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States Alliance

An Equitable Solar Access Pilot Project in Minnesota benefitting Manufactured (Mobile) Home Residents

August 31, 2023

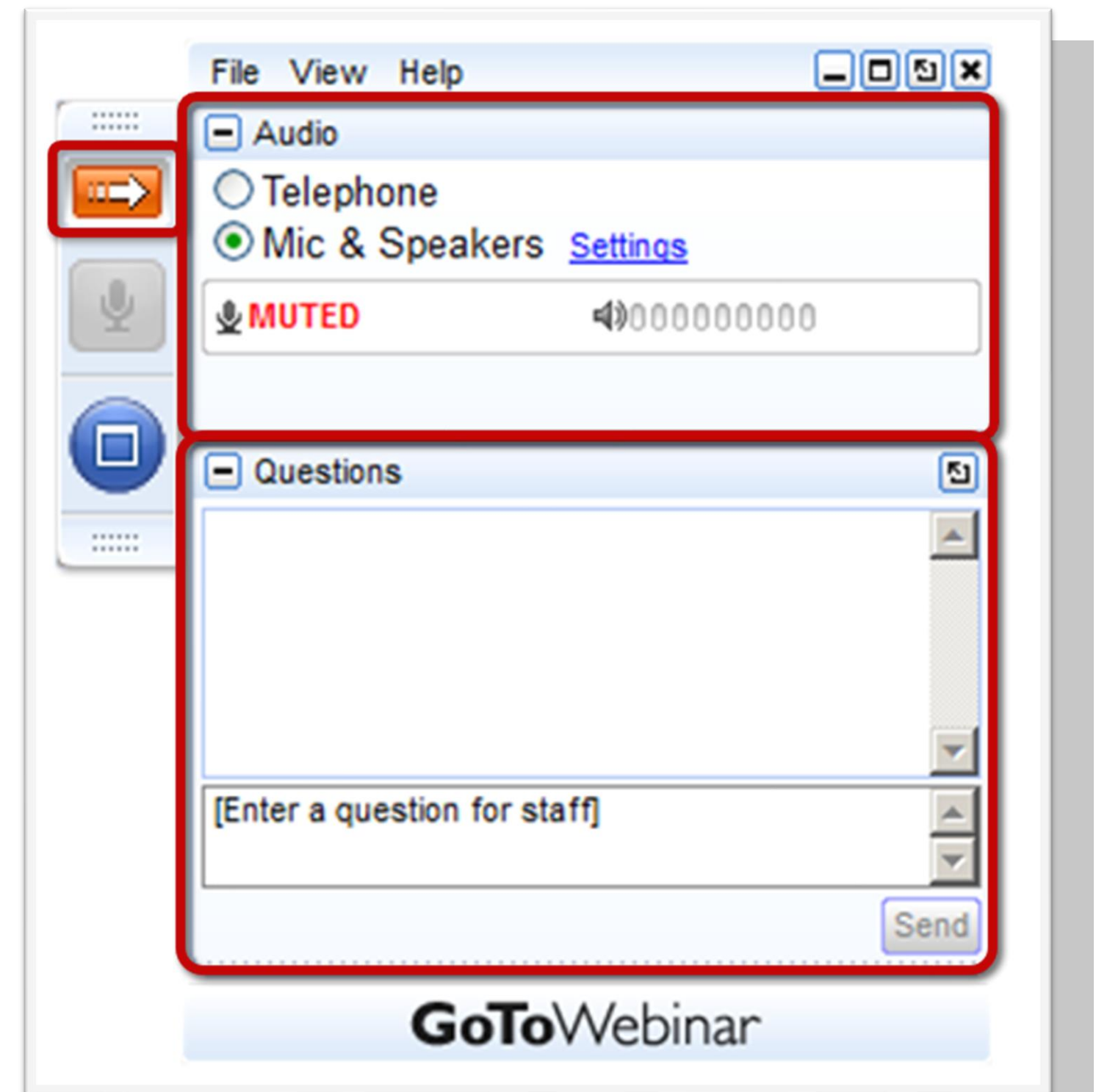
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Celebrating 20 Years of State Leadership



The Clean Energy States Alliance (CESA) is a national, nonprofit coalition of public agencies and organizations working together to advance clean energy.

