



October 24, 2019

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101-2147

Re: Annual Expansion Plan Costs and Assumptions of Xcel Energy's Integrated Resource Plan (IRP) Appear Biased Toward Risky Major Capital Projects and Against Cost-Effective and Reliable Demand Response (DR) and Distributed Solar – Docket No. E002/RP-19-368

Dear Mr. Wolf,

Xcel Energy's commitment to carbon-free generation is commendable. However, as a former Xcel Energy employee who had a significant hand in helping keep nuclear in the carbon-free mix, part owner of a small solar installation business, director of a non-profit advocating for distributed solar microgrids, and rate payer; I'm urging the PUC to compel Xcel Energy to incorporate more demand response (DR) and point-of-use solar in their Preferred Plan.

After reviewing the Upper Midwest Integrated Resource Plan 2020-2034 (IRP), I believe it to be directionally what is needed to address fossil-fueled climate change. It may, however, mislead rate payers and regulators into thinking major capital projects such as grid-scale solar, combined cycle, and as yet TBD "firm dispatchable" technologies are the most reliable, most affordable, most equitable, least risky solutions, best in the public interest. Major capital projects are inherently risky and expensive; that's why a large multi-party team was needed to manage the recent CapX2020 transmission build-out. No one utility, not even Xcel Energy, would undertake CapX2020 on their own, though by any measure it is in the public interest to have a robust transmission and distribution grid able to safely transport massive amounts of electricity from one end of the Midwest to the other. Nuclear is rightly a cornerstone of Xcel Energy's carbon-free IRP, but we must not forget how massively the Monticello uprate project went sideways – hundreds of millions of dollars over the plan approved by the PUC.

Responsibility for capital investment and O&M cost on behind the meter DR and distributed solar rests solely on individual owners. Thus these capacity additions reduce risk and cost to the public and must be given more than lip service in the IRP. Expansion Plan Tables 3-3 and 3-4 (p.63) and Resource Additions Table 4-1 (p.72) all show 270MW of DR dropping to 20MW by 2021 and 154MW of distributed solar dropping to 22MW in that same period. This omission/radical reduction is explained away by market uncertainties and Strategist computer modeling limitations. When one makes the reasonable assumption NOT to eliminate 14 years of at least 402MW of capacity added ANNUALLY through DR and distributed generation, Load and Resources Table 3-2 (p.58) would show a surplus of thousands of MW of generation available

above anticipated load throughout the planning period. It is unreasonable and irresponsible to show a 90% loss of these valuable resource additions when DR and distributed solar have been growing exponentially in recent years, thousands of quality Minnesota jobs depend on the work involved, and addition of this electricity supply capacity costs nothing to the general public.

In order to advocate for a heavier weighting for distributed solar and DR and to support rejecting Xcel Energy's Preferred Plan to increase major capital project generation costs at rate payers' expense, I will address Xcel Energy's stated IRP Objectives one-by-one:

Reliability – Utility-owned grid-scale solar or any other centralized generation is NOT more reliable than point-of-use generation, battery back-up, and DR solutions. Puerto Rico has more than enough large generation resources, including grid-scale solar, but once Hurricanes Irma and Maria destroyed 80% of the grid in 2017, only those who had pro-actively installed distributed solar with battery back-up had any safe, reliable power for months. Pacific Gas and Electric (PG&E) is the nationwide leader in grid-scale solar capacity but has publicly stated they must plunge hundreds of thousands of people into darkness intermittently for ten years due to under-maintained lines, costing billions to the economy and annoying, even putting at risk, rate payers. In both cases, “more expensive” home and community level point-of-use renewable micro grids with energy storage would be the best value investment for the public interest.

Affordability – Even though Xcel Energy points to savings from economies of scale for constructing massive solar projects, the IRP is largely silent on the costs of supporting infrastructure such as substations, transmission, and distribution upgrades needed for them to build their Preferred Plan generation plants. These would be VERY significant; CapX2020 cost more than \$2M/mile for new transmission lines and \$100,000/mile for distribution.

