

April 6th, 2018

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
Saint Paul, MN 55101

RE: Comments on Value of Solar Adders Analyses, Community Solar Gardens Program (Docket No. M-13-867)

Dear Mr. Wolf,

Assistant Professor Gabriel Chan, Center for Science, Technology, and Environmental Policy and the Humphrey School of Public Affairs, University of Minnesota, hereby provides comments regarding PUC Docket No. M-13-837, which involve a potential residential tariff adder to the Value of Solar for Xcel Energy's Solar*Rewards Community program. These comments are in reference to the notice published February 14, 2018. Isaac Evans and Matthew Grimley, Graduate Research Assistants of the Center for Science, Technology, and Environmental Policy, University of Minnesota, join as co-signers of these comments.

Background

In its February 1, 2018 filing regarding a declining \$0.025/kWh adder to the Value of Solar in the Solar*Rewards Community program, Xcel Energy concluded that “the costs to implement an incentive framework are not supported by this record”. Xcel’s filing includes calculations of the total and per-subscriber costs of a residential adder under several different scenarios¹. Based on this analysis, Xcel noted its support for “non-incentive tools,” highlighting as an alternative, a per-project 5% residential carve-out.

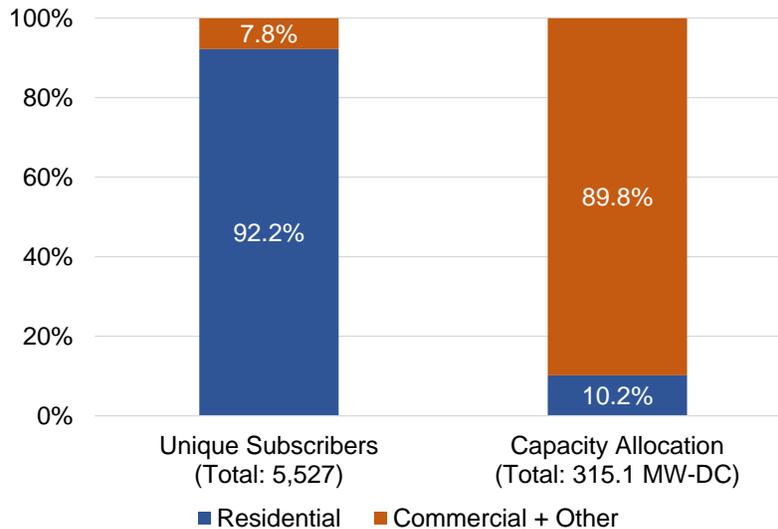
Through our comments, we want to provide insight to the Commission about the implications of a residential adder and a carve-out. This insight is gleaned from our research into community solar programs across the country, where different states have experimented with adders, carve-outs, and other mechanisms intended to increase access to community solar.

We stress the initial intent of Xcel’s Solar*Rewards Community program to facilitate residential access. Two memorandums submitted on January 29th and August 14th of 2015 by MN Senator John Marty stressed that the program was intended “to allow more people of all economic means to participate in the growing solar

¹ We note that Table 6 in Xcel’s filing is not calculated correctly and appears identical to Table 5. As an addendum, we have reverse-engineered the calculations that should appear in Table 6.

economy even if they did not own their own homes or could not install solar on their housing.”² Through February 2018, however, residential customers were only subscribed to 10.2% of overall project capacity in Xcel’s program (see Figure 1)³.

Figure 1. Residential and Non-Residential Subscriptions by Unique Subscribers and Capacity



Data source: Monthly Compliance Report for Xcel’s Solar*Rewards Community (March 9, 2018)⁴

We find it pertinent to highlight that the Applicable Retail Rate (ARR) did provide an additional incentive to developers to engage residential subscribers in the form of an approximate 3 cents/kWh adder⁵. The ARR’s residential adder created an incentive to pursue some residential subscriptions, despite the additional soft costs incurred from residential customer acquisition and management. Without a residential adder, there will be little reason to expect that projects under the VOS will achieve a higher residential subscription rate than was realized under the ARR (note all subscriptions in Figure 1 fall under the ARR).