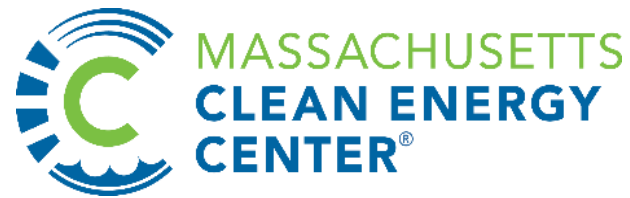
CESA members—mostly state agencies—include many of the most innovative, successful, and influential public funders of clean energy initiatives in the country.

CleanEnergy States Alliance

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GOVERNOR'S Energy Office



Maryland Energy Administration



NYSERDA



Scaling Up Solar for Under-Resourced Communities

How can we ensure that solar technologies benefit all Americans regardless of income?

- Three tracks: single-family homes, manufactured homes, and community institutions.

- Funded by the US Department of Energy's Solar Energy Technology Office.

www.cesa.org/projects/scaling-up-solar-for-under-resourced-communities



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Webinar Speakers

Gabe Chan

Chan Lab at the
University of Minnesota
Humphrey School of
Public Affairs

Steve Coleman

Chan Lab at the
University of Minnesota
Humphrey School of
Public Affairs

Dan Josephson

Mahube-Otwa
Community Action
Partnership

Matt Ohloff

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Community Action Partnership, Inc.



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Upcoming Webinars

Energize Your Impact: How Funders & Donors Can Support Equitable Solar Power (9/6)

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Battery Decommissioning, Recycling, and Reuse (9/20)

Energy Storage for Peak Demand Reduction: A New Incentive Program by Efficiency Maine (9/28)

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An Equitable Solar Access Pilot Project in Minnesota benefitting Manufactured (Mobile) Home Residents

Minnesota Clean Energy Resources Team, Detroit Lakes Public Utilities, Mahube-Otwa Community Action, the Minnesota Department of Commerce, and the Chan Lab at the University of Minnesota Humphrey School of Public Affairs

This Clean Energy States Alliance webinar is part of US Department of Energy-funded Scaling up Solar for Under-Resourced Communities project. Funding to pursue this project has been received from the Clean Energy Research Teams (CERTS), the National Association of Energy Officials (NASEO), the National Energy Assistance Directors Association (NEADA), and the Clean Energy States Alliance (CESA).

