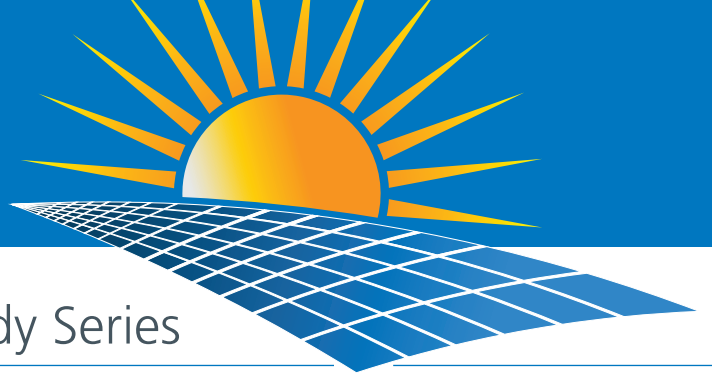


JUNE 2023



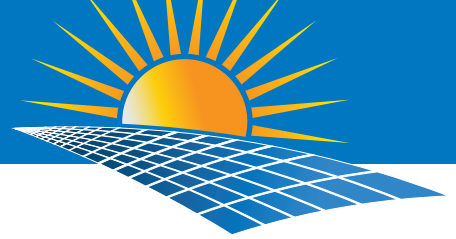
Solar with Justice Case Study Series

Partnering to Reduce Energy Burden

A Michigan Community Solar and Weatherization Pilot

By **Anna Adamsson**
Clean Energy States Alliance





About this Report

The Clean Energy States Alliance (CESA) prepared this case study to describe how Michigan's energy office collaborated with local community action agencies and utilities to develop three separate community solar pilots aimed at reducing the energy burden of low-income Michiganders. Residents that participated in the pilots enrolled in community solar programs and received free weatherization services. This case study illustrates how the program partners developed each pilot, what they learned, and what advice they would give to those developing future programs.

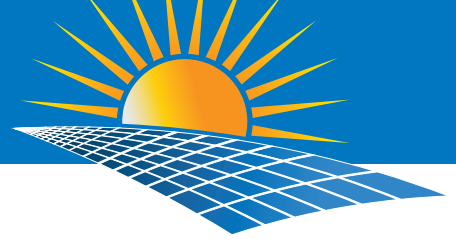
This case study was developed as part of the CESA's Solar with Justice: Connecting States and Communities project. The Solar with Justice project aims to bring together state energy agencies (SEAs) and community-based organizations (CBOs) developing solar for environmental justice (EJ) communities to create opportunities for dialogue and collaboration. This case study is the second of six case studies that will be published by CESA under the Solar with Justice project, highlighting models of collaboration between CBOs and SEAs on solar for environmental justice communities.



This case study was produced by the Clean Energy States Alliance (CESA) and based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Solar Energy Technologies Office (SETO) Award Number DE-EE0009360. Under this project, known as Solar with Justice, CESA is working in conjunction with academic, state, and nonprofit partners to understand and improve how state energy agencies and community-based organizations collaborate on solar. Learn more at: <https://www.cesa.org/projects/solar-with-justice>.

The U.S. Department of Energy Solar Energy Technologies Office accelerates the advancement and deployment of solar technology in support of an equitable transition to a decarbonized economy. Learn more at energy.gov/eere/solar. Logo was developed by the U.S. Department of Energy to indicate receipt of DOE funding—not an endorsement by DOE.





Land Acknowledgement

This case study focuses on three pilot programs in northwest Michigan (the location of the first pilot), the Upper Peninsula (the second pilot), and central Michigan (the third pilot). The author recognizes that these are the unceded lands of the Peoria, Anishinabewaki, Odawa, Sauk, Mississauga, Ojéwé, Šakówin, Wyandot, and Bodwéwadmí.¹

Special Thanks

For this case study, the author interviewed many of the collaborating partners on their experiences building these pilot programs. The author would like to thank Lisa Thomas and Julie Staveland of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for their valuable input, as well as the following partners from all three pilots, for their contributions to this report:

- Tish Stave, Weatherization Program Manager for Northwest Michigan Community Action Agency (Pilot 1)
- Rachel Johnson, Member Relations Manager for Cherryland Electric Cooperative (Pilot 1)
- Bob La Fave, Village Manager for L'Anse (Pilot 2)
- Miguel Rodriguez, Executive Director of Capital Area Community Services (Pilot 3)
- Jacob Stoll, Brain Shew, and Eric Clinton from Consumers Energy (Pilot 3)

The author would also like to recognize Michigan's Department of Health and Human Services (MI DHHS) Bureau of Community Action and Economic Opportunity for the important role the Department played in these pilots and Karl Hoesch, MPP' 20 and Doctoral Candidate at the University of Michigan School for Environment and Sustainability (SEAS) for their illuminating research of these pilots.

Additional assistance was provided by Maria Costello, Warren Leon, and Abbe Ramanan of the Clean Energy States Alliance.

This paper features EGLE's low-income weatherization program. The first pilot within this program won CESA's State Leadership in Clean Energy (SLICE) award in 2020. Information about that pilot is available in the case study *Michigan Solar Communities: Using a Community Solar Model to Expand Solar Access to Low- and Moderate-Income Communities*, by CESA Communications Manager Samantha Donalds and published in 2020.

¹ *Native-land.ca*, (accessed January 12, 2023).

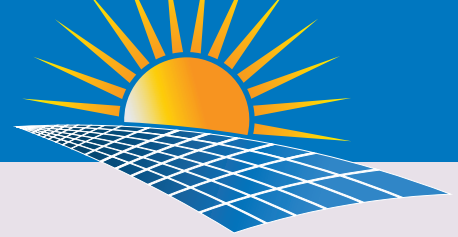


Photo: Brookhaven National Laboratory

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

COVER PHOTO

Cherryland Electric Cooperative's Cadillac community solar array. Photo: Cherryland Electric Cooperative

Contents

5 Introduction

8 The Three Pilot Programs

- 8 The First—Building on the Utility's Experience
- 10 The Second—Building on the Community's Momentum
- 12 The Third—Building on the Community Action Agency's Work. Weatherizing Homes First.
- 14 Approaches to Community Outreach
- 15 Funding These Pilot Programs

