multiple generators interconnected to that line. It is difficult to collect money from a net-metered customer to pay for upgrades if they are needed years after the generator was installed and if the need only arises after multiple such generators have been interconnected to the power line.

For example, without some process for payment in place, the first 15 customers on a given feeder line would connect with minimal costs. But if tens of thousands of dollars in upgrades become necessary due to reverse power flows caused by additional customer generators interconnected to this line, the costs for those upgrades could be prohibitive. In this situation, the high cost for upgrades is incurred even though, individually, these customers placed no greater impact on the system than did the individual net-metered customers before.

Protections could be imposed that ensure non-net metered customers do not have to pay through their rates any costs related to interconnecting the net-metered customers. These would be costs related to shifts in fixed costs of operating the utility system or costs of capital improvements attributable to net-metering interconnections. This is the single most important consideration of any change.

Question No.19 Individual Co-op Responses

Big Flat Electric Cooperative
There is no way to understate the danger in our industry whether it is an investor-owned utility or a co-op. There is no way you can insure an individual that has net metering will follow the rules of the industry.

Fergus Electric Cooperative
Our system is designed to deliver electricity to our members. We size everything from our substation, poles, wires, voltage regulation and outage controls for the loads delivered. Multiple generation with net metering in a local area may offset our loads during the summer, but with solar installations becoming the net metered choice and our system being winter peaking, we may have to spend considerable costs for upgrading the line with no increase in revenue to offset those costs.

Flathead Electric Cooperative
Sectionalizing and regulation are definitely two concerns depending on size and density. Controls will have to be smart to sense 2-way power flow and be able to operate in either direction. We will also have to be looking at sizing feeders not only for load but for generation.

Glacier Electric Cooperative
The main operational issue is safety. Potential issues include sectionalizing and relaying on a feeder-by-feeder basis, inability to detect minimum fault currents, additional regulators and smart inverters, mapping upgrades, the effects of reverse power flow on equipment, and issues with disconnects.

Goldenwest Electric Cooperative
Unknown as we don't have any.

Hill County Electric Cooperative
This could be a potential impact requiring equipment upgrades depending on the size and number of net metered accounts in each area.

Lincoln Electric Cooperative
As noted in previous comments, net metering should not be considered a dispatchable resource. In fact, net metering creates a variety of operational challenges.

First, due to its intermittent nature, it can create load flow variances as quickly as the weather changes. So trying to schedule true dispatchable resources becomes a huge challenge as the feeder power flows swing with net metering fluctuations. Next, most net metering facilities are single-phase. With their generation variations, different phases could have significant load differences, creating phase imbalances at the substations.

Another important issue to consider is system coordination and fault currents. A feeder without any net metering facilities installed can be modeled and coordinated easily because power flows are one direction and fault currents are all determined relative to the substation. Net metering facilities create coordination challenges because reverse power flows are possible. And the generation sources are scattered along the feeder. And since they are constant, modeling and coordinating become a huge problem. And WHY is this problematic? Poor coordination creates safety and reliability issues as power line facilities can become damaged. This creates longer outages and even possible public safety issues.

Mid-Yellowstone Electric Cooperative
See our answer in question 16.

Missoula Electric Cooperative
Many rural cooperative distribution systems are radial systems. Generally, the further away from a substation you travel, the capacity of the system decreases. If a large enough load or generator wants to interconnect, then an engineering study would need to occur. Methods of increasing capacity of a distribution system include re-conductoring, multi-phasing, and voltage conversions. System protection devices may also need to be upgraded from hydraulic controls to electronic devices. SCADA (supervisory control and data acquisition), which provides control of remote systems, and communication systems may also need to be added to monitor the system.

An industry reference to this subject is a book entitled *Electrical Distribution-System Protection, Section C, chapter 2.* This book was written by Cooper Power Systems.

NorVal Electric Cooperative
Our system was design to serve members that do not generate. If other members want to install generation, they should be liable for all equipment changes and for any safety or equipment damaged by their generation.

Park Electric Cooperative
The operational issues of expanding net metering could prove to be insurmountable. I know it would be years before it got to this point but it is very likely the number of net metered systems could expand to the point where our current protective scheme would no longer function properly. As an example, we currently wheel power from four small privately owned hydroelectric systems to NorthWestern Energy. Those four systems are all located on the same circuit of a substation. Together they frequently generate enough to change the flow of electricity across our lines. In doing so, the power flows through a device called a voltage regulator which does just that. It measures the voltage on the line and adjusts it to keep a more constant voltage. When the flow of power is reversed, it can see too high of voltage on the wrong side of the regulator and try to adjust it by dropping the voltage. It has the opposite effect on the line. We have had to replace all of the voltage regulators on this circuit to a more expensive regulator that can detect reverse flow.

By injecting generation in different locations on a line, protective devices, such as breakers, do not operate correctly. Considering you never know when power is being generated, you can no longer calculate how much amperage may be flowing through a device. With very long, lightly loaded distribution lines, the challenge of coordinating protective devices is difficult. Adding intermittent generation makes it nearly impossible. This would become a huge safety concern if net metering is expanded.

Ravalli Electric Cooperative
We presently look at all net metering applications of any size. Our policy is 10 kW but we have allowed a 20 kW system. Expanding net metering past what the consumer would use will cause reliability issues as our breakers, fuses and equipment were built and designed for the energy to flow one direction. Putting a large generation source at some other point on the system will cause the system to be rebuilt, operational responses to outages to be changed and outage times to increase.

Sun River Electric Cooperative
Generation of any size is a concern if installed on a less than robust system, which is typical of cooperative systems. Over the years our systems have been built to accommodate load, not generation. Current flows back to source, typical in co-generation, will cause line regulators to malfunction. Two directional line regulators are a typical system upgrade that is required when installing generation. Also, system protection schemes must be upgraded to ensure proper line tripping during an emergency.

Vigilante Electric Cooperative
Coordination and sectionalizing would become a major issue. This may not only include large OCRs and additional regulators, but may also require re-conductor of the feeders as many are still older feeders with 6 HD or 4 ACSR as the main line. Periodic testing of equipment for the larger systems would also probably be a requirement to ensure safety of cooperative personnel and equipment. IEEE 1547 addresses DG saturation on a feeder and must be consulted when larger quantities are installed.

Yellowstone Valley Electric Cooperative
Yellowstone Valley Electric Cooperative, Inc., has a sectionalizing plan and process designed for our entire system. Regulator sizes both in substations and out on the feeder systems, breaker sizing, both in the substation and on the distribution lines, as well as fuses and other sectionalizing equipment are all based on the current loads and system data we have available today. Expanding net metering would promote generation in various random areas throughout our system. This would change load balancing on feeder lines as well as the need to re-analyze the sectionalizing equipment (breakers, fuses, etc.) for an entire feeder if not for the entire substation too. Additionally, the need for regulation (regulators) would likely increase as generation increased. This would be an added cost exposure for all co-op consumers. The presence of larger generation across the system, that is quite variable in its production, would cause power quality issues, which could only be addressed by adding equipment to filter those issues. This equipment would be expensive and require maintenance. All of this adds to higher operational costs for the utility, which affects the consumer's rates.

Question #20: Identify one or more methods for quantifying the benefits of net metering. In your opinion what are the advantages and disadvantages of each method.

MECA Summary Response
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.

Question No.20 Individual Co-op Responses

Big Flat Electric Cooperative
kWh's are from a different source.

Fergus Electric Cooperative
We have 12 net metered accounts and see no advantage or disadvantage to our membership. We charge an additional $8.00/month for the net metered accounts to cover our bookkeeping costs. We are not a member of Bonneville Power so we do not receive any exchange credits.

Flathead Electric Cooperative

Net metering members receive per kWh credit applied to their account for all power produced behind the meter in any month that production exceeds consumption. The benefit to the net metering member is the retail rate less the cost to the member of their own installation. The benefits to other members of the Cooperative are the avoided power supply costs less any cost of service study determined fixed costs that are collected in the variable charge within the per-kWh-credit at the retail rate.

