



April 6, 2018
Via Electronic Filing

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

RE: Comments of Cooperative Energy Futures Regarding Xcel Energy's Analysis of Impact of a Residential Adder, Proposed Carve-Out Model, and Need for Commission Action
Docket No. E002/M-13-867

Dear Mr. Wolf:

Cooperative Energy Futures (CEF) is a member-owned community energy cooperative developing and operating residentially-focused community solar gardens through the Xcel Energy Solar* Rewards Community program. CEF is now in the construction cycle of 8 community solar gardens under the Applicable Retail Rate (ARR) bill credit structure totaling 6.7MW (DC), including 4 urban rooftop/parking canopy projects and 4 rural ground-mount projects. Each of CEF's 8 community solar gardens are at least 60% residential, with most greater than 85% residentially subscribed. Other CEF subscribers are General Service back-up subscribers, mostly local municipalities, community institutions, or places of worship; and a number of small businesses that are Small General Service meters. CEF expects a total residential subscription base of 600-700 residents once all of these gardens are filled, and is currently over halfway towards this goal. CEF partners closely with affordable housing groups and community organizations anchored in low-income communities and communities of color, and prioritizes serving low-income subscribers. Based on a partnership with the United States Department of Energy Solar In Your Community Challenge, CEF has a target of achieving 50% of our subscriptions by volume of garden capacity on 6 of our 8 community solar gardens being subscribed by low-income individuals.

CEF's cooperative model puts residential subscribers first and foremost with user-friendly termination provisions and a subscription pricing model that, over the life of the subscription, results in a discount on energy service in excess of 22%. We include a 50% minority hiring requirement in our contracts with installers, and ensure long-term member benefit through cooperative ownership that returns long-run project profits to subscribers.

The switch from ARR to VOS has significantly impacted CEF's ability to continue operating our model, and without a Residential Adder as proposed by the Department of Commerce or amended as recommended below, we do not anticipate being able to continue developing residential and low-income accessible community solar gardens. The only types of residential



projects that might fit under VOS without a Residential Adder - and even then financeability is in question - are the most cost-effective 1MW ground-mount sites in areas with low-cost Interconnections. These types of sites are an increasingly scarce resource and one that reflects the type of development that Xcel Energy, the Commission, and CEF itself has identified as least desirable (as compared to near-load, urban systems used by residents in the immediate vicinity). In considering the ratepayer impact of the Department of Commerce's proposed Residential Adder and a 5% solar carve out, we urge the Commission to consider both:

1. The legislative direction that an approved community solar garden program reasonably allow for the financeability of community solar gardens and their accessibility to a wide range of customer classes.
2. The impact of its decision on community-based, low-income accessible residential community solar gardens, like those that Cooperative Energy Futures develops, that are only just starting to come to fruition under the ARR framework.

Cooperative Energy Futures appreciates this opportunity to present our feedback on the three topics of public comment requested by the Commission.

1. Did Xcel provide reasonable analysis of the potential incremental bill impacts of various levels of residential solar garden penetration under the Department of Commerce's proposal for a Residential adder?

Xcel Energy has generally presented a reasonable analysis of the potential incremental bill impacts of the Department of Commerce's proposed residential adder based on the various volumes of residential participation that they modelled. To make the ratepayer impact analysis calculable, we must assume that the Department of Commerce's proposed residential bill credit represents a net cost to the ratepayers. CEF does not believe that the Value of Solar process has thoroughly identified and captured all the components of value that solar provides to ratepayers (including sorting out the locational value question deferred to 2019 in the Commission's latest ruling adopting the 2018 Value of Solar as well as other social and economic benefits solar provides that were left out of the original Value of Solar methodology). Therefore, CEF does not believe that the full value of the proposed Residential Bill Credit adder represents a net cost to ratepayers. However, given that these items will be evaluated in future processes, we understand that for the purposes of determining whether Xcel Energy's analysis is reasonable, it is fair to start from the assumption that the value of the Residential Bill Credit adder proposed by the Department of Commerce represents in full a cost to the ratepayers.

The calculation involved once we adopt this assumption is simple and non-controversial: once a volume of community solar developed at an assumed 5% residential participation rate (as modelled in Tables 1 and 2 of Xcel's analysis or an assumed 100% residential participation rate (as modelled in Tables 3 and 4) has been established as a modelling scenario, one must simply multiply the resulting number of MW of residential participation by a factor of the number of kWh produced per year per MW installed and multiply that by the value of the residential adder for that year of the Department of Commerce's proposal.