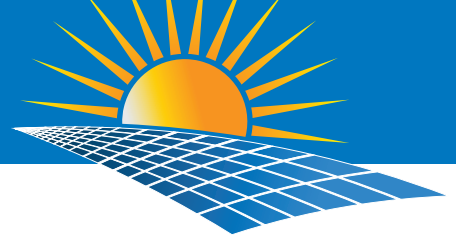
17 Building a Successful Partnership

- 19 The Importance of a State Energy Agency

20 Design Considerations for Constructing a Community Solar Low-to Moderate-Income Solar Access Program

- 20 Size the Subscriptions for a Meaningful Impact
- 20 Advice for Utilities
- 21 Consider the Area's Climate When Planning for the Solar Array's Installation Date
- 21 Rural Communities' Access to Contractors
- 22 A Tiered Approach—An Opportunity for Unregulated Utilities
- 23 DOE's National Community Solar Partnership

24 Conclusion: Creating New Community Solar Programs



Introduction

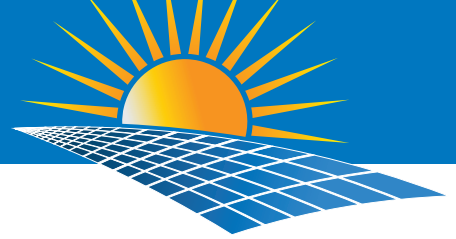
Millions of households across the country struggle with being able to pay their energy bills. Before the coronavirus pandemic, it was estimated that 25 percent of households in the US had a high energy burden, defined by needing to spend 6 percent or more of their income on energy costs.² That statistic likely rose during the pandemic.³ In Michigan, the average energy burden is 3 percent, but low-income households spend 15 percent of their income on energy on average.⁴

In 2017, Michigan's Department of Environment, Great Lakes, and Energy (EGLE) applied for and joined the U.S. Department of Energy's (DOE) Clean Energy for Low-Income Communities Accelerator (CELICA) with the goal of reducing the energy burden in the state.



Cherryland Electric Cooperative's Grawn community solar array. Photo: Cherryland Electric Cooperative

- 2 Drehobl, A., L. Ross, and R. Ayala, "How High are Household Energy Burdens?" *aceee.org*, September, 10, 2020, <https://www.aceee.org/research-report/u2006> (accessed January 12, 2023).
- 3 Ariel Drehobl, "A Perfect Storm? COVID-19 Cuts Incomes and Hikes Home Energy Bills," *aceee.org*, May 15, 2020, <https://www.aceee.org/blog-post/2020/05/perfect-storm-covid-19-cuts-incomes-and-hikes-home-energy-bills> (accessed January 12, 2023).
- 4 Elevate Energy, "Fact Sheet: Energy Burden in Michigan," *elevatenp.org*, May 31, 2017, <https://www.elevatenp.org/wp-content/uploads/Energy-Burden-in-MI.pdf> (accessed January 12, 2023).



[CELICA] was a voluntary partnership between the U.S. Department of Energy (DOE) and state and local governments to lower energy bills for low-income communities. Partners worked to better understand and address low-income energy challenges, and to demonstrate a wide range of locally designed energy efficiency and distributed renewable energy solutions.⁵

With CELICA's initial funding and support, EGLE developed a pilot demonstrating how to pair the benefits of weatherization with community solar for low- and moderate-income (LMI) residents.

Community solar enables households to benefit from the cost savings and environmental benefits of solar, without needing to install solar on their own roofs. Households oftentimes pay a fee to subscribe to a local community solar array and then receive bill credits on their energy bills.⁶

Community solar creates an opportunity to engage low-income households that experience a higher barrier to accessing and financing rooftop solar.⁷ Weatherizing homes enables residents to reduce their energy need by making key energy-saving updates.

The EGLE pilot's participants were able to benefit from substantial savings. The residents with community solar subscriptions reduced their yearly electricity costs by 30 percent. These savings accrued through monthly credits on their electric bills based on the amount of energy produced by the solar panels during that month. Although community solar reduces a household's energy *bills*, it does not affect household energy *usage*. The weatherization measures undertaken through the pilot made a large impact on both. By installing weatherstripping, new windows, or insulation, households reduced the amount of energy they *needed to use*, and thus the amount of money they needed to spend on electricity. By pairing community solar with weatherization, participants in this pilot experienced 70 percent total savings.⁸

The weatherization measures undertaken through the pilot made a large impact on both bills and usage. By pairing community solar with weatherization, participants in this pilot experienced 70 percent total savings.

After the success of the first pilot in 2018, EGLE decided to replicate this model and create pilots focusing on other geographies, types of utility service territories, and kinds of billing options. EGLE led the creation of three pilot programs, each in a different Michigan community and working with a different type of electric utility: cooperative, municipal, and investor-owned. With each pilot, EGLE partnered with a local community action agency (CAA), whose community-centered programming includes weatherization services to income-qualified residents. By choosing to pursue pilots within different communities, EGLE was

5 "Clean Energy for Low Income Communities Accelerator (CELICA) Overview," *osti.gov*, July 1, 2019, <https://www.osti.gov/biblio/1756503> (accessed January 12, 2023).

6 Learn more about community solar on DOE's webpage "Community Solar Basics."

7 Learn more by reading CESA's report *Bringing the Benefits of Solar Energy to Low-Income Communities*.

8 "NMCAA-Energy Partnership Helps Cut Residents' Utility Bills with Solar," *nmcaa.net*, https://www.nmcaa.net/downloads/celica_article.pdf (accessed January 12, 2023).



able to learn about the similarities and differences in implementing LMI community solar programs with different program designs. EGLE anticipated that these pilots could become blueprints for communities across Michigan with similar characteristics.

Each pilot was led by three core partners: the local CAA, an electric utility, and the state's energy agency. Broadly defined, the roles of each partner remained the same in each of the three pilot programs.

The **CAAs** provided free weatherization services to the participating homes and verified the participants' income eligibility. They also were often the first to approach prospective households about this opportunity - introducing the idea of community solar and sharing how this could benefit them. The CAAs were able to use their trusted relationship with the low-income communities that they serve to approach residents about participating in the pilot. The community action agencies participating in these pilots are the following: Northwest Michigan Community Action Agency, Baraga-Houghton-Keweenaw Community Action Agency, and Capital Area Community Services.