Glacier Electric Cooperative

No methods determinable.

Goldenwest Electric Cooperative

Not applicable.

Hill County Electric Cooperative

No advantage to non-net metered members just additional cost they will need to cover in likely rate increases.

Lincoln Electric Cooperative

As discussed previously, there are few benefits of net metering to electric cooperatives. The main value LEC sees is the value it adds for the member. Net metering facilities are installed for a variety of reasons by the membership. Having a net metering policy gives the member the freedom to explore and potentially realize tangible and intangible benefits.

Missoula Electric Cooperative

The largest potential benefit to net-metering would be to reduce the peak demand on the electrical grid. The largest source of net-metering for Missoula Electric comes from solar applications that do little to offset the peak demand.

NorVal Electric Cooperative

In our cooperative, the only benefit we have seen is it makes the member feel good. As far as the system is concerned, the owner of net-metered generation’s annual consumption has gone up.

Park Electric Cooperative

If net metering could be used as a method for reducing demand it would be a benefit. I don’t know of a system that does that at this time.

Ravalli Electric Cooperative

Benefits of net metering could be quantified by the coincident net generation with the utility’s time of peak demand, or generation during high load hours. Verification would have to be supplied by net generator metering with time stamp. BPA’s present billing has 90% of the capacity costs rolled into fixed costs. The benefit of capacity from a system will be difficult to identify with our present AMI system and BPA’s rate methodology. Until a cost effective and proven power storage method is developed, present renewables provide only energy not capacity.

Sun River Electric Cooperative

As long as co-generation is more expensive than what can be purchased off the grid, the financial benefit to a net meterer is directly related to how much others are willing to subsidize the net meterer's electric bill.

Vigilante Electric Cooperative

DG installations may reduce the need to acquire Tier 2 power from our power supplier BPA. However, the cost of Tier 2 is nearly equal to Tier 1 currently and thus no savings. Other than that, I don’t see any benefits.

Yellowstone Valley Electric Cooperative

Yellowstone Valley Electric Cooperative, Inc., gladly facilitates the consumer when they are searching for information in regards to net-metering. The biggest benefit is the ability for the consumer to off-set their usage. Like anything, there are limits to which a benefit can be realized. The lure of the net-meter set up is the retail exchange. The best case scenario is for a net-metered service to off-set all of their own usage. This allows them to utilize the full benefit of the retail rate subsidy. Over production does not help them, nor does it help the utility. Too much generation creates load balancing and regulation problems for the utility all due to a customer, who is still very reliant on the poles and wires of the utility.

Having too much generation on a distribution system is difficult to handle. The distribution system is designed to deliver power, not necessarily take production. As stated before, this challenges the power quality being delivered to customers. Very close attention to sectionalizing, voltage regulation and power quality is a must. The result is likely equipment being added by the utility, such as regulators, at the cost of the entire consumer group.

Questions 21a: Identify the benefits of net metering that are shared between net metering customers and customers that do not net meter. Identify the avoided:

MECA Summary Response

From a practical standpoint, there are no benefits shared between net metering customers and customers that do not net meter.

Following is our summary response to the list of costs suggested as possibly being avoided by net-metered power:

Supply related

- The cost of energy from traditional supply is the same every hour of the day for the majority of Montana electric cooperatives. For cooperatives served by BPA, the energy cost is traditionally only slightly different in low load hours than high load hours. There are only four non-BPA co-ops whose energy prices vary based on the time of day.
-
- Capacity costs avoided by solar power production is zero during most months and minimal in others. This is because the time of peak determines capacity costs and the winter peaks occur before the sun rises and after it sets. Even in summer months, the utility system's time of peak power demand is late in the day when solar production has dropped off, sometimes occurring after solar generation has completely stopped producing.

Cost for transmission and distribution

Both transmission and distribution lines have to be built with enough capacity for times of peak power demand. Net-metered generation cannot be relied upon at these peaks to provide any capacity to meet demand. This is especially true in view of the fact that most of our systems peak before the sun rises or after it sets and during extreme weather events with prolonged sub-zero temperatures extending over several days and with little or no wind.

Load following, regulation and frequency response

The needs for load following and regulation increase with variable generation.

Pollution control costs

Interconnection of net-metering would not reduce the cost of pollution controls for co-ops.

Power plant operations and maintenance costs

Ramping of generation levels due to the variable characteristics of net-metered generation would increase, not decrease, operations and maintenance costs. An example is the premature failure of winding insulation at generators at Yellowtail Dam in southeast Montana. This failure occurred as a result of the generators having to be ramped up and down to meet regulation needs in portions of Wyoming and Colorado. The ramping up and down of a generator causes expansion and contraction of the copper and other metals as temperatures change. (Greater heat created by greater generation.) The insulation does not expand and contract as the metal does and over years can degrade more quickly than if the generator is run at a steady state.

Fuel price hedging

No savings for electric cooperatives.

Generation capacity investments or purchases

Purchases of generation must be adequate to meet peak loads. Because the net-metering generation cannot be counted on to produce power during peak times, generation capacity investments or purchases do not decrease. In addition, power supply to the co-ops that is delivered through other balancing authorities, including NorthWestern Energy, requires that a specific amount of power be scheduled ahead of when it is needed. To the extent the scheduled power exceeds or falls short of actual power use, a co-op or its power supply cooperative can be subjected to penalties that are in addition to power supply market costs. The variability of net metered generation can increase scheduling error and the related costs.

Renewable energy standard compliance costs

There would not be any current savings to co-ops of meeting renewable energy compliance costs as the co-ops are in compliance. It is questionable whether the production of net-metering generators would give any credit to the co-op even if the co-op did need additional credits for compliance.

<u>Question No.21a Individual Co-op Responses</u>

Big Flat Electric Cooperative
We do not have any meters with net metered customers. The benefits would exist in excess kWh power production during peak times.

Fergus Electric Cooperative
We have 12 net metered accounts and see no advantage or disadvantage to our membership. We charge an additional $8.00/month for the net metered accounts to cover our bookkeeping costs. We are not a member of Bonneville Power so we do not receive any exchange credits.

Flathead Electric Cooperative
The primary benefit of net metering is the avoided energy cost of equivalent power supply. There may be some shared benefit from line loss by having a source of generation closer to load. There is no benefit in other areas as we have to build and support our system based on demands and be able to serve our membership when generators are not generating. Since we are a winter peaking system we won't see the DG systems contributing to our demand reductions when our system is peaking and thus won't see benefits that other systems could see depending on location.

Hill County Electric Cooperative
None. Base generation still needs to be in place when net metering is down. It offsets hydro-carbon or water usage through base generation

Missoula Electric Cooperative
While transmission losses will decrease with net-metering, savings in distribution losses cannot be assumed due to location and size of the generator and layout of the distribution system.

Some peak demand charges can be assumed but no guaranteed. Our BPA supplied demand billing indicates little correlation.

Park Electric Cooperative
We do not have this information.

Sun River Electric Cooperative
The notion that net metering somehow benefits the cooperative by cutting line losses is flawed. What benefit can generation provide if the consumer ultimately pays the utility nothing for the kWh's generated? Also, line losses can INCREASE if the generation is on during a lightly loaded period.

Vigilante Electric Cooperative
See our answer to question 20. Do not see any benefits other than that.

<u>• cost for supply-related energy and capacity, accounting for the timing of energy and capacity produced by net-metered generators;</u>

Flathead Electric Cooperative
Flathead Electric's power supply agreements include load following service that follows load. There is a difference between on-peak hour costs and off-peak hour costs and a large cost of monthly coincident peak demand. Unless the generator is generating at the time of monthly coincident peak, there is no capacity benefit, and the on-peak energy benefit is minimal.

Glacier Electric Cooperative
Would not be a benefit due to inability to rely on net metering system capacity during peak.

