

Building a State Solar Program for Low- and Moderate-Income Homeowners

Replicating Connecticut's Success



ABOUT THIS WHITE PAPER

This paper aims to inform states across the country about Connecticut's solar program to help low- and moderate-income (LMI) homeowners benefit from solar photovoltaics (PV). It also seeks to encourage states to replicate the Connecticut program or to adopt other programs for LMI households and communities. The paper is a product of the *Scaling Up Solar for Under-Resourced Communities* project.

ABOUT THIS PROJECT

The *Scaling Up Solar for Under-Resourced Communities* project is a three-year effort, led by the Clean Energy States Alliance (CESA), to accelerate the development of solar installations that benefit LMI communities. For more information about the project, and to access informational materials, visit www.cesa.org/projects/low-income-clean-energy/scaling-up-lmi-solar.

For the part of the project focused on LMI single-family homeowners, CESA is working with Connecticut Green Bank, Inclusive Prosperity Capital, Lawrence Berkeley National Laboratory, and PosiGen to evaluate and promote Connecticut's solar program for LMI homeowners.

The project is made possible through an award from the US Department of Energy Solar Energy Technologies Office. That office supports early-stage research and development to improve the affordability, reliability, and performance of solar technologies on the grid. Learn more at energy.gov/solar-office.

DISCLAIMER

This material is based upon work supported by the US Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) award number DE-EE0008758.

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 its 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.



Clean Energy States Alliance
50 State Street, Suite 1
Montpelier, VT 05602
802.223.2554
www.cesa.org
cesa@cleanegroup.org

Cover Photos

Background: © iStockphoto/ooyoo; Installation: © David Gerratt/NonprofitDesign.com

© CLEAN ENERGY STATES ALLIANCE
JANUARY 2020

CONNECTICUT'S MODEL FOR SUCCESS

To ensure that those most in need of electricity bill savings would be able to take advantage of the benefits of solar, Connecticut Green Bank created an elevated solar incentive for low- and moderate-income (LMI) homeowners and launched an initiative to attract solar providers to work in the state's under-resourced communities. In 2015, PosiGen became the first solar company to receive program support to enter Connecticut's LMI markets. Since then, Connecticut Green Bank's partnership with PosiGen has resulted in over 2,700 installed projects, collectively amounting to nearly 18 MW of solar capacity. Seventy-three percent of PosiGen's projects in Connecticut are in LMI census tracts.

Tremendous potential exists for LMI homeowners in states beyond Connecticut to be served by variations on this pioneering solar financing and marketing model. This white paper details Connecticut's program and offers information and resources for states interested in replicating the model.

Connecticut's Program Structure

In 2014, Connecticut Green Bank realized that it would need to implement extra measures to enable LMI homeowners to meaningfully participate in the state's solar market. The organization expanded solar access through two channels: 1) an **elevated LMI solar incentive** and 2) a **Solar for All financing program and focused marketing initiative**.



Steve Adams Photography

CONNECTICUT'S LMI SOLAR INCENTIVE

Since 2012, Connecticut Green Bank has offered performance-based residential solar incentives through its Residential Solar Incentive Program (RSIP). In 2014, the Green Bank added an elevated incentive for LMI homeowners: projects serving customers who earn less than 100 percent of area median income are eligible for the LMI incentive, which was originally set at three times the level of the market-rate solar incentive.

Because Connecticut Green Bank did not want LMI homeowners to be responsible for large upfront payments and wanted to ensure that they would benefit from the federal solar tax credit, at least indirectly, only third-party-owned systems are eligible for the LMI incentive. Connecticut Green Bank's incentive is paid to the solar company that owns the system, which is then able to offer a reduced price to the customer.

To qualify for the LMI incentive, solar companies must submit their proposed product pricing, marketing strategy, and qualifications, and agree to abide by program rules. These additional program requirements ensure that Green Bank-supported solar projects for LMI homeowners have a positive economic benefit for customers and include strong consumer protections. For example, price escalators, which increase the price customers pay over time, are not allowed under the LMI solar incentive program.

