2022 AWARDS
State Leadership in Clean Energy
Case Studies of Six Exemplary State Programs that Advance Clean Energy Goals, Standards, and Equity

CleanEnergy States Alliance
About this Report

This report was prepared by Maria Blais Costello of CESA to highlight the winners of the 2022 *State Leadership in Clean Energy Awards*. The winners were selected by a panel of independent judges, based on the program details provided in state’s nomination materials. This report is also based on that information. Several CESA staff members were also involved with, and contributed their time and expertise to, the awards process: Warren Leon, Samantha Donalds, Todd Olinsky-Paul, Vero Bourg-Meyer, and Val Stori. Their assistance to both the case studies contained in this report and for the implementation of the webinar series on the winning programs that will be held throughout the fall and early winter of 2022 is greatly appreciated. David Gerratt of DG Communications designed the report. Finally, we would like to thank all the CESA members who participated in the 2022 State Leadership awards. The nominations that were received described excellent programs that were undertaken by dedicated clean energy leaders and implemented by committed staff members. We appreciate their nominations and the innovative work they are doing to advance clean energy.
Introduction

The pace of clean energy expansion is accelerating rapidly, thanks in large part to states putting in place goals, standards, and public funding to reduce greenhouse gas emissions, improve community resilience, and advance energy equity. The 2022 State Leadership in Clean Energy Awards recognize six outstanding programs that are providing the benefits of clean energy expansion to the people in their states, while demonstrating to others how they could establish similar programs.

In California, an updated Energy Code has established air source heat pumps as well as solar plus battery storage systems as performance standards in newly constructed and renovated buildings, renewing the state’s leadership concerning energy efficiency and clean energy technologies. In Connecticut, the Green Bank created a new investment bond for everyday investors that leverages private investment to fund solar incentives, thereby making solar more affordable. Maryland has strengthened community resilience in the face of climate change by providing support for microgrids, solar, and battery storage systems, including funding for feasibility assessments and grants to establish community resiliency hubs.

New York is advancing the decarbonization of multifamily affordable housing through a new program coordinated by both NYSERDA and New York State Homes and Community Renewal, combining their respective expertise and budgets to allow more families to live in clean energy homes. Oregon has developed a state-wide program to provide rebates for solar plus battery storage systems to residential customers and low-income service providers, granting greater access to these resilient power technologies with easier eligibility mechanisms. And the state of Washington produced a State Energy Strategy that used extensive stakeholder input and detailed modeling to devise an equitable and inclusive plan for a clean energy transition.

This marks the 8th time these biennial awards have been given to highlight state programs and policies that have helped change the trajectory of clean energy. Without exception, each of this year’s winning programs is grounded in its state’s goals for decarbonization and meeting the challenge of climate change. Many of these state programs are also focused on solving the problem of inequitable distribution of clean energy benefits, by ensuring those benefits are accessed by underserved and low-income communities. Without a doubt, the six programs described in this report will make a significant impact on the course of the clean energy transition in their states, and in other parts of the country as well, as they foster the clean energy economy. These successes will also help create the political will for even more ambitious policies and programs in the future.

The stakes are high for shifting to clean energy quickly and equitably. It is a privilege to share these success stories with you. This year’s State Leadership in Clean Energy Award winners have set new standards for what is possible, and we wish all of them continued success. We invite you to learn more about these programs from their respective program managers by viewing CESA’s webinar series, to be held during the fall and early winter of 2022. More information can be found at www.cesa.org/projects/state-leadership-in-clean-energy/2022-awards.

Maria Blais Costello
Manager of Program Administration, CESA
September 2022
The 2022 Award Judges

The State Leadership in Clean Energy Awards are made possible by the generous donation of time and expertise by our panel of judges. These individuals have an impressive wealth of knowledge and years of experience related to clean energy. We would like to express our sincere appreciation for their enthusiasm and participation in this process. It should be noted that the participation of the judges and the granting of these awards are not intended to represent the views of the judges’ organizations or any of the organizations’ respective members.

Lori Bird
World Resources Institute (WRI)

Lori Bird is Director of WRI’s U.S. Energy Program and the Polsky Chair for Renewable Energy. In this role, she leads a team of about 20 specialists who work with utilities, cities and others to decarbonize the electric sector and accelerate transportation electrification. Prior to joining WRI, she was a principal analyst in the Markets and Policy Group at the National Renewable Energy Laboratory, and a consultant for the U.S. Department of Energy and Hagler Bailly Consulting. She has co-authored more than 150 publications on clean energy. In 2020, she received the American Solar Energy Society’s inaugural award for Leadership in Solar Policy and Market Transformation and earlier received the Chairman’s and Presidents awards from NREL. Lori holds a master’s in economics and environmental studies from Indiana University.

Shanna Cleveland
Energy Foundation

As Program Director, Northeast Policy, Shanna Cleveland fosters development of innovative clean energy and climate policies and strategies in the Northeast (Mid-Atlantic, New York, and New England). Working closely with the Northeast Team and Energy Foundation’s other policy experts, she develops and funds policy strategies that will achieve ambitious, equitable, and regionally aligned policy goals in the power, transportation, climate, and building sectors. Prior to joining Energy Foundation, Shanna served as Program Officer, Clean Energy, at the Barr Foundation, where she facilitated collaboration between climate advocates, grassroots organizers, state agency officials, health care groups, labor, and industry experts to implement innovative clean energy strategies with an emphasis on community-led solutions centering racial equity and justice. She holds a J.D. from University of Virginia School of Law; an LL.M. in Environmental Law from Vermont Law School; and an A.B. from Harvard University. (Note: Ms. Cleveland recused herself from discussions regarding the Connecticut Green Bank’s nomination.)

Paula Garcia
Union of Concerned Scientists (UCS)

Paula García is a Senior Bilingual Energy Analyst and Energy Justice Lead at the Union of Concerned Scientists. She evaluates energy resource and climate solutions in the electricity sector and works to further public understanding of clean energy technologies, policies, and markets. Paula is committed to advance energy justice and sustainable development through her work. With prior work at Oxfam America and at Meister Consultant Group, she has broad experience as a researcher and analyst interacting with a variety of stakeholders, including government, community-based organizations, private sector and international nongovernmental organizations. Paula holds an M.A. in sustainable international development from Brandeis University and an industrial engineering degree from Pontificia Universidad Javeriana in Colombia, where she is originally from. She serves on the Boston Area Solar Energy Association’s Board of Directors.

Olivia Nedd
Vote Solar

Olivia Nedd serves as the Senior Policy Director, Access & Equity Program for Vote Solar. In this role she works to support Vote Solar’s policy and regulatory work, to advance a more equitable and just clean energy future. Prior to joining Vote Solar, Olivia worked with Florida Conservation Voters where she led a statewide campaign to bring electric school buses to low-income and communities of color. Olivia grew up in Beacon, New York and now lives in Palm Beach, Florida. She holds a B.A. in English and political science from the University of Central Florida and a J.D. from Howard University School of Law. In her free time Olivia enjoys acrylic pour painting and spending time with her family in Antigua and Barbuda, where she is from.

Ben Passer
McKnight Foundation

Ben Passer is a Senior Program Officer for the Midwest Climate and Energy Program at the McKnight Foundation. In this role, Ben oversees and develops significant grant portfolios that support efforts to build power through partnerships, aligning McKnight’s climate and equity goals to advance solutions to the climate crisis. Prior to joining McKnight, Ben worked at Fresh Energy, an independent energy policy nonprofit in Minnesota, where he spearheaded the creation and growth of Fresh Energy’s Energy Access and Equity program and led the organization’s diversity, equity, inclusion, and anti-racism initiatives. A licensed attorney and member of the Minnesota State Bar Association, Ben holds a B.A. in political science from the University of Minnesota and a J.D. from William Mitchell College of Law (now Mitchell Hamline School of Law).
The 2022 Energy Code includes heat pumps as the performance standards baseline for single-family homes, multifamily, and other select commercial buildings, such as schools, offices, banks, libraries, retail, and grocery.

The Energy Code includes solar-electric systems plus battery systems as the performance standards baseline for select non-residential building types.

Over the next 30 years, this code is estimated to provide the state with $1.5 billion in environmental benefits. The development of this code was a multi-year effort led by the CEC through a robust public process and with support from an expansive network of key market partners such as California’s largest utilities, the building community, and environmental advocates.

**Updating the Energy Code and Moving the Needle**

Roughly every three years, the state of California updates its Energy Code to reduce wasteful, inefficient, uneconomic, and unnecessary energy consumption in newly constructed buildings, additions, and alterations. California’s Energy Code impacts residential and commercial buildings, and the industrial sector, which together account for almost 50 percent of California’s greenhouse gas (GHG) emissions. Updates to these standards must be technologically feasible and cost-effective in their entirety, making the Energy Code itself a consumer protection mechanism. The Energy Code encourages load flexibility and responsible use of an increasingly clean electrical grid, and it does all of this while also providing for compliance flexibility and allowing for trade-offs through a performance modeling approach.