Goldenwest Electric Cooperative
Not applicable.

Lincoln Electric Cooperative
Solar does not provide any usable capacity and so no savings. We currently use energy sales to make our margin so if we are not purchasing energy we are not making margins and are losing sales. No benefit.

Park Electric Cooperative
Our line loss varies. Over the last two years we have averaged around 3.48% line loss for an average of about $316,685.

Ravalli Electric Cooperative
Avoided cost would depend on the month and hours of the day the net meter is operating. Demand reduction, kWh charge HLH vs LLH. This would all have to be manually calculated. As approximately 90% of capacity is rolled into monthly costs, there would not be a cost benefit for the majority of capacity provided.

Yellowstone Valley Electric Cooperative
Avoided costs for supply-related energy and capacity, etc. – None. It has been the experience of Yellowstone Valley Electric Cooperative, Inc. that our net meter customers, in general, add more load thus needing more kWh and capacity from the co-op than prior to net-metering.

<u>• cost for transmission and distribution line losses;</u>
Flathead Electric Cooperative
Member net metering does not avoid transmission and distribution losses in the same way as energy efficiency.

Lincoln Electric Cooperative
Solar systems will actually contribute to an increase in the percent of line loss on our distribution system during the summer months. The loss of those kWh sales contributes to a reduction in revenue to pay for our no-load losses on the system.

Ravalli Electric Cooperative
Distribution losses would depend where on the system the net meter is generating. Distance sensitive. The further away on smaller wire the larger the losses.

Yellowstone Valley Electric Cooperative
Avoided cost for transmission and distribution lines – None. There is not a single instance where the transmission or distribution lines are not needed. Additionally, the reliance on these systems appears to be higher by the net-metered customers, so no cost is avoided.

<u>• cost for transmission and distribution capacity and operation and maintenance;</u>
Flathead Electric Cooperative
Member net metering does not avoid transmission and distribution capacity operation and maintenance in the same way that energy efficiency does, because, unlike energy efficiency, the load can re-appear when the generator is not generating.

Glacier Electric Cooperative
Would not be a benefit due to an increase in the use of the system, not able to rely on net metering system capacity during peak, increased costs due to safety issues.

Lincoln Electric Cooperative
Since there is no real capacity (12%) to solar systems there is no cost savings for system capacity. Operational expenses still occur at least at the same level so therefore no savings, no benefit.

Park Electric Cooperative
Not applicable.

Ravalli Electric Cooperative
Capacity would have to be addressed as though the net meter was off line. Zero benefit. As the peak for solar does not match up to our present loads, there will have to be a cost effective storage device developed and installed before there would be a benefit.

Yellowstone Valley Electric Cooperative
Capacity – The net-metered customer is not increasing the load carrying capacity of distribution or transmission lines, rather they are increasing their reliance on those systems and decreasing the capacity of those systems.

• cost for load following, regulation, and frequency response;
Flathead Electric Cooperative
Costs for load following and regulation are billed on total retail load and the impact of net metering is the same as energy efficiency.

Lincoln Electric Cooperative
Not applicable.

Park Electric Cooperative
Not applicable.

Yellowstone Valley Electric Cooperative
Costs for load following, regulation and maintenance costs are most definitely going to increase as generation begins to saturate a system designed to deliver power, not take power production.

• pollution control costs;
Flathead Electric Cooperative
Flathead Electric does not have significant pollution control costs due to the primarily hydro and renewable power portfolio. Any other pollution control costs are melded into wholesale power supply costs.

Lincoln Electric Cooperative
Not applicable.

Park Electric Cooperative
Not applicable.

Yellowstone Valley Electric Cooperative
Pollution controls – None avoided.

• power plant operations and maintenance costs;
Lincoln Electric Cooperative
Maintenance and plant operation expenses would actually increase. Generation plants must vary their energy output to match the load across its service territory. If a variable resource which produces energy independent of load is added to the resource stack, generators must vary their output to match the variability of both load and the variable resource. This increase in fluctuation of the generator increases wear and tear and therefore maintenance expense.

Park Electric Cooperative
Not applicable.

Yellowstone Valley Electric Cooperative
Power Plant operations, maint. – None. Again the capacity requirements by the net-metered customer is the same or larger post net-meter connection. This does not lessen the power requirements or pollution controls for power generators.

• fuel price hedging costs;
Lincoln Electric Cooperative
Market prices are much lower than purchasing energy at retail rates.

Park Electric Cooperative
Not applicable.

Yellowstone Valley Electric Cooperative
Fuel Price Hedging – None. See our answer above.

• generation capacity investments or purchases; and
Flathead Electric Cooperative
Existing power plant operations and maintenance costs are committed. Any impact from a large expansion in net metering would be to future resource decisions.

Lincoln Electric Cooperative
Again there is no real capacity from solar to benefit the system.

Park Electric Cooperative
Not applicable.

Yellowstone Valley Electric Cooperative
Generation Capacity investments, etc. – None. See our answer above.

• renewable energy standard compliance costs.
Flathead Electric Cooperative
Net metering currently does not contribute to Renewable Resource Standard compliance, but could in the future. The administrative costs of tracking and getting credit for member owned or procured renewable energy credits currently outweigh the policy benefits.

Lincoln Electric Cooperative
Are you referring to the standard that the renewable energy community forced on us to provide a pathway for them to make money from our members?

Park Electric Cooperative
Not applicable.

Yellowstone Valley Electric Cooperative
Renewable Energy Standard Compliance Costs. – None. Yellowstone Valley Electric Cooperative, Inc. does not account for the generation by net-metered customers to help with energy portfolio standards. First, the power is netted by the customer, delivery to our system is minimal. Second, we have to engage in large scale, and much more reliable programs to attempt to meet the standard. The small scale systems are much less reliable and much less predictable. Also, our net-meter customer is increasing usage and the need for capacity. This is not the type of program the helps with renewable energy standard compliance

21b Identify the benefits of net metering that are shared between net metering customers and customers that do not net meter. Identify the value of:

MECA Summary Response

- *Excess net metering credits sacrificed to the utility by net metering customers at the end of billing periods;*

  Very few of the co-op net-metering customers do not use all credits prior to true up when the customer's use of co-op power is netted against power production by the net-metering generator. As a result, very few credits would be retained by the co-op. 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 very few customers who may not use all their credits. (See individual co-op responses as to the use of credits.)

- *Unclaimed BPA residential exchange credits.*

  The residential exchange does not benefit any co-op. It is a program that only provides benefit to investor-owned utilities. A unique situation in 2016 and 2017 is a refund of an over collection of revenue by BPA from its customers. BPA in earlier years collected more money from its customers than it needed to provide investor-owned utilities' residential exchange credits. As a result, there could be some effect on the credit back of the overcharge to BPA customers related to the exchange.

Question No.21b Individual Co-op Responses

Big Flat Electric Cooperative
We do not have any meters net metered customers.The benefits would exist in excess kWh's during peak times.

Fergus Electric Cooperative
We have 12 net metered accounts and see no advantage or disadvantage to our membership. We charge an additional $8.00/month for the net metered accounts to cover our bookkeeping costs. We are not a member of Bonneville Power so we do not receive any exchange credits.

Goldenwest Electric Cooperative
Not applicable.

McCone Electric Cooperative
Any member receiving service under McCone Electric Cooperative's net metered rate forfeits excess kWh at the end of each month. If the net metered DG is sized to the load, there would be minimal loss of excess kWh.

Sun River Electric Cooperative
There has never been even one kWh sacrificed to Sun River by net meterers at the end of a billing cycle. We allow an annual true up. There are no benefits that net meterers and non-net meterers might "share". Net metering benefit is entirely dependent on non-net meterers' willingness to pay more.

Vigilante Electric Cooperative
We are monthly true-up and we have only not compensated for 15 kWh's in 2014. Less than $1.

