The 600 kW solar electric system installation on the Minneapolis Convention Center. Local installers inspecting PV panels that are part of the District Energy St. Paul Solar Thermal project. *Photo by NREL, 18700.*

Case Study: Braiding Funding for Rooftop Solar in WAP and LIHEAP in Minnesota

Pathways: Rooftop Solar as an Eligible Measure in WAP; Rooftop Solar as an Eligible Measure in LIHEAP; LIHEAP Funds to Pay for Community Solar Subscriptions

Solar in WAP

The Minnesota Department of Commerce (Commerce) first explored implementing solar through the Weatherization Assistance Program (WAP) in 2017, meeting with service providers in-person and through webinars to scope a pilot program.[1] WAP annually adjusts the amount of funds per unit that can be used for renewable energy systems (the limit was $3,598 in 2017), which means that non-U.S. Department of Energy (DOE) funds were needed to cover the remaining system cost. In 2017, Commerce worked with Xcel Energy to develop the Income-Qualified Solar*Rewards program, where Xcel Energy provided a $2.00 per-watt-installed upfront incentive and a production incentive of $0.07 per kWh of solar generation for the first 10 years of operation. The Xcel Energy Income-Qualified Solar*Rewards program was a critical source of leveraged funding for the WAP solar pilot.

Commerce requested DOE approval of the pilot program in its Program Year 2020 (PY20) Grantee Plan and received approval for a rooftop solar pilot from DOE in September 2019. The pilot was structured to install rooftop solar and weatherization measures on 15 homes, where WAP funds covered approximately one-third of solar installation costs and utility funds covered the remaining solar costs. Work began on the first pilot home in early 2020, but the COVID-19 pandemic delayed weatherization work, extending the timeline for pilot completion to July 2021.[2] Through the pilot, solar arrays were installed by two service providers on 15 homes with an average system cost of $18,000, totaling a 54-kW capacity. The pilot program cost $163,177 in total, of which $56,097 were WAP funds and the remaining were Xcel Solar*Rewards funds. The resulting average cost per watt was $3.80/watt, and the estimated average annual bill savings were $587 per home.[3]

Following the successful completion of the pilot, Commerce requested and received approval from DOE for rooftop solar to be an eligible WAP measure with implementers statewide. Based on lessons learned during the pilot, Commerce hired a solar technical assistance liaison to serve as a point of contact for WAP solar activities. This position coordinates with stakeholders to expand WAP solar offerings statewide, train service providers on identifying eligible homes, and communicate with solar installers.[4]

[1] DOE updated procedures for solar inclusion in WAP in Weatherization Program Notice 23-6, and no longer requires a pilot prior to program-wide approval of solar as an eligible WAP measure.
[2] State of Minnesota Department of Commerce Energy Equity Program (cesa.org).
[3] MN Department of Commerce–2024 direct communication.

Leveraging LIHEAP

Commerce also administers the Low-Income Home Energy Assistance Program (LIHEAP), called the Energy Assistance Program (EAP) in Minnesota. In 2021, Commerce updated the rules governing EAP weatherization (EAPWx) funds to expand the services provided, including rooftop solar.[5] Minnesota EAPW[x] funds are not subject to WAP average cost per unit limits and may cover measures with a Savings-to-Investment Ratio (SIR) of 0.75 or greater. EAPWx funds buy down the system cost for the WAP SIR cost-effectiveness calculations. Solar cost-effectiveness in Minnesota is further supported by the DOE-approved Social Cost of Carbon adder and increase in measure lifetime.[6] Rooftop solar up to 60 kW installed using WAP funds can qualify for a National Environmental Policy Act (NEPA) categorical exclusion, whereas LIHEAP funds do not carry a categorical exclusion.[7] By combining WAP, EAPWx (LIHEAP), and utility funds, Commerce has been able to secure sufficient solar funding sources, meet cost-effectiveness requirements, and support projects that qualify under the NEPA categorical exclusion. Through June 2023, Commerce had allocated $96,394 of WAP funds, $317,553 of EAPWx funds, $65,030 of non-federal funding from Xcel's Income Qualified Solar* Rewards, and $51,338 in Minnesota state funds to install 21 solar arrays with a total capacity of 73.11 kW.

Expanding LIHEAP to Include Community Solar

In 2021, Minnesota joined the Inclusive Shared Solar Initiative, a multistate partnership led by the National Association of State Energy Officials and the National Energy Assistance Directors Association to increase accessibility of community solar for low-income households. Minnesota's plan aims to develop two community solar projects in underserved areas and targets six key strategies to develop their Equitable Solar Access project:

1. Leverage the EAP network and resources to reduce burdens and barriers on low-to-moderate income community solar garden (CSG) participants
2. Adjust EAP policy to include CSG subscription cost as a household energy cost factored into the calculation of benefit payments
3. Focus efforts on non-Xcel utility territory
4. Credit CSG-participation benefits as a kWh credit rather than a dollar credit
5. Assess Inclusive Shared Solar Initiative CSG pilot site options based on local priorities and needs
6. Pursue opportunities for broader impact.[8]

Additionally, Minnesota received approval from the Department of Health and Human Services in PY22 to include community solar vendors as LIHEAP vendors to allow LIHEAP payments to cover community solar subscription fees.

Program Status

As of February 2024, Commerce has completed 29 solar projects in WAP with 22 additional initiated projects. Typical solar photovoltaic systems range from 3.8–5 kW, offsetting an average of 50% of the household electric usage, or over $500 per year.[9] Minnesota has found that approximately 5%–10% of WAP homes are suitable for rooftop solar installations due to rooftop and electrical system quality.

Key Takeaways

- Diverse sources of funding offer complementary features. LIHEAP, utility, and state funding sources provided flexibility in funding amounts, cost-effectiveness thresholds, and applicable rules.
- Strategic partnerships are critical in developing and adapting program design. Commerce worked with Xcel Energy for upfront incentives and production-based incentives, local service providers to administer WAP and identify solar-eligible homes, and solar installers to provide competitive pricing and install solar photovoltaic systems.

[4] MN Department of Commerce–2023 survey response.
[5] py21-policy-manual-addendum-eapwx-measure-expansion.pdf (mn.gov).
[6] Weatherization Program Notice 22-10, Weatherization Program Notice 23-6: Attachment 9, Weatherization Program Notice 24-5.
[7] Weatherization Program Notice 23-6.
[8] MN State Implementation Plan_FINAL_7-12.pdf (naseo.org)
[9] MN Department of Commerce–April 4, 2022 interview.

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