In the past, the core focus of the Building Energy Efficiency Standards has been efficiency, but now with the inclusion of solar photovoltaic (PV) systems and battery storage standards, buildings will provide significant greenhouse gas savings. Photo of UC Davis West Village courtesy of the California Energy Commission.

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**Key Accomplishments**

- The 2022 Energy Code includes heat pumps as the performance standards baseline for single-family homes, multifamily, and other select commercial buildings, such as schools, offices, banks, libraries, retail, and grocery.

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**California Energy Commission**

**CALIFORNIA’S 2022 ENERGY CODE**

The California 2022 Energy Code for newly constructed and renovated buildings blazes a trail for states and local governments seeking to decarbonize the building sector aggressively, feasibly, and cost-effectively. The updated code, adopted by the California Energy Commission (CEC) in August 2022, encourages electric heat pumps, establishes electric-ready requirements for new homes, and strengthens ventilation standards. For the first time in the nation, this update also includes solar-electric systems plus battery systems as the performance standards baseline for select nonresidential building types. Over the next 30 years, this code is estimated to provide the state with $1.5 billion in environmental benefits. The development of this code was a multi-year effort led by the CEC through a robust public process and with support from an expansive network of key market partners such as California’s largest utilities, the building community, and environmental advocates.
Proactive decarbonization of these sectors, as exemplified by the Energy Code, is a critical, least-cost means to achieving the state's climate action goals. For this reason and others, the Energy Code is considered a key strategy to actualizing the CEC’s mission of “leading the state to a 100% clean energy future for all.”

**Innovation in Building Efficiencies**

The 2022 Energy Code builds on decades of meticulous work and leverages California’s latest market-ready technology innovations. The Code elevates the use of air source heat pumps, a standout electric technology used for water heating and space heating. Electric heat pumps can provide substantial increases in energy efficiency, drastic reductions in GHG emissions, and opportunities for load flexibility, all while being cost-comparable to other prevalent systems in the market. The 2022 Energy Code includes heat pumps as the performance standards’ baseline for single-family homes, multifamily housing, and for select commercial buildings, such as schools, offices, banks, libraries, retail, and grocery. These heat pump measures are not mandatory and can be traded off—using approved computer modeling software—by increasing energy efficiency in other aspects of the building.

One of the more tangible public benefits of the Energy Code is a first-in-the-nation set of standards for nonresidential solar-electric plus battery storage systems. The 2022 solar-electric plus battery storage standards build on the success of the 2019 Energy Code update, which first introduced a rooftop PV requirement for new low-rise residential buildings. Using battery storage allows onsite energy to be available when needed and reduces the grid’s reliance on fossil fuel power plants. The 2022 Energy Code establishes solar-electric systems plus battery systems as the standard for select nonresidential building types, including high-rise multifamily buildings, hotel-motels, offices, medical offices, clinic, retail, grocery stores, restaurants, schools, and civic spaces. For the purposes of the standards, solar plus battery systems are sized modestly to help ensure that nearly all of the electricity that is generated on-site is used on-site—thereby helping to ensure cost-effectiveness of the systems over time.

This update also includes additional electric-ready requirements for residential buildings. Electric ready means having dedicated circuits and panel accommodations to easily enable the installation of electric appliances in the future. The 2022 Energy Code will require dedicated electrical circuits for space heating, cooking, and clothes drying for both single-family and multifamily homes. Additionally, dedicated electrical circuits for water heating are required for single-family homes and multifamily units served by individual water heaters. For single-family homes only, battery storage ready requirements will include a minimum electrical panel size requirement of 225 amps to accommodate future electric load. These codes are anticipating the growing market for electric homes and electric vehicles.

**Costs and Public Benefits of the Code**

Updating and developing the building codes to support the state’s energy efficiency goals is a huge undertaking with a sizeable budget, roughly $135 million over three years. This includes $4 million per fiscal year to the CEC for the Energy Code’s development, and an additional $40 million per year that is used by program administrators to support the state’s energy efficiency standards. This budget also supports a network of technical consultants who propose, justify, and vet new codes and standards for the state. In comparison, the stated benefits of the 2022 Energy Code to the public are estimated to be $1.5 billion in consumer and environmental benefits and the reduction of 10 million metric tons of GHG emissions, equivalent to taking nearly 2.2 million cars off the road for a year. Additionally, the state of California has a number of above-code new construction programs that go towards incenting projects that exceed the minimum requirements of the Energy Code.

California’s Energy Code is strategically structured to be transparent, replicable, and scalable for other states and governments to learn from and build upon. In essence, the Energy Code is public benefit developed by the public. Between April 2019 and the date of adoption, the CEC held and participated in 45 stakeholder meetings and public workshops, with support from the Public Utilities Commission and statewide Codes & Standards Program. The CEC also held three Lead Commissioner hearings, considered over 300 formal public comments, and committed countless hours to collaboration with a diverse spectrum of public stakeholders.
The Energy Code updates undergo a formal rulemaking process and are vetted over a 45- to 60-day period before they go to the CEC for adoption. Then they are submitted to the California Building Standards Commission for approval as one part of the whole building code. Builders, contractors, and other stakeholders have one year until implementation to gear up for the change. The public process also ensured that analytical assumptions and technical feasibility were vetted by the public and substantiated with best available data, so that by the time of adoption, the public had confidence that cost-effectiveness and technical feasibility were assured.

During the adoption of the 2022 Energy Code, over 80 speakers (representing hundreds of public and private companies) provided public comments that were overwhelming in support of the Energy Code.

All materials from CEC-hosted public workshops, rulemaking documents and all other important documents used to develop and adopt the 2022 Energy Code are posted to the CEC’s website. The CEC’s public process includes publication of detailed reports, called Codes & Standards Enhancement (CASE) reports, which contain detailed analysis and assumptions used to substantiate cost-effectiveness of the proposed measures. CASE reports also address technical feasibility concerns, as well as project estimated energy and GHG savings associated with the proposed measures. These reports are released in draft iterations, so that any member of the public can scrutinize and provide comments or questions on these documents.

Setting the Standard for the State and Beyond
The Energy Code is also considered a minimum requirement by which the state’s local jurisdictions have the option to exceed through reach codes. Local jurisdictions wishing to enforce locally adopted energy standards are required to apply to the CEC for approval, demonstrate cost-effectiveness, and demonstrate stringency greater than the statewide Energy Code requirements. These requirements are often met by local jurisdictions by providing the CEC with analysis similar to the aforementioned CASE reports. For the 2019 Energy Code, over 40 reach codes have been approved. This speaks to the flexibility and the customizability of California’s Energy Code. It also speaks to the leadership role of the state’s local jurisdictions. Coming full circle, the state’s local reach codes are thoroughly assessed by the CEC for trends to help inform
subsequent code cycles as statewide requirements—making local jurisdictions natural partners that build upon the foundational influence of the Energy Code.

The team that leads development of the California Energy Code also actively engages in national energy code developments efforts, such as the International Energy Conservation Code (IECC) and ASHRAE 90.1 updates. This level of collaboration consistently affords ample opportunities for two-way learning with code development efforts happening nationally.

The Energy Code has not only revolutionized building construction in California but influenced efficiency goals and practices in countries around the globe. Every update helps the state meet its energy and environmental goals while directly benefiting building owners and occupants through more comfortable buildings that save money on energy costs and, not incidentally, increase market value. In 2020, California was ranked first among all US states in energy efficiency by the American Council for an Energy-Efficient Economy, summarizing, “California’s energy code is considered to be one of the most aggressive and best enforced energy code in the United States and has been a powerful vehicle for advancing energy-efficiency standards for building components and equipment.” California’s Energy Code also has strong influence outside of the United States. In just in the last year, the CEC has been contacted by representatives from the Danish Energy Agency, Swedish Energy Agency, Mexico City, Tokyo Metropolitan Government, and other climate-action driven governments. These entities have reached out to exchange learnings relating to the success of California’s rooftop solar standards and overall building energy efficiency standards process.

About the California Energy Commission
The California Energy Commission (CEC) is the state’s primary energy policy and planning agency leading the state to a 100 percent clean energy future. Homes and businesses use nearly 70 percent of California’s electricity and are responsible for a quarter of the state’s greenhouse gas (GHG) emissions. The CEC adopts building energy efficiency standards every three years to cost-effectively increase the energy efficiency and lower the carbon footprint of buildings. The CEC is home to roughly 700 employees across seven divisions and a broad range of energy-focused regulatory and funding programs. In addition to building and energy efficiency, the CEC’s programs focus on electric vehicle and charging infrastructure deployment, advancement of renewable energy and zero-carbon resource programs, forecasts and analysis of all aspects of energy supply and demand, siting and environmental review of large power plants and energy infrastructure projects, and an extensive research and development funding portfolio.

