

# Testimony on the Cost of the Community Solar Garden Program

## Minnesota Legislative Energy Commission

November 13, 2023

Dr. Gabriel Chan

Thank you Co-Chair Acomb, Co-Chair Frentz, and members of the Legislative Energy Commission for the opportunity to testify this afternoon on the Community Solar Garden Program. My name is Gabe Chan, and I am an Associate Professor of Science, Technology, and Environmental Policy at the University of Minnesota, here today in my own capacity as a researcher and private citizen, not as a representative of the University of Minnesota.

The central questions I wish to address in my testimony are:

- **Is the Community Solar Garden Program that serves subscribers in Xcel Energy's service area *compatible* with the public interest?**
- **How does the Community Solar Garden program impact customer bills?**
- **Is the way Community Solar Gardens recover costs equitable and therefore in the public interest?**

### Compatibility with the Public Interest

Economic principles propose that investments that have benefits to society in excess of the costs to society are compatible with the public interest. And once determined to be compatible with the public interest, whether investments actually do materially advance the public interest requires a separate and additional analysis of the costs and benefits to specific sub-groups of the population. With this framing in mind, I would first like to address whether the CSG program is *compatible* with the public interest. In my view, the answer is yes.

Minnesota statute provides guidance on the law's definition of benefits of distributed solar resources based on the value to the utility, its customers, and society.<sup>1</sup> Statute directed the Department of Commerce to conduct a robust stakeholder process to quantify the benefit streams of distributed solar, including the value of energy, its delivery, generation capacity, transmission capacity, line losses, and environmental value, and then seek Commission approval of its methodology.<sup>2</sup> The Value of Solar methodology was developed and approved in 2014 and has been calculated annually by Xcel Energy and approved by the Commission.

Historically, approximately one-third of the Value of Solar has been derived from avoiding the emissions of greenhouse gases. In 2024, the annual Value of Solar was estimated at

---

<sup>1</sup> 216B.164 Subd.10

<sup>2</sup> 216B.164 Subd. 10(f)

\$99/MWh—or 9.9 cents per kWh. However, using the most recent Commission-approved valuation of greenhouse gas emissions, the 2024 Value of Solar would increase to nearly \$200/MWh.<sup>3</sup> With this updated Commission-approved methodology and greenhouse gas valuation, this estimate suggests that any distributed solar generation with a cost (to the utility and other customers) below \$200/MWh is compatible with the public interest because total benefits to society will be greater than the total cost to society. In simple terms, when a utility pays a price less than the value of the energy resource, everyone benefits. This is the same test utilities apply to all their proposed spending on other resources. And based on current costs of renewables, we have a lot of beneficial clean energy we can build.

There are important caveats to this conclusion. First, I believe that there could be meaningful changes to the Value of Solar methodology to improve accuracy of the valuation methods. There has been robust discussion of the methodology at the Commission, which I have been able to contribute to. For example, as the regional grid continues its pace of decarbonization, the environmental benefits should be pegged to the generation resource that is displaced by new solar generation. This is not a static target. Right now, there is still coal generation operating on the system, but with scheduled retirement dates and clear state goals, including in Minnesota, for elimination of carbon-emitting generation resources, our regional grid is becoming increasingly clean. The way we value environmental benefits should reflect this.

### **How does the CSG program impact customer bills?**

The costs of the CSG program are recovered differently from utility-owned renewable energy projects because CSGs are not owned by the utility. When a CSG project is developed, a private developer invests their own capital and recovers their costs by charging subscribers a subscription fee, retaining any margin above their costs as profit. In turn, subscribers receive payments from Xcel Energy for every kilowatt-hour their subscribed project puts back onto the grid. This can be considered a type of “performance payment,” because CSG subscribers are only paid when projects produce energy that gets put onto the grid. This is different from how utilities are paid based on direct cost recovery on their investments. Xcel pays the subscribers this Commission-approved rate and recovers this cost by considering it as a component of its cost of fuel. The “cost of fuel” from CSGs is then assigned to all Xcel customers in Minnesota, roughly proportional to their consumption of energy.

