



Berkeley Lab and the Clean Energy States Alliance

CASE STUDIES OF STATE SUPPORT FOR RENEWABLE ENERGY

Low-Income Renewable Energy Programs: A Survey of State Clean Energy Funds

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Introduction

This survey reviews efforts by CESA member clean energy funds to promote the use of renewable energy technologies in low-income residential buildings or communities. Only programs specifically targeting low-income applications are covered. Funds providing support to low-income households for other purposes (e.g., weatherization programs) fall outside the scope of this survey,¹ as do programs offered by non-CESA member funds.

To date, only the California Energy Commission has promoted the use of renewable energy technologies on low-income homes through an ongoing program of specifically targeted incentives. However, several other funds have been active as well. The Massachusetts Technology Collaborative recently

launched a Renewables & Low Income Collaborative with low-income community stakeholders to formally explore and pursue opportunities in this area. The Connecticut Clean Energy Fund also plans to target a future component of a PV buy-down program directly at low-income households. Others, including the Illinois Clean Energy Community Foundation, the New Jersey Clean Energy Program, the New York State Energy Research and Development Authority, the Energy Trust of Oregon, two Pennsylvania funds (the Sustainable Development Fund and the Sustainable Energy Fund of Central Eastern Pennsylvania), and Wisconsin Focus on Energy have also provided support for the use of renewable energy in specific low-income projects, despite not having distinct programs targeted to this purpose. The efforts of these funds are summarized below.

¹ Such funds include the New York State Energy Research and Development Authority, the Long Island Power Authority Clean Energy Initiative, and the West Penn Power Sustainable Energy Fund.

California Energy Commission

The California Energy Commission (CEC) is currently the only state clean energy fund specifically targeting incentives at increasing the use of renewable energy technologies in low-income housing through an *ongoing, standardized* program offering. Through its “Emerging Renewables Program” (ERP), the CEC provides rebates to consumers who purchase and install qualifying renewable energy systems. Under the ERP, affordable housing projects may qualify for an extra 25 percent above the standard rebate, not to exceed 75 percent of the system cost.²

To apply for the additional rebate, owners of the affordable housing project must submit a copy of the property’s regulatory agreement or equivalent documentation indicating that residency is limited to low- and moderate-income persons. In addition, each residential unit must have its own electric utility meter. Also, the applicant must demonstrate that energy efficiency measures have been installed sufficient to reduce the home’s energy use by 10% below standard construction, either via documented usage or a letter indicating receipt of an energy efficiency rebate from the CEC or an applicable electric utility provider.

Financial incentives under the ERP vary according to technology, system size, and installation method. Eligible technologies include photovoltaic systems, small wind turbines (output of 50 kW or less), fuel cells operating on renewable fuels, and solar thermal electric systems.

The ERP was initiated in 1998, and the additional incentive for affordable housing was added in March 2003, as required by Assembly Bill 58, which became law in the fall of 2002. To date, a total of \$200 million has been paid or committed through the ERP for approximately 14,000 projects, most of which are customer-sited PV. Of this, \$1.2

million has been used for 100 affordable housing projects, approximately 70 of which were built in the San Diego area and 20 of which were constructed by Habitat for Humanity in various locations. Still in its infancy, the provision allowing larger rebates for affordable housing projects has yet to yield any significant lessons.

Massachusetts Technology Collaborative

The Massachusetts Technology Collaborative (MTC) has awarded nearly \$2 million of its funding of green buildings to low-income housing projects in the Commonwealth of Massachusetts. Several multiple unit projects have been completed with high performance design in energy efficiency. MTC has also recently established a Renewables & Low Income Collaborative (the Collaborative) to formally explore and pursue opportunities in this area. Through the Collaborative, MTC plans to work with low income stakeholders and other interested parties to identify, develop, and fund project proposals which generate maximum public benefits for the ratepayers of the Commonwealth through applications targeted at addressing the specific needs and advancing the particular interests of low income ratepayers. MTC is committed to pursuing a broad strategy to generate both public (e.g., increased energy supply diversity and delivery, pollution reduction) and private (e.g., lower electric bills) benefits in the interests of low-income consumers.

The initial focus of the Collaborative will be on the development and implementation of a four-year, \$10.35 million Joint Energy Efficiency and Renewable Energy Low Income Housing Initiative through a strategic partnership with the Low-Income Energy Affordability Network (LEAN).³ Through this unique partnership, MTC plans to provide immediate and direct benefits to low-income households by supporting on-site housing

² “Affordable housing” is defined in the California Health and Safety Code sections 50052.5, 50053, and 50199.4. For more information, visit <http://www.leginfo.ca.gov>.