Link to the Program

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Connecticut Green Bank
GREEN LIBERTY BONDS

The Connecticut Green Bank has created Green Liberty Bonds, a new type of green bond from which the proceeds are invested in projects that confront climate change in Connecticut. Modelled after the Series-E War Bonds of the 1940s, the bonds are structured to be purchased by retail investors, through lower-dollar denominations (with minimums at $1,000), enabling ordinary people to directly participate in the green economy and earn a return on their investment. The bonds are Climate Bond Certified and currently carry a rating by S&P of A+. The bonds are backed by a unique revenue stream created by the sale of Solar Home Renewable Energy Credits (SHRECs), which are generated by the solar panels on homes that received state incentives for going solar. In honor of the 50th anniversary of Earth Day, the first issuance of the bonds (in July 2020) sold nearly $17 million, and the second issuance (May 2021) sold nearly $25 million in investments.

Increasing Local Investment in Clean Energy
To meet the challenge of climate change, experts agree that a transition to clean energy technologies will help to mitigate the crisis. Many more clean energy projects must be built, both large and small in scale. To help finance those projects, the Connecticut Green Bank facilitates clean energy deployment by leveraging a public-private financing model that uses limited public dollars to attract private capital investments. By partnering with the private sector, the Green Bank creates solutions that result in long-term, affordable financing to increase the number of clean energy projects.

Key Accomplishments

- The bonds were collateralized by revenue from the SHRECs from approximately 11,700 residential solar photovoltaic systems across Connecticut in the first issuances of the bonds in 2020 and 2021.
- The bonds were Climate Bond Certified and were rated “A” by S&P at the time of issuance.
- Total retail orders received during the order period the first issuance in July 2020 was over $9.9 million, as part of the total sale of $16,795,000 over a two-day period. This transaction won The Bond Buyer Award in Innovative Financing for its structure.
- With nearly $100 million in orders requested from both retail and institutional investors for the 2021 issuance, far greater than the supply of bonds could satisfy, the high-level of interest in supporting investment to confront climate change in Connecticut is evident.

Coretta went solar in 2019 to help improve the environment for her grandkids. Photo courtesy of Connecticut Green Bank.
Connecticut Green Bank

for homes, buildings, and communities statewide. Bonds, an investment tool well known to large and small investors, are still under-utilized to fund clean energy projects, let alone programs. Green bonds, particularly, have been cited as a vehicle with the potential to bring in the necessary investment capital.

Green bond issuances are a key tool for expanding the Green Bank’s reach and impact through increased retail and institutional investment. While it had previously issued privately placed Clean Renewable Energy Bonds (CREBs),1 2019 marked the Green Bank’s first publicly offered debt issuance.2 The Connecticut Green Bank became the first green bank globally to issue solar PV asset-backed securities (ABS) to finance its solar programs.3 The Green Bank used the funds from the ABS bonds for the deployment and administration of its residential solar incentives through the state’s Residential Solar Investment Program (RSIP). These bonds, however, were sold to an institutional investor. Shortly thereafter, the Green Bank’s leadership team started discussions about offering bonds to retail investors (everyday individual investors) to unite more people in the mission to confront climate change through investment, and to allow Connecticut residents to share in the solar investment opportunity.

The success of initial offering of the CREBs, and the potential to use debt capital markets as a tool for accessing capital and engaging everyday investors in support of clean energy, led the Green Bank to build a larger multi-year strategy. This strategy seeks to raise additional lower-cost capital from individual investors through bonds, including smaller denomination bonds, to support the clean economy and accelerate deployment of clean energy.

This led to the launch of the Green Liberty Bonds in 2020, in honor of the 50th anniversary of Earth Day. A Green Liberty Bond is a unique type of green bond that must have three specific features.

1. First, the use of proceeds from the bond must go towards projects that confront climate change and support job creation in Connecticut.
2. Second, modelled after the Series-E War Bonds of the 1940s, the bonds must be accessible to everyday citizens in lower-dollar denominations ($1,000 minimums).
3. Third, to instill confidence and encourage investment, Green Liberty Bonds must have consumer protections built in. These bonds are independently certified and the use of proceeds as investments to confront climate change is verified.

An innovative feature of the Green Liberty Bonds is that they are backed by a unique revenue stream created by the sale of Solar Home Renewable Energy Credits (SHRECs), which are generated by the solar panels on homes that received state incentives for going solar. As opposed to other more traditional solar asset-backed securities, the revenue being used to “back” the investment is not a pool of consumer receivables originated by solar companies (like loans, leases, and PPAs), but a stream of long-term proceeds from statutorily mandated REC sales from the Green Bank to two Connecticut utilities in compliance with the state’s renewable portfolio standard (RPS).

The Green Bank has provided these homeowners with upfront incentives or performance incentives over time in exchange for the SHRECs, which are then sold to the utilities through a 15-year Master Purchase Agreement to assist them in their compliance with Connecticut’s RPS. The proceeds from the sale of Green Liberty Bonds support the deployment of more solar energy through the RSIP (see Figure 1).

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1 Clean Energy Renewable Bonds, or CREBs, were a type of tax credit bond, in which an investor/buyer receives a federal tax credit rather than an interest payment from the issuer. The bond issuer remained liable for repaying the principal.
2 The SHREC ABS Note Series A & Series B Climate Bond to institutional investors.
3 “The term ABS generically refers to any financial instrument that is collateralized by a pool of cash-flow-generating assets other than real estate and mortgages. Typically, these instruments are based on consumer receivables, such as payments on auto loans, credit card debts, and student loans (to name three of the more conventional asset types).” See The Potential of Securitization in Solar PV Finance, Travis Lowder and Michael Mendelsohn, NREL 2013.
Strong Demand Confirms Success for a New Financing Model
The inaugural offering occurred on July 29, 2020, in the midst of the COVID-19 pandemic, with the sale of $16,795,000 of Series 2020 Green Liberty Bonds over a two-day period (with retail investors getting exclusive preference on the first day). These bonds were collateralized by revenue from the SHRECs from approximately 4,800 residential solar photovoltaic systems across Connecticut. These bonds were Climate Bond Certified, and at the time of issuance were rated “A” by S&P. Total retail orders received during the first day of this order period surpassed $9.9 million. With priority given to Connecticut retail investors, their orders for nearly $5 million of bonds were filled before the national orders. Due to heavy volume of interest seeking the first two years of maturities, the Green Bank was only able to fill $1 million of the more than $5 million in national retail orders placed. This transaction won The Bond Buyer Award in Innovative Financing for its structure.

A second issuance of Green Liberty Bonds occurred on May 11, 2021, with the sale of $24,834,000 of the Series 2021 Green Liberty Bonds. Again, the bonds were rated “A” by S&P and Climate Bond Certified. These bonds were collateralized by SHRECs from approximately 6,900 residential solar systems. With nearly $10 million in orders from both retail and institutional investors, demand was much greater than the supply of bonds could satisfy, showing the high-level of interest in supporting investment to confront climate change in Connecticut. Total retail orders received during the retail order preference period surpassed $20 million, while institutional orders (on the second day) topped $77 million. On the retail side, some priority was given to Connecticut retail investors, and their orders for nearly $12 million of bonds were filled before approximately $9 million of bonds were obtained by orders from individuals nationally.

Expanded Benefits to More Connecticut Communities
The proceeds of 2020 and 2021 issuances of the Green Liberty Bonds were used to support the Green Bank for the incentives and program administration costs related to the RSIP, an initiative designed to make rooftop solar installations more affordable in Connecticut. The solar PV systems that backed these bond issuances supported the creation of 3,391 direct, indirect, and induced jobs; generated $10,485,805 in individual and corporate tax revenue; and created public health outcomes valued between $48 million and $100 million. Additionally, these systems had positive environmental benefits, with lifetime emissions avoidance of more than 1.5 million tons of CO₂, 1.5 million pounds of NOₓ, 1.4 million pounds of SO₂ emissions, and 120,000 pounds of small particulates (PM₂.₅).