Colorado’s Experience with a Low-Income Residential Carve-Out

To provide insight into the anticipated outcomes of a residential carve-out, we would like to highlight the experience of Colorado’s community solar program (as Xcel’s filing also highlights)⁶. In particular, we would like to draw attention to the evaluation requested by the Colorado Energy Office (CEO) and

² Document ID: [20158-113265-02](#), M-13-867, August 17th, 2015; Document ID: [20158-113265-01](#), M-13-867, August 17th, 2015

³ Document ID: [20183-140921-01](#), M-13-867, March 9th, 2018

⁴ Document ID: [20183-140921-01](#), M-13-867, March 9th, 2018

⁵ In the 2018 ARR, the residential service credit was 3.024 cents/kWh greater than the credit a general service customer would have received for the same garden. Document ID: [20183-141563-01](#), M-13-867, March 30, 2018.

⁶ Other states with community solar programs have also implemented carve-outs, and in many of these programs, a carve-out is paired with a financial incentive to attract participation, particularly for low-income access. See [Low Income Solar’s database of state approaches](#).

conducted by Lotus Engineering & Sustainability on how the Colorado’s low-income carve-out worked in practice, *Analysis of the Fulfillment of the Low-Income Carve-Out for Community Solar Subscriber Organizations*⁷.

In Colorado’s program, developers must comply with a 5% low-income carve-out under the state’s community solar program. It is important to note that a low-income carve-out could function differently from a more general residential carve-out, but from this and other research, it is possible to conclude that carve-outs do not solve or mitigate the barriers associated with acquiring residential subscribers beyond the size of the carve-out. Evidence from community solar programs across the country shows it costs more to engage residential customers than commercial customers, and it is more difficult to engage low-income residents than wealthier residents through traditional outreach strategies⁸. The Colorado experience suggests that without a financial incentive to mitigate soft costs, developers will fill subscriptions with qualifying subscribers up to the level of the carve-out and no further.

In regards to Colorado’s low-income carve-out, the Lotus Engineering & Sustainability study found that community solar developers, despite meeting the requirement, were essentially donating the costs of the carve-out subscriptions to qualifying subscribers. This resulted in developers either taking on the losses associated with unsellable subscription contracts, transferring costs to other participating subscribers, or seeking out even larger subscribers for the 95% of capacity outside of the carveout, thereby circumventing the original intent of the legislation.

“Free subscriptions discourage developers from exceeding the low-income carve-out, thus creating an artificial cap. There is only one instance in [Colorado] where the 5% requirement has been exceeded... And to recoup the costs of the solar panels that were given away for free, developers increase costs to their non-low-income subscribers.” (Lotus Engineering & Sustainability, p. 19)

Additional Considerations to Inform a Decision

Xcel Energy’s calculations of the anticipated aggregate and per-subscriber costs in their February 1, 2018 submission provide a limited window into the impacts of the proposed adder. Here, we suggest a number of additional considerations that we recommend the Commission consider.

1. What are the per-customer bill impacts of the proposed residential adder?

The PUC has asked whether Xcel’s analysis provides “a reasonable analysis of the potential incremental bill impacts.” However, Xcel’s analysis only calculates total costs and costs per subscriber, not the more relevant figure, the cost per non-subscriber (sometimes referred to as “cross-subsidization”).

⁷ Lotus Engineering & Sustainability. November 2015. [Analysis of the Fulfillment of the Low-Income Carve-Out for Community Solar Subscriber Organizations](#).

⁸ Interstate Renewable Energy Council. 2016. [Shared Renewable Energy for Low-to Moderate-Income Consumers: Policy Guidelines and Model Provisions](#).