The primary role of the three **electric utilities** was to develop a way for participants to join a community solar program. One utility built a new solar array. The other two utilities leased shares from an existing community solar array. The utilities had to establish a billing structure so that community solar participants would automatically receive credits on their utility bill statements. Cherryland Electric Cooperative, L'Anse municipal utility, and Consumers Energy were the utilities participating in these pilots. Where the utility had established close ties with community members, it could also take an active role in engaging with prospective household participants.

EGLE, the **state energy agency**, contacted potential partners at CAAs and utilities and asked them to partner on the development of these pilots. EGLE played an important role in these pilots by building out each pilot's parameters, coordinating program development, convening key stakeholders, negotiating each partner's roles, and securing initial funding.

Each pilot was led by three core partners: the local CAA, an electric utility, and the state's energy agency. The CAAs were able to use their trusted relationship with the low-income communities that they serve to approach residents about participating in the pilot.



The Three Pilot Programs

In this section, the three pilot programs that Michigan EGLE supported will be detailed from the first pilot’s inception in 2017 through to each pilot’s ultimate success. Figure 1 shows the timeline of the pilot’s development. The pilots, while structured similarly, served different geographies, partnered with different utilities and types of utilities, and were designed to meet their community’s needs. This section contrasts those differences, some of which are summarized in Table 1, while still recognizing the similarities between pilots.

TABLE 1 **Locations of the Three Pilot Programs**

Location	Cost to LMI subscribers	Utility Structure	Communities Served
Grand Traverse County	No cost to subscribers	Cooperative	Rural
L’Anse	Subsidized on-bill financing	Municipal	Rural
Lansing	No cost to subscribers	Investor-Owned	Urban/Rural

The First—Building on the Utility’s Experience

In 2017, EGLE reached out to Cherryland Electric Cooperative and the Northwest Michigan Community Action Agency (NMCAA) about the prospect of creating a pilot to reduce electricity costs for local low-income residents through weatherization and participation in community solar. Cherryland and NMCAA both work out of northwest Michigan. Cherryland services 36,000 member customers in six counties; NMCAA serves 10 counties. The pilot focused on the five counties they both serve—Benzie, Grand Traverse, Kalkaska, Leelanau, and Wexford. These five counties boast over 100 miles of shoreline with Lake Michigan and experience over 100 inches of snow on average every winter.^{9,10,11}

EGLE, Cherryland, and NMCAA agreed to build a new community solar and weatherization program for LMI residents in their service territories. EGLE, Cherryland, and CELICA (a US DOE program providing

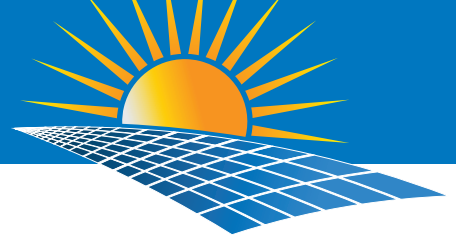
FIGURE 1 **Pilot Roll-Out Schedule**



9 Lisa Thomas, Julie Staveland, interview by author, February 15, 2022.

10 Rachel Johnson, interview by author, March 15, 2022.

11 Tish Stave, interview by author, April 6, 2022.



financial support) committed \$270,000 to the program. The program partners decided to assign nine solar panels to each participating household, estimating that the combined savings from the solar panels would create a meaningful and impactful reduction in the household’s energy burden. Based on the amount of available funding and the number of panels assigned to each subscriber, the program partners calculated they could support community solar subscriptions for up to 50 LMI households in the first pilot.

Once the program partners established the program’s budget and size, they needed to begin enrolling households into the program. Cherryland already had experience with community solar; in 2013, it built Michigan’s first community solar project, a 224-panel solar array.¹² Today, Cherryland has 1.7 megawatts of community solar capacity available for their member customers. With Cherryland’s experience and access to established community solar arrays, it was able to expedite the process of enrolling participants into the new LMI community solar program.

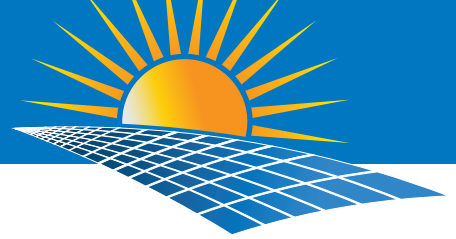
Weatherizing 50 homes takes significantly longer. To launch the pilot within a year, EGLE, Cherryland, and NMCAA decided to engage households who had previously received weatherization services from NMCAA. They needed only six months to launch the pilot.

One subscriber expressed relief at being enrolled in the program. “I was starting to really panic. Just knowing I could save \$30 to \$40 a month on my electricity bill makes things a lot easier,” said Ruby Ogemagededo.



Left: Jeremy Truog, Technical Manager and Building Performance Institute (BPI) Certified Energy Auditor performs a blower door test on a home during an energy audit. A blower door is a machine that tests the air tightness of a home and helps measure how much air is entering or escaping from it. Center: Jeremy checks a propane tank for gas leaks during an energy audit. Right: Jeremy runs diagnostics on a home’s furnace during an energy audit. Photo: Northwest Michigan Community Action Agency

¹² Balaskovitz, Andy, “Community Solar Coming of Age in Michigan,” *energynews.us*, May 27, 2014, <https://energynews.us/2014/05/27/community-solar-coming-of-age-in-michigan> (accessed January 12, 2023).



Subscribers to the program receive \$0.10 per kilowatt-hour of output for their PV shares. That equates to approximately \$350 annually in solar bill credits. That amount of savings can be life-changing for some households. One subscriber expressed relief at being enrolled in the program. “I was starting to really panic. Just knowing I could save \$30 to \$40 a month on my electricity bill makes things a lot easier,” said Ruby Ogemagedo. “It means that I don’t have to worry about how my dogs are going to eat.” The winter before this program was initiated, she had fallen behind on her monthly utility payments.¹³ She was approached by NMCAA about receiving free weatherization for her house, which made her eligible to join the pilot when it was starting later that year.

After one year of the community solar pilot, Cherryland experienced a 9.7 percent decrease in late payments from enrolled households. This program will have a lasting impact on this Michigan community.