Through the RSIP, Connecticut has become a “solar with justice” state, ensuring equal access to solar among low-to-moderate (LMI) families and non-LMI households by adding special incentives for low- and moderate-income households.
to the RSIP, which quickly accelerated solar adoption in LMI communities. Recent analysis shows that these income-eligible incentives have also been extremely successful in reaching communities of color in the state. As of 2019, on a per owner-occupied household basis, there are 86 percent more RSIP installations in majority Black neighborhoods, 18 percent more in majority Hispanic neighborhoods, and 20 percent more in No Majority race neighborhoods as compared to majority white neighborhoods. This increasing investment in clean energy reduces the energy burden in these vulnerable communities, and solar PV systems in the tranches supporting Green Liberty Bonds are serving homeowners in these areas.

A key focus of Green Liberty Bonds is to appeal to retail investors from both an investability standpoint and an impact-investment standpoint. Low denomination minimum purchase requirements, combined with credit support from the State of Connecticut, make the investment affordable for retail investors. In addition, investors can rely on the Climate Bond Certified designation attached to the use of the bond issuance proceeds, which is why the Green Bank chose to have the bonds certified as green by a third-party verification service.

With low investment costs and diverse base of retail and institutional investors, the Green Liberty Bonds have become a key tool in the Green Bank’s mission to provide everyday citizens the opportunity to confront climate change and invest in a cleaner, more sustainable future.

Due to the success of the first two issuances, the Green Bank intends to offer Green Liberty Bonds on or around each Earth Day in the future. After the first issuance in 2020, Green Bank leadership received inquiries from other states and nonprofit organizations seeking information about replicating this product to support other green causes like voluntary carbon offsets for forest protection. The Green Bank encourages other issuers to use the Green Liberty Bond name and structure, ensuring that the three defining principles (use of proceeds for projects that support the Paris Agreement; retail accessibility of purchase; certification and verification) are in place.

**JUDGES’ QUOTE**

“The Green Bank has created an interesting, innovative, and highly creative way to generate revenue for clean energy projects and to increase public benefits from—and greater public participation in—investments that will accelerate funding for clean energy deployment in Connecticut.”

**About Connecticut Green Bank**

The Connecticut Green Bank is the nation’s first green bank. Established in a bipartisan fashion by the Connecticut General Assembly and the Governor on July 1, 2011 as a part of Public Act 11-80, as a quasi-public agency and the nation’s first green bank. Connecticut Green Bank supports the Governor's and Legislature's energy strategy to achieve cleaner, affordable, and reliable sources of energy while creating jobs and supporting local economic development. Our vision is a planet protected by the love of humanity. The Green Bank’s mission is to confront climate change by increasing and accelerating investment into Connecticut’s green economy to create more resilient, healthier, and equitable communities. We facilitate clean energy deployment by leveraging a public-private financing model that uses limited public dollars to attract private capital investments. By partnering with the private sector, we create solutions that result in long-term, affordable financing to increase the number of clean energy projects for homes, buildings, and communities statewide. Our staff of approximately 40 people is dedicated to making the benefits of the green economy inclusive and accessible to all.

**Link to the Program**

https://www.ctgreenbankbonds.com/connecticut-green-bank-ct/about/esg-program/i6126

**Contact for More Information**

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The Resilient Maryland Program’s feasibility assessments and analyses have provided important, granular-level information on microgrid and other DER system configurations, as well as use-cases that can be replicated and scaled across industries and other sectors of the state.

Resilient Maryland awardees have utilized their projects as catalysts for clean energy economic development, particularly in economically challenged and underserved areas of the state.

Resiliency Hub grant funding covers roughly 50 percent of the cost of components needed to install a resiliency hub. The system must be sized to provide energy for a designated period of time (currently 72 hours).

The Resilient Maryland and Resiliency Hub Programs specifically favor DER projects that prioritize bringing resiliency benefits to Marylanders who experience socio-economic vulnerabilities and challenges as well as disproportionate detrimental impacts from power outages.

The Maryland Energy Administration’s Resilient Maryland Program and Resiliency Hub Program help Maryland organizations to develop resilient energy system projects that support their operations, protect communities, enhance sustainability, and achieve energy affordability. The Resilient Maryland Program provides funds to help pay for feasibility analyses, preliminary modeling, and other important preconstruction activities in the development of microgrids, resilient facility power systems, and resiliency hubs for Maryland communities, businesses, critical infrastructure, and many others. The Resiliency Hub Program provides capital funds to organizations for the installation of solar PV and battery storage systems that enable them to become “resiliency hubs,” which are local, community-serving locations where residents can access power for their essential devices, to refrigerate temperature-sensitive items, and to shelter in safe and healthy temperature-conditioned spaces.

Creating Path to a More Resilient State
The Maryland Energy Administration (MEA) has provided millions of dollars in state investment for clean and efficient energy technologies and resources over its 30-year history. MEA has offered innovative incentive programs designed to be dynamic and responsive to a rapidly developing...
The Maryland Energy Administration allocates a substantial amount of SEIF funds to its energy incentive programs and initiatives—available to its residents, businesses, nonprofits, communities, and many other organizations—to help pay for the costs of developing and installing these technologies. This flexibility has allowed MEA to place a substantial amount of focus on investing dollars from the SEIF into making microgrids and other distributed energy resource (DER) systems possible for Maryland organizations and communities. Specifically, the Resilient Maryland Program and Resiliency Hub Program were both started to enhance energy resiliency for communities, critical infrastructure, businesses, educational institutions, and many others across the state. The programs provide funds to 1) address resource gaps in the mobilization of resilient energy systems by reducing out-of-pocket expense by adopters, and 2) to attract more private capital into the DER market.

The Resilient Maryland Program was first offered as a pilot program in early 2020 to help awardees pay for the costs of conducting important initial feasibility analysis and preconstruction planning for microgrids, resilient facility power systems, and resiliency hubs. Feedback from industry, grantees, and other stakeholders over the past decade revealed that the primary point of failure for many DER projects was the inability to get through the costly early development phase, due to lack of available capital and/or the failure to meaningfully and concisely communicate the value proposition to key project stakeholders and capital providers. Following a robust response to the pilot year, in which MEA received 25 unique applications for a total funding ask of well over $1 million, there was a clearly demonstrated demand for this type of DER system support and ripe potential uptake statewide, across nearly every sector of Maryland’s economy. MEA recently announced the Resilient Maryland award winners for its FY22 program, which together represent $827,165 in SEIF allocations to resilient energy system development.

The Resiliency Hubs Program was first launched in 2019 to help Maryland communities engage local organizations to create “resiliency hubs” that residents could easily access in times of grid outage. MEA considers a resiliency hub to be a location within a community, such as a community center, library, or faith-based institution, that provides emergency power for charging portable electronic devices, refrigerating temperature-sensitive medications, and providing safe and healthy conditioned space where residents can stay until the outage situation concludes or more robust emergency response services arrive. Resiliency hubs are situated at locations well known and trusted by surrounding community members, where community leadership can best understand and balance the residents’ unique needs with the resources that the resiliency hub can provide. The Resiliency Hubs FY22 program awarded over $753,600 to two resiliency hubs: one at a training facility to serve a particularly flood-prone neighborhood in Baltimore, and one at an affordable housing complex in Hyattsville, MD. The program is subject to the same conditions as Resilient Maryland. Both Resilient Maryland and Resiliency Hubs continue in MEA’s annual program offerings, subject to annual budgetary approval by the Maryland General Assembly.
Benefits and Impacts

Both programs are ongoing and have been incredibly well received across the state. The Resilient Maryland Program has awarded 30 grants at over $2.3 million combined. The Resiliency Hubs Program has provided seven grants totaling over $2 million combined. The grants fund equipment and installation services for the solar PV, battery energy storage, and associated racking, mounting, and wiring necessary to equip community-facing facilities with the resilient energy infrastructure to become resiliency hubs for their communities. A key success driver is the flexibility in the programs in allowing applicants to propose project locations, energy system configurations to explore and install, and to provide a detailed justification for their choices. This differs from the prescriptive approach in which programs detail what systems can be installed, and instead trusts the organization to know its needs and articulate why the configuration(s) it pursues will help meet its goals.

Funding the Just Transition

This portfolio of energy resilience incentives has provided critical planning and capital funds for DER projects that have historically been unable to advance due to lack of adequate planning and access to affordable financing. The analysis produced by Resilient Maryland has revealed systems and use-cases with serious potential for serving as models to industry peers, thereby lessening the knowledge gap and need for exploratory/pioneering research. The same outcome is produced by the Resiliency Hubs program: installations have helped provide proof of a relatively new concept, and as such, more Maryland organizations across the state are taking notice and seeking to become resiliency hubs for their communities. MEA’s resiliency portfolio recognizes the role of sustainability to mitigate and reduce the detrimental impacts of the aging energy system on the climate and environment as an inherent part of building resilient communities.