³ LEAN was established among agencies of the low-income weatherization and fuel assistance program network in Massachusetts to provide coordination and implementation services related to residential demand-side management and education programs within the state.

improvements in concert with Massachusetts electric utility conservation (energy efficiency) programs and Federal weatherization and fuel assistance programs. MTC will also be funding off-site, grid-connected renewable energy installations and directing a portion of associated revenue streams to low income communities.

The Initiative will provide \$750,000 per year for four years to LEAN for on-site weatherization and energy efficiency measures. While these efforts will be focused around traditional energy-related building repairs, including building repairs that make it possible to install energy-related measures (e.g., repairing a roof leak in order to install attic installation), other high-performance measures will also be eligible. For example, solar domestic hot water applications, ground source heat pumps, and demonstration-level statutorily eligible renewable installations will be eligible for funding.

The Initiative will also provide an additional \$7 million for the development of wind turbines or other appropriate off-site renewable energy installations, with 55% of the gross revenues received from electricity (and REC) sales from these renewable sources devoted to the low-income community over a 20-year period. MTC's initial plan is to construct three 1.5 MW wind turbines that will generate sufficient operating revenues (energy and REC sales) to permit MTC to distribute 55% of the gross revenues from the wind turbines to LEAN. The intent of the parties is to provide LEAN with the income stream over the economic life of the turbines.

Connecticut Clean Energy Fund

The Connecticut Clean Energy Fund (CCFE) has recently approved a new \$2 million residential solar PV buy-down program, through which \$200,000 of future support will be targeted directly at low-income housing applications. This three-year program will provide monetary incentives to installers selected through an RFP process, who in turn will pass the incentives on to their customers

in the form of rebates. Support will be set at a subsidy level of \$5 per watt, with a cap of \$25,000 per residence (up to 5 kW). Awards will be granted on a rolling first-come, first-served basis. Details regarding the support targeted at low-income housing are not yet available.

Illinois Clean Energy Community Foundation

The Illinois Clean Energy Community Foundation (ILCECF) has provided support for the installation of solar energy technologies on a number of affordable housing projects, despite not having an explicit program targeting that building type.

In 2002, ILCECF provided a \$10,069 total grant to Claretian Associates supporting the installation of 1.2 kW PV systems on each of 12 new affordable homes being built on Chicago's South Side. The grant helped to cover system costs in excess of the core funding provided by the State of Illinois and the City of Chicago. Together, funding from these sources covered approximately 80% of the installation costs.

ILCECF also gave a similar grant to Neighborhood Housing Services of Chicago in the same year. The \$8,036 total grant, also covering system costs in excess of the core funding from the State of Illinois and City of Chicago, supported the installation of 2.4 kW PV systems on each of two new affordable homes in Chicago.

ILCECF also provided a grant in 2002 to the Interfaith Housing Development Corporation of Chicago. The \$35,000 grant covered the purchase of a solar energy water-heating system for Interfaith's Sanctuary Place, a multi-family housing project for the homeless.

In 2001, ILCECF presented a grant of \$48,000 to Kreider Services, Inc., in Dixon, IL. This grant supported the installation of solar water-heating systems in ten group homes and an industrial workshop for disabled adults.

New Jersey Clean Energy Program

The New Jersey Clean Energy Program (NJCEP) has also supported the installation of renewable energy technologies in low-income communities.

Through the Micro-Load Pilot Program, NJCEP provided \$1 million in grant funding to the Department of Community Affairs (NJCA), Division of Housing; Green Homes Office and Balanced Housing Program. In partnership with the New Jersey Board of Public Utilities (NJBPU) Office of Clean Energy, these agencies will select, design, and assist in the construction of 20-25 units of micro-load, "zero energy" housing within the City of Camden. This effort will include extensive pre-design commissioning, recommendations of design alternatives, and extensive monitoring and publicity.

The NJBPU also provided the NJCA with \$200,000 from the State Energy Plan to fund the incremental cost of solar installations in three low-to-moderate income residential projects. One of these projects, Bellevue Court, involved a rehab of 22 single-family low-income homes, two of which utilize integrated passive solar, active solar, solar thermal, and 27 other green high performance features. In another, the Casino Redevelopment Authority constructed six low-income high-performance modular homes, all of which included passive and active solar features, and two of which are net producers of energy.

The Green Homes Office has also initiated the NJ Affordable Green (NJAG) program. NJAG uses NJ Realty Transfer Taxes to provide low-to-moderate income housing projects up to \$7,500 of training per unit for developers, design teams and contractors toward the integration of green high-performance systems and methodologies including passive, active and thermal solar systems. To date 1,285 units are in the program; including 21 projects and 11 developers.