The IRP correctly states that the cost of solar equipment has come down dramatically over the past few years. Please be aware - Xcel Energy keeps a thumb on the scales and drives the soft costs of distributed solar higher than market in their territory: 1.) Our company's average time from submittal of residential solar interconnection package to approval is less than a week with MN utilities that are not investor-owned; when working with Xcel Energy we frequently need to delay construction of small residential projects by at least a month, 2.) As a small business, we need to pay one person to dedicate almost 100% of his time to managing the Solar Rewards process, 3.) MN-DIP/MN-DER is intended to simplify and streamline the interconnection process but Xcel Energy has used it to add an additional layer of compliance detail to their already cumbersome approval process, often changing the rules mid-stream.

Thirdly, the IRP's negative impact to rate payers is directly correlated to major capital project expenditures especially combined cycle and “firm dispatchable” (cf. Chapter 6, especially Table 6-1 and Figure 6-4, pp 132-133 cross-referenced to Preferred Plan capacity additions). Private rate payer's individual investments in DR and distributed residential and community solar show no cost impacts to the general public. Xcel Energy must not be allowed by modeling to obscure or dismiss the future value of hundreds or thousands of MW of DR and distributed solar annual capacity additions – currently being added at a cost deminimus to rate payers.



Risk and Innovation – It is telling that “firm dispatchable” and storage resources take a TBD status in the IRP; the technology is evolving very rapidly. In exchange for continued monopoly status, Xcel Energy has an obligation to the public to maintain and operate the system safely; they must leave the R&D and future technology risks to the entrepreneurs. They must also let property behind the meter be governed by state electrical statutes and local building inspectors so innovation can thrive without undue interference or overly-prescriptive utility mandates.

Environmental – In order for Xcel Energy to build 4,000MW of grid-scale solar, they will need to secure over 20,000 acres, likely through eminent domain processes, of previously undeveloped land as well as building roads, feeder lines, and expanded substation capabilities. What are the chances that this land is all non-productive farmland and/or devoid of wildlife? Distributed solar and DR, on the other hand, make use entirely of already developed areas and infrastructure that is generally adequate to support energy improvements. In addition, solar mounted on a pitched residential or commercial roof occupies about half the footprint of ground-mounted solar which requires significant spacing between rows to accommodate inter-row shading.

We all know bigger is not necessarily better. Consider a hypothetical commercial building pursuing solar to save energy costs and go green, as a microcosm of a grid seeking 100% renewables. At Demand rates of \$0.10/kWh (cf. Rates Table 6-5) for 15,000kWh needed per month, one third of the bill is variable electricity kWh; another third is 100kW demand at a charge of \$15/kW; the last third of the bill is driven by gas. If the owner spends \$300,000 (\$2/W assumed for commercial scale) for a solar installation to replace grid electricity, the other 2/3 of the bill remains untouched and the solar will take 20 years to pay back (cash purchase, no tax credits or incentives assumed). On the other hand, \$25,000 spent optimizing HVAC systems and swapping out lights for LED's pays back in 2 years and \$40,000 on a small battery-based energy management system to flatten the energy demand profile can pay back in 7 years - now just \$100,000 for 40kW of solar (\$2.5/W assumed for small commercial/large residential) is needed. A large solar plant that at face value appears cheaper per Watt installed far exceeds the costs of smart building management and “expensive” batteries. NOTE: Rate payers are on the hook for \$0 capital or O&M costs in either scenario – behind the meter solar OR a balanced DR solution.

To conclude, Xcel Energy's 100% renewable plan is bold and admirable for a Fortune 500 investor-owned utility. However, neither the public nor the PUC can take at face value claims that major capital projects solely controlled by a monopoly energy firm are the cheapest, least risky, most reliable, and environmentally friendliest options for getting MN 100% carbon-free. I am urging the PUC to include DR and distributed solar additions in the modeling at no less than Xcel's predicted 2020 resource increase levels, but across the entire planning period.

Peter Reese

peter@littysolar.com

COO, Litty Solar

Executive Director, Energy ReLeaf

Former Nuclear Fleet Category Manager & CapX2020 Sr. Commercial Analyst, Xcel Energy