The Resilient Maryland and Resiliency Hub programs specifically favor DER projects that prioritize bringing resiliency benefits to Marylanders who experience socioeconomic vulnerabilities and challenges, as well as disproportionate detrimental impacts from power outages. Together, the programs drive DER system investment into these communities to bolster the resilience and sustainability of businesses, organizations, core government services, critical infrastructure, and housing that these Marylanders depend on. Benefits include but are not limited to the preparation of actionable plans for systems, as well as the creation of easily accessible locations for community residents to safely congregate during grid outage situations and access electricity for essential devices.

For example, both the Resilient Maryland and Resiliency Hubs programs have enabled city of Baltimore to move forward on its plan to create a network of resiliency hubs across the city’s most vulnerable and underserved communities. This network, by virtue of its design, places communities in leadership roles for their hubs and allows for the sharing of resources between hubs. The Resilient Maryland program awarded a comprehensive $300,000 award to clean energy nonprofit Groundswell, Inc., which allowed it to gauge feasibility and complete preliminary solar PV and battery storage system designs for 26 prospective hub sites across the city, in its partnership with the Baltimore City government. Examples of common locations include faith-based institutions and community centers, namely due to the community-wide trust they have established with residents.

Resilient Maryland and Resiliency Hubs have provided over 21,000 hours of employment in energy sector jobs since their inception—these include but are not limited to analysis, engineering, financial modeling, and installation, as well as student internships and other workforce development opportunities. The Resiliency Hubs program has so far helped to install approximately 657 kW-dc of solar PV and 1,641 kWh of battery storage capacity that will benefit Maryland communities experiencing low income.

Each of these programs takes an innovative approach to enhancing energy resiliency for communities and organizations. Resilient Maryland’s success is its innovative approach to project flexibility in that it solicits proposals for DER systems from a broad array of Maryland organizations seeking to enhance resiliency; and it encourages approaches that also help meet sustainability, efficiency, equity, and cost management goals. MEA’s resiliency portfolio ensures that the communities and
organizations it funds are leaders in execution of their projects. While award recipients must certainly adhere to the program requirements and contribute to program objectives, MEA’s role is to ensure that funds are being expended responsibly, and the analysis and systems that they produce are of expected quality and deliver the outcomes proposed and selected for award. Recipients inform MEA of their progress, lessons learned, challenges experienced, and how the programs can be modified for future grantees to deliver optimal and meaningful outcomes.

Funding Leverage
Resilient Maryland awards leverage funds from grantees that can come in multiple forms, such as value of donated labor, cost-match, and developer discounts. To date, the amount of leveraged funds is over $1 million. Resiliency Hub grant funding covers roughly 50 percent of the cost to install a resiliency hub. In addition, the system owners are required to provide personnel to operate the hub when the electrical grid is down. While this is not a cash cost, it has value just the same. In most cases, the resiliency hubs have been installed using a Power Purchase Agreement model, so in essence, 50 percent of the initial capital is coming from a third party. Resiliency Hub award amounts are designed to partially pay for the solar photovoltaic system, energy storage system, system controls, rewiring, and new switchboards. The system must be sized to provide energy for a designated period of time (currently 72 hours). Award amounts are based on the size of the solar photovoltaic system required to meet the expected loads required to provide the resiliency hub’s services. The energy storage unit(s), controls, rewiring and additional equipment are assumed to be proportional to the size of the system. As most resiliency hubs are in low- or moderate-income neighborhoods, MEA’s incentive must be sufficient to ensure local organizations are able to pay the remaining costs.

Both Resilient Maryland and Resiliency Hubs Programs can be replicated by other states/jurisdictions. Their formats are simple and employ evaluation criteria that should easily mesh with other requirements, such as those that come with various funding sources and statutory/regulatory objectives. While no formal programs have been opened by states replicating Resilient Maryland yet, MEA has had talks with states such as Wisconsin, California, and Kentucky about the program’s precedent, setup, and funding. Resilient Maryland and Resiliency Hubs have been featured at a number of different national energy webinars, conferences, and other engagements.

Maryland Energy Administration
The Maryland Energy Administration (MEA) advises the Governor and General Assembly on all energy matters, promoting affordable, reliable and cleaner energy for Maryland. MEA develops and administers programs and policy to support and expand all sectors of the state’s economy while benefiting all Marylanders and implementing legislation. The Administration consists of 42 highly trained and professional personnel including policy, finance, communications specialists as well as a seasoned program management and grant administration team. MEA is the statutorily enabled Administrator of Maryland’s Strategic Energy Investment Fund (SEIF), which is a special fund that primarily receives proceeds from the Regional Greenhouse Gas Initiative (RGGI). This multimillion-dollar fund spans across a number of Maryland agencies and departments.

Link to the Program

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JUDGES’ QUOTE
“Maryland Energy Administration’s suite of resiliency programs are well designed, with holistic project evaluation criteria and ample opportunity for community input on system configuration. These programs will help support low-income and medically vulnerable communities by providing access to solar and battery storage systems during outages.”

Maryland Energy Administration
STATE LEADERSHIP IN CLEAN ENERGY 16 CLEAN ENERGY STATES ALLIANCE
NYSERDA and NYS HCR
CLEAN ENERGY INITIATIVE

The New York State Energy Research and Development Authority (NYSERDA) and New York State Homes and Community Renewal (HCR) partnered to accelerate the decarbonization of multifamily affordable housing developments in New York State. The Clean Energy Initiative (CEI) provides a replicable and scalable model to accelerate the decarbonization of affordable housing. The combined budgets and coordinated efforts of both organizations—and financing innovations—have allowed developers easier access to incentives and technical assistance to ensure tenants receive high quality living spaces that meet performance standards. This will allow more New York families to benefit from healthy, clean energy homes, while providing housing developers with streamlined access to technical expertise and clean energy funding to support decarbonization scopes.

Leveraging the Efforts for Clean Energy in Multifamily Affordable Housing
NYSERDA and HCR have historically developed their own distinct programs to ensure that funding for energy performance improvements is accessible to the low- and moderate-income new construction and rehabilitation housing projects within New York. NYSERDA is a public benefit corporation and offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975. New York State HCR develops, preserves, and protects affordable housing and invests in economically vibrant communities. HCR works with many private, public, and nonprofit partners to create safe, healthy, and affordable housing opportunities for all New Yorkers. HCR is charged with carrying out New York State’s Five-Year, $20 billion Homelessness and Housing Plan to create or preserve more than 100,000 affordable homes and 6,000 supportive homes for New Yorkers.

Pan American Square is a 150-unit new construction project in Buffalo, NY. HCR and NYSERDA CEI funds will be used to install heat pump systems for space heating and cooling and a high-performance envelope. The CEI-funded scope of work is expected to result in PHIUS+ certification for this project. Source: NYSERDA.
The Clean Energy Initiative (CEI) is the first jointly implemented NYSERDA and HCR program to bring NYSERDA incentive funds directly to HCR applicants. As two independent state agencies, NYSERDA and HCR both support affordable housing communities throughout New York State, but they have historically developed their own distinct support programs for energy performance improvements for low- and moderate-income new construction and rehabilitation housing projects within New York. By leveraging the expertise of the other, both agencies have partnered to successfully implement the CEI.

Meeting the Challenge to Achieve State Decarbonization Goals for Buildings
Under the 2019 Climate Leadership and Community Protection Act (Climate Act), New York State has mandated a 40 percent reduction in greenhouse gas emissions by 2030, and an 80 percent reduction by 2050. To achieve these goals, New York must significantly reduce emissions from the six million buildings in New York, of which 200,000 need to be retrofitted every year to meet these goals.

As announced by Governor Hochul in 2022, New York State has also committed to achieve two million climate-friendly homes by 2030—specifically, one million electrified homes and one million electrification-ready homes—including at least 800,000 low- and moderate-income households. Additionally, HCR has proposed a new Five-Year Housing Plan (that would run from April 2022 through March 2027) that includes a focus on electrification and electric readiness, with as much as $250 million in funding available for clean energy measures and improvements. Given these mandates and commitments, the state is focusing resources on a new model to incentivize electrification and high-performance envelopes in affordable multifamily housing throughout New York State.

The CEI developed a model for decarbonizing HCR’s affordable housing portfolio, with technical and financial support in the amount of $100 million provided by NYSERDA. The CEI seeks to deliver building decarbonization incentives to HCR affordable housing projects within HCR’s established project intake and funding disbursement processes. This effort addresses the challenge of traditional state efficiency incentive programs that require extensive outreach, coordination, and application processes for developers, and that can result in the uncertainty—or asynchronous timing—of when incentive funding is committed and provided to project developers.