Presenters

Dan Josephson - MAHUBE-OTWA CAP

Gabe Chan - University of MN

Steve Coleman - University of MN



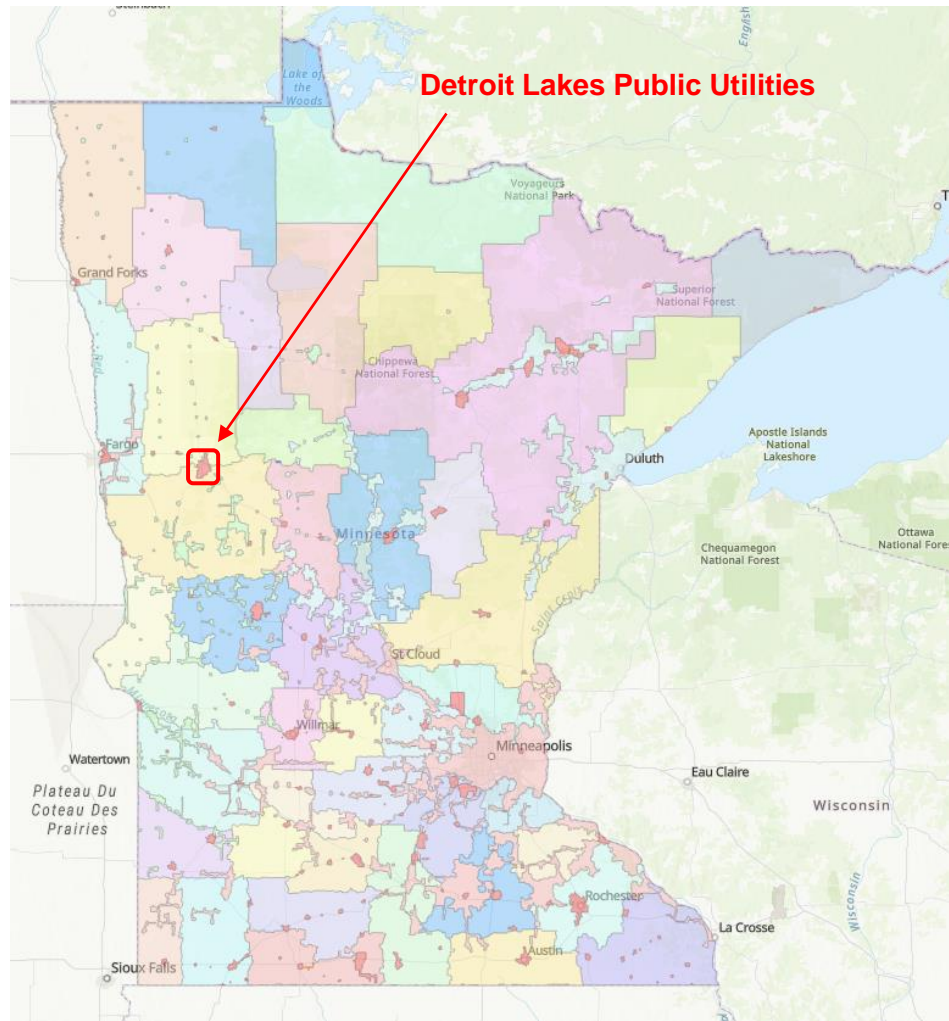
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Equitable Solar Access Pilot Project

Inclusive Shared Solar Initiative (ISSI)

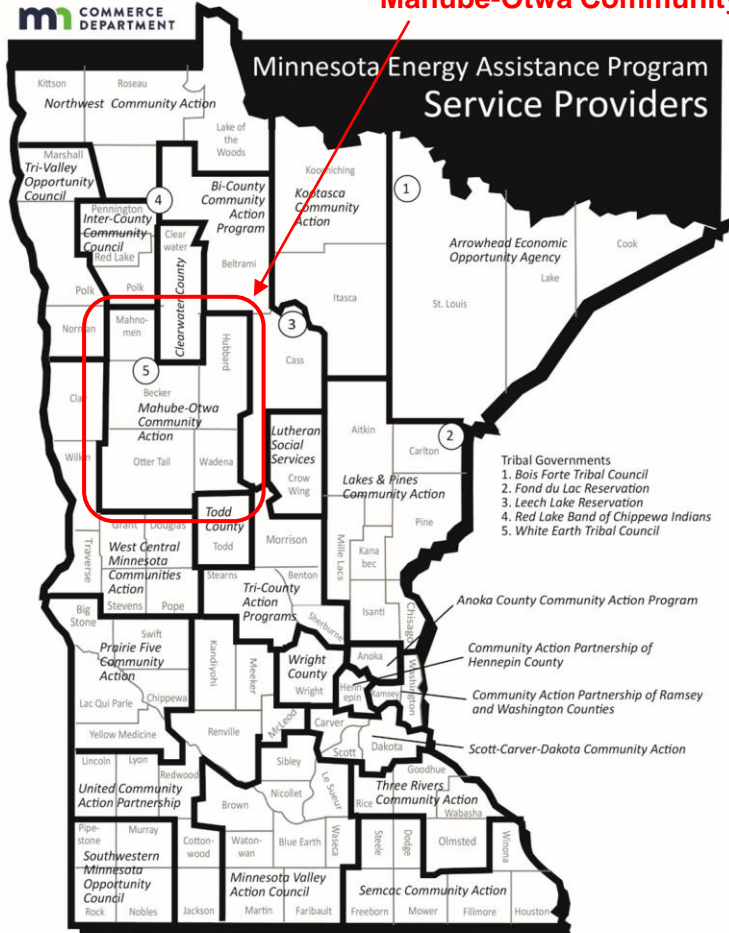
Gabe Chan and Steve Coleman



DLPU's first community solar garden built in 2017 serves ~50 customers at up to ~40% of annual energy consumption.