HOW THE LMI ELEVATED INCENTIVE WORKS

All incentives under the Residential Solar Incentive Program (RSIP) are paid by Connecticut Green Bank to the solar system owner. The elevated LMI RSIP incentive is a production-based incentive, which has declined over time, and is paid to the third-party system owner for six years. The elevated LMI RSIP incentive was originally set at \$0.11/kWh. Its current value is \$0.081/kWh. For a 5-kW system, which would generate roughly 6,360 kWh/year, the value of the LMI RSIP is $(\$0.081)(6,360)(6) = \$3,090.96$ over six years.

The non-LMI RSIP incentive, in contrast, is available as either a performance-based incentive (for third-party-owned systems) or an upfront incentive (for customer-owned systems). The current value of the non-LMI performance-based incentive is \$0.030/kWh, which means that for a third-party-owned 5-kW system the value of the non-LMI RSIP is $(\$0.030)(6,360)(6) = \$1,144.80$ over six years.

Connecticut Green Bank takes ownership of the Renewable Energy Credits (RECs) for all solar systems that receive the RSIP incentive. Connecticut Green Bank recovers the cost of some of the money it spends on the RSIP through the sale of RECs.

Customers who lease their systems do not receive a direct incentive from Connecticut Green Bank, but they benefit financially when the reduction in their electric bills exceeds the cost of their solar leases. Additionally, all PosiGen customers receive efficiency upgrades, leading to further savings. Based on a customer's solar generation in Year One and modeled annual demand reduction from the efficiency upgrades, the average participating customer receives a net annual financial benefit of \$700. PosiGen experiences very few defaults on its leases.

CONNECTICUT'S SOLAR FOR ALL PROGRAM

Connecticut Green Bank recognized that solar contractors were hesitant to enter the LMI solar market because of its unique challenges. In 2015, to address this challenge, Connecticut Green Bank issued a solicitation for solar providers to increase solar penetration in LMI communities. Connecticut Green Bank chose to focus on the LMI single-family homeowners because that market segment seemed easier to reach than other underserved market segments, while still representing a meaningful share of the state's LMI market. In Connecticut, 40 percent of the households earning less than 80 percent of the area median income are homeowners; 66 percent of moderate-income households (those households earning between 80 to 100 percent of the area median income) own their homes.

PosiGen, a solar company with a history of serving LMI households in Louisiana after Hurricane Katrina, was the first company to be approved for Connecticut's elevated LMI incentive and was also selected through a competitive process to receive financing to enter the state's LMI solar market. PosiGen, in partnership with Connecticut Green Bank, has since been providing solar and energy efficiency services to LMI Connecticut homeowners through the Solar for All program.

HOW THE SOLAR FOR ALL PROGRAM WORKS

Connecticut's Solar for All program uses community-driven marketing campaigns to target underserved communities. Under the program, Connecticut Green Bank assists PosiGen in the execution of the solar campaigns through the co-branding of marketing materials, community and municipal partner outreach, marketing training, and consultation support.

Underserved municipalities are selected to participate in the program after submitting a letter of interest. Selected municipalities are required to assign a representative to serve as the point of contact for the campaign, and they must agree to promote the program, seek out community partners, and approve the use of their municipal logo on campaign materials. Representatives from Connecticut Green Bank and PosiGen work with municipal officials and community partners over a five-month period to implement a 16-week campaign on average. PosiGen typically relies on a combination of door-to-door canvassing, community events and partnerships, peer-to-peer interactions, social media, and traditional advertising to drive its marketing during these campaigns.

Any homeowner can contract with PosiGen during a Solar for All campaign, but the company specifically targets LMI homeowners. PosiGen uses alternative underwriting, rather than relying on credit scores, to qualify customers.

PosiGen offers customers a 20-year-term rooftop solar lease. The model includes standard solar system sizing and fixed monthly pricing to reduce sales complexity and increase operational efficiencies. As part of its package, PosiGen customers receive deep energy efficiency measures, the cost for which are rolled into the lease price. PosiGen guarantees customer savings and does not use escalating lease payments over time. Customers have an option to purchase their system at fair market value at the end of their lease term.