In traditional energy incentive programs, applications and subsequent incentive funding requests often entail rounds of document revisions and site visits by program management staff, which can add substantial soft costs and require significant investment up front. These processes can adversely impact project schedules as they are often separate from the timing and processes required by other agencies, regulatory bodies, and/or private lenders involved in a project. These overlapping processes, involving multiple agency programs, create a barrier for affordable housing developers to access building decarbonization incentives in an efficient and timely manner. In addition to these hurdles, NYSERDA incentives are typically paid out upon project completion. Owners and developers must take on additional construction financing debt to support the project until incentives are disbursed, since the incentives cannot always be considered a source of financing at the time of closings for HCR construction finance agreements.

Regarding project performance criteria, HCR’s current Design Guidelines prescribe design standards that all developers must follow when applying for HCR financing, which helps the agency ensure that tenants receive high-quality living spaces and specifies size requirements, space materiality, and some standards for mechanical equipment. The Design Guidelines also require developers to implement efficiency improvements based on standards prescribed by Energy Star Multifamily, NYSERDA incentive programs, LEED, and/or Enterprise Green Communities—relying on those criteria as project performance standards.

Steamboat Square Revitalization is a gut renovation project, which will create 88 high-quality affordable rate apartments for Albany residents. CEI funds will be used to implement air source and/or ground source heat pump space conditioning systems and a high-performance envelope exceeding New York State Energy Conservation Construction Code. Source: NYSERDA.
Solutions under the Clean Energy Initiative for Efficiency in Affordable Housing

The CEI provides a streamlined incentive delivery model, more ambitious performance standards, and technical assistance for HCR staff and project developers. The collaboration between NYSERDA and HCR to leverage sources of state funds for affordable housing developers is a first-of-its kind model, designed to achieve New York State’s Climate Act goals and reach HCR’s proposed Five-Year Housing Plan.

Under a Memorandum of Understanding (MOU) executed by HCR and NYSERDA in December of 2021, the agencies established a collaborative program and streamlined incentive delivery infrastructure. In addition, this collaboration led to the establishment of CEI’s Sustainability Stretch Standards for project scopes, which were designed to complement HCR’s existing Design Guidelines’ construction standards. This will enable more HCR projects to achieve high-performance envelope improvements and electrification of space heating and domestic hot water systems using heat pump technology.

Without the initial funding by NYSERDA, the Stretch Standards’ requirements for electrification and enhancements to building envelope would otherwise not have been possible to directly fund through HCR’s existing Five-Year housing plan. Additionally, NYSERDA’s funding for CEI’s incentive model, technical assistance, and Stretch Standards—along with the HCR capacity building that will result from it—have positioned HCR to provide an additional $250 million for decarbonization scopes in the upcoming Five-Year Housing Plan, which runs through March 2027.

Benefits of Streamlining Applications and Improved Financing

The CEI model provides developers access to clean energy incentives, affordable housing finance, and tax credits from a single source. Developers applying for either HCR’s 4 percent Bond or 9 percent Low Income Housing Tax Credit (LIHTC) programs are now able to apply for additional clean energy incentives provided by NYSERDA through their regular Housing Financing Application. HCR will directly administer building decarbonization funds to the projects, creating a streamlined process for developers, while also providing technical support through NYSERDA and its technical assistance contractors.

This one-stop-shop approach also enables developers to utilize these funds as a source in the project’s proposed underwriting, instead of as a rebate after construction, allowing it to be seen as a source of revenue at construction finance closing. Project developers can apply for CEI funding within established HCR application processes and receive incentives alongside HCR funding disbursements, so there are no additional administrative hurdles. This is game-changing in terms of creating up-front funding for projects striving to meet high performance and innovative solutions to meet climate goals.

Better Building Standards with more Funding and Technical Assistance

To access the new CEI funds, development teams must comply with the HCR Sustainability Stretch Standards outlined in the CEI application. The new CEI scope requirements to design deep envelope improvements to meet high-performance, whole-building U-values, R-values, and infiltration standards and/or replacing existing heating systems with heat pumps. The result will be deeper decarbonization scopes that will set standards for future iterations of HCR’s Design Guidelines, and lead to improved comfort and indoor air quality of tenants’ homes by removing carbon emissions producing equipment, such as oil-fired boilers and gas stoves.

However, these high-performance scopes are relatively new to both HCR project management staff and project developers. To address this, NYSERDA is providing program level support to assist HCR staff with managing such projects. These contractors will provide the needed technical review and execution support to facilitate implementation of these more ambitious decarbonization scopes. Additional NYSERDA contractors will also provide project-level support and oversight for project teams and will assist teams from pre-design through to post-construction commissioning.

Advancing Electrification in New York for Environmental Justice and Disadvantaged Communities

The NYSERDA/HCR partnership and CEI are key first steps in advancing the case for affordable housing electrification throughout the State and providing all stakeholders with case studies and evidence of how these projects can be successfully implemented. NYSERDA-funded technical contractors will provide program-level support to HCR and build capacity within the agency to establish decarbonization scopes as the HCR design standard in the coming years.

NYSERDA and HCR are offering substantial incentives for affordable housing decarbonization—up to $25,000/dwelling unit, depending on project scopes—through the CEI model to support projects that seek to achieve electrification and/or advanced envelope improvements. NYSERDA is also funding technical assistance contractors who will provide project-level support for project developers to facilitate integrated design
and help the teams integrate these systems in projects’ pre-design, design, bidding, construction, and post-construction phases.

All projects utilizing CEI funds are HCR-regulated affordable housing, and the tenants are low- to moderate-income New Yorkers. Heat pumps provide improved tenant comfort, can improve indoor air quality by eliminating fossil-fuel burning appliances, and give users more control over heating and cooling of their homes. Delivering these benefits to underserved, low-income populations furthers NYSERDA’s goals for serving disadvantaged communities and supports the Climate Act mandate, which dictates that at least 40 percent of the State’s clean energy program benefits be allocated towards disadvantaged communities.

A Replicable Model
The CEI model is adaptable to new sources of funding, such as utility incentives or potential additional federal funds for clean energy programs, and it provides a replicable approach for integrating building decarbonization technical assistance and funding into established housing agency financing processes. Through close coordination and joint implementation between different incentive programs (e.g., state agencies, utilities, and municipalities) and affordable housing agencies, incentives can be made available to applicants much more efficiently. It is also important to leverage technical assistance contractors to both assist project developers with implementing heat pump and/or high-performance envelope scopes, and to support housing agency staff with managing such projects and developing the administrative tools and internal capacity for doing so.

JUDGES’ QUOTE
“The Clean Energy Initiative tackles a challenging sector with an innovative and de-siloed approach for technical assistance and funding. The positive equity impacts from the decarbonization of affordable housing can be long-term and transformative. NYSERDA’s long-term vision is excellent, and the partnership with the housing authority [NYS-HCR] will help remove barriers to clean energy expansion.”

About NYSERDA
NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975. To learn more about NYSERDA’s programs, visit nyserda.ny.gov or follow us on Twitter, Facebook, YouTube, or Instagram.

About HCR
New York State Homes and Community Renewal (HCR) develops, preserves, and protects affordable housing and invests in economically vibrant communities. HCR works with many private, public, and nonprofit partners to create safe, healthy, and affordable housing opportunities for all New Yorkers. HCR is charged with carrying out New York State’s Five-Year, $20 billion Homelessness and Housing Plan to create or preserve more than 100,000 affordable homes and 6,000 supportive homes for New Yorkers. HCR is NYSERDA’s partner in implementing the Clean Energy Initiative. To learn more, visit hcr.ny.gov or follow us on Twitter, Facebook, YouTube, or Instagram.

For more information:
https://hcr.ny.gov/clean-energy-initiative

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NEW YORK STATE NYSERDA

NEW YORK STATE OPPORTUNITY Homes and Community Renewal
The Oregon Solar + Storage Rebate Program offers rebates to residential customers and low-income service providers who install solar or solar paired with energy storage systems (batteries). Rebates are issued to customers through the Oregon Department of Energy’s (ODOE) approved contractors, who pass the full amount of the rebate on as savings to their customers. Homeowners are eligible for rebates for solar-alone systems as well as solar paired with battery storage. Low-income service providers are also eligible for rebates to install solar and solar paired with storage. The program has a focus on expanding access to renewable energy to Oregonians who may not otherwise be able to afford the investment in solar. ODOE collaborated with other state agencies to develop an efficient model for confirming eligibility requirements for low- and moderate-income Oregonians who can receive higher incentive amounts.

Background
The Oregon Solar + Storage Rebate Program was established by the Oregon Legislature in summer 2019 and launched by the Oregon Department of Energy in January 2020. The program offers rebates to residential customers and low-income service providers who install solar or solar paired with batteries. Rebates are issued to ODOE-approved contractors, who pass the full amount of the rebate on as savings to their customers.

