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Energy and Telecommunications Interim Committee (ETIC)
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Ms. Nowakowski,

Please consider the following ideas while studying the issues regarding possible legislation affecting net-metering regulations in Montana.

We very much appreciate the option we had to install rooftop solar panels on our garage to generate electricity. Without that option our only choice would be to buy all our electricity from NorthWestern Energy (NWE). That is not a bad alternative, but NWE should not be the only choice. Using rooftop solar is interesting, and in the long run will be financially advantageous for us. Net-metered rooftop solar is also advantageous for all NWE customers – even the majority who do not have rooftop solar.

We get an important service from NWE. Our solar system is intertied with the NWE grid so we can "bank" excess kWh credits for later use when we need them. We certainly want to pay appropriately for this important service.

However we also provide important service to NWE with our rooftop solar system (and thereby to NWE's other electric customers). NWE should pay us appropriately for that service.

The questions are: **Considering all the costs and benefits to us, and to NWE, who should pay who? And what fee, if any, is appropriate?**

ANY NWE customer (not just those with rooftop solar) may choose to be more frugal in their use of electricity. They may do this by purchasing a more efficient refrigerator or other appliances. They may choose a gas stove rather than an electric one. They may purchase CFL or LED lights, or simply turn off lights when not needed. Etc. There is not, and should not be, any fee (or penalty) charged to ANY NWE customer for taking such actions to reduce their electricity use and cost.

Much of the electricity we use is generated by our solar panels and never touches the NWE grid. It is used as it is generated. In fact NWE has no way to even measure this use. It looks to the NWE system identical to the lower use by ANY frugal customer. There is not, and should not be, any fee (or penalty) charged for our private solar electricity which is invisible to NWE because it never touches the grid.

The services and mutual benefits we net-metering customers exchange with NWE occur when we generate electricity faster or slower than we use it. It is only this difference that matters to NWE. When we are generating excess electricity (e.g. daytime and summer), NWE immediately sells that excess to our neighbors at their standard rate – and credits us for that excess. When we are using more electricity than we are generating (e.g. night and winter) NWE provides the difference until we run out of credits. Then they charge us at their standard rate.

Obviously this kWh credit banking is a significant benefit to us. But it is also a benefit to NWE and all NWE's customers. Our excess electricity sold by NWE to our neighbors does not involve transmission costs on the grid from distant power plants. And this excess is often during times (daytime and summer) when electricity demand is highest and thus the NWE's cost per kWh for electricity is greatest. Much of the electricity we "buy" with credits from NWE is during times (night and winter) when demand is lower and thus NWE's cost per kWh for electricity is less.[1] Thus we provide higher valued electricity to NWE and in exchange receive lower valued electricity from NWE at a later time. This is a good deal for NWE and all NWE customers. And we provide the electricity where it is needed with no transmission costs to NWE.

Many studies[2] have shown that benefits to power companies of net-metering are greater than the costs. This net benefit to power companies is passed on to their customers. Note a typical conclusion in the Mississippi study (page 49):

> *"From a Total Resource Cost perspective, solar net metered projects have the potential to provide a net benefit to Mississippi in nearly every scenario and sensitivity analyzed. These benefits will only be realized if customers invest in distributed generation resources. This may never happen if net metering participants are not expected to receive a reasonable rate of return on investment."*

The ETIC should either accept the results of these studies, or contract for a similar Montana study. That might be just be reinventing the wheel. But NWE dogmatically refuses to acknowledge any "tangible benefits" from net-metered systems as reported in many independent studies. (See "Northwestern Energy's Responses to ETIC Net Metering Questions"). NWE's analysis of the issue should not be considered credible unless supported by an independent Montana study of the issue. Such a study must be carried out by qualified independent economists and electrical engineers. They should have experience in both traditional and renewable power generation and delivery systems so they can sort out the valid and invalid claims about solar power made by NWE. As a retired physics professor (dw) I noticed many questionable assertions about solar power and the grid by NWE in its response to ETIC questions.