— CONTINUED —

To jumpstart the program, Connecticut Green Bank supplied initial debt capital of \$5 million for PosiGen to use for solar leases in Connecticut. Connecticut Green Bank's investment was subordinated by an additional \$5 million dollars in private-debt investment from Enhanced Capital.

Capital invested in PosiGen's solar lease is returned to Connecticut Green Bank, the tax equity investor, and the lenders through lease payments. The financial structure of the product includes origination, servicing, and financing features managed by PosiGen, in combination with the support of Connecticut Green Bank.

The concept started with Connecticut Green Bank serving as "anchor debt capital" for PosiGen, together with PosiGen's own resources as sponsor, as well as tax equity from an investor. Financing was structured to facilitate funding by a senior lender, providing for the subordination of Connecticut Green Bank's loans once this senior lender could be secured.

The investment had its intended impact: PosiGen was able to establish operations and accelerate activity in Connecticut's LMI market. This enabled Connecticut Green Bank and PosiGen to secure a senior lender and multiple sources of tax equity to enable operations to expand.

Connecticut Green Bank has successfully run campaigns in seven underserved Connecticut communities—Greater Hartford, New London, Hamden, Middletown, New Haven, Bridgeport, and Hartford—resulting in over 2,700 complete projects. Seventy-five percent of these projects are in census tracts below the area median income. The Solar for All program has been particularly effective at reaching communities of color; in some instances, solar penetration in communities of color exceeds that in white neighborhoods. Amplified by the program, solar in LMI communities in Connecticut grew by 185 percent between 2015 and 2018.

PROGRAM ELEMENTS

The success of Connecticut's solar program for LMI homeowners rests on five pillars:

1. **It employs a public-private partnership to combine marketing financing.** The program is supported by a trustworthy public entity (in Connecticut's case, the state's quasi-public Green Bank), which has partnered with a vetted private-sector solar provider (PosiGen) to reach LMI single-family homeowners.
2. **It makes going solar affordable for LMI homeowners.** The program allows for alternative methods to credit scores for evaluating the eligibility of LMI households. Elevated incentives are offered for projects serving homeowners who earn less than 100 percent of area median income. The model relies on a third-party ownership structure to monetize the federal tax credit, to reduce capital investment burdens on participating households, and to increase affordability. The program allows for solar to be combined with energy efficiency upgrades and other energy solutions to maximize savings for participants.
3. **It protects LMI participants from financial risks.** Connecticut Green Bank provides direct oversight controls over the program. PosiGen guarantees that contracts are cash-flow positive so that customers reap real financial benefits for participating. It has no upfront costs, price escalators, or hidden fees.



4. **It supports solar companies entering the LMI market.** Connecticut Green Bank's program provided a glidepath for a competitively-selected solar company to enter the LMI market, jumpstarting the market for a customer segment that might otherwise be overlooked.
5. **It leverages targeted outreach campaigns to spread solar to under-resourced communities.** By assisting with community selection, providing outreach support, and co-branding campaign marketing materials, Connecticut Green Bank provides the on-the-ground knowledge needed to expand solar awareness and reduce customer acquisition costs.

These are the basic building blocks for Connecticut's success, but when considering whether and how to replicate the program, it is important to recognize the model's constraints:

1. **It does not serve all portions of the LMI market.** Connecticut's program targets LMI homeowners; it does not target the entirety of Connecticut's LMI populations. The program does not serve LMI renters.
2. **It requires financial resources.** The program's success relies on Connecticut Green Bank's ability to provide and attract capital. Connecticut Green Bank initially supplied \$5 million in debt capital and attracted an additional \$8.5 million from two private lenders to start the Solar for All program. Beyond the lease fund capital, Connecticut Green Bank offers an enhanced solar incentive for LMI homeowners and dedicates considerable staff time to the program.
3. **It cannot operate under certain regulatory or market conditions.** Certain underlying policies must be in place for the program to work. For example, the program would not be able to function in a regulatory environment that does not allow for third-party ownership of solar systems. Nor would it be economically feasible where solar compensation rates or electricity rates are particularly low.