Currently, the normalized tariff paid to CSGs on the fuel clause is \$144 per megawatt-hour. This cost is primarily driven by CSG projects that were built in the first two years of the program when compensation rates for CSGs were significantly higher than they have been for new projects from 2017-2023. In the 2013 legislative design of the program, the legislature established that solar gardens in the first two years of the program would be compensated at the applicable retail rate, which has been higher than the Value of Solar. Additionally, the higher costs in the early years of the program were further increased by a Commission decision to

---

<sup>3</sup> See Department of Commerce at 22.  
<https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={20B1DD8A-0000-C311-8B94-7A5A519A77BD}&documentTitle=20239-199236-01>

value the benefit CSGs were providing in enabling Xcel Energy to comply with its solar energy standard, which added \$20 per megawatt-hour to the cost of these early projects. Notably, CSGs account for over 60% of the solar energy in the state and have enabled Xcel to work toward compliance with its solar energy standard.

Since 2017, new projects were compensated at a lower rate that is pegged to the Value of Solar. And in the 2023 legislative session, a new compensation scheme was developed to peg compensation to policy goals of encouraging residential and low-income subscriptions.

There is an active discussion at the Commission on the so-called “above-market” costs of the CSG program. This discussion relates to the 2023 statutory provision that “a utility must exclude from the fuel adjustment charged to a utility customer the net cost of community solar garden generation” for low-or-moderate income non-subscribers.

However, the notion of “above-market” costs of CSGs paints a confusing picture of the cost of the program to non-subscribers. In filings, some parties have taken the position that CSG costs should be compared to the short-term market prices for wholesale energy. But wholesale energy prices are only a part of the value of delivered energy used in homes and businesses. This is an inaccurate comparison for at least three reasons:

- First, CSGs are connected on the low-voltage part of the electric grid and are not in the wholesale energy market to which they are being compared.
- Second, CSGs do not just offset short-run market value but also provide long-term value by offsetting the need for system capacity.
- And finally, there are non-market costs that CSGs avoid that are not included in the current notion of “above market costs.”

As the Department has stated before the Commission, “if the net cost calculation included these other measures of the program’s value, all of which account for a higher value of the program than the LMP, the overall net cost would be lower (or even negative, i.e., a benefit to society).”<sup>4</sup> I have provided a chart with my testimony that summarizes these values.

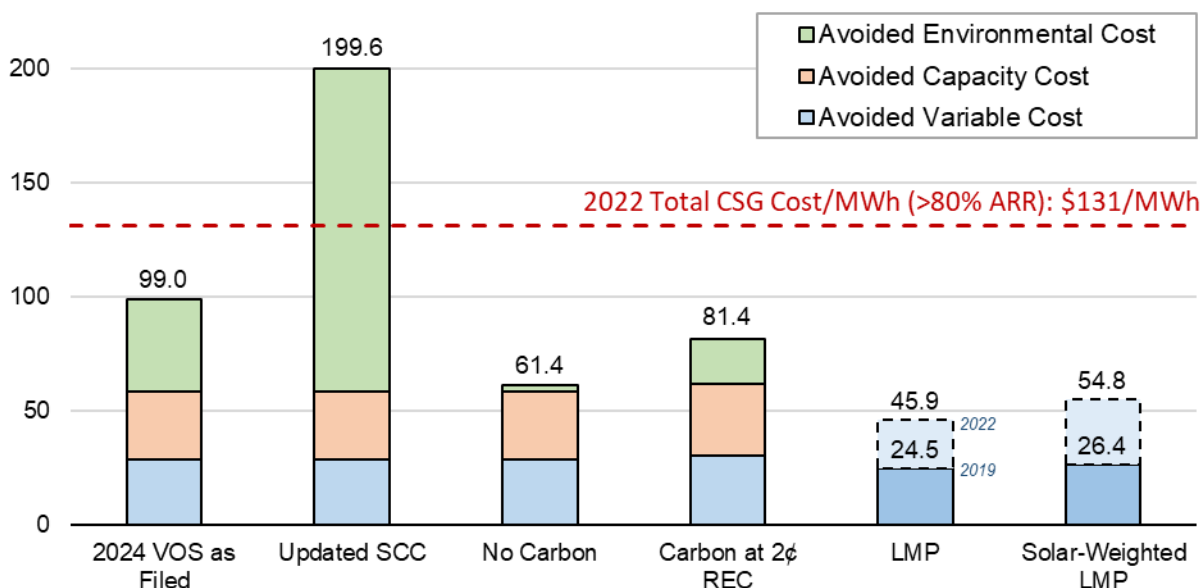
Nevertheless, despite these methodological concerns, it is a worthwhile policy discussion to seek to differentiate whether the CSG program has net societal value and how those costs should be assigned to customers.