The program’s rebates advance Oregon energy policy by increasing renewable energy production, strengthening energy resilience through energy storage, and supporting clean energy jobs through...
the Oregon solar installer industry. The program helps expand access to renewable solar by reducing the upfront costs associated with the purchase and installation of renewable energy production and energy storage systems. While the cost of solar has dropped significantly over the last ten years, it still remains out of reach for many homeowners, especially those with low and moderate incomes.

Rebates to Those who Need Them Most
The Solar + Storage Rebate program provides homeowners with rebates up to $5,000 for solar, and an additional $2,500 for paired energy storage systems when installed together. Low-income service providers—such as nonprofits, municipalities, or other organizations serving low-income Oregonians—are eligible for rebates up to $30,000 for solar, plus $15,000 for paired storage.

The program’s emphasis on expanding access to renewable energy to Oregonians who may not otherwise be able to afford the investment in solar demonstrates ODOE’s commitment to energy equity. At least 25 percent of the program’s rebate funds each year will be reserved for low- or moderate-income residential customers and low-income service providers. Income-eligible Oregonians can receive higher rebates of $1.80 per watt of installed capacity, up to 60 percent of the net cost of the system. For higher-income Oregonians, the rebate is $0.20–$0.50 per watt, capped at 40 percent. For low-income service providers, the rebate is capped at 50 percent of the net cost.

In the initial funding of the program, ODOE exceeded its program goal by allocating nearly $750,000—half of the rebate dollars, rather than just 25 percent—to low- and moderate-income Oregonians and low-income service providers. Sixteen low-income service providers have received nearly $380,000 in rebates so far, including Habitat for Humanity chapters, Boys and Girls Club chapters, affordable housing organizations, and others. ODOE is actively working with Oregon Tribes to encourage greater participation in the program with the newly allocated funding.

The program is extremely successful, and with an initial budget of $1.5 million, all funding was reserved or rebated by the end of September 2020—within nine months of program launch. In 2021, the Oregon Legislature allocated an additional $10 million to the program, and ODOE resumed accepting applications in Fall 2021. In 2022, the Legislature tacked on an additional $5 million for the program, and the agency will be seeking to continue the program through the next biennium.

New Model for Program Eligibility Determination and Implementation
The program has also been successful at reaching Oregonians statewide, with reserved or issued rebates for projects in 30 of Oregon’s 36 counties. In the first $1.5 million of the program, ODOE issued 352 rebates for completed projects, 24 of which are projects for low-income service providers. Of projects that received a rebate, 32 were paired solar and storage projects. The 352 completed projects that received a rebate represent solar electric generation that is estimated to displace 2,193 metric tons of CO2e (carbon dioxide equivalent) per year based on the carbon intensity of the electric utility serving the project. Nearly 50 Oregon solar companies are signed up as approved contractors.
One of the ways the agency made the program more cost-effective was to develop an efficient pathway for Oregonians to prove eligibility for the higher low- and moderate-income rebate amount. ODOE worked with Oregon Housing and Community Services (OHCS) to develop the program rules for eligibility. The agency determined that individuals and households could have their projects qualify if they were also eligible for services offered by OHCS through the Low-Income Home Energy Assistance Program, the Oregon Energy Assistance Program, or the Low-Income Weatherization Assistance Program. Participants are also able to submit tax transcripts through the Oregon Department of Revenue. These pathways allow ODOE to confirm eligibility without having to conduct the primary income verification, which is both administratively resource-intensive and outside the scope of the department’s program expertise. This is the first time ODOE has used this innovative approach for program eligibility, and it has been successful. In fact, ODOE is adopting this same process for determining eligibility for a new incentive program at the agency for energy efficient rebuilding of structures lost in wildfires.

Second, and paired with the low- and moderate-income rebate participants, is providing rebates to organizations that provide services to low-income Oregonians. Those low-income service providers include developers or owners of affordable multifamily housing; community services organizations like public, Tribal, or 501(c) nonprofits; or Tribal or local government entities. These groups often can’t take advantage of state or federal tax credit incentives, as they typically don’t have tax liability. Providing rebates through ODOE’s program ensures they can save significant dollars to invest in renewable energy.

**Cost Effectiveness and Success**

The initial budget for the program was $1.5 million (plus $500,000 for set-up and administration) when it launched in 2020. ODOE released funding in two buckets to ensure the agency met its requirement to allocate at least 25 percent of the funds to low- and moderate-income participants. In January 2020, ODOE made half of the total budget—$750,000—available to those low- and moderate-income participants and low-income service providers, plus $375,000 in non-restricted funding. The second half of the non-restricted funding was released in April, and just 30 minutes after making the funds available, ODOE had received requests for rebate reservations that exceeded available funding.
The popularity and success of the program encouraged the Oregon Legislature to allocate an additional $10 million to the program in late 2021 and another $5 million in 2022. As of August 15, 2022, 1,858 projects have either received or reserved rebates in 30 Oregon counties—a state investment of about $5.5 million leveraged to support $63 million in total project costs.

The program aligns well with ODOE’s mission to shape an equitable transition to a clean energy future. It also provided an opportunity for ODOE to partner with the solar industry and other energy partners to create a program that would benefit more Oregonians, such as those with lower incomes. Program participants can “stack” incentives if they are also eligible for Energy Trust of Oregon or other utility-level incentives to save even more. Designing the program so rebates are issued to contractors (who pass on the savings) also allows a more streamlined process for participants, so they save immediately instead of having to pay that additional cost up front, to be reimbursed later.

A Program that Other States Could Adopt
The Solar + Storage Rebate Program could be readily replicated by other states and jurisdictions. For those that already offer a solar incentive, the program’s added incentive for installing paired solar and storage to increase energy resilience is worth noting. ODOE found success in providing the incentive as a rebate, rather than a tax credit, to reach more lower-income Oregonians and low-income service providers who may not have enough tax liability to benefit from a tax credit program.

In Oregon, the program is funded by State General Fund dollars. Considering the launch of the program was a modest $1.5 million investment, it shows that even smaller programs can make a big difference in supporting the transition to a clean energy future—and their success, like this program, paves the way for future larger investments, as Oregon did by allocating an additional $15 million total in 2021 and 2022.

Other states and jurisdictions can also benefit from some of the lessons learned from the development of ODOE’s program, including the approach to provide rebates directly to contractors who pass the savings on to their customers. The income verification pathways used in Oregon could also be replicated by other state agencies that have partnerships with organizations serving similar constituencies. ODOE’s administrative rules are publicly accessible for other states or jurisdictions to review.

JUDGES’ QUOTE
“This Oregon Department of Energy’s solar plus storage rebate program was thoughtfully designed to maximize participation by low-income communities, with impressive results. ODOE’s ability to collaborate with other agencies on eligibility pathways was a good approach to increase the program’s accessibility.”

About the Oregon Department of Energy (ODE)
The Oregon Department of Energy’s vision is a “safe, equitable, clean, and sustainable future.” Our mission is to help Oregonians make informed decisions and maintain a resilient and affordable energy system. We advance solutions to shape an equitable clean energy transition, protect the environment and public health, and responsibly balance energy needs and impacts for current and future generations. We achieve our mission in five main ways: acting as a central repository of energy data, information, and analysis; serving as a venue for problem-solving Oregon’s energy challenges; providing energy education and technical assistance; offering regulation and oversight; and administering energy programs and activities. ODOE is located in Salem, Oregon, and has about 90 employees.

For more information:
https://www.oregon.gov/energy/Incentives/Pages/Solar-Storage-Rebate-Program.aspx

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The State of Washington’s 2021 State Energy Strategy (SES) provides a roadmap for Washington to meet its critical and ambitious energy and climate goals: transitioning to 100 percent clean electricity by 2045 and reducing greenhouse gas emissions in accordance with climate science. The SES was notable for the State Energy Office’s efforts to combine extensive stakeholder and technical input with detailed modeling, and to identify actions in every major sector of the state’s economy. The SES puts equity and climate justice at the fore because climate change inflicts the greatest harm on overburdened communities and low-income households. It envisions an energy transition that breaks from historical patterns and narratives, reflecting legislative direction that embeds equity in the state’s energy policy.

Developing a Strategy to Meet State Goals
The Washington State Legislature authorized the 2021 State Energy Strategy in 2019, at the same time it enacted the Clean Energy Transformation Act (CETA), a clean energy standard that requires electric utilities to eliminate coal-fired generating resources. Updated in 2020, the legislature supported statewide greenhouse gas emissions limits to require a 45 percent reduction by 2030, a 70 percent reduction by 2040, and net-zero emissions by 2050. The State Energy Office was charged with developing an updated comprehensive energy strategy to achieve clean electricity and emissions reduction limits, while also ensuring reasonable energy prices and sufficient supplies to support the economy.