Xcel Energy serves 1.23 million customers in Minnesota. As one example, Xcel has calculated the total costs of a 2.5 cent/kWh residential adder with 5% residential participation across 150 MW of projects (the highest-cost scenario in Xcel's filing, which would represent a ~50% increase in the program in the first year). In this scenario, Excel estimates total system costs would be \$279,790 per year for 25 years, or \$3.5 million in present value. If these costs were spread equally among all of Xcel's Minnesota customers, the average customer would see an increase in their fuel clause of \$0.23 per year, or \$2.89 over the 25-year lifetime of the project in present value.

2. *What are the implications of a carve-out, adder, or both for the overall size of the community solar program?*

Pursuing only a carve-out would likely have direct implications for the total capacity installed in the Solar*Rewards Community program. A carve-out would mandate certain levels of residential participation without additional cost mitigation incentives to account for the soft-costs of residential customer engagement. If a potential Minnesota residential carve-out follows the experience of Colorado's low-income carve-out, the financability of all community solar projects in Minnesota may significantly decline.

If developers are not able to fulfill the carve-out profitably, they may opt to not build projects, threatening future growth of the Solar*Rewards Community program, which has already suffered significant policy volatility. A destabilized community solar program could also erode the significant progress Minnesota has made in the last 1-2 years in creating a stable environment for solar investment (Minnesota had the second-highest rate of solar job growth in 2017⁹ when community solar contributed over 50% of new solar capacity¹⁰). An adder, however, makes a community solar project with a given level of residential participation more financeable and may result in more projects being developed overall.

We also would like to highlight that adders and carve-outs are not mutually exclusive and not the only options available for incentivizing residential and low-income participation.

3. *What are the benefits of residential participation in the Solar*Rewards Community program?*

Xcel's February 1, 2018 analysis does not provide an assessment of the benefits of residential participation in the Solar*Rewards Community program. This is reasonable given that many of the benefits of residential participation may be hard to quantify (e.g. civic engagement, reduced energy burden, more equitable distribution of economic benefits). It is standard economic practice in the absence of identified but unquantifiable benefits to conduct cost-effectiveness analysis to assess the least-cost option for achieving a particular goal. In this context, we would recommend that Xcel Energy assess the projected costs of achieving different scenarios of residential participation levels *and* overall program size. For example, what is the most cost-effective means for achieving a community solar program that is 500 MW, 750 MW, 1000 MW with at least 5%, 10%, 15%, 20%, and 25% residential participation? What would total and per-

⁹ The Solar Foundation. 2017. [National Solar Jobs Census 2017](#).

¹⁰ Minnesota Department of Commerce. January 24, 2018. "[2017 was another sunny year for solar energy in Minnesota.](#)"

customer costs be of achieving these goals with a residential adder, carve-out, or another more innovative approach?

We appreciate this opportunity to comment on the accessibility of Xcel Energy's community solar garden program, the largest community solar program in the country. Broadening access to energy efficiency and renewable energy programs, as many commentators have noted, oftentimes raises complex questions about fairness, both to participating and non-participating customers. These complexities are critical to grapple with, particularly in the design of creative new programs like Xcel's Solar*Rewards Community program. Such programs have the potential to bring access to solar to customers who have been historically excluded from clean energy options. We hope to continue the conversation about how to ensure fairness in the transition and operation of our energy system and would welcome further opportunities to engage in the Commission's critical deliberations.

If you have any questions regarding the information provided in this filing, please contact me at 612-626-3292 or gabechan@umn.edu.

Sincerely,



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Addendum

Correction to Table 6: Present Value of Residential Adder Compensation per Subscriber

	350	500	650	800	1100
2.5 (2018)	\$1,263	\$1,805	\$2,346	\$2,887	\$3,970
Res. Adder Cents/kWh 1.5 (2019)	\$758	\$1,083	\$1,408	\$1,732	\$2,382
0.5 (2020+)	\$253	\$361	\$469	\$577	\$794

* Assuming an 18% capacity factor and a discount rate of 6.18% (calibrated to the one data point provided: 2.5 cents/kWh adder associated with \$2,346)