The Second—Building on the Community’s Momentum

The Village of L’Anse is a small community—under 2,000 residents at the time of the 2020 census. It is in Michigan’s Upper Peninsula, bordering Lake Superior, an area that has not been a hub of solar development. In fact, L’Anse became only the third town in Michigan’s Upper Peninsula to build a solar array.^{14,15}

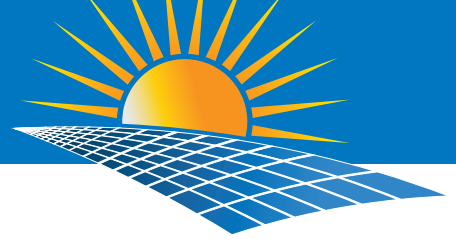
In 2015, the Village’s municipal-owned utility began exploring how it could bring solar into the area and prove that it is an effective energy source for a northern climate. The utility decided to pursue a demonstration project at the Village water treatment plant. L’Anse sources its water from Lake Superior and pumps it into the community. The process is energy intensive, so the prospect of saving money on the plant’s high energy bill was enticing. By choosing the water treatment facility for its solar project, the utility also wanted to show that the solar project was relevant to everyone in the community, since everyone uses water. The 11.4-kW solar array completed in 2016 was a success. The project “started a whole conversation in the community about solar energy and whether there’d be a way the rest of the community could participate in a more meaningful way if they wanted to,” recalled L’Anse Village Manager Bob La Fave.

L’Anse then began exploring community solar during the fall of 2018. The Village municipal utility partnered with Michigan Tech University faculty and students to provide the expertise and capacity needed to develop this new project. Together they hosted community listening sessions, canvassed neighborhoods, and created a community survey. The community’s commitment to this project made the local news and caught the attention of EGLE staff, who reached out to L’Anse about partnering on a pilot.

¹³ Holly, Derrill, “Helping Low-Income Members Spend Less on Energy,” *electric.coop*, July 2, 2018, <https://www.electric.coop/michigan-cherryland-electric-co-op-trims-member-bills-community-solar> (accessed January 12, 2023).

¹⁴ Christensen, Kelley, “Solar for the People,” *mtu.edu*, March 3, 2020, <https://www.mtu.edu/news/2020/03/solar-for-the-people.html> (accessed January 12, 2023).

¹⁵ Bob La Fave, interview by author, April 4, 2022.



The pilot relied on the same set of stakeholders as the one with Cherryland and NMCAA: a local utility, a local community action agency, and EGLE. L'Anse's utility area was served by the Baraga-Houghton-Keweenaw Community Action Agency (B-H-K CAA). Like the first pilot, this program enrolled households who had already received weatherization services through the CAA within the past few years.

The L'Anse pilot diverged from its predecessor by requiring buy-in from subscribers, instead of offering free enrollment. Before EGLE joined the program, L'Anse had already decided through community input to create an LMI tier of the program. In this tier, subscribers would not have to pay any upfront cost. LMI subscribers would commit to a small monthly fee for half the life of the solar array. The fee would be charged to their electricity bills, in a type of on-bill financing. Under this payment structure, households would normally pay back the entire cost of the solar subscription; however, in this pilot, EGLE subsidized the cost of each subscription to make the fee affordable for LMI households.

Community solar programs benefit from considering the community they are built to serve and listening to their needs. La Fave remarked in response to the payment structure, “. . . [community solar] could work anywhere, but this is L'Anse's recipe . . . just because it worked like this here doesn't mean that there isn't a better recipe for somebody else based on their own individual community needs.”

The L'Anse Village municipal utility partnered with Michigan Tech University faculty and students to host community listening sessions, canvass neighborhoods, and create a community survey. Community solar programs benefit from considering the community they are built to serve and listening to their needs.

L'Anse built a 110.5-kilowatt, 340-panel solar array with their wholesale purchase provider, WPPI, for this community solar program. The LMI pilot served 25 subscribers who could choose how many solar panels they wanted to subscribe to. Twenty-four of the 25 subscribers committed to 10 solar panels each, the maximum allowed per household. A subscription for a single solar panel costs \$0.90 every month but is offset by monthly bill credits of \$0.95 per kilowatt-hour of output. The program was launched in 2020. So far, subscribers have not had any out-of-pocket costs because the solar credit has always exceeded the lease payment for the panels. LMI subscribers have since earned about \$275 in solar bill credits each year, or \$21 to \$23 each month. Before this pilot began, some of these households would fall behind on their bills and become delinquent. Importantly, these monthly savings enable households to keep up with and afford their energy bills.



The Third—Building on the Community Action Agency’s Work. Weatherizing Homes First.

Nearly three-quarters of all electricity customers in the United States are served by investor-owned utilities. Consumers Energy, the largest investor-owned utility in Michigan, serves 6.8 million of the state’s 10 million residents.¹⁶ EGLE sought to test its LMI community solar model with all three utility structures—cooperative, municipal, and investor-owned—so it developed a third pilot and partnered with Consumers Energy. Unlike the first two pilots, this one focused on a major city, Lansing, the state capital, as well as surrounding areas.^{17,18}

EGLE first met with Capital Area Community Services (CACS), a CAA serving Lansing and surrounding towns. CACS had not previously worked with EGLE but saw this pilot as an opportunity to build a new relationship with a state agency. Like many CAAs, it had existing relationships with other city and state agencies for weatherization and other community-serving programming.

Nearly three-quarters of all electricity customers in the United States are served by investor-owned utilities. Consumers Energy, the largest investor-owned utility in Michigan, serves 6.8 million of the state’s 10 million residents.

CACS then reached out to Consumers Energy about the potential program in October 2018. By November, Consumers Energy had met with both EGLE and the Michigan Public Service Commission (MPSC). Consumers Energy issued a biennial voluntary green pricing filing with the MPSC in October 2019,¹⁹ which the MPSC approved in September 2020.²⁰ At that point, the project partners were able to begin moving forward. Like Cherryland, Consumers Energy had already established a community solar program in 2016 named the Solar Gardens-Sunrise Program.

This pilot utilized existing community solar subscription capacity and created a specialized subset of the Sunrise Program for low-income households. From an administrative standpoint, Consumers Energy uses the same enrollment database that it uses for the entire Solar Garden program. The participating households do not pay for their subscriptions at all. The costs are completely absorbed by EGLE, which funnels money through CACS to pay for the subscriptions. Consumers Energy bills CACS. The earnings from the solar arrays are distributed in bill credits to the subscribing households.

The previous two pilots allowed participating households to stay subscribed for 15 or 25 years. This pilot diverged from that by capping participation at three years. Consumers Energy shared that households could be eligible for extensions at the discretion of the CAA,

16 *Consumersenergy.com* (accessed January 12, 2023).