Yellowstone Valley Electric Cooperative

Of the 13 net-metered services on our system, only two have actually produced more than they use. Yellowstone Valley Electric Cooperative, Inc. has a yearly true-up, which allows the customer to bank their production and try and off-set it with usage during the entire year. At the end of the year, only two had kWh's in the bank. One was a 10 kW solar system with very little usage by the customer. They had 4,088 kWh in the bank. This was enough to feed one large house for one month. It was not enough to change power delivery schedules from our power provider. Similarly, the other customer with kWh's banked at the end of the year is a 15 KW solar system, with a little higher usage. They had 5,439 kWh's banked at the end of the year. Again, this was enough to power one large house for one month. It was not enough to change power delivery requirements.

• excess net metering credits sacrificed to the utility by net metering customers at the end of billing periods; and

Flathead Electric Cooperative

Flathead Electric does not zero out the credits. Thus, there is no benefit to the Cooperative and no sacrifice for the member. Flathead Electric's net metering policy allows the rollover of net metering credits for the member so there are no credits sacrificed unless the member leaves the service area and the service location does not transfer to another member.

Glacier Electric Cooperative

Glacier Electric does keep excess kWh at the end of each fiscal year.

Lincoln Electric Cooperative

Of the 13 net metering accounts, only one has ever produced excess kilowatt hours that were donated to LEC at the year-end true up. On average, this account donates 2,674 kilowatt hours annually.

Park Electric Cooperative

We think this amount is zero.

Ravalli Electric Cooperative

Excess net metering credits reduce the energy purchased from BPA. The value is the avoided cost of purchases. On average, losses account for 7% of purchased energy from the power supplier. For example: it takes 100 kWh's to provide the end user with 93 kWh's. If the net meter returns 100 kWh's to the grid only 93 kWh's are sold.

• unclaimed Bonneville Power Administration (BPA) residential exchange credits.

Flathead Electric Cooperative

Bonneville calculates Flathead Electric's Residential Exchange Refund credits on the Residential Exchange Settlement amounts. These are applied like other Bonneville Tier 1 power supply costs. Like all Bonneville ratemaking, these are set on a forecasted load basis in each two-year rate case. Since Bonneville load forecasting embeds projected net metering and energy efficiency in the forecast, there is no impact as long as the Bonneville customer is taking its full Tier 1 contract allocation. However, if aggressive net metering policies cause a utility to decrease its forecasted need from Bonneville below its contract allocation, then less Residential Exchange credits result as well as less power at the Tier 1 preference rate. If the Tier 1 preference rate is higher than the Tier 2 preference rate, then this is a benefit. If the Tier 1 preference rate is lower than the Tier 2 preference rate, then this is a cost.

Glacier Electric Cooperative

This is not available to our cooperative.

Lincoln Electric Cooperative
There is no real way to trace any benefit from renewables to any reduction in this credit given to the investor-owned utilities. It is a dollar amount based on a percentage of the output of the FCRPS. No benefit!

Park Electric Cooperative
Not applicable.

Ravalli Electric Cooperative
On residential exchange credits, this is a benefit only available to investor-owned utilities.

Question 22: Describe methods used to determine each of the avoided cost categories in Question 21.

MECA Summary Response
See answer to 21a.

Question No.22 Individual Co-op Responses

Big Flat Electric Cooperative
Cost can be determined through metering.

Fergus Electric Cooperative
We have 12 net metered accounts and see no advantage or disadvantage to our membership. We charge an additional $8.00/month for the net metered accounts to cover our bookkeeping costs. We are not a member of Bonneville Power so we do not receive any exchange credits.

Flathead Electric Cooperative
Flathead Electric reports the avoided cost of power on calendar year financials based on the Bonneville Tier 1 and Tier 2 rate, the Basin Class A rate plus adders, and the cost of owned Renewable generation procured to meet the intent of the Montana Renewable Resource Standard.

Flathead Electric's fixed costs are determined based on other costs of providing service to members through an annual cost of service study. The Board makes an annual policy decision about the portion of fixed costs recovered through an energy charge.

Goldenwest Electric Cooperative
Not applicable.

Lincoln Electric Cooperative
As this is difficult to quantify, it is even more difficult to show any methodology.

Missoula Electric Cooperative
No dollars stated because the benefit generally may or may not occur. More study would definitely have to be done to quantify nearly all of the bullet points listed, and for the others that may or may not occur.

Park Electric Cooperative
Bullet two is the difference between kWh purchased and kWh sold times the price per kWh. Bullet is our actual cost of transmission expense, distribution expense operations and distribution expense maintenance.

Sun River Electric Cooperative
Net metering provides no real avoided costs for the net meterer. If taxpayer subsidies and other rate payer subsidies are removed from the equation, the net meterer's costs go up, not down.

Yellowstone Valley Electric Cooperative
Actual costs were not calculated. Actual kWh's were used for the two customers who had kWh's banked at the end of the year. The value of those kWh's at our retail rate are as follows:

4,088 kWh
5,439 kWh
9,527 kWh using Yellowstone Valley Electric Cooperative, Inc.'s rates. The retail value of those kWh's for a residential customer is: $818.96. When compared to Yellowstone Valley Electric Cooperative, Inc.'s annual revenue and annual kWh requirements. The value of this is very fractional.

Question 23: Describe how increasing a net metering cap to 100 kW, 1,000 kW, and 5,000 kW would likely impact each of the avoided cost categories in question 21.

MECA Summary Response
See answer to 21a.

Question No.23 Individual Co-op Responses

Fergus Electric Cooperative
We have 12 net metered accounts and see no advantage or disadvantage to our membership. We charge an additional $8.00/month for the net metered accounts to cover our bookkeeping costs. We are not a member of Bonneville Power so we do not receive any exchange credits.

Flathead Electric Cooperative
The cost impact would vary depending upon the amount of socialized fixed costs for each rate class and the overall avoided cost of power supply from year to year.

Glacier Electric Cooperative
Glacier Electric does keep excess kWh at the end of each fiscal year if any exist, but net metering system sizes are increasingly designed to avoid this excess generation thus benefits to Glacier Electric are not likely to increase significantly.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
Base load generation may need to increase their rates to recover its cost of generation, which would be bad for non-net metered members but make the cost of net metering more appealing to other and may start a bad cycle for those unable to afford some type of renewable generation.

Lincoln Electric Cooperative
See answer to question 16.

Park Electric Cooperative
It would make it more difficult to collect those avoided costs. There is a chance that as net meter systems are added we would need to do system improvements to accommodate changes in

capacity from the net meter locations to other areas. That has the potential of increasing our avoided cost.

Sun River Electric Cooperative
The answer to 16 is responsive.

Yellowstone Valley Electric Cooperative
Avoided costs would not increase as they did not increase for current net-metered customers. The work of the utility to regulate voltage, ensure proper sectionalizing and load balancing would increase. This would increase operational and maintenance costs for the utility, affecting the rates of all customers.

Question 24: Do the retail inverters in rooftop systems have adequate EMF (voltage) protection from induced seasonal electrical storms? Is there a risk for any level of loss of phase synchronicity?

MECA Summary Response
[Nothing to add to member-supplied information.]

Question No.24 Individual Co-op Responses

Fergus Electric Cooperative
We require that the installer of the generation system provide IEEE certified equipment for all installations. All of the installers that I have dealt with have provided this information and use IEEE rated equipment. They have asked if we require it so I am assuming that there are inverters and associated equipment available that do not meet the IEEE criteria. We require a separate disconnect between the generator inverter and our meter that provides us with a visual open before we can work on our lines. If it is not open and grounded it is not dead.

Flathead Electric Cooperative
This would vary from manufacturer to manufacturer. IEEE 1547 states that DG interconnected equipment shall have capabilities to withstand voltage and current surges as defined by IEEE C62.41.2, which is the same for standard generators, relaying equipment, and so on.
Always risk, but probably only if there was a malfunction with the inverter itself.

Glacier Electric Cooperative
Yes, adequate EMF protection is required in our net metering policy. There is not a risk of loss of phase synchronicity if requirement in our net metering policy are adhered to.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
Not sure.