New York State Energy Research and Development Authority

NYSERDA has also made stand-alone investments supporting the installation of PV on a few low-income homes. In partnership with Steven Winter Associates, the National Association of Home Builders Research Center, and a dozen builders across the state of New York, NYSERDA is providing up to \$20,000 for the demonstration of PV systems on 12 New York ENERGY STAR labeled model homes in ENERGY STAR subdivisions. Among the supported systems are three 1.2 kW PV systems installed on three Habitat for Humanity duplexes in Yonkers, NY.

NYSERDA is also working to forge relationships between PV installers, manufacturers, system dealers, and Habitat for Humanity staff to facilitate the installation of additional PV systems on Habitat Homes across the state. Many installers have offered to waive all or part of their labor costs for PV installations on Habitat homes. Thus, for these homes, NYSERDA projects that its standard \$4.50 per watt incentive combined with, on average, another \$1.50-\$2.00 per watt in donated labor from installers, will bring the installed costs of a PV system on an ENERGY STAR labeled Habitat home down to \$2.00 - \$2.50 per watt.

Energy Trust of Oregon

The Energy Trust of Oregon (ETO) has also facilitated the use of renewable energy in low-income housing. In the summer of 2002, ETO provided an incentive of \$1,800 per system toward the installation of solar water heating systems on eight homes constructed by Bend Habitat for Humanity. Habitat and New Path Renewables, Inc., also based in Bend, managed the project, completed the installations, and performed community marketing, training, and outreach to raise public awareness of the benefits of solar water heating.

Sustainable Development Fund of Pennsylvania

Though it does not typically target incentives specifically at the use of renewable energy in low-income settings, the Sustainable Development Fund (SDF) of Pennsylvania has partnered with PECO Energy's renewable energy pilot program – one piece of a restructuring settlement that requires PECO to commit \$500,000 in support of PV for low-income customers – on two low-income housing projects. SDF plans to contribute some of its standard PV grant dollars to these projects in order to increase the number of homes receiving PV systems. However, SDF is not providing as high an incentive as its PV grant program typically allots,⁴ but rather a negotiated figure that depends on the number of homes/units involved and budgetary considerations. Concerned about the maintenance costs of the PV systems (primarily inverter replacement in the 7-10 year timeframe), SDF convinced PECO to target housing occupied by low-income customers but owned and maintained by someone else. The building owners, rather than the tenants, will be responsible for system maintenance.

Specifically, in 2002, SDF committed to provide a subsidy of \$5,400 (\$3/W) for each of thirty 1.8 kW PV systems installed in one low-income housing project. SDF was to spend a total of \$161,990 toward the \$456,990 cost (\$8.5/W) of the PV systems, which would have a total capacity of 54 kW. However, this project never came to fruition due to unrelated zoning problems faced by the developers, Better Homes, Inc. and C&M Builders. PECO Energy has issued a new request for proposals to identify a replacement project.

SDF has also committed to supporting a second PV project involving eight homes. PV systems are slated to be installed in the spring of 2004 in a rehabilitated housing project,

⁴ Nor is the SDF using the same structure as its solar grant program, which currently provides \$4/W up-front (up to \$20,000), with another \$1/kWh (up to \$5,000) and \$0.10/kWh (up to \$250) paid to the system owner and installer, respectively, after one year.

managed by the Norris Square Civic Association. Each home will receive a 1.2 kW system, with SDF covering \$27,000 (\$2.8/W) of the total \$115,000 (\$12/W) project cost.

Sustainable Energy Fund of Central Eastern Pennsylvania

The Sustainable Energy Fund of Central Eastern Pennsylvania (SEFCEP) has also provided support to select projects for the installation of renewable energy technologies in low-income housing, despite the absence of regular incentives exclusively targeted at such projects.

In the fall of 2002, SEFCEP gave a \$75,000 grant (in \$25,000 increments) towards the construction of the Pine Street Neighborhood Project in Hazleton, supporting the installation of photovoltaic and solar water-heating as well as other energy efficiency technologies. All of the Project's 24 residential units were to be built to ENERGY STAR standards for energy efficiency. Under the agreement, the project developer was given the authority to determine the portion of the grant that would be used for PV and solar water-heating technologies.

In the fall of 2003, SEFCEP also provided a \$1,000,000 no-fee, 1% interest loan to the Redevelopment Housing Authority of Cumberland County to support a new green affordable housing project. The project, Petersburg Commons, will be comprised of 14 units designed based on draft Leadership in Energy and Environmental Design (LEED) standards for residential construction. SEFCEP's construction financing loan is supporting efforts to make each of the single-family attached townhouse dwellings "green," including the use of renewable energy to the extent seen fit by the project developer. While final decisions have not yet been made regarding how the loan money will be spent, it is likely that a relatively small portion will be directed toward renewable energy systems.