17 Miguel Rodriguez, interview by author, March 24, 2022.

18 Brian Shew, Eric Clinton, Jacob Stoll, interview by author, April 18, 2022.

19 Consumers Energy Company, “U-20649-0001,” *mi-psc.force.com*, Oct. 18, 2019, <https://mi-psc.force.com/s/filing/a00t000000EQDSoAAP/u206490001> (accessed January 12, 2023).

20 Michigan Public Service Commission, “U-20649-0100,” *mi-psc.force.com*, Sept. 24, 2020, <https://mi-psc.force.com/s/filing/a00t000000HOf4jAAD/u206490100> (accessed January 12, 2023).



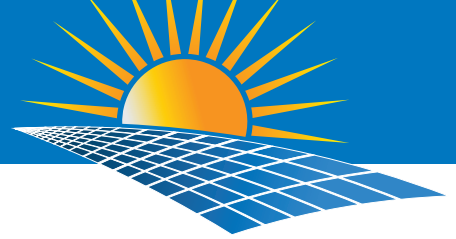
but that this limit would allow more income-qualified households to participate and benefit from the program.

Another significant difference between this pilot and the former two is that participants would be newly weatherized. CACS described the weatherization process as potentially lengthy. The initial weatherization intake process can take up to two weeks as households gather and prepare the necessary paperwork verifying their identity and income. Then, the household meets with an inspector who does an audit and assesses effective weatherization measures. After that, a contractor makes the weatherization upgrades, before the inspector returns to make sure the upgrades were implemented satisfactorily. Finally, CACS signs off on their successful completion. This whole process can take up to a year, although CACS is looking to reduce this turnaround time by onboarding more inspectors.



Left: Weatherization crew member performs air duct sealing in home being Weatherized. Sealing and insulating leaky air ducts increases energy efficiency and can lower monthly utility bills. Right: Foundation insulation after a home has been Weatherized: foil-faced insulated boards, air-sealed around the edges, prevent cold from entering the basement in this home. Photos: Northwest Michigan Community Action Agency

In the former two pilots, households needed to have been recently weatherized within the last few years. By restricting enrollment to households who have not yet undergone weatherization, this pilot can more accurately study the effect that weatherizing a home and subscribing to community solar has together. For example, do households change their energy use habits and how would they characterize the amount of savings they experience? This third pilot seeks to answer these questions. CACS and Consumers Energy have enrolled 50 households in the pilot since 2022.



Approaches to Community Outreach

Grand Traverse County—NMCAA led the pilot’s outreach to prospective households. Because they decided to work with homes that they had already provided weatherization services to, NMCAA was able to rely on their pre-existing relationships. Weatherization is an in-depth process from start to finish, so the CAA had built a connection with their clients and kept in touch with them over time. These households were already income-qualified through their participation in WAP-funded weatherization.

NMCAA used a combination of letters and phone calls to reconnect with their past weatherization clients. To introduce the concept of community solar to prospective participants, they used a fact sheet. Cherryland also compiled a fact sheet with important talking points about community solar and offered to talk to households who had additional questions. NMCAA also encouraged prospective participants to reference [Cherryland’s community solar webpage](#) dedicated to providing educational information and resources. The utility created this page in 2013 when it first began selling community solar subscriptions.

L’Anse—In the smaller community of L’Anse, the municipal utility enlisted the help of the local media to spread word of the program. The utility reached out to the local newspaper, the local TV stations, and the local radio stations to invite them to attend several community meetings for this program. Word spread about the goal of creating a community solar program and the opportunity for community members to provide feedback on how this program was planned and implemented.

To reach people who didn’t regularly tune into the news, L’Anse included info sheets in utility bills and sent letters to households they knew were eligible for this program because they had previously received income-qualified services from B-H-K-CAA. On the weekends and evenings, L’Anse staff went door to door reaching out to people where they were, answering questions about the opportunity to participate in community solar, and building trust. Later, the utility followed up with subscribers and offered to give tours of the community solar array after it was built and operational. The small municipal utility that is only staffed by three people—the Village Manager, Clerk, and Treasurer—invested their time into making this program a success.

Lansing—CACS is the first point of contact for potential participants. Every household who applied and qualified for CACS’ weatherization services is approached about whether they would also like to participate in the community solar pilot. CACS explained the program, gave them an informational sheet, and shared any additional information that Consumers Energy developed for their [Sunrise Program](#).

In the smaller community of L’Anse, the municipal utility enlisted the help of the local media to spread word of the program. The utility reached out to the local newspaper, the local TV stations, and the local radio stations to invite them to attend several community meetings for this program.



Besides needing to meet income requirements, participants were also required to receive both their electricity and heat through Consumers Energy. If both those conditions were met and the household agreed to participate, then CACS added the household to a list, which Consumers Energy used to enroll the household in the program.

Funding These Pilot Programs

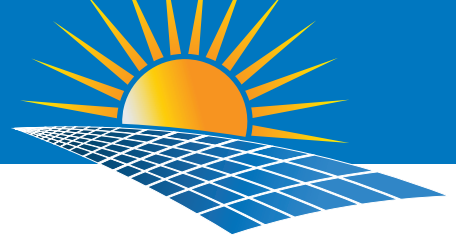
US DOE created the CELICA program to bring local and state partners together to reduce low-income communities' energy burden. Each partner crafted its own pilot project under CELICA and then reconvened to share the project's lessons learned. The CELICA program served as an avenue for both information and resource-sharing between levels of government: local, state, and federal. CELICA also provided funding to propel these programs forward.

EGLE joined the CELICA program in 2016. The agency applied for and received \$80,000 from CELICA to create their first pilot with NMCAA and Cherryland. CELICA only provided financial support for this initial pilot. To increase the pilot's impact, Cherryland decided to invest \$190,000 to increase the number of community solar subscriptions in the pilot. At that time, Cherryland's existing community solar program had approximately 2 megawatts of capacity from over 5,500 solar panels at two locations: one in Cadillac and one in Cassopolis, Michigan. The \$270,000 in combined funds were used to pay for 450 panel share subscriptions from Cherryland's existing arrays. These 450 panel shares were allocated to the 50 households participating in the pilot. In 2022, Cherryland expressed interest to EGLE that they wanted to expand the LMI pilot. EGLE agreed to purchase \$54,000 worth of additional subscriptions for ten additional LMI households. The Cherryland pilot now includes 60 homes.