Note that net-metering customers are already paying NWE for grid intertie service. Like all NWE customers we pay the standard base fee of $5.25 per month regardless of how many kWh we use. In addition in any year that we get more kWh from NWE than we "bank," we pay the standard charge for those additional kWh including the embedded costs of the grid. In any year that we "bank" more kWh than we later use, we must "gift" those excess credits to NWE for free. NWE has already sold those excess kWh to our neighbors – often during high value times and without transmission costs. In our case that "gift" to NWE has been 10% to 20% of the total electricity we generated and used for the year.

In summary, we have no objection to paying appropriately for the grid intertie service we get from NWE. But both costs and benefits to NWE must be analyzed. Based on the above discussion and previous studies it appears that we are already be paying more than enough for that service.

Our choice to purchase a rooftop solar system from a Montana business has helped us and all NWE customers. And it has made a small difference in reducing CO_2 emissions. This choice should be available to more Montana homeowners without a punitive fee.

Sincerely,

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P.S. Also see enclosed Addendum.

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[1] NWE doesn't have time-of-use (TOU) pricing for residential customers like MDU and many other power companies do. But the cost per kWh to NWE still varies by time of use. MDU's TOU pricing is higher in summer and daytime.

[2] For example:
Nevada: http://www.renewableenergyworld.com/articles/2014/07/nevada-net-metering-will-save-the-grid-36-million-says-state-report.html
Mississippi: http://www.synapse-energy.com/project/mississippi-net-metering-study
http://www.synapse-energy.com/sites/default/files/Net%20Metering%20in%20Mississippi.pdf
http://votesolar.org/2014/10/01/study-net-metering-would-help-keep-rates-low-in-mississippi/
Vermont: http://buyersguide.renewableenergyworld.com/allearth-renewables/blog/new-state-study-demonstrates-benefit-to-ratepayers-of-net-metering.html
http://publicservice.vermont.gov/sites/psd/files/Topics/Renewable_Energy/Net_Metering/Act%20125%20Study%2020130115%20Final.pdf

Warning: Thinking in terms of averages can be seriously misleading:
A "small" fee for an "average" person may be large and punitive for others.

The average adult NWE customer is about 5' 7" tall (67"). Almost all adults are within 10% of that height. i.e. between 5' and 6' 2". Outliers are rare and not far from this narrow range. Therefore chairs and other furniture built for the "average" adult are satisfactory for nearly all adults. All "typical" people are close in height to an "average" person.

The average NWE customer reportedly uses about 800 kWh per month. At current rates this costs nearly $100 per month. But the range is huge. Things appropriate and true for the "average" electricity consumer are NOT valid for the whole range of consumers. Most "typical" NWE customers are NOT similar to the hypothetical "average" customer. (It is analogous to having typical people range from 2 feet to 12 feet tall but only providing chairs sized for "average" people 6 feet tall.)

Many NWE customers use far less electricity than the "average" kWh per month - sometimes only a third or less of the "average".[1] For the "average" to be 800 kWh per month there must be numerous NWE customers using much more than the average – perhaps 2,000 kWh per month. This may be due to special circumstances or grossly wasteful consumption.

We don't have statistics[2] but it is a very plausible hypothesis that typical solar net-metering NWE customers are on the low end of the range of total electric use, that is they are among the many customers who are below "average." (By "total electric use" we mean their entire electric consumption whether or not some of it generated by solar panels, not just the electricity purchased from NWE.)

One foot high walls are not significant obstacles for an average 6 foot tall person or even for a short, 5 foot tall person. But they would be considerable obstacles for 2 foot tall people. Similarly a monthly $15 (for example) special fee for solar net-metering would not be a big reach for an "average" NWE customer using 800 kWh per month and paying $100 per month. But $15 monthly solar net-metering fees (penalties) would be a considerable obstacle for customers whose total electricity use is worth only about $30 per month.[1] Such a fee would economically stifle the opportunity for people to install their own rooftop solar systems.

Any special net-metering fee must be justified by a detailed analysis of actual costs and benefits to NWE for providing the grid intertie to the customer. There are good studies that show such a fee is NOT justified. Furthermore any such fee must not be punitive. Using numbers for "average" NWE customers would be very misleading.

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[1] Our (*dw & sn)* electric use for the two years before we installed rooftop solar in 2013 was a little under 200 kWh per month, about $25/month at current rates. Our electric use since installing rooftop solar has been about 250 KWH per month including charging our new plug-in hybrid car, about $33/month at current NWE rates.