Photo credit: Clean Energy Resource Teams

Mahube-Otwa Community Action



Updated October 2019

Energy Assistance Program Dashboard

10/1/22-8/28/2023 (Updated Weekly)

\$122,828,851

AWARDED TO HOUSEHOLDS

\$927

AVERAGE HOUSEHOLD BENEFIT

How does Energy Assistance award benefits?

Energy Assistance has helped **132,493** households this program year.

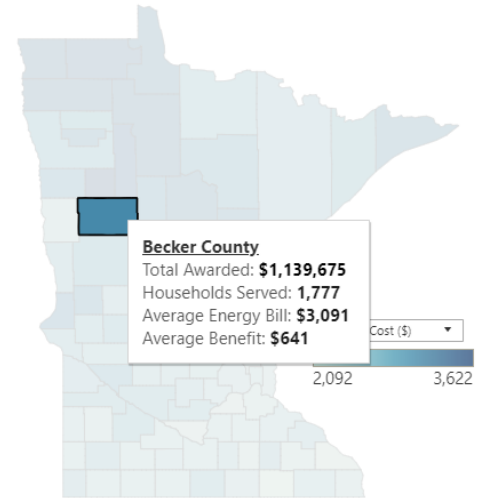
43% have a person over 60

39% have a disabled member

18% have a child under 6

Benefits by County

Mouse over a county for more information.



Emergency Assistance

Emergency assistance helps households at risk of losing heat or power.

50,701

DISCONNECTIONS PREVENTED

17,929

HEATING FUEL DELIVERIES

6,010

FURNACE REPAIRS

DETROIT LAKES

Equitable Solar Access project hits a major milestone

MARCH 2023

Central, MN

We are thrilled to announce that Detroit Lakes Public Utilities has interconnected a new 11 kilowatt (kW) solar array as part of our shared Equitable Solar Access project.

Read more:

<https://www.cleanenergyresourceteams.org/story/equitable-solar-access-project-hits-major-milestone>