SAMPLE PROGRAM MATERIALS

Connecticut Green Bank's Solar Financing RFP: https://ctgreenbank.com/wp-content/uploads/2015/12/Resi-Solar-Financing-RFP_Reissue_FINAL1.pdf

Solar for All Campaign Materials: https://sustainablect.org/fileadmin/Random_PDF_Files/Solar_for_All/Solar_For_All_Campaign.pdf

Sample Municipal Solar for All Letter of Interest: https://sustainablect.org/fileadmin/Random_PDF_Files/Solar_for_All/6.8_Solar_for_All_Campaign_LOI_2020.docx

PROGRAM CONSIDERATIONS

Before implementing a solar program for LMI homeowners in your state, you should consider the following:

- **Assess the agency architecture and available resources in your state.** Prior to launching an LMI solar program, it is critical to have regulatory authority and administrative support for it. If your state agency has a broad mandate, you may be able to establish a program that falls within your agency's delegated authority. If additional staff or agency authority are needed, you may need to seek authorization from your state legislature or governor's office before proceeding.
- **Gather information about the demographics and housing stock of the LMI population and how solar installations are spread among different population groups in your state.** This information can help you tailor a program to fill gaps in the existing solar market, meet the needs of the households you aim to serve, and provide baselines from which to measure progress. In particular, it will be helpful to know your state's current level of solar penetration, what existing solar incentives and financing options are available, the distribution of LMI households, the ratio of LMI homeowners to renters, and the particular energy demands faced by LMI households in your state. Resources for this information include Lawrence Berkeley National Laboratory's *Income Trends of Residential PV Adopters*, the National Renewable Energy Laboratory's *Solar for All map*, and the US Department of Energy's *Low-Income Energy Affordability Data (LEAD) tool*.
- **Share information with and gather information and ideas from under-resourced communities in your state.** Beyond any public processes required in your state, reaching out to communities that will be targeted by your state's LMI solar program can help affected communities feel engaged and empowered and ensure that your program is responsive to their needs. Addressing concerns during the program design process will reduce the risk of program failure.

The contours of a solar program for LMI homeowners—the incentives needed to stimulate LMI participation, the financing instruments used, the actors and partnerships involved, the outreach strategies employed—should be carefully calibrated to the needs of the local market.

Through a US Department of Energy-supported project, the Clean Energy States Alliance (CESA) is working with the Connecticut Green Bank, Inclusive Prosperity Capital, Lawrence Berkeley National Laboratory, and PosiGen to help state agencies across the US learn about and replicate Connecticut's model. CESA and its project partners can help states assess their LMI solar market economics and establish appropriate state-specific incentive levels.

CESA WORKING GROUP

States interested in Connecticut's model are invited to participate in a CESA working group where they can receive technical assistance and other support to develop similar programs for their states. If your agency is interested in joining this working group or learning more, please contact CESA Project Director Nate Hausman at nate@cleanegroup.org.

ADDITIONAL RESOURCES

Connecticut's solar program for LMI homeowners has received significant attention and recognition:

- In 2018, CESA awarded Connecticut Green Bank and PosiGen a State Leadership in Clean Energy (SLICE) award for their Solar for All program. A summary of the Solar for All program starts on page three of CESA's 2018 SLICE program award report.

"State Leadership in Clean Energy Awards" (Clean Energy States Alliance, June 2018):

<https://www.cleaneigroup.org/wp-content/uploads/State-Leadership-in-Clean-Energy-2018.pdf>.

- The Green Bank Network, a membership organization managed by Natural Resources Defense Council and the Coalition for Green Capital, produced a case study on Connecticut Green Bank's Solar for All program to highlight the success of the model:

"Solar for All: How Connecticut Green Bank Drives Solar and Energy Efficiency for Low- to Moderate-Income Households," (Green Bank Network, July 2018): https://greenbanknetwork.org/wp-content/uploads/2018/07/GB-TT-Connecticut-18-07-A_05-1.pdf.

- US Department of Energy's Clean Energy for Low-Income Communities Accelerator (CELICA), a voluntary federal partnership with state and local governments to lower energy bills for low-income communities, published a case study on Connecticut's Solar for All program.