The only factor in this calculation that is not set either by the definition of the scenario Xcel modelled or by the Department of Commerce's proposal is the production efficiency (the number of kWh generated per year per amount of solar. Xcel has calculated this based on an 18% capacity factor, which is equivalent to a 1MW (AC)/ 1.25MW (DC) system that produces 1,261.4kWh in year 1/ kW(DC) installed with roughly a 0.5% annual degradation in solar production. Solar PV production can easily range between 1100 kWh/kW(DC)/yr and 1350 kWh/kW(DC)/yr (some projects achieve even higher or even lower production), and different developers may use different DC/AC ratios to optimize efficiency and cost-effectiveness, so while Xcel Energy's assumption is not necessarily spot on in estimating production and therefore impact, it is in the right range. CEF does not take issue with the overall outcomes of Xcel's analysis for any given amount of residential subscriptions, recognizing that the actual cost impact might be $\pm 10\%$ (likely closer to $\pm 5\%$) based on the variance between Xcel's production assumption and the actual production of developed solar projects.

Further attempts to improve accuracy in comparison to actual community solar production are unlikely to deliver substantially different results. We believe the PUC should deem Xcel's analysis of the incremental cost of a residential adder at any given level of residential subscriber participation as reasonable. As stated before, CEF does not believe that these incremental costs represent, in full, a net cost to ratepayers due to our other concerns with the existing Value of Solar, but such discussions will be engaged at other more relevant points in Docket 13-867 and elsewhere.

What will the volume be?

Not included in the analysis Xcel provided is any estimation of the likely volume of residential community solar garden subscriptions. While any calculation of projected volume is speculative, which is perhaps why Xcel Energy did not comment on this point, a number of factors point towards a potential scope:

1. As of February 2018, Xcel Energy had reported 271MW of community solar in operation with 12% subscribed by residential subscribers (~32.5MW of residential subscribers) from the first 3 years of community solar garden development.
2. That volume of community solar development reflected Applicable Retail Rate (ARR) bill credits that were substantially higher than under VOS and with a substantial difference between the General Service and Residential rate creating substantial value for developers to include residential subscribers (~\$0.125/kWh for General Service subscribers and ~\$0.155/kWh for residential). Even with the Department of Commerce's proposal for a Residential Adder, the bill credit available to residential subscribers is still almost \$0.03/kWh less than it was under ARR.
3. The volume of community solar development included a substantial period and a large number of gardens in which 5MW co-location was allowed, which is no longer allowed. A large number of developers have left the state after 5MW co-location ended.
4. While the long-term cost trend of solar development is still downward, the near-term imposition of trade tariffs on solar panels and the wind down of the Investment Tax



Credit in the early 2020s suggest that development will not become substantially cheaper in the next couple of years.

Taken together, these factors suggest to Cooperative Energy Futures that the historic volume of ~32.5MW of residential subscriptions of community solar (developed over the first three years of the program) is likely to be substantially higher than the amount going forward. Due to the early delays in the launch of the program, CEF would suggest that this 32.5MW could be considered a reasonable maximum bound for annual development of residential subscriptions of community solar, and we suspect due to the factors identified above, that the actual value will be less. This would equate to around 650MW of total community solar developed per year at a 5% residential participation rate or 271MW developer per year of total community solar developed at the current 12% residential participation rate.

We believe this maximum bound to be a substantial over-estimate of the actual scope of development under VOS. CEF notes that Xcel Energy has identified only 68 total projects in some stage of development under the VOS methodology to date. Assuming an average project size of 1MW, a 5% residential penetration of this volume of annual development would entail 3.4MW of residential community solar per year, while the current 12% residential participation rate would entail 8.16MW of residential community solar per year. While the volume of development might pick up to some degree to serve the residential market if an adder was in place, given that almost 90% of development under ARR did not serve residential customers even though the bill credit value was roughly \$0.03/kWh higher for them suggests that any such increase would be minor. CEF estimates that while the above mentioned 32.5MW represents a reasonable maximum bound for residential subscriptions with the DoC's recommended adder, something in the range of 5-10MW of residential subscriptions per year is more likely to occur.

In previous deliberations in this Docket, the Commissioners have noted that developers have made predictions about market size that have then not been borne out by the actual program participation, especially in the early flood of applications. While CEF of course cannot predict the future, or the actions of other developers, we would simply note that most developers have not been primarily focused on residential subscription models, and that developer efforts to develop residential subscription bases have only resulted in the identified 32.5MW of residential subscriptions under a much more attractive bill credit framework than the one that the Department of Commerce has proposed, and has dropped to near zero under the Value of Solar without the creation of a residential adder. The Commission should consider the comparison between the relative value of past ARR bill credits and the amount of residential community solar developed under that framework when estimating the potential volume of residential community solar to evaluate potential ratepayer impact.