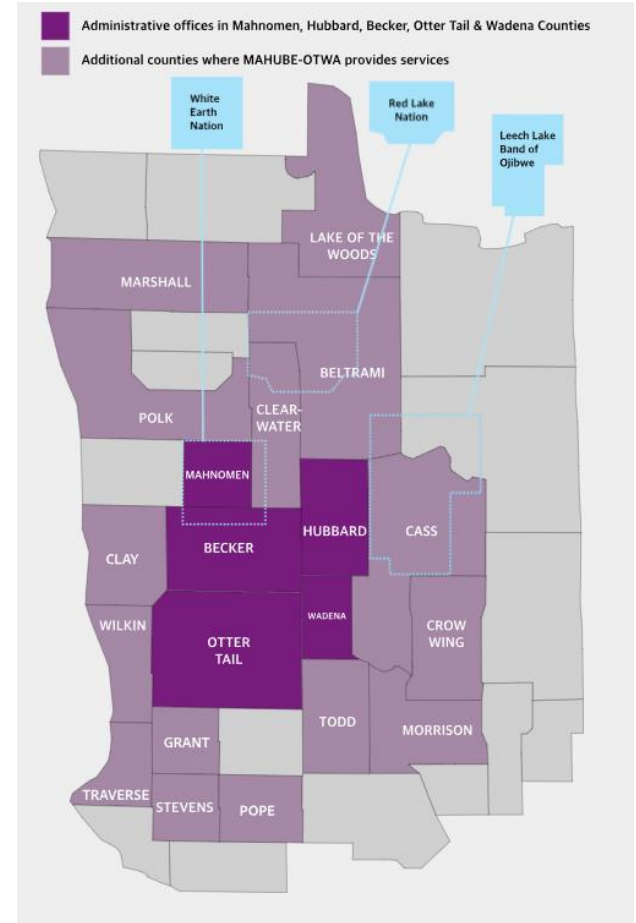
MAHUBE-OTWA CAP

- Background of MAHUBE-OTWA and role in ISSI, Equitable solar access
- Regional relevance of Detroit Lakes
- Necessity of CAP participation to identify low-income residents with energy profiles best suited for solar subscriptions
- How to utilize and integrate the Energy Assistance process and program with the utility billing process and crediting for Energy Assistance clients.



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<https://mahube.org/>



MAHUBE-OTWA CAP

- An analysis of the criteria to prioritize Energy Assistance clients such that this model will deliver meaningful energy burden reduction to these households.
- Why are manufactured homes included in this project?
 - a. Manufactured Homes have many challenges to deploying on-site solar arrays
 - i. Land is not owned by utility customer, Little desire to invest/
 - ii. Building is not capable of supporting much solar. Roof setbacks,
- 11 Participants and 6 sample usage amounts



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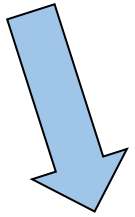
DLPU PARTICIPATION

- Hosting 11kW Array on available capacity on current Community Solar System.
- System components provided by grant from CERTS
- Will utilize an administrative system to manage billing with CAP MAHUBE-OTWA
- Avoided Demand Cost to DLPU for DG
- Positive value for utility and EA Customer

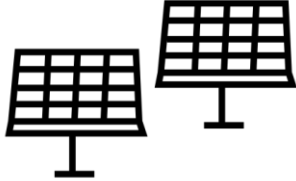


<https://cityofdetroitlakes.com/utilities>





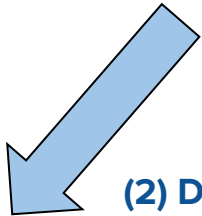
(1) Initial investment



DLPU solar array



(2) DLPU avoided wholesale purchase cost



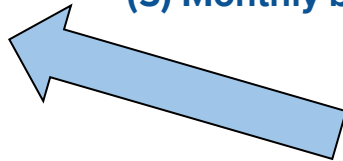
(3a) Monthly kWh deposits



(3b) EAP transfer (\$ transfer in heating season)

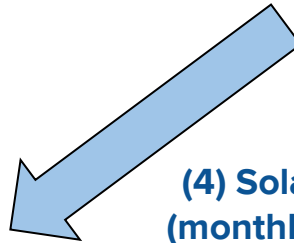


(5) Monthly bill



EAP Home

(4) Solar EAP benefit (monthly kWh credit in heating season)



MAHUBE-OTWA CAP kWh "bank"



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Model Functionality

Model that tracks:

- Solar output that fluctuates based on historic weather
- Utility avoided cost based on:
 - Solar project cost
 - Solar avoided wholesale energy and demand (based on historic peaks)
 - EAP transfer
 - kWh credit lost revenue
- Solar EAP tracking account (kWh bank)
- Customer impact:
 - kWh credits in heating months; monetized on bill as a kWh credit
 - Customer bills pre- and post- kWh credit

Data and Model Used:

- Solar production from NREL SAM model
- Utility wholesale rates applicable to DLPU
- Project Cost Base from LBNL Tracking the Sun and LBNL Utility Scale Solar
- Monthly customer load profiles from NREL End User Load Profiles and Mahube-Otwa CAP