[2] The Net-metering Committee should obtain appropriate statistics regarding the distribution of electric use by net-metered customers. Knowing the average is not sufficient.

a. NWE says in their response to ETIC questions (page 20) that solar net metering systems are predominantly installed by higher income households. This was certainly true in the past when solar was much more expensive. But it is probably less true now, and will be even less true in the future since the cost of solar has decreased considerably.
b. NWE then says that higher income households use more electricity. This is also presumably true on average.

But it may still be true that typical solar net metering households are on the low side of average for electricity use. Likely those high income households that install solar are also more concerned about their carbon footprint and use less than the average for high income households. That is they are not "average" high income households. Also people often increase their energy efficiency before, or at the same time as they install solar.

Northwestern Energy assumes everyone is average in erroneously demonstrating "cost shifting" by net metering.

In NWE's "Northwestern Energy's Responses to ETIC Net Metering Questions" (pages 4-8) they assume everyone is average and hope to lead the ETIC to reach unwarranted conclusions about "cost shifting."

Case 1:
In the section "Cost Shifting Illustrated in More Detail ..." NWE describes a model community and assumes in "Case 1: Base Case" a community of 25 residences and small businesses in which "each customer will use 750 KWH of electricity per month." From this NWE computes the total electricity need per day and the fixed cost of building an appropriate hydro electric power system to provide it. (In this model all costs are fixed costs.) Then since in this fantasy world everyone is "average," each customer uses the same 750 KWH per month and pays the same monthly bill. This apparently models NWE's ideal world.

But this unrealistic case is not "similar to "NorthWestern's system" as they claim. If it were, individual customer use would range from 200 kWh per month to 2,000 kWh per month. So the high use customers would pay ten times the monthly bill as the low use customers. NWE would consider this unfair "cost shifting." They apparently think all the customers should pay the same regardless of electricity usage since all the costs (in this model) are fixed costs.

Obviously this doesn't make sense either in this simple model or in NWE's real world. It was the high use, 2,000 kWh per month, customers who raised the "average" to 750 kWh and therefore required a much larger generator, with higher fixed cost, than would have been needed if all customers used only 200 kWh per month. So the high use customers *should* pay more of the fixed costs. If all customers paid an equal share of the fixed costs, that would be unfairly cost shifting from the high users to the low users. (Without the low use customers lowering the average, the total use would have been significantly higher; a larger generator would have been needed with a higher fixed cost.)

Case 2:
Now consider NWE's "Case 2: Net Metering Introduced." NWE assumes two members[1] of the community install PV systems with net metering and reduce their electricity usage from the "average" 750 kWh per month to 75 kWh per month. NWE claims this sky-is-falling scenario leads to either bankruptcy or unfairly and increasingly shifting costs to other customers as more and more people install PV and net metering.

It is instructive to consider a slight change to NWE's Case 2 scenario. No one installs PV with net metering. Instead three community members reduce their use from 750 kWh to 300 kWh by energy efficiency changes.[2] This probably would be much cheaper to do than installing PV. The utility would "lose" exactly the same revenue in this scenario as in NWE's version in which two community members install PV with net metering. (Alternatively a single community member seeing the light and reducing use from 2,000 KWH per month to 650 KWH per month would have the same effect.)

This modified Case 2 would not require a single number, calculation or word to be changed from NWE's discussion of Case 2. Clearly the supposed "cost shifting" issue has nothing to do with PV and net metering. Apparently NWE considers it unfair for people to be more frugal and use less electricity. (NWE's Case 3 can be modified the same way with the same conclusion.)

Cost shifting by net metering is a bogus claim by NWE. NWE's claim of "cost shifting" is even less credible since they do not admit ANY benefit to NWE (and non net metering customers) of net metering. Their denial is completely in conflict with the many detailed studies done around the country showing just such benefits.

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[1] Note that two out of 25 is 8% of the community. This is far higher (20x) than the percentage of NWE customers currently using rooftop solar and net metering (about 1/3 %).
[2] In the real NWE world this would have already been true. See case 1 above. Our (*dw & sn*) actual use from NWE was under 200 kWh per month.