2. Did Xcel Energy provide a reasonable discussion of the concept of the residential solar carve-out for the Company's Community Solar Garden program?



Xcel Energy has provided a reasonable discussion of their approach to implementing a residential solar carve-out for the Company's Community Solar Garden program. The one primary area that Xcel has not effectively addressed is what would happen under the carve-out model if due to subscriber attrition, a developer fell below the 5% requirement after the garden was in operation and for some reason was unable to find adequate replacement residential subscriber(s). In this case, CEF believes that any capacity below the 5% rate should be considered unsubscribed energy, since the alternatives of threatening the continued operation of the project as a community solar garden threaten financeability from the outset. Both financiers and subscribers will be reluctant to participate in the project when they will be subject to the risk that the withdrawal of another subscriber could threaten their access to bill credits (for the subscriber) and revenue (for financiers) at any time.

Additionally, Xcel has not discussed the potential value or purpose (if any) of such a carve-out.

Cooperative Energy Futures is a community-based developer that focuses on residential subscribers, and because we would not be developing community solar gardens in any circumstance that does not achieve much greater than 5% residential subscriber anyway, creating such a carve-out would not create an additional hardship for us. However, as we have commented before, without a residential adder to the VOS (or other revisions to the VOS that create greater value for residential subscriptions, whether locational value updates or other revisions to methodology), developing residential community solar may not be viable. CEF does not consider a carve-out that results in 5% residential participation of 0 community solar gardens to be either a desirable outcome or to reflect the legislative requirements that the development of a community solar garden program reasonably allow for the accessibility and financeability of community solar gardens. CEF does not see a 5% carve-out without a Residential adder to be a viable way accelerate residential participation. Instead, we believe it will have the function of further limiting community solar garden development.

Colorado's experience with a 5% low-income community solar carve out is instructive. The primary approach that community solar developers have taken in Colorado is to treat 5% of the garden capacity as uncompensated and uncreditworthy capacity that is required by law and finance their gardens based on secured revenue flows from the remaining 95%. With an adequate bill credit, this is viable at the 5% level, but has the effect of further disincentivizing low-income subscriber participation above and beyond the 5% minimum. Because the carve out model does nothing to resolve the underlying barriers (increased customer acquisition cost, increased credit risk and perceived risk of subscriber default) to customer access (low-income or residential), it does not meaningfully enable customer access. The experience in Colorado suggests that a 5% carve-out will effectively become a ceiling, not a floor. As Xcel notes, a 5% residential carve-out can easily be filled by a handful of residential subscribers. In testimony before the commission, several developers that conduct commercial community solar garden development and would pursue residential community solar have made clear that without an adder, the only residents that they can cost-effectively pursue are immediate contacts - friends, family, and associates - of developers. CEF suspects that a 5% residential carve-out without



any accompanying tools to enable residential accessibility would be filled in a similar manner by most developers, and will only be cost-effective for developers focusing almost entirely on large commercial and industrial subscribers and meeting the 5% carve-out to check off a requirement. This approach does not seem to meaningfully provide for the accessibility for a broad range of customers contemplated in the enabling legislation.

Coupled with meaningful supports to enabling residential participation (such as a Residential adder), a 5% carve-out can ensure a minimum standard of performance to ensure a baseline level of inclusion. However, in a situation where adequate supports are in place to enable meaningful residential participation, CEF considers a 5% carve out as both an inadequate goal and an inefficient tool for achieving inclusion. The current ARR bill credit gardens in effect are already achieving 12% residential participation (as of Xcel Energy's February 2018 report), and a truly equitable program would achieve proportions of subscribers approaching the proportions of energy use by rate class in the state. Furthermore, a 5% carve-out provides little incentive for developers to reach beyond their most immediate circles, meaning that subscriber outreach will likely be limited and focused on the easiest to reach customers. CEF suspects that across the industry as a whole, this subscriber base would skew middle and upper income, white, and urban.

CEF is not opposed to a 5% carve-out, but feel that this strategy provides little value to ensuring broad-based customer participation, and will be completely ineffective unless complemented by elements that support broader residential participation (such as the DoC's Residential adder proposal, inclusion of subscription charges on the utility bill as in Xcel Energy's own low-income solar garden, and other strategies recommended previously in this docket).