Lincoln Electric Cooperative
As far as LEC knows, there is no problem. Furthermore, since net metering facilities are on the customer side of the meter, we have no way of policing the equipment.

Missoula Electric Cooperative
Inverter systems usually provide for some over voltage protection. Any time a piece of equipment is subject to a lightning strike there is potential of impacting a utility including phase synchronicity.

Park Electric Cooperative
I have no information on this.

Sun River Electric Cooperative
What is an "induced electrical storm"? If the question is, "are inverters impervious to lightning strikes?", the answer is "no." Loss of synchronicity is of no concern if the inverter fails.

Vigilante Electric Cooperative
IEEE 1547 addresses this issue as well. We do not have any data related to this.

Yellowstone Valley Electric Cooperative
No if the utility loses power, so does the rooftop system. They cannot "island". The inverter shuts off as it is powered by the utility.

Question 25: Are there national standards for the inverters established by IEEE or other such institutions?

MECA Summary Response

The IEEE standard for inverter interconnections is within IEEE 1547 and UL 1741 for inverters. See individual co-op comments below for other, related standards.

Question No.25 Individual Co-op Responses

Fergus Electric Cooperative
We require that the installer of the generation system provide IEEE certified equipment for all installations. All of the installers that I have dealt with have provided this information and use IEEE rated equipment. They have asked if we require it so I am assuming that there are inverters and associated equipment available that do not meet the IEEE criteria. We require a separate disconnect between the generator inverter and our meter that provides us with a visual open before we can work on our lines. If it is not open and grounded it is not dead.

Flathead Electric Cooperative
IEEE 1547 and UL 1741.

Glacier Electric Cooperative
Yes.

Goldenwest Electric Cooperative
Not applicable.

Hill County Electric Cooperative
IEEE 1547, UL 1741 listed.

Lincoln Electric Cooperative
LEC requires that net metering inverters are IEEE 1547, IEEE 929 and/or UL 1741 compliant.

McCone Electric Cooperative

Standards for Interconnecting Distributed Resources with Electric Power Systems

- IEEE Std 100-2000, "IEEE Standard Dictionary of Electrical and Electronic Terms"
- IEEE Std 519-1992, "IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems"

- IEEE Std 929-2000,"IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems".
- IEEE Std 1547, "IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems"
- IEEE Std C37.90.1-1989 (1995), "IEEE Standard Surge Withstand Capability (SEC) Tests for Protective Relays and Relay Systems".
- IEEE Std C37.90.2 (1995), "IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers".
- IEEE Std C62.41.2-2002, "IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits"
- IEEE Std C62.42-1992 (2002), "IEEE Recommended Practice on Surge Testing for Equipment Connected to Low Voltage (1000V and less) AC Power Circuits"
- ANSI C84.1-1995,"Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)"
- ANSI/IEEE 446-1995, "Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications".
- ANSI/IEEE Standard 142-1991, "IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems – Green Book",
- UL Std. 1741 "Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources"
- NEC – "National Electrical Code", National Fire Protection Association (NFPA), NFPA-70-2002.
- NESC – "National Electrical Safety Code". ANSI C2-2000, Published by the Institute of Electrical and Electronics Engineers, Inc.

Missoula Electric Cooperative
Underwriters Laboratories standard UL 1741 is an industry reference to inverters. IEEE 1547-2003 and amendment (a) may contain additional information.

Ravalli Electric Cooperative
IEEE has standards but not all inverters are created equal according to the installers we have dealt with.

Sun River Electric Cooperative
While not addressing inverters specifically, IEEE 1547 addresses Distributed Resource system requirements with regard to voltage regulation, synchronization, grounding, harmonics, flicker, and electromagnetic interference.

Vigilante Electric Cooperative
IEEE 1547.

Question 26. At what level of loss of synchronization is there an electrical risk (due to wire heating) or efficiency loss?

MECA Summary Response
[Nothing to add to member data.]

Question No.26 Individual Co-op Responses

Fergus Electric Cooperative
We require that the installer of the generation system provide IEEE certified equipment for all installations. All of the installers that I have dealt with have provided this information and use IEEE rated equipment. They have asked if we require it so I am assuming that there are inverters and associated equipment available that do not meet the IEEE criteria. We require a separate

disconnect between the generator inverter and our meter that provides us with a visual open before we can work on our lines. If it is not open and grounded it is not dead.

Flathead Electric Cooperative
Any level of loss is going to cause issues.

Glacier Electric Cooperative
Depends on the size of the system.

Goldenwest Electric Cooperative
Not applicable.

Lincoln Electric Cooperative
That is still to be determined.

Missoula Electric Cooperative
IEEE-1547-2003 and amendment (a), will be a good source of information on this topic.

NorVal Electric Cooperative
On large generators ± ¼ of a cycle off with cause problems.

Park Electric Cooperative
Here is some boiler plate language at FERC for a Large Generator Interconnect Agreement: If the Transmission System is designed to automatically activate a load-shed program as required by the Applicable Reliability Council in the event of an under-frequency system disturbance, then the Interconnection Customer shall implement under-frequency and over-frequency relay set points for the Large Generating Facility as required by the Applicable Reliability Council to ensure "ride through" capability of the Transmission System. Large Generating Facility response to frequency deviations of predetermined magnitudes, both under-frequency and over-frequency deviations, shall be studied and coordinated with the Transmission Provider in accordance with Good Utility Practice. The term "ride through" as used herein shall mean the ability of a Generating Facility to stay connected to and synchronized with the Transmission System during system disturbances within a range of under-frequency and over-frequency conditions, in accordance with Good Utility Practice.

Ravalli Electric Cooperative
Electrical risk would primarily be to the generator. Loss of synchronization would look like a load or fault to the utility so the generator would drop off line.
.
Sun River Electric Cooperative
Synchronization issues, at least for small systems as is the case with our 10 kW limit, are not of concern at the cooperative level. Wire heating and possible fires should be of great concern to the net meterer.

Vigilante Electric Cooperative
At small sizes this is insignificant and minimal risk.

Question 27: If an inverter's lockout fails and there is a backflip of power on a "downed" line, for what distance does a shock risk remain for linemen engaged in repairing the distribution line?

MECA Summary Response

In theory, the distance is miles. However, in practice the answer would be based on a variety of factors. These include other loads connected to the line and the size of the inverter. If there is no load on a line it does not take much power to energize it. Once power is fed backwards through the transformer the voltage would be increased in most cases to 7,200 volts. However, voltage on some distribution lines is as high as 14,400 volts to ground and 25,000 volts between the phase wires.

There may be no inverter involved if in the case of a wind generator, it is generating alternating current power. In our experience, the likelihood of power back feed is greater with units that generate three-phase power. In one case, small relays failed on three of four generators that had been interconnected in the 1980s. The result was that, with one phase de-energized and two phases energized, the generators back-fed the phase that was disconnected from the grid source, yet the back-feed from the generators onto the line energized many services for miles with 60 to 80 volts. This meant the line was energized at over 3,000 to 5,000 volts – a voltage level certainly great enough to cause a fatality had the public or line workers come in contact with the power line.

Question No.27 Individual Co-op Responses

Fergus Electric Cooperative

We require that the installer of the generation system provide IEEE certified equipment for all installations. All of the installers that I have dealt with have provided this information and use IEEE rated equipment. They have asked if we require it so I am assuming that there are inverters and associated equipment available that do not meet the IEEE criteria. We require a separate disconnect between the generator inverter and our meter that provides us with a visual open before we can work on our lines. If it is not open and grounded it is not dead.

Flathead Electric Cooperative

If the inverter lockout fails and energizes a “downed” line, the entire length of the line will be brought up to line voltage and a shock risk will exist at any distance.

Glacier Electric Cooperative

Unlimited-depending on the size of the system.

Goldenwest Electric Cooperative

Not applicable.