The 2021 SES bases its policy direction on an economy-wide analytical framework that allows stakeholders and decision makers to see the impact of choices in one sector or time period, on other sectors and time periods. By using this rigorous, economy-wide model, the strategy steers away from rigid proportionate reduction scenarios by identifying those end-uses that are ready for immediate action, and those where improvement opportunities lie at the point of equipment turnover. The energy model also identifies end-uses that are difficult to decarbonize with existing technologies and finds reductions in other sectors to compensate. Finally, the energy model uses comprehensive data on supply-side and demand-side technologies and costs to evaluate alternative reduction pathways and identify cost-minimizing solutions to achieve the required emissions reductions.

The strategy is not determined solely by model results. Instead, it uses these results as the starting point for technical, policy, and environmental justice analysis. The comprehensive model helps focus discussions and sharpen decisions, illuminating points that could be missed easily in sector-specific plans or interest-based stakeholder discussions. The development of the SES was also influenced by input from hundreds of stakeholders.

Focus on Community Input, Equity, and Environmental Justice
The 2021 State Energy Strategy emphasizes that the clean energy transition must benefit urban and rural communities, overburdened and low-income households, and Indigenous communities throughout the state. It identifies public sector investment and planning, data analysis, public outreach, and stakeholder input as crucial steps for an equitable and inclusive transition.
Sacramento Municipal Utility District (SMUD) presents many opportunities to address inequities through enhancing resilience in rural Washington, growing and diversifying Washington’s economy and clean energy workforce, and improving health outcomes and quality of life. The 2021 SES reflects the leadership and innovation of Governor Jay Inslee and other elected officials in acknowledging and purposefully addressing the disproportionate impacts of environmental burdens and systemic racism on people with low incomes and people of color.

The Environmental Justice Task Force (EJTF) that convened in 2019 was charged with developing measurable goals and policy recommendations to correct these negative impacts on overburdened communities. The Department of Commerce, along with several other state agencies, community-based organizations, and community members, drafted the EJTF final report, which provides the initial framework for the equity and environmental justice component of the strategy. The SES recognizes the multiple dimensions of environmental justice and the limitation of any single definition of equity. It identifies the need to evaluate environmental justice in multiple dimensions—procedural, distributional and structural—and offers a multi-step process for building equity into clean energy policies. Although the strategy development process did not fully realize those principles, it laid the foundation for further efforts to reduce environmental and health disparities.

In 2021, the state enacted the Healthy Environment for All (HEAL) Act, which is legislation based on several recommendations from the EJTF final report and establishes comprehensive environmental justice obligations for relevant state agencies, including Commerce. Starting in the summer of 2022, state agencies will work with a governor-appointed Environmental Justice Council. Members of the council include people from Tribes, communities overburdened by environmental harms, labor and business representatives, and an interagency policy group. Compliance requirements include developing a community engagement plan and public participation requirements, incorporating environmental justice into agency strategic plans, and increasing government-to-government consultation requirements with Tribal governments.

Program Costs and Impact
Washington produced the 2021 SES with a budget of approximately $2 million, which is a low cost for the immense benefits of more cost-effective Clean Energy Fund investments, data analysis to support strong clean energy policies, embedding of environmental justice at the core of the state’s energy policymaking, and other positive outcomes. The majority of costs were for expert services in energy modeling, sector-specific technical analysis, economic modeling, and equity and environmental justice analysis. Washington also contracted for professional meeting facilitation for the 27-member advisory committee. The project budget included expert services to ensure a visually appealing, carefully edited final report and supporting materials.
Employees from the State Energy Office wrote the final energy strategy, with subject matter experts responsible for individual chapters on equity, energy modeling, electricity, buildings, transportation, and industry. The office contracted for technical and analytical support from multiple experts in energy, building science, equity, economic analysis, industrial processes, and transportation. The lead consultant was the Clean Energy Transition Institute, a nonprofit based in Seattle. Evolved Energy Research provided analysis of deep decarbonization pathways using publicly available energy models.

The SES has served as the touchstone and guiding document for Washington policy makers. During the 2021 legislative session, the Washington Legislature passed significant legislation reflecting recommendations from the 2021 strategy. These include the following:

- An economy-wide, cap-and-invest program with significant climate protections for overburdened communities
- A clean fuel standard to reduce transportation emissions
- Comprehensive environmental justice and energy equity requirements for state agencies
- Authorization of multi-year rate plans and financial assistance for organizations that represent broad customer interests in regulatory proceedings
- A planning directive for a zero-emissions transportation future

In addition to these changes in regulatory and climate policy, the Legislature in 2021 allocated nearly $60 million to the Energy Office’s Clean Energy Fund, with the directive to use the 2021 SES to guide the design of clean energy programs— with a particular focus on equity and environmental justice. It also included funding that will support grid modernization, strategic research and development of emerging clean energy technologies, innovative approaches to the electrification of transportation systems, building electrification, maritime electrification, bioenergy projects, and further development of a rural clean energy strategy. The Legislature provided an additional $1,175,000 to support the implementation of the strategy as it relates to emissions from energy use in new and existing buildings.

The 2021 SES again catalyzed climate-related legislation during the Washington Legislature’s shorter 2022 session. This includes innovative proposals to transition Washington away from the natural gas system, establish a stretch building code for local governments, expand Washington’s first-in-the-nation Clean Buildings Performance Standard, and accelerate the availability and use of renewable hydrogen. Prompted by the strategy, budget proposals included $100 million for a solar-plus-storage grant program, $91 million for Washington state ferry electrification, nearly a half-million dollars for a clean energy workforce transition workgroup, another nearly half-million dollars to expand the state’s Energy Emergency Management Office, and other budget items that would further the research, development, and deployment of clean technologies.

While not all of these bills and budget items would be enacted during the current legislative session, they nonetheless tee up an aggressive climate agenda for the longer 2023 session. The
strategy’s influence on adopted legislation and clean energy investments will improve the lives of Washingtonians in the coming decades and create a more equitable, inclusive, and resilient clean energy future for all residents. It is the hope of the Energy Office that the foundational ideas in the 2021 SES not only benefit Washingtonians, but also spread beyond Washington’s borders and influence the federal government, other state governments, and countries around the world to chart a similar course for their communities.

**Replicability**

Many other states and jurisdictions are considering and adopting energy transformation policies focused on 100 percent clean electricity supplies and science-based emissions reduction limits. Understanding the technical and economic requirements to meet those goals using robust models and analysis is critical to informing long-term planning. However, the technical analysis of energy transformation strategies must be grounded in the lived experiences of communities most at risk of environmental and economic harm.

The 2021 SES used an approach that is replicable and, at least as important, adaptable. One reason the strategy was successful as a policy development exercise is that it adapted procedures and approaches that the public understands and trusts. Washington convened a large stakeholder group, actively engaged political leaders, and provided multiple opportunities for public comment and review of written drafts. However, Washington expanded this familiar, trusted approach to dig deeper on fundamental energy, climate and justice issues. This approach is readily adapted to the energy and economic contexts and policy objectives of other jurisdictions.

### JUDGES’ QUOTE

“With the 2021 State Energy Strategy, Washington has demonstrated a deep commitment to meaningful community engagement and centering equity concerns. The impacts from this effort were impressive: they effectively used modeling tools and community engagement at the start of the process to influence a variety of policy decisions.”

The Washington strategy’s deep decarbonization modeling approach is used with increasing frequency as an analytical tool to support energy and climate policy development; the state engaged Evolved Energy Research to perform this analysis. This firm and others have produced comparable work in several other states. An active community of practitioners and clients supports ongoing improvements in the modeling and input data.

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**About the Washington State Energy Office**

The Washington State Energy Office is creating a clean, affordable and equitable energy economy for the people of Washington. The office catalyzes the transition to a clean and just energy future by informing, investing and influencing decisions and programs throughout the state and in partnership with the federal government and other states. A primary element of the office’s strategic plan is creating a common understanding of Washington’s energy future. The State Energy Office consists of a team of about 45 employees who implement energy grant and loan programs, deliver weatherization and home improvement services, prepare for and respond to energy emergencies, coordinate and assist state agencies in efficiency and environmental performance, and oversee clean energy standards. The Office also leads the Washington State Department of Commerce’s environmental justice efforts and advises policy makers on advancing the state’s ambitious energy and climate goals.

**For more information:**

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More information about CESA’s members can be found on our website at http://www.cesa.org/members.
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, industry representatives, and other stakeholders to develop and promote clean energy technologies and markets. It supports effective state and local policies, programs, and innovation in the clean energy sector, with an emphasis on renewable energy, power generation, 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.

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