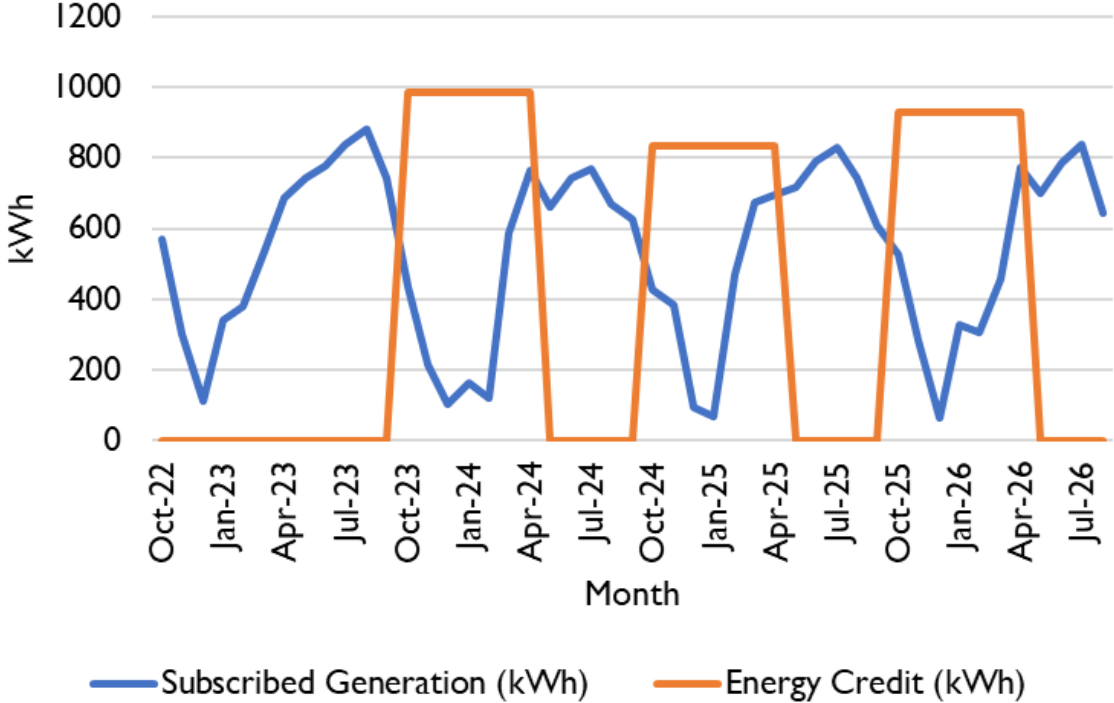


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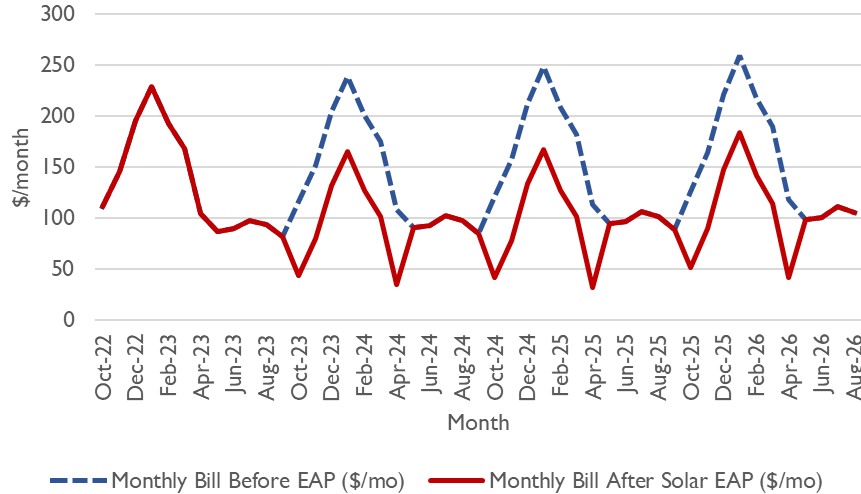
Solar production creates an “energy bank”

4kW solar subscription generation fluctuates but subscriber benefits accrue at fixed rate in EAP months