Hill County Electric Cooperative

Should be minimum if standard operating procedure are followed.

Lincoln Electric Cooperative

The answer to this question is difficult to quantify simply because each installation is unique. Plus the distribution feeder characteristics make each calculation different.

Before each net metering facility is placed into service, LEC performs a field test and simulates that the inverter does isolate during outage situations.

The better question should be... Are utilities using proper grounding and personal protection methods during line work? A proper grounding before work procedure would eliminate most back-feed threats.

Missoula Electric Cooperative
There is no defined distance where a lineman will be at risk and not be at risk due to back feed.

NorVal Electric Cooperative
This would have come from an expert. NorVal does not want to use their employees as test subjects.

Park Electric Cooperative
There are a lot of variables to answer this. It has happened on our system before and we had reports of low voltage over three miles from the system that malfunctioned.

Ravalli Electric Cooperative
Any downed line is a risk until it is visually isolated from all sources and grounded. Distance has nothing to do with mitigating risk. Initial risk would be to the public and responsibility of the owner of the inverter to prevent back feed.

Sun River Electric Cooperative
There are a lot of variables to consider so an absolute distance that a shock risk would be present can't be quantified with the information given. However, understand that the typical co-generation is back feeding through a transformer and is stepping the voltage up to 7200 volts. A long distribution line with few consumers on it (a very common scenario for cooperative circuits) could present a shock hazard for many miles. For those brave souls that are so certain no risk exists, I would propose that they be the first to grab the downed line.

Vigilante Electric Cooperative
It would depend on the size of the generator and the amount of load on the line. But simply energizing a line would not take a very large generator. This simply cannot be allowed as our linemen are in serious danger if this takes place. If the line is de-energized from our source the DG must go off-line without exception.

Yellowstone Valley Electric Cooperative
During an outage, with a breaker or fuse open on the utility line, the solar or wind generator will likely burn itself up trying to energize the utility's facilities. Even without the presence of a large number of customers in the area, the generator would have to over work itself to energize transformer coils and power line. There is a definite risk to lineman, but distances for safety are difficult to answer as they depend on transformer sizes, wire sizes and load sizes in the area.

Individual Co-ops' Exhibits

Flathead Electric

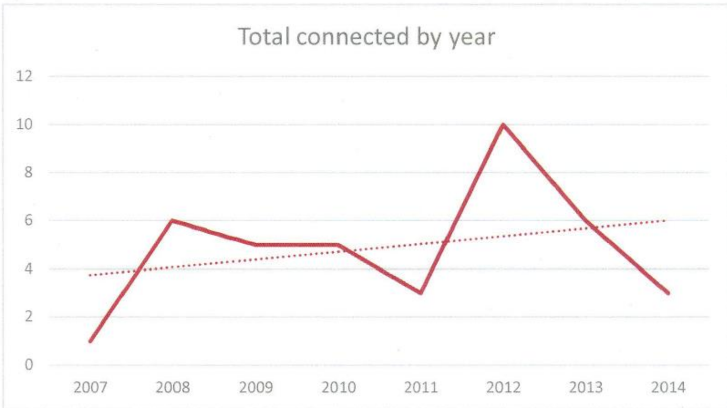
Exhibit A

Rate	system	size in kW
106	pv	3.36
106	pv	1
106	wind	2
106	pv	2.76
106	pv	6.75
106	pv	25
106	pv	2.8
106	wind	1.8
106	pv	2.7
106	pv	4
106	pv	1.5
106	pv	1.4
106	pv	9
106	pv	6
106	pv	2.5
106	pv	1.4
106	pv	2.9
106	pv	1.05
106	wind	0.35
106	pv	10
106	pv	6
106	pv	2.1
106	pv	1
106	pv	4.32
106	pv	3
106	pv	2.2
106	pv	6
106	wind	1
106	pv	4
106	pv	2.5
403	pv *	12
403	wind *	0.48
406	pv	1.75
406	pv	0.48
406	pv	14
406	pv	2.5
406	pv	6
406	pv	1
600	pv *	1.4
	Average =	4.10
	Total =	160

* metered but not billed

39 systems connected
5 wind generators
34 PV systems
36 meters/members
30 Residential members
9 General Service members

Year	# PV	# Wind	Total
2007	1		1
2008	5	1	6
2009	5		5
2010	3	2	5
2011	3		3
2012	8	2	10
2013	6		6
2014	3		3
Totals	34	5	39



Hill County Electric **Exhibit A**

Hill County 2014

		KW	CM CP Time
JAN	CP	26750	5-Jan
	Peak	26906	1830
FEB	CP	20215	6-Feb
	Peak	24620	730
MAR	CP	17449	1-Mar
	Peak	24881	1900
APR	CP	17118	4-Feb
	Peak	20724	730
MAY	CP	14075	28-May
	Peak	21850	1800
June	CP	14279	12-Jun
	Peak	19451	2200
July	CP	10477	10-Jul
	Peak	24902	1830
August	CP	22199	12-Aug
	Peak	24876	1730
September	CP	20072	25-Sep
	Peak	24907	2000
October	CP	19907	28-Oct
	Peak	24684	730
November	CP	25241	13-Nov
	Peak	28066	700
December	CP	21517	30-Dec
	Peak	28477	1930

Lincoln Electric Cooperative Exhibit 1

Customer #1

Meter 15104/129030085

Bill Period	KWH Delivered to Member	KWH Returned to LEC	Credited	Banked	In Bank	Annual True Up
Sep-08	555	85	85	0	0	
Oct-08	429	87	87	0	0	
Nov-08	630	49	49	0	0	
Dec-08	826	12	12	0	0	
Jan-09	908	5	5	0	0	
Feb-09	705	23	23	0	0	
Mar-09	770	35	35	0	0	
Apr-09	525	87	87	0	0	True Up Month
May-09	337	105	105	0	0	
Jun-09	347	229	229	0	0	
Jul-09	386	208	208	0	0	
Aug-09	328	219	219	0	0	
Sep-09	435	170	170	0	0	
Oct-09	638	107	107	0	0	
Nov-09	831	29	29	0	0	
Dec-09	1096	10	10	0	0	
Jan-10	902	6	6	0	0	
Feb-10	1031	11	11	0	0	
Mar-10	992	92	92	0	0	
Apr-10	603	80	80	0	0	True Up Month
May-10	622	113	113	0	0	
Jun-10	510	122	122	0	0	
Jul-10	433	191	191	0	0	
Aug-10	388	228	228	0	0	
Sep-10	471	146	146	0	0	
Oct-10	490	102	102	0	0	
Nov-10	589	32	32	0	0	
Dec-10	1012	10	10	0	0	
Jan-11	854	10	10	0	0	
Feb-11	901	14	14	0	0	
Mar-11	692	32	32	0	0	
Apr-11	646	81	81	0	0	True Up Month
May-11	398	136	136	0	0	
Jun-11	566	119	119	0	0	
Jul-11	618	178	178	0	0	
Aug-11	337	217	217	0	0	
Sep-11	425	221	221	0	0	
Oct-11	489	83	83	0	0	
Nov-11	553	38	38	0	0	
Dec-11	686	21	21	0	0	
Jan-12	899	18	18	0	0	
Feb-12	756	34	34	0	0	
Mar-12	714	38	38	0	0	

Marias River Electric

Exhibit A

Marias 2014

		KW	CM CP Time
JAN	CP	17187	5-Jan
	Peak	17229	1830
FEB	CP	18556	6-Feb
	Peak	18579	730
MAR	CP	17027	1-Mar
	Peak	17076	1900
APR	CP	12446	4-Feb
	Peak	12951	730
MAY	CP	9554	28-May
	Peak	11911	1800
June	CP	9562	12-Jun
	Peak	10973	2200
July	CP	12068	10-Jul
	Peak	13384	1830
August	CP	13036	12-Aug
	Peak	13377	1730
September	CP	10273	25-Sep
	Peak	11541	2000
October	CP	11329	28-Oct
	Peak	11667	730
November	CP	15530	13-Nov
	Peak	16244	700
December	CP	16086	30-Dec
	Peak	17021	1930