US DOE created the CELICA program to bring local and state partners together to reduce low-income communities' energy burden. Each partner crafted its own pilot project under CELICA and then reconvened to share the project's lessons learned.

For the second pilot, EGLE invested \$62,500 to fund 25 solar subscriptions in a newly built 110 kW, 200 panel community solar array in L'Anse. EGLE committed \$200,000 to the third pilot. Like the first pilot, this money funded the subscriptions for Consumers Energy's already-built community solar array. CACS received the first \$50,000 to pay for a portion of the first set of community solar subscription enrollment fees and then was able to request the remaining balance when they had shown growth in the number of households wanting to participate in the program. The weatherization completed in all three pilots was completed by the CAAs and funded by DOE's Weatherization Assistance Program (WAP).

Future community solar programs of similar scope and intention could benefit from introducing innovative funding structures or sources. Cherryland decided to provide funding for the initial pilot because they wanted to help support this proof of concept. However, they admitted that small utilities cannot necessarily fund these programs indefinitely.



In the second case study, L'Anse decided that LMI community members could afford on-bill financing of their community solar subscription, subsidized through the program's funding. However, this structure would not benefit all LMI communities equally and should not be considered in all programs. The L'Anse program engaged households with income at or below 300 percent of the federal poverty line (FPL), prioritizing households at 200 percent or below the FPL. Currently, the pilot is fully subscribed with households at or below 200 percent of the FPL. Households in the second pilot save about \$23 every month. The first and third pilot, which did not require any buy-in, focused on households with income at or below 200 percent of the federal poverty level. These households save about \$30 every month.

The program administrators understood the communities they were serving and then built programs that created benefits sized to the needs of their community. The program design is not one-sized. Income levels were not the only factor that influenced the payment structure; there were other nuanced reasons arrived at through engagement with the community, but average income is an important factor.

Stakeholders interested in creating similar programs in their communities should look for grant funding, funding support from their state government and local utility, and other forms of creative fundraising.

The Inflation Reduction Act (IRA) passed in 2022 creates new funding opportunities and removes barriers to accessing significant federal tax incentives. Before the IRA, the Investment Tax Credit (ITC) aimed to lower the cost to install solar by providing a tax credit equal to 26 percent of the project's installation cost. However, this policy excluded nonprofit organizations and state, local, and Tribal governments who are tax exempt. To remedy this issue, the IRA created the ITC direct payment option, which enables tax-exempt organizations to receive the benefits of the ITC as an upfront payment, rather than a tax credit.²¹

The IRA created the ITC direct payment option, which enables tax-exempt organizations to receive the benefits of the ITC as an upfront payment, rather than a tax credit.

The IRA and the Infrastructure Investment and Jobs Act (IIJA) also created new funding opportunities for equity-focused solar projects. Stakeholders interested in creating a similar program in their area should reference [DOE's Solar Energy Technologies Office \(SETO\)](#) and the [Office of State and Community Energy Programs \(SCEP\)](#) to learn more about open funding opportunities. [CESA's Solar Equity Digest newsletter](#) also shares funding updates and features new and innovative solar projects and policies.

²¹ Learn more about the updates made to the ITC by the IRA in these articles by Clean Energy Group "The Inflation Reduction Act is a Game Changer for Nonprofits Seeking Solar+Storage," and "What Nonprofits Need to Know About the Investment Tax Credit."



Building a Successful Partnership

These pilots were built on the successful collaboration among the following partners:

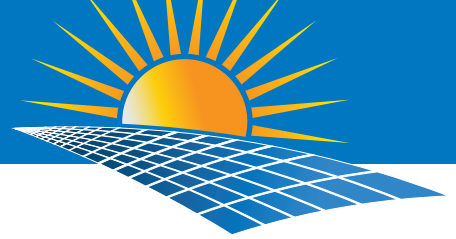
1. A community action agency that provides weatherization services to community members
2. A utility
3. A state energy agency

The partners credited their success to effective and frequent communication, both during the planning process and while implementing the program.

When a pilot is designed, the program partners should play an active role in developing the program's scope, goals, and each partner's responsibilities. For example, when EGLE worked



Representatives from Cherryland, NMCAA, and EGLE stand in front of Cherryland's Grawn community solar array. Photo: Cherryland Electric Cooperative



on the development of the latter two pilots, they allowed these pilots to be customized by and for the communities they were serving. The Cherryland and NMCAA pilot had already been successful, but EGGLE did not prescribe that same vision to the other pilots. Instead, the L'Anse and Lansing communities were able to establish their own vision and steps toward success.

This understanding extended to the process of developing a contract with EGGLE and signing memorandums of understanding (MOUs) between all partners. In the Lansing CACS pilot, CACS requested that the contract include language permitting termination of the contract if there were significant obstacles or unresolved issues. While they have not had reason to invoke that stipulation, the inclusion of the principle protects all the partners involved.

All partners should strive to establish organization-wide commitment to the program. This protects the program from the possible effects of staff turnover. If, in this case, the key collaborators for the program left, then each partner organization should still be motivated to see the pilot succeed. Pilots can take months, and sometimes years, to develop and implement. State agencies tend to have extensive internal processes and the need for internal approval before programs can advance. To prepare for a potentially slow development, program partners should prepare a failsafe in case one or more staff leave. This includes keeping internal notes of program progress and next steps.

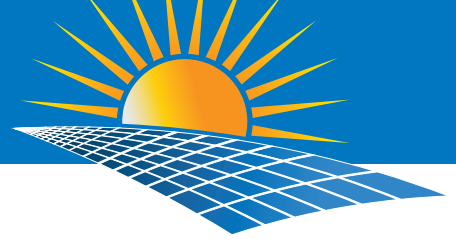
In the case of these pilots, the primary contact at EGGLE who had led the development of the first pilot with Cherryland and NMCAA transitioned out of their role shortly after it was established and before the second pilot was launched. Someone else within EGGLE was able to take up the mantle from there. Since these community solar subscriptions are eligible for participation for up to 25 years, there will inevitably be and have already been changes in staff leadership within the utility and CAA partners, as well.

If a state energy agency wants to become involved in or begin a similar program, the agency should consider what funding they are willing and able to commit to the program and whether the funding can help offset the administrative costs that the community action agencies will bear.