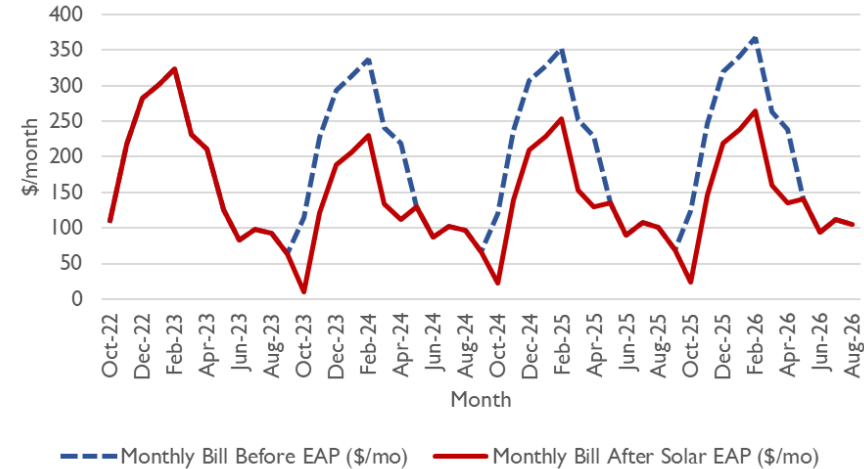


Customer bills before and after solar subscription

Solar subscription create bill reductions of \$15-20/kW-mo in heating months



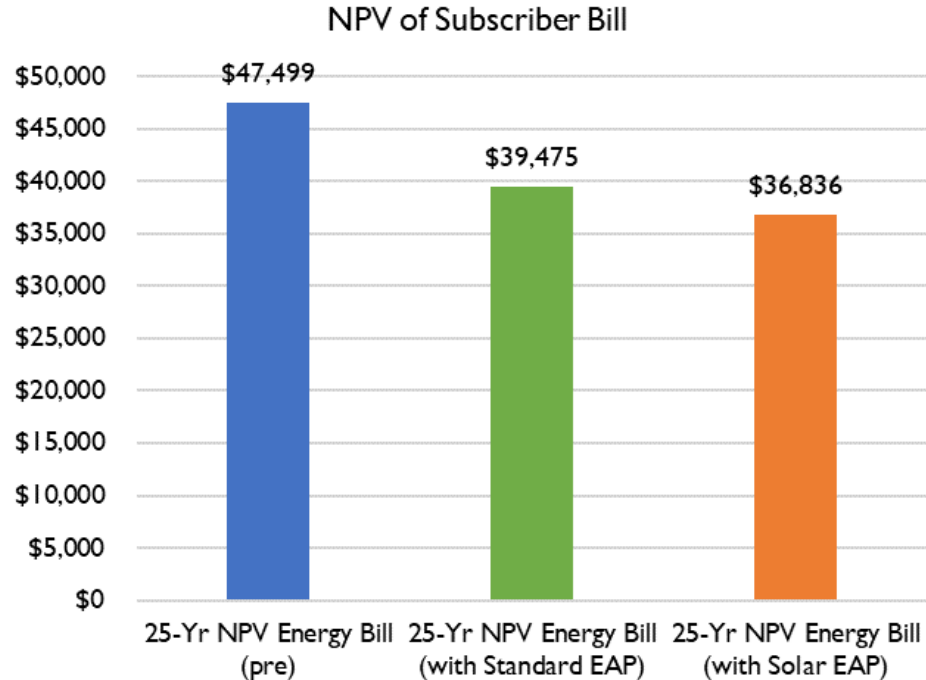
Customer A with 4kW subscription corresponds to ~\$72/mo in EAP months (24% annual bill reduction on NPV basis)



Customer B with 5kW subscription corresponds to ~\$95/mo in EAP months (22% annual bill reduction on NPV basis)

Customer bills before and after solar subscription

Solar subscription size can reduce bills throughout heating season at a comparable level to continuous enrollment in LIHEAP