"Case Study: Connecticut's Efforts to Scale Up Integrated Energy Efficiency and Renewable Energy for Low-Income Homes" (US Department of Energy Better Buildings, November 2018): https://betterbuildingsinitiative.energy.gov/sites/default/files/CS_CTs%20Efforts%20to%20Scale%20Up%20EERE%20LI%20Homes_FINAL_1.pdf.

In 2019, Connecticut Green Bank analyzed the success of its solar incentive program in reaching racial and ethnic minorities, in addition to LMI households:

- Connecticut Green Bank released a report on its demographic analysis in May, 2019:

"Sharing Solar Benefits: Reaching Households in Underserved Communities of Color in Connecticut" (Connecticut Green Bank, May 2019): <https://ctgreenbank.com/wp-content/uploads/2019/05/Sharing-Solar-Benefits-May2019.pdf>.

- CESA conducted a webinar titled "Sharing Solar Benefits—Expanding Residential Solar in Connecticut's Communities of Color" featuring Connecticut Green Bank panelists:

"Sharing Solar Benefits—Expanding Residential Solar in Connecticut's Communities of Color" (Clean Energy States Alliance, December 2019): <https://www.cesa.org/webinars/sharing-solar-benefits-expanding-residential-solar-in-connecticuts-communities-of-color/?date=2019-12-06>.

CESA published a report to help guide the implementation of solar in under-resourced communities, providing specific recommendations for states. This report, titled "Solar with Justice," includes a case study on Connecticut's solar program for LMI homeowners starting on page 56.

"Solar with Justice: Strategies for Powering Up Under-Resourced Communities and Growing an Inclusive Solar Market" (Clean Energy States Alliance, December 2019): <https://www.cesa.org/assets/2019-Files/Solar-with-Justice.pdf>.

THE PROJECT TEAM

The *Scaling Up Solar for Under-Resourced Communities* project is made possible through an award from the US Department of Energy Solar Energy Technologies Office. That office supports early-stage research and development to improve the affordability, reliability, and performance of solar technologies on the grid. Learn more at energy.gov/solar-office.

For the part of the project focused on LMI single-family homeowners, CESA is working with Connecticut Green Bank, Inclusive Prosperity Capital, Lawrence Berkeley National Laboratory, and PosiGen to evaluate and promote Connecticut's solar program for LMI homeowners. For more information about the project, and to access informational materials, visit www.cesa.org/projects/low-income-clean-energy/scaling-up-lmi-solar.

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 nation's most innovative, successful, and influential public funders of clean energy initiatives. CESA has developed a focus on solar for under-resourced communities in response to the needs of its members and to increased national attention on broadening solar access. www.cesa.org