When approaching a community action agency about a potential partnership, both utilities and states agencies alike should recognize and understand the breadth of services that a CAA provides and their expertise in these areas. Prospective partners should approach this relationship with a desire to maintain transparency.

When establishing a new relationship, prospective partners should also recognize existing bonds. For example, CAAs in Michigan work with the state's Department of Health and Human Services (DHHS) on weatherization. Within these pilots, it was important to engage MI DHHS early on, which helped create a stronger foundation when initially interacting with the local CAAs.

All partners should strive to establish organization-wide commitment to the program. This protects the program from the possible effects of staff turnover.



Creating a new program requires work. The process can be made easier by establishing a solid foundation of communication and respect between the program's partners.

The Importance of a State Energy Agency

These pilots benefited from having a champion within the EGLE office, Sarah Mulkoff. She developed the first pilot, convened, and motivated the program's partners at Cherryland and NMCAA, and succeeded in moving the program through the state's bureaucratic systems. Rachel Johnson who is the Member Relations Manager for Cherryland and was a key partner in its pilot shared, "This program would not have happened without Sarah, she was a true champion for the pilot project and helped the team overcome many early challenges and roadblocks."²² EGLE created the idea for the first pilot and then reached out to key potential partners: Cherryland and NMCAA. Once those partners officially signed on to the pilot, EGLE convened meetings and kept the development of the program moving forward. They also committed funding towards the program, first from CELICA and later their own state energy budget. Future iterations of the pilot were able to learn from and develop from the groundwork EGLE initially laid down.

State partners can play a pivotal part in encouraging a program's creation and success, like EGLE has done in these pilots. While a partnership with a state agency can be ideal, it is not always necessary nor is it possible in every political climate. Johnson from Cherryland went on to say that "the most important relationships are the local ones," indicating the utility and the CAA, because those partners are meeting with the homeowners, weatherizing homes, and administering the community solar program.²³

²² Johnson, interview.

²³ Johnson, interview.



Design Considerations for Constructing a Community Solar Low-to Moderate-Income Access Program

Size the Subscriptions for a Meaningful Impact

The designers of the first pilot had originally set out to engage as many LMI households as possible within their limited budget. Maximizing participation would have meant gifting each participating household one solar panel. However, the relative impact on each household would have been small. The savings accrued from one solar panel subscription could have been as low as \$30 a year or \$3 every month. Instead, the designers of the first pilot decided to scale down the number of households in the program and assign each household 10 solar panels. This change meant participating households could earn savings of approximately \$350 on average every year through this pilot, which is much more impactful. It is important to structure a program so that LMI households achieve a meaningful reduction in their energy burden.

Advice for Utilities

Utilities that are developing their first community solar programs will need to dedicate time and resources to creating the foundation for the program. For example, utilities will need to develop a contract for prospective community solar subscribers. Cherryland Electric Cooperative advised fellow small utilities to not make the contracting process “more complicated than it needs to be.”²⁴ Their community solar contract is only two pages long.

Community solar programs generally include adding both costs and credits to the subscriber’s utility bill. Subscribers will incur a monthly flat fee for participating in the program and they will concurrently receive a bill credit representing the amount of energy produced by the solar panels they subscribe to. Utilities should consider what their billing system is capable of detailing. If the utility’s system is unable to add a miscellaneous credit onto the bills of participating households, then the utility will need to work through other options. If the utility’s billing system is capable, then that makes the job of the utility much easier.

Utilities that are developing their first community solar programs will need to dedicate time and resources to creating the foundation for the program.

²⁴ Johnson, interview.



Once the utility has worked through these questions and established a community solar program, the program will likely not need significant ongoing support. In fact, the program may only need general auditing to catch whether a participant moves away. Then, they will need to onboard a new community solar subscriber to replace the last one. The L'Anse municipal utility shared that in their case there was “no sense in hiring someone new” when developing a community solar program.²⁵ L'Anse recommended that utilities should plan to develop their community solar programs when the utility feels comfortable devoting extra staff capacity. Depending on the utility's capacity, some utilities may still want to consider onboarding an additional staff person before developing a community solar program.

Consider the Area's Climate When Planning for the Solar Array's Installation Date

Both the first and the third pilots leveraged use of existing solar arrays for their community solar programs. The second pilot in L'Anse designed, built, and commissioned a new solar array. After the system was installed, they had it commissioned in November, just as winter was beginning. L'Anse is a small town located far north in the Upper Peninsula of Michigan. Winters are dark, cold, and snowy. L'Anse's municipal utility, with the help of Michigan Tech University, had modeled the solar array's anticipated production and knew that the array's output would be lower in November.

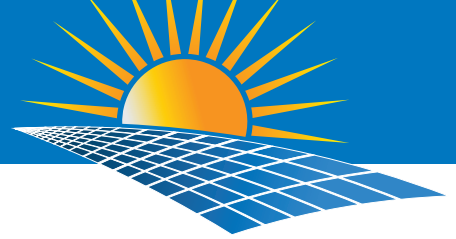
However, they did not expect it to underperform as much as it did. The program's team questioned whether its poor performance was a result of the weather. Eventually, they identified that some of the components of the system, including the optimizers, were malfunctioning and needed to be replaced. When commissioning a solar array in areas with seasonal inclement weather, plan on installing it during a season when high production is likely to occur. A problematic low output beginning when a system is first installed is more noticeable during a season of high production than during a time when production levels were already anticipated to be lower than usual.

Rural Communities' Access to Contractors

L'Anse, a small community in Michigan's Upper Peninsula, had issues finding contractors who would service the area and help build the solar array for the community solar program. The timetable for launching the program was delayed several times, because of the challenges of building in a rural area. Program teams in rural areas should plan for possible delays when creating a timeline. These teams should also consider how the solar array will be serviced in the future.

Depending on the utility's capacity, some utilities may still want to consider onboarding an additional staff person before developing a community solar program.

²⁵ La Fave, interview.



A Tiered Approach—An Opportunity for Municipal Utilities

When L'Anse first began engaging with community members about what they wanted to see come from community solar, they received “a very strong response that people felt this should be something that everyone in the community should be able to participate in regardless of their income,” said Village Manager Bob La Fave. In response to this, L'Anse created three tiers. The **lowest tier** became what is now recognized as the second pilot within EGLE's low-income community solar program. That tier was created for LMI households and required no upfront cost and only minimal monthly recurring payments for half the lifetime of the solar array, about 10 years. Subscribers will receive monthly bill credits for 20 years.