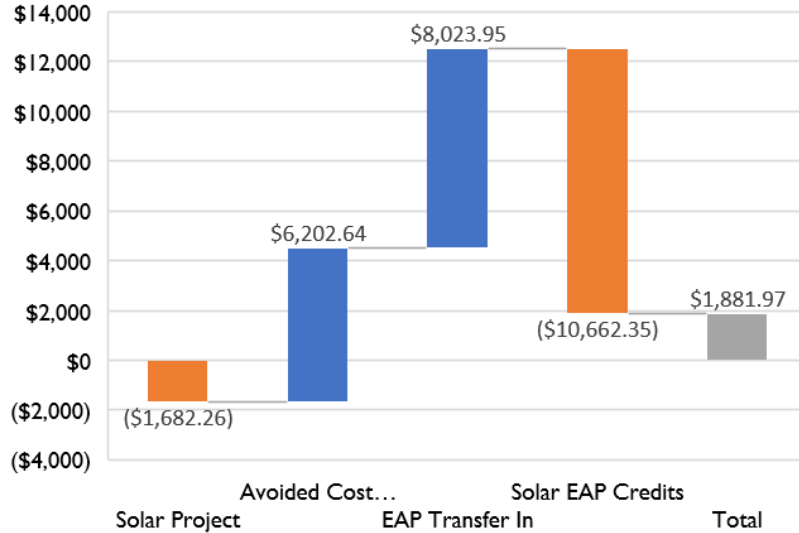


Utility cost impact

Subscription model can create net benefits to the utility

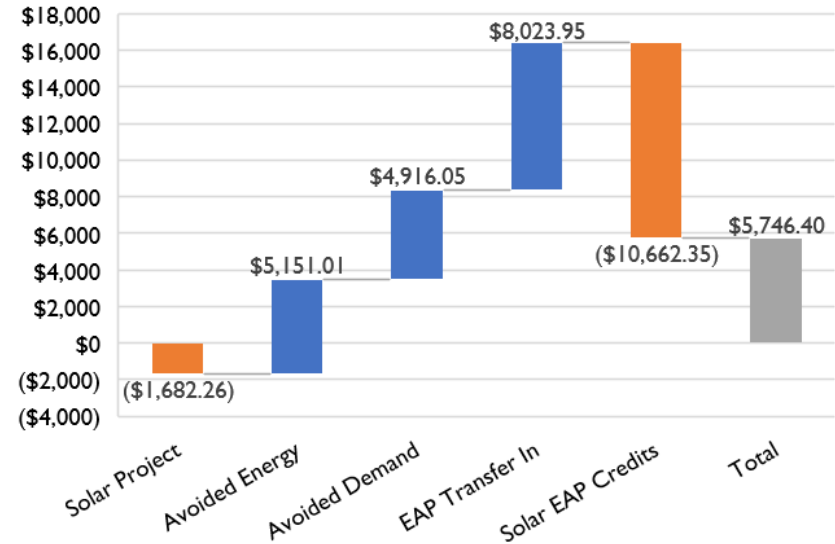


Utility NPV (DG Export)



Solar production valued at DG export rate

Utility NPV (Modeled Avoided Cost)



Solar production valued at utility avoided energy and demand costs

Open Questions

- **How to best create benefits for subscribers:**
 - “Shaping” customer benefits and risk sharing: the model grows a kWh balance at CAP and then annual production is fully allocated to consumers after initial period of production, but the initial kWh balance could act as a buffer which could provide ability for the CAP to give the customer a fixed benefit or flatten bills
 - Will solar subscriptions prove “stickier” than EAP enrollment?
- **How to best create benefits for the utility:**
 - Complexity of financing options for DLPU (esp tax treatment)
 - Opportunities to build scale across multiple municipal utilities in the same power provider
- **How to best minimize administrative complexity:**
 - How to manage the complexity of billing, financial transfers, and “banking” credits
- **How to scale the concept:**
 - Opportunities to scale under the EPA GGRF Solar of All program; particularly for munis and co-ops and manufactured and multi-family housing