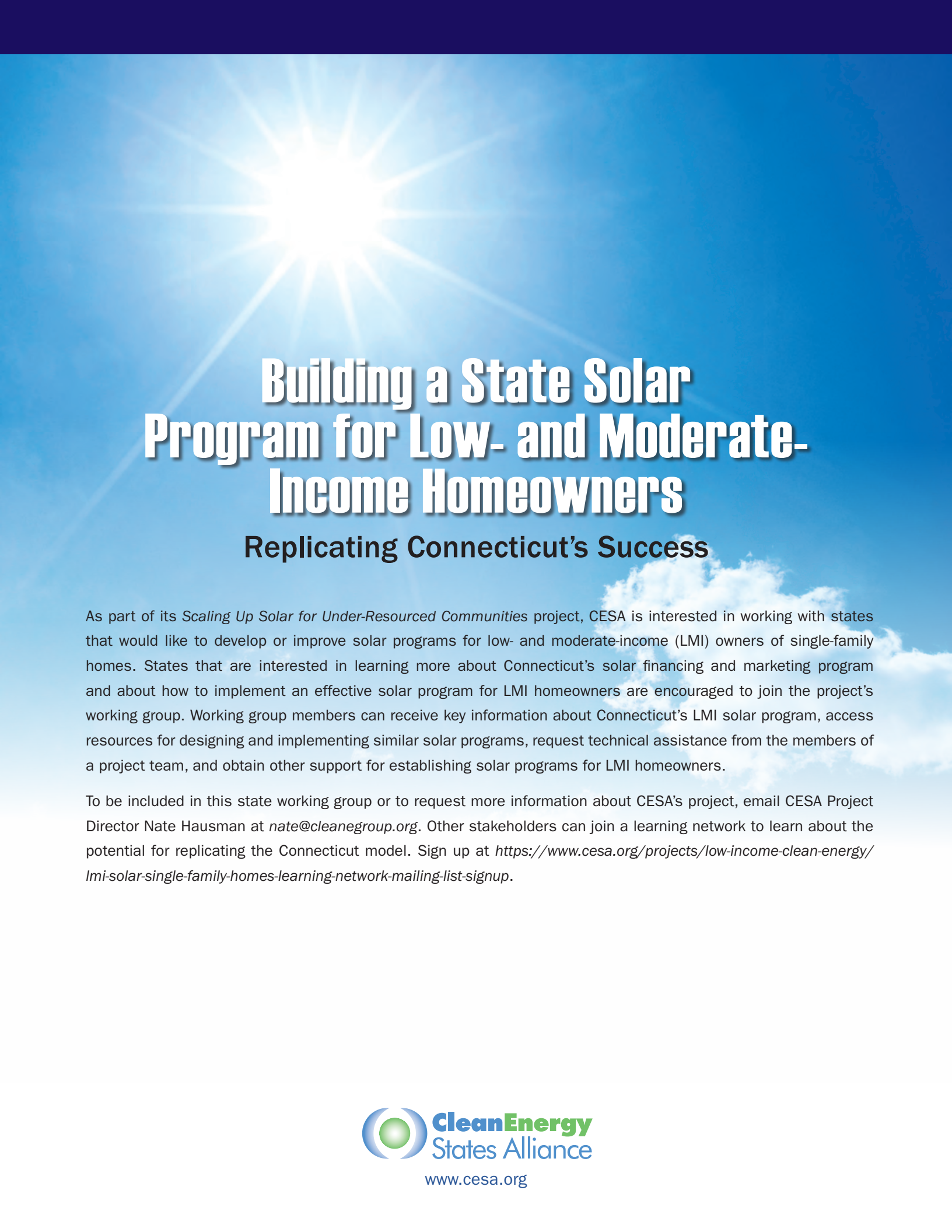
Connecticut Green Bank, the nation's first green bank, supports Connecticut's energy strategy to achieve cleaner, less expensive, and more reliable sources of energy while creating jobs and supporting local economic development. It has implemented a multi-pronged strategy to make solar accessible for LMI customers in the state. www.ctgreenbank.com

Inclusive Prosperity Capital is an independent not-for-profit investment fund that helps scale energy financing solutions, channeling investment capital to program partners in communities that need it most. It is a strategic partner of the Connecticut Green Bank, focused on replicating the Green Bank's work nationally by accessing new capital sources. www.inclusiveprosperitycapital.org

Lawrence Berkeley National Laboratory is a US Department of Energy lab managed by the University of California. Berkeley Lab has broad analytical experience evaluating income trends of residential solar adopters and has worked extensively on residential energy project financing. www.lbl.gov

PosiGen is a private-sector firm dedicated to giving LMI families access to clean energy. It has implemented solar access solutions in Louisiana and Connecticut. www.posigen.com





Building a State Solar Program for Low- and Moderate- Income Homeowners

Replicating Connecticut's Success

As part of its *Scaling Up Solar for Under-Resourced Communities* project, CESA is interested in working with states that would like to develop or improve solar programs for low- and moderate-income (LMI) owners of single-family homes. States that are interested in learning more about Connecticut's solar financing and marketing program and about how to implement an effective solar program for LMI homeowners are encouraged to join the project's working group. Working group members can receive key information about Connecticut's LMI solar program, access resources for designing and implementing similar solar programs, request technical assistance from the members of a project team, and obtain other support for establishing solar programs for LMI homeowners.

To be included in this state working group or to request more information about CESA's project, email CESA Project Director Nate Hausman at nate@cleanegroup.org. Other stakeholders can join a learning network to learn about the potential for replicating the Connecticut model. Sign up at <https://www.cesa.org/projects/low-income-clean-energy/lmi-solar-single-family-homes-learning-network-mailing-list-signup>.