Alongside the LMI community solar pilot, L'Anse offered two other tiers for other households interested in supporting clean energy and accruing energy bill savings. Households participating in any of the three tiers would become a subscriber for the lifetime of the solar array or about 20 years unless they decided to move outside L'Anse's service territory. The **highest tier** asked households to pay the entire cost of the solar panel subscription upfront. They would not need to pay anything else through the life of the solar array. For households participating through the **middle tier**, they would need to pay approximately half the cost of the panel upfront. Then, the balance would be divided into small installments paid through on-bill financing for the next ten years.

Subscriptions to the high and middle tier cost the same amount, but by giving two payment options, interested households could choose which payment plan made more sense for them and their budget. L'Anse had witnessed how fellow community solar programs only offered a flat fee to join a subscription. Since L'Anse is a municipal utility and is not regulated by Michigan's Public Service Commission, L'Anse had control over the financing options and could develop this three-tiered approach.

Subscriptions to the high and middle tier cost the same amount, but by giving two payment options, interested households could choose which payment plan made more sense for them and their budget.

Price sensitivity should be carefully considered. From their community survey, L'Anse gauged residents' price sensitivity and discovered that community members were more likely to participate in the program if the price of one panel was no more than \$350.

To get near that price per panel goal, L'Anse realized they would need to expand the size of the solar array from their planned 50-kilowatt system to a larger 110-kilowatt system to achieve economies of scale. Building a larger solar array meant L'Anse would need to spend more money upfront. They had no guarantee that enough households in their small town would invest in the community solar program to make it economically viable.

From the results of their community survey, enough households were interested to warrant building a bigger array, but it was uncertain if enough of those interested households would commit to being a paying subscriber. L'Anse decided to put their faith in the community



survey results and in the depth of their community outreach and engagement. L'Anse also looked into and received additional grant resources and secured stakeholder purchase in the program. L'Anse was not able to reach the goal of selling community solar subscriptions for \$350 per panel; however, they were able to reduce the cost to \$385 per panel. The L'Anse community solar program remains nearly fully subscribed.

DOE's National Community Solar Partnership

Stakeholders interested in developing a community solar program can join DOE's [National Community Solar Partnership \(NCSP\)](#). The Partnership is open to any individual or organization who wants to support the development of equitable community solar projects in the United States. Members have access to an online platform where they can network with other members, ask questions, and seek additional resources. NCSP also offers no-cost technical assistance on a rolling basis to support partners in developing their community solar project.

National Community Solar Partnership members have access to an online platform where they can network with other members, ask questions, and seek additional resources.



Conclusion: Creating New Community Solar Programs

EGLE and the participating community action agencies and utilities successfully created three pilot programs benefiting 135 low-income Michigan households. Now that these pilots have been established and households are enrolled, the pilot administrators have only a small ongoing role. The program partners have now begun pursuing new projects. NMCAA applied for grants to be able to replicate this program with more households. Through the first pilot, Cherryland realized that the capacity to weatherize homes was much lower than the need. They created a program committed to funding weatherization for more households in their service territory. Consumers Energy, which participated in the third pilot, is also looking to expand the program with more nonprofits in other parts of its service territory. CACS would like to connect all their weatherization clients to community solar if they had the funding. EGLE is looking into how they want to expand the existing three pilots or if they should create a fourth pilot under new conditions.

EGLE is also developing a Michigan Solar Communities Guidebook to provide communities with instructional guidance for building their own large-scale community solar projects; it is expected to be released in the fall 2023. EGLE's Catalyst Communities program takes a multi-tiered approach to providing communities across the state with the knowledge, tools, and resources they need to take steps toward a just transition to decarbonization. This program aims to provide a range of options to meet communities wherever they are, regardless of geography, population size, or pre-existing knowledge.

The success of these three pilot programs is evident in the sometimes life-changing benefits that participating households have experienced because of their community solar subscription and home weatherization. These households have saved hundreds of dollars every year and are now able to afford their monthly energy bills. Each of the three pilots encouraged and inspired the next. The utility and community action agency partners were also inspired to create new programs of their own.

The success of these three pilot programs is evident in the sometimes life-changing benefits that participating households have experienced because of their community solar subscription and home weatherization. These households have saved hundreds of dollars every year and are now able to afford their monthly energy bills.



The collaborative structure of these pilot programs has the potential to be replicated across the country.

- There are more than 1,000 CAAs in the US, serving communities in every state, Puerto Rico, and the District of Columbia. Many of these CAAs utilize funding from the Department of Energy’s Weatherization Assistance Program (WAP) to provide free weatherization services to local low-income households. A utility in any state could approach their local CAA about creating a similar project, or vice versa.
- A CAA and the local utility generally have an already-established working relationship if the CAA provides weatherization services to low-income households. Creating a project that pairs weatherization with community solar could be built through the CAA’s and utility’s existing partnership.

These three pilot programs created a meaningful impact in three Michigan communities, providing economic benefits for 135 low-income households. The lessons learned from these pilots can help inform the development of future programs across the country.

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.

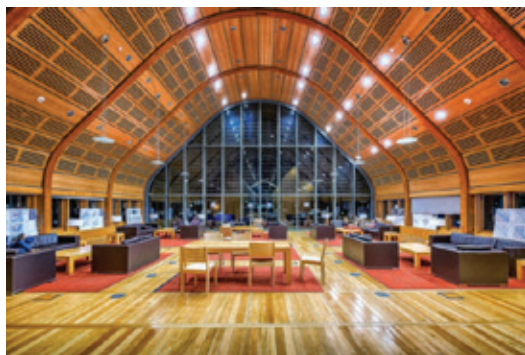


CESA works with state leaders, federal agencies, and other stakeholders to develop and promote clean energy programs and markets, with an emphasis on renewable energy, energy equity, financing strategies, and economic development. CESA facilitates information sharing, provides technical assistance, coordinates multi-state collaborative projects, and communicates the views and achievements of its members.

Ørsted US Offshore Wind/Block Island Wind Farm



50 State Street, Suite 1, Montpelier, VT 05602
802.223.2554 | cesa@cleanegroup.org | www.cesa.org



Clockwise from upper left: Shutterstock/Soonthorn Wongsaita; Tom Piorkowski; Resonant Energy; Portland General Electric; RE-volv; Bigstockphoto.com/Davidm199