---

4

<https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={20B1DD8A-0000-C311-8B94-7A5A519A77BD}&documentTitle=20239-199236-01>

## Solar Value Estimates in 2024 (\$/MWh)



Note: Baseline Value of Solar (VOS) uses Xcel's 2024 filed VOS calculation of the 2024 inflation-adjusted VOS for year 1 and allocates costs based on proportions of the levelized VOS. Avoided variable costs include fuel costs and variable O&M. Avoided capacity costs included fixed O&M and capacity costs (generation, reserve, transmission, and distribution). Avoided environmental costs include avoided carbon emissions and other pollutants. The 2024 VOS as Filed case uses estimates of the social cost of carbon (SCC) from 2007 at a 3% discount rate. The Updated SCC case uses EPA's 2022 estimate of the SCC at a 2% discount rate. The No Carbon case excludes avoided carbon emission costs but includes other environmental pollutants. The Carbon at 2¢ REC case values avoided carbon emissions at \$0.02 per kWh, which is the solar REC price the PUC established for "enhanced" bill credits for community solar gardens under the applicable retail rate. The locational marginal price (LMP) case uses the average LMP at MINN.HUB in 2019 and 2022, adjusted to 2024 dollars. And the Solar-Weighted LMP case uses the VOS PV fleet generation profile to weight hourly LMP by solar production.

## Equity of CSG cost recovery

As I stated at the beginning of my testimony, compatibility with the public interest does not in any way imply that an investment or policy will actually align with the public interest or policy goals in practice. Simply put, while there can be aggregate benefits to society, there can still be "winners" and "losers" to get there. As I stated earlier, I believe that the CSG program does create net benefits to society and therefore has the potential to be in the public interest. Yet it remains critically important to think about how the costs of the Community Solar Program are paid for and how the benefits of the program are delivered.

As referenced earlier, the legislature made significant changes to the CSG program, including new provisions for "nonsubscriber protections." These protections are now under the purview of the Public Utilities Commission, and it is my understanding that the legislative intent has provided clear guidance on how to proceed.

Therefore, I would urge that this conversation is separated into how to treat the costs of the legacy program versus the cost of the new program. For the legacy program, it is difficult to go back in time and rehash old policy decisions. At the time that the original CSG program was

developed in 2013, Minnesota had only a tiny fraction of the solar generation it does now, and solar energy costs were much higher than they currently were. The legislature adopted a solar energy mandate for Xcel Energy to require it to develop more solar energy, but also sought to create a pathway for private developers to bring their own capital to solar projects. In this environment, it was unclear in 2013 what the best pathway was to develop clean energy projects. But it is clear that those early policy decisions helped shape a robust and dynamic solar energy development market in Minnesota. I believe that these were sound policy decisions and led to private sector investments based on those policies. Our market and policies stand out in the national landscape for the mix of utility-owned and third-party owned solar projects. I think it is important that policymakers avoid considerations of “retroactive ratemaking” that undercut the investments of third parties that were predicated on clear statutory guidance on payments. Such an approach has been taken in other jurisdictions with deeply chilling effects on private investments in clean energy. And without a robust environment for private capital to flow into clean energy projects in Minnesota, meeting our statutory goals for carbon reductions will likely become much more difficult.

To address equity in the costs of the legacy program, the legislature could consider alternative methods of making good on the commitments to paying the early movers in CSG development that are driving the large share of the “above market” costs. One approach other states have taken is to establish an income-exempt public benefit charge. A public benefit charge would create a revenue stream separate from the fuel clause to pay for any “above-market” costs of the legacy program. By exempting low-income customers from paying into the public benefit charge, this approach would align quite directly with the 2023 policy design to establish nonsubscriber protections in the new program. This approach would have the effect of avoiding retroactive ratemaking by keeping payments to legacy community solar projects unchanged, while creating a more equitable pathway to collecting the costs of the program.

It is my view that the legislature has taken significant steps in 2023 to design nonsubscriber protections and develop an approach to setting clear price signals to ensure that the CSG program going forward prioritizes equitable access to solar. This new program also positions Minnesota extremely well to be able to tap into new federal funding and incentives under the Inflation Reduction Act that are aligned in prioritizing equity in delivering the benefits of solar energy. This alignment could bring in millions of additional federal dollars into Minnesota.

Thank you and I would welcome your questions.