Wisconsin Focus on Energy

Wisconsin Focus on Energy (WFE) partnered with Madison Gas and Electric (MGE) in 2003 to provide technical and financial assistance toward the incorporation of solar thermal systems onto the 60-unit Yahara River View Apartments facility in Madison, WI. WFE provided a \$12,000 grant toward the project, while MGE contributed an additional \$86,000 grant through its Neighborhood Revitalization program. Common Wealth Development, a local nonprofit organization, served as the project developer and continues to manage the apartment complex. While most of WFE's support was used for a variety of energy efficiency measures in the building, the highly

visible solar thermal systems have received the most public attention.

WFE has also funded repairs and the re-commissioning of the solar domestic hot water system at the Quaker Housing apartment complex. This system was built in the 1980s with assistance from MGE. By 2001, the system was not functioning properly. WFE subsidized \$10,000 (one-third) of the cost of having the system inspected, refurbished, and commissioned, and also paid to have a consultant write an operation and maintenance manual for the system.

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INFORMATION SOURCES

California Energy Commission. "Emerging Renewables Program Guidebook." CEC Publication Number 500-03-001F. December 2003.
<http://www.consumerenergycenter.org/erprebate/forms.html>

California Energy Commission. Emerging Renewables Program promotional flyer. August 2003. http://www.energy.ca.gov/renewables/documents/2003-10-10_Affordable_Solar.pdf.

Connecticut Clean Energy Fund. "CCEF Approves New Residential Solar PV Program." Viewed on 5/1/04.
<http://www.ctcleanenergy.com/news/68.php>.

Illinois Clean Energy Community Foundation. "Grants Awarded." Viewed on 3/15/04.
<http://www.illinoiscleanenergy.org/grantees/grants.htm>.

New York State Energy Research and Development Authority. "Photovoltaic (PV) Incentives for Eligible Installers: Program Opportunity Notice (PON) 716." <http://www.nyserda.org/716pon.pdf>.

Energy Trust of Oregon. "Renewable Energy." Viewed on 3/15/04. http://www.energytrust.org/Pages/renewable_energy_programs/index.html.

Sustainable Development Fund. "Semi-Annual Report to the Pennsylvania Public Utility Commission and to the Joint Petitioners for the Period January 1, 2002 – June 30, 2002." July, 2002. http://www.trfund.com/sdf/PUC_Report_7.pdf.

Sustainable Development Fund. "Annual Report to the Pennsylvania Public Utility Commission and to the Joint Petitioners for the Period January 1, 2003 – December 31, 2003." January, 2004.
http://www.trfund.com/sdf/PUC_report_01_30_04.doc.

Sustainable Energy Fund of Central Eastern Pennsylvania. "Projects & Portfolio." Viewed on 3/1/04.
<http://www.sustainableenergyfund.org/projects.htm>.

Sustainable Energy Fund of Central Eastern Pennsylvania. "Reports & Plan." Viewed on 3/1/04.
<http://www.sustainableenergyfund.org/reports.htm>.

Wisconsin Focus on Energy. 2003. "Reviving a Money-Saving Solar Domestic Hot Water System (Quaker Housing Case Study)." www.wifocusonenergy.com/data/common/dmsFiles/R_AC_MKCS_QuakerHousingCaseStudy.pdf

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ABOUT THIS CASE STUDY SERIES

A number of U.S. states have recently established clean energy funds to support renewable and clean forms of electricity production. This represents a new trend towards aggressive state support for clean energy, but few efforts have been made to report and share the early experiences of these funds.

This paper is part of a series of clean energy fund case studies prepared by Lawrence Berkeley National Laboratory and the Clean Energy States Alliance. The primary purpose of this case study series is to report on the innovative programs and administrative practices of state (and some international) clean energy funds, to highlight additional sources of information, and to identify contacts. Our hope is that these brief case studies will be useful for clean energy funds and other stakeholders that are interested in learning about the pioneering renewable energy efforts of newly established clean energy funds.

Twenty-six total case studies have now been completed. Additional case studies will be distributed in the future. For copies of all of the case studies, see:

<http://eetd.lbl.gov/ea/ems/cases/> or <http://www.cleanenergystates.org/>

ABOUT THE CLEAN ENERGY STATES ALLIANCE

The Clean Energy States Alliance (CESA) is a non-profit initiative funded by members and foundations to support the state clean energy funds. CESA collects and disseminates information and analysis, conducts original research, and helps to coordinate activities of the state funds. The main purpose of CESA is to help states increase the quality and quantity of clean energy investments and to expand the clean energy market. The Clean Energy Group manages CESA, while Berkeley Lab provides CESA with analytic support.

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