3. Should the Commission take further action at this time in response to Xcel's February 1, 2018 filing?

Yes, the Commission should approve the Department of Commerce's proposed Residential adder to comply with the original legislative direction that a community solar garden program must reasonably allow for the accessibility of community solar gardens as required by 216B.1641. Cooperative Energy Futures would propose two amendments to the Department of Commerce's proposal, one operational and one substantive:

1. Operationally, due to the extensive delay in reviewing and approving the DoC's proposal, now appearing to stretch a decision into mid 2018 at the earliest, we recommend that the Residential Adder three -year schedule proposed by the Department of Commerce apply for full years starting from the date of any PUC order approving them. For example, if the PUC ordered the adder schedule to be approved effective 9/1/2018, the first year adder (\$0.025/kWh) should be available from 9/1/2018-8/31/2019, the second year adder (\$0.015/kWh) for a following full year, etc. This schedule could either be linked to the date of an order or timed to correlate to the availability of a given VOS rate.



2. Substantively, CEF continues to support the recommendations put forward by MNSEIA, Institute for Local Self-Reliance, and others that the adder rate should not be stepped down arbitrarily without evidence of the effectiveness of a given adder at creating meaningful residential access. We are concerned that the year 2 and especially year 3 rates are likely inadequate to enable residential participation, and that setting these ramp downs without evidence of market performance in year 1 could result in an early death of residential access. Nevertheless, we would support the DoC's original proposal as enabling at least one and possibly two years of residentially accessible community solar development if this recommendation was rejected.

CEF finds little credibility in arguments that no action should be taken because the impact of the VOS rate structure on residential participation cannot yet be assessed. While it is true that development of solar gardens under the VOS rate has not yet proceeded to a stage where residential participation in these gardens (if any) can be measured, several factors point clearly to the impact on residential access:

- Even under ARR, residential subscriptions have only reached the 10-12% range, substantially less than residents share of energy usage. This was true even though the bill credits, and thus the subscription rates charged, to residential subscribers were roughly \$0.03/kWh higher for residents than for General Service subscribers under ARR.
- The shift to VOS hits residential subscribers disproportionately. ARR provided roughly 25% more compensation for General Service subscribers than under VOS and roughly 55% more compensation for Residential subscribers than under VOS without an adder. While VOS provides slightly more certainty around 25-year value of bill credits than ARR, this increased certainty does not compensate for the substantial loss in bill credit value, especially for residential subscribers. So the ability of developers to offer accessible and financeable subscription offers to residents under VOS is substantially less than under ARR.
- In previous iterations of this document, numerous developers, including CEF, have demonstrated that the costs of subscriber acquisition and management are far higher when engaging with hundreds of residential subscribers as opposed to serving a handful of institutional, municipal, or corporate subscribers.
- Numerous developers, including CEF, have commented and directly testified that under VOS at current rates, they will not be able to meaningfully serve residential customers.

The delay on a decision on this residential adder has already prevented CEF from evaluating and proposing further community solar gardens after the ARR rates structure expired at the end of 2016. We have been waiting to develop further community solar gardens beyond those we are currently completing under the ARR structure for this decision, because we are doubtful that the residentially-focused community solar gardens that are our focus will be viable without it. Starting with the opening of the original comment period on residential and low-income access February 26th, 2016 and the September 1, 2016 direction by the PUC to the Department of Commerce to evaluate the appropriateness and need for adders, CEF has been engaged in this docket process to preserve both our cooperative, community-based approach to community



solar and the viability of meaningful residential access in the market as a whole. Since the Department of Commerce's March 1, 2017 recommendation of the Residential adder, we have been ready to proceed with a subset of sizes, locations, and financing structures of residentially-focused and low-income accessible community solar gardens that we believe will be viable with this adder. Over the past year, we have been waiting for a decision in order to proceed. The PUC seemed to be on the verge of a decision on this matter at its deliberation on October 24th, 2017, and requested further analysis from Xcel on the potential ratepayer impact from the Residential adder (again, based on the assumption that VOS accurately captures all aspects of ratepayer value and thus that the full amount of an adder is a ratepayer cost). CEF understood that request as one intended to enable the PUC to make a decision on the Department of Commerce's proposal. Now that the analysis has been provided, we see no reason for further delay in providing clarity to CEF and the rest of the developer community as to whether we will be able to proceed with developing residential community solar.

Cooperative Energy Futures does not see any compelling reason to suggest that a 5% residential carve out contributes meaningfully to customer access, and would oppose its adoption at this time as a stand-alone item. If this carve-out were proposed in combination with the DoC's proposed Residential Adder or a similar amended Residential adder, CEF would generally support the inclusion of the residential carve-out, though even in this case we see it as a strategy that is neither adequate in the scope of residential access it requires nor particularly effective as a strategy for getting there.

As always, we appreciate the dedication of the Public Utilities Commission and the Department of Commerce in evaluating this complex issue, and to all the other stakeholders for providing their analysis and perspective.

Sincerely,

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