Missoula Electric

Exhibit A

SOLAR		Net Metered	Pre Net Metered	WIND		Net Metered	Pre Net Metered	SOLAR		Net Metered	Pre Net Metered	SOLAR		Net Metered	Pre Net Metered
Donovan		2014	N/A	Flood		2014	2008	Pratt		2014	2008	Oconnor		2014	2010
Dec-14	77012920	3,528		Dec-14	77145275	1,756		Dec-14	77578417	407		Dec-14	79579476	7,280	
Dec-14	77012920	2		Dec-14	77145275	67		Dec-14	77578417	1		Dec-14	79579476	0	
Dec-14	77012920	3,526		Dec-14	77145275	1,689	2843	Dec-14	77578417	406	1759	Dec-14	79579476	7,280	5920
Nov-14	77012920	3,350		Nov-14	77145275	1,359		Nov-14	77578417	472		Nov-14	79579476	5,760	
Nov-14	77012920	5		Nov-14	77145275	143		Nov-14	77578417	6		Nov-14	79579476	0	
Nov-14	77012920	3,345		Nov-14	77145275	1,216	1984	Nov-14	77578417	466	689	Nov-14	79579476	5,760	4320
Oct-14	77012920	2,771		Oct-14	77145275	658		Oct-14	77578417	405		Oct-14	79579476	4,800	
Oct-14	77012920	18		Oct-14	77145275	342		Oct-14	77578417	13		Oct-14	79579476	0	
Oct-14	77012920	2,753		Oct-14	77145275	316	1641	Oct-14	77578417	392	752	Oct-14	79579476	4,800	4160
Sep-14	77012920	2,580		Sep-14	77145275	471		Sep-14	77578417	377		Sep-14	79579476	4,240	
Sep-14	77012920	61		Sep-14	77145275	544		Sep-14	77578417	34		Sep-14	79579476	80	
Sep-14	77012920	2,519		Sep-14	77145275	0	1211	Sep-14	77578417	343	468	Sep-14	79579476	4,160	5120
Aug-14	77012920	2,963		Aug-14	77145275	405		Aug-14	77578417	585		Aug-14	79579476	4,000	
Aug-14	77012920	58		Aug-14	77145275	524		Aug-14	77578417	26		Aug-14	79579476	80	
Aug-14	77012920	2,905		Aug-14	77145275	0	1124	Aug-14	77578417	559	518	Aug-14	79579476	3,920	5360
Jul-14	77012920	2,551		Jul-14	77145275	417		Jul-14	77578417	391		Jul-14	79579476	4,080	
Jul-14	77012920	80		Jul-14	77145275	485		Jul-14	77578417	32		Jul-14	79579476	80	
Jul-14	77012920	2,471		Jul-14	77145275	0	969	Jul-14	77578417	359	729	Jul-14	79579476	4,000	8160
Jun-14	77012920	2,502		Jun-14	77145275	563		Jun-14	77578417	439		Jun-14	79579476	4,080	
Jun-14	77012920	97		Jun-14	77145275	564		Jun-14	77578417	37		Jun-14	79579476	80	
Jun-14	77012920	2,405		Jun-14	77145275	0	899	Jun-14	77578417	402	511	Jun-14	79579476	4,000	5760
May-14	77012920	1,949		May-14	77145275	718		May-14	77578417	359		May-14	79579476	3,600	
May-14	77012920	120		May-14	77145275	457		May-14	77578417	33		May-14	79579476	80	
May-14	77012920	1,829		May-14	77145275	261	1204	May-14	77578417	326	472	May-14	79579476	3,520	6960
Apr-14	77012920	2,361		Apr-14	77145275	1,176		Apr-14	77578417	354		Apr-14	79579476	4,640	
Apr-14	77012920	89		Apr-14	77145275	323		Apr-14	77578417	31		Apr-14	79579476	80	
Apr-14	77012920	2,272		Apr-14	77145275	853	1399	Apr-14	77578417	323	563	Apr-14	79579476	4,560	8800
Mar-14	77012920	2,652		Mar-14	77145275	1,429		Mar-14	77578417	719		Mar-14	79579476	6,240	
Mar-14	77012920	29		Mar-14	77145275	148		Mar-14	77578417	8		Mar-14	79579476	0	
Mar-14	77012920	2,623		Mar-14	77145275	1,281	1776	Mar-14	77578417	711	718	Mar-14	79579476	6,240	9680
Feb-14	77012920	3,546		Feb-14	77145275	1,834		Feb-14	77578417	794		Feb-14	79579476	6,320	
Feb-14	77012920	8		Feb-14	77145275	107		Feb-14	77578417	4		Feb-14	79579476	0	
Feb-14	77012920	3,538		Feb-14	77145275	1,727	1846	Feb-14	77578417	790	1197	Feb-14	79579476	6,320	8000
Jan-14	77012920	3,315		Jan-14	77145275	1,716		Jan-14	77578417	398		Jan-14	79579476	6,800	
Jan-14	77012920	3		Jan-14	77145275	89		Jan-14	77578417	1		Jan-14	79579476	0	
Jan-14	77012920	3,312		Jan-14	77145275	1,627	2813	Jan-14	77578417	397	819	Jan-14	79579476	6,800	8800
		34068				12502				5700				61840	
		570				3793				226				480	
		33498				8970	19709			5474	9195			61360	81040

Solar Installed New Construction - No Data

NOTE: Data not normalized for weather, comparative historical data used from same location

Missoula Electric

Exhibit B

Commercial

Axmen		Net Metered 2014	Pre Net Metered 2011
Dec-14	12196868	8,800	
Dec-14	12196868	0	
Dec-14	**12196868**	**8,800**	9080
Nov-14	12196868	7,600	
Nov-14	12196868	0	
Nov-14	**12196868**	**7,600**	9040
Oct-14	12196868	6,320	
Oct-14	12196868	0	
Oct-14	**12196868**	**6,320**	8360
Sep-14	12196868	6,880	
Sep-14	12196868	0	
Sep-14	**12196868**	**6,880**	8200
Aug-14	12196868	7,880	
Aug-14	12196868	0	
Aug-14	**12196868**	**7,880**	9440
Jul-14	12196868	7,280	
Jul-14	12196868	0	
Jul-14	**12196868**	**7,280**	8880
Jun-14	12196868	6,360	
Jun-14	12196868	0	
Jun-14	**12196868**	**6,360**	8840
May-14	12196868	6,400	
May-14	12196868	0	
May-14	**12196868**	**6,400**	8240
Apr-14	12196868	8,200	
Apr-14	12196868	0	
Apr-14	**12196868**	**8,200**	8600
Mar-14	12196868	8,760	
Mar-14	12196868	0	
Mar-14	**12196868**	**8,760**	8800
Feb-14	12196868	9,200	
Feb-14	12196868	0	
Feb-14	**12196868**	**9,200**	8000
Jan-14	12196868	8,280	
Jan-14	12196868	0	
Jan-14	**12196868**	**8,280**	8520
		91960	104000

Exhibit A

Norval 2014	Fixed Annual	Variable Annual
Residential	$734,040	$3,151,282
Seasonal	$370,440	$644,813
Irrigation	$46,956	$184,543
Comm and Ind. 1000 KVA or less	$54,505	$1,743,515
Comm and Ind. Over 1000 KVA	$2,544	$521,983
Public Street and Highway Lighting	$2,880	$96,475
Schools	$3,240	$93,468
Total	$1,214,605	$6,436,079

NorVal Electric

Exhibit B

NorVal 2014

		KW	CM CP Time
JAN	CP	12,608	5-Jan
	Peak	12,142	1830
FEB	CP	11,672	6-Feb
	Peak	12,142	730
MAR	CP	10,874	1-Mar
	Peak	11,544	1900
APR	CP	8,809	4-Feb
	Peak	9,618	730
MAY	CP	6,672	28-May
	Peak	8,518	1800
June	CP	6,663	12-Jun
	Peak	8,207	2200
July	CP	8,483	10-Jul
	Peak	10,676	1830
August	CP	8,945	12-Aug
	Peak	10,699	1730
September	CP	7,262	25-Sep
	Peak	8,148	2000
October	CP	7,188	28-Oct
	Peak	8,287	730
November	CP	9,989	13-Nov
	Peak	11,751	700
December	CP	10,861	30-Dec
	Peak	11,759	1930
Total Annual	CP	110,026	
Total Annual	Peak	123,491	

Sun River Electric Exhibit A

Sun River Electric Co-Gen Accounts - 2014 (Exhibit A)

	Name	Type	Equip. Size	XF Size	Acc. #	Meter #	Loc. #	Pole #	DECEMBER Rec. kwh	DECEMBER KW Draw	DECEMBER Pur. Kwh	July Rec. kwh	July KW Draw	July Pur. Kwh
1		Wind	10	10 KVA		76886499	08-14450	H8-35-L1	0	6.23	828	2	NR	897
2		Wind/ Solar	10	10 KVA		78234185	03-10160	R2-D142	1133	11.63	1414	682	NR	1324
3		Wind	2.5	15 KVA		78234274	07-08600	G6-D16	8	21.12	4260	15	NR	1437
4		Solar	2.1	10 KVA		109477501	13-38050	YF-52-L3-R1	73	6.63	723	475	NR	429
4		Wind	2.4	10 KVA		109477951	04-01050	D4-A18-L3	62	5.97	1352	102	NR	241
6		Wind	2.5	10 KVA		109478498	13-16860	Y1-18-R2	39	23.54	3216	21	NR	822
7		Wind	10	10 KVA		108956409	09-11930	R1-A94-L11-L8	15	12.35	2700	36	NR	862
8		Wind	2.4	10 KVA		78233906	06-08050	F7-B31-R30	0	13.79	2004	11	NR	982
9		Wind	2.5	15 KVA		76325544	15-10800	P2-140-L4	40	9.6	1360	60	10	540
10		Solar	3.6	10 KVA		76349337	01-42450	CT-46	16	9.63	2000	264	NR	535
11		Solar	4.5	10 KVA		109236985	13-05350	DD-3-R1	0	11.4	2540	420	NR	740
12		Wind/ Solar	6.4	10 KVA		109477984	13-01250	D- 87- R4	177	19.48	2479	702	NR	998
TOTAL			58.9						1563	151.37	24876	2790	10	9807
									130.25	12.61417	2073	232.5	NR	817.25

Sun River Electric Exhibit B

Monthly Comparison of Co-Gen Members

Member #		1	2	3	4	5	6	7	8	9	10	11	12	TOTALS	DC
Jan.	Purchased	705	1215	3391	740	1518	3348	2211	1813	1040	2388	1960	2040	22369	
	Generated	0	2095	40	128	58	125	117	10	220	25	60	366	3244	3000
	Net	705	-880	3351	612	1460	3223	2094	1803	820	2363	1900	1674	19125	
Feb.	Purchased	899	1455	4870	635	2362	3391	3009	1777	1420	2146	2360	2835	27159	
	Generated	0	1369	4	168	32	76	51	26	160	38	20	236	2180	1675
	Net	899	86	4866	467	2330	3315	2958	1751	1260	2108	2340	2599	24979	
Mar.	Purchased	773	1365	4037	732	1842	2864	2229	1753	1400	2167	2040	2427	23629	
	Generated	0	1572	6	188	70	110	103	16	120	44	120	276	2625	4575
	Net	773	-207	4031	544	1772	2754	2126	1737	1280	2123	1920	2151	21004	
Apr.	Purchased	655	931	1958	508	643	2243	1142	1026	600	1340	1840	1458	14344	
	Generated	800	1756	85	371	204	75	178	66	140	140	260	615	4690	8750
	Net	-145	-825	1873	137	439	2168	964	960	460	1200	1580	843	9654	
May	Purchased	1137	1273	1483	479	723	1537	931	984	680	986	1180	1288	12681	
	Generated	950	373	28	448	95	20	72	17	60	195	480	501	3239	9850
	Net	187	900	1455	31	628	1517	859	967	620	791	700	787	9442	
June	Purchased	959	886	1198	400	206	1207	705	953	480	430	920	1048	9392	
	Generated	139	776	39	426	238	10	101	25	60	240	100	468	2622	8650
	Net	820	110	1159	-26	-32	1197	604	928	420	190	820	580	6770	
July	Purchased	897	1324	1437	429	241	822	862	982	540	535	740	998	9807	
	Generated	2	682	15	475	102	21	36	11	60	264	420	702	2790	10450
	Net	895	642	1422	-46	139	801	826	971	480	271	320	296	7017	
Aug.	Purchased	965	896	1489	454	288	1019	718	1099	460	586	760	1069	9803	
	Generated	0	537	18	397	106	7	47	1	60	234	560	569	2536	9125
	Net	965	359	1471	57	182	1012	671	1098	400	352	200	500	7267	
Sept.	Purchased	900	500	1402	471	322	1307	798	969	540	629	1920	1129	10887	
	Generated	114	607	29	356	78	22	78	0	60	288	160	610	2402	8400
	Net	786	-107	1373	115	244	1285	720	969	480	341	1760	519	8485	
Oct.	Purchased	562	840	1118	540	237	1591	741	937	500	532	1280	1242	10120	
	Generated	852	1703	98	289	264	112	185	0	140	286	240	678	4847	7925
	Net	-290	-863	1020	251	-27	1479	556	937	360	246	1040	564	5273	
Nov.	Purchased	864	1286	2666	697	872	2708	2109	1783	960	1519	2380	2621	20465	
	Generated	0	1508	97	162	208	106	122	0	140	73	60	323	2799	3375
	Net	864	-222	2569	535	664	2602	1987	1783	820	1446	2320	2298	17666	
Dec.	Purchased	828	1414	4260	723	1352	3216	2700	2004	1360	2000	2540	2479	24876	
	Generated	0	1133	8	73	62	39	15	0	80	16	0	177	1603	2400
	Net	828	281	4252	650	1290	3177	2685	2004	1280	1984	2540	2302	23273	
Total	**Purchased**	10144	13385	29309	6808	10606	25253	18155	16080	9980	15258	19920	20634	195532	78175
Avg.		845.3333	1115.417	2442.417	567.3333	883.8333	2104.417	1512.917	1340	831.6667	1271.5	1660	1719.5	16294.33	
Total	**Generated**	2857	14111	467	3481	1517	723	1105	172	1300	1843	2480	5521	35577	**0.18195**
Avg.		238.0833	1175.917	38.91667	290.0833	126.4167	60.25	92.08333	14.33333	108.3333	153.5833	206.6667	460.0833	2964.75	
Total	**Net**	7287	-726	28842	3327	9089	24530	17050	15908	8680	13415	17440	15113	159955	**0.81805**
Avg.		**607.25**	**-60.5**	**2403.5**	**277.25**	**757.4167**	**2044.167**	**1420.833**	**1325.667**	**723.3333**	**1117.917**	**1453.333**	**1259.417**	13329.58	
% SREC Avg.		0.626893	-0.06246	2.481246	0.286218	0.781917	2.110289	1.466793	1.368548	0.746731	1.154078	1.500344	1.300155		

Average SREC Member Usage

Jan.	1223
Feb.	1325
Mar.	1219
Apr.	881
May	754
June	682
July	792
Aug.	842
Sept.	754
Oct.	788
Nov.	1116
Dec.	1248
TOTAL	11624
Avg.	968.66667

		% Comp
Total Generation from Co-Gen Accounts	113752	
Total kwh's SREC Sold	85404642	0.001332
Total kwh's sold for Residential	44971029	0.002529