



**BEST PRACTICES FOR ENERGY RETROFIT PROGRAM DESIGN**

## **CASE STUDY: BERKELEY FIRST**

**MARCH 2010**

This document is one of nine case studies conducted by the Best Practices Committee of the Home Performance Resource Center to examine government-run incentive programs that target residential energy efficiency retrofits and renewable power generation. These nine case studies were used to compile best practices recommendations for the design and implementation of successful home energy retrofit programs, specifically focusing on the areas of financing and incentives, marketing, workforce development and business models. Additional documents in the *Best Practices for Energy Retrofit Program Design* series are available online at [www.hprcenter.org](http://www.hprcenter.org).

## BEST PRACTICES FOR ENERGY RETROFIT PROGRAM DESIGN

# CASE STUDY: BERKELEY FIRST

### SUMMARY

Berkeley FIRST, the nation's first Property Assessed Clean Energy (PACE) financing program, was launched as a pilot program in November 2008 to provide funding for commercial and residential solar photovoltaic installations in the city of Berkeley, California. Participants received energy improvement loans to be repaid incrementally over 20 years in installments as a voluntary special tax appended to their property tax bills. The loan obligation is fixed to the owner's property tax assessment, and automatically transfers to any subsequent owners if the property is sold before the financed amount is fully repaid.

The City of Berkeley Office of Energy and Sustainable Development managed the program, with one full-time employee and some support from additional city workers. Administration of funding and applications was outsourced to Renewable Funding, LLC, a third-party PACE financing specialist based in the adjacent city of Oakland.

### FINANCING PROCESS

The municipal government authorized bond funding for up to 40 projects in the Berkeley FIRST pilot program. Application materials were posted online on Nov. 5, 2008, and all 40 application slots were reserved within nine minutes of the posting. Each applicant paid a \$25 reservation fee.

After applications had been reviewed and approved (a process that took up to 30 days), property owners were authorized to contract directly with any qualified private solar installer registered with the California Solar Initiative (CSI), a state-sponsored incentive program.

### PROGRAM PROFILE

**Incentive Type:**

Property Assessed Clean Energy (PACE) financing for solar photovoltaic installations

**Time Frame:**

Pilot program launched Nov. 5, 2008, concluded in fall 2009

**Homes in Jurisdiction:**

65,000

**Property Owners Participating:**

40 applications received;  
13 installations completed during the duration of the program

**Investment:**

\$1.5 million in bond funding approved for up to 40 projects; \$336,552 in bonds issued for 13 completed projects

**Energy Savings:**

39.213 kW of photovoltaic capacity installed; 64466.2 kWh projected per year; 1800 MWh projected over the life of the systems

**Carbon Abatement:**

996.4 tons CO2 projected savings over the life of the systems

**Finance Mechanism:**

Owners repay borrowed funds over 20 years in incremental payments added to their property tax bills

**Jobs Created:**

No data collected

**Web Site:**

[www.ci.berkeley.ca.us/Content/Display.aspx?id=26580](http://www.ci.berkeley.ca.us/Content/Display.aspx?id=26580)

All applicants were required to comply with the following eligibility requirements:

- Installation had to be completed within 270 days of the approval of the application.
- The property could have no notices of default on mortgage, property taxes or any other type of lien or financial obligation.
- The property had to comply with City of Berkeley energy conservation ordinances prior to the disbursement of payment for the solar installation (these pre-existing ordinances set minimum requirements in residential and commercial buildings for insulation, weatherization, duct sealing, etc.).
- Property owners were required to apply for and comply with the California Solar Initiative rebate program in order to receive Berkeley FIRST financing.
- Property owners were required to consent to release of names and contact information to CSI, as well as utility billing information for the period of 18 months prior to and following installation.

Upon completion of the work, property owners used an online form to submit a funding request, at which time the owners were informed of the current interest rate for the financing. Owners were then required to submit supporting documents, including a copy of the final invoice from the installer and signed authorization to impose a special tax lien on the property. Once the program confirmed that all eligibility requirements had been met, Renewable Funding issued payment directly to the property owners. The principal amount, plus interest and administrative costs, was appended to the owner's property tax assessment as incremental payments over a 20-year period.

## **PROGRAM DEVELOPMENT**

Berkeley FIRST was a result of Measure G, a city ballot initiative passed by referendum in 2006 that established a citywide goal of 80% reduction in carbon emissions by 2050. The PACE financing concept was approved by the Berkeley City Council in November 2007; the council took other actions to move the program along in April, July and September of 2008. After the recommendation to establish a PACE financing district was approved, the program took about a year to set up.

### **Marketing**

The program used no paid media or direct mail, relying instead on news coverage, public hearings and community outreach to spread the word about the PACE financing opportunity. The program received significant free media attention prior to launch. Program administrators also conducted outreach to local solar installers who had qualified under the statewide California Solar Initiative (a requirement for contractors participating in the Berkeley FIRST program).

### **Workforce Development**

Given the relatively small number of projects approved for the pilot, and the existence of a well-developed solar contracting industry in the San Francisco Bay Area, there was

no need for Berkeley FIRST to engage in training or workforce development for this particular pilot program.

## Finance and Incentive Models

As the nation's first PACE financing program, Berkeley FIRST was designed to address two key impediments to adoption of onsite solar power generation: 1) up-front costs and the ability to secure credit, and 2) portability (traditional home improvement loans are not fixed to the property, while with PACE financing, the loan obligation transfers to subsequent owners).

The City of Berkeley outsourced project funding and some administrative functions to Renewable Funding, LLC, which managed the application process and committed to purchasing individual municipal bonds for each project funded by the program (these bonds could later be bundled for trade on the bond market). Financing was distributed to property owners upon confirmation of the installation.

The minimum amount financed was \$5,000 per project, and the maximum was \$37,500, to be paid off incrementally over 20 years along with the owner's property taxes. Interest rates were fixed at 3.25% over the 10-year U.S. Treasury Note or 6.75% (whichever was greater at the time of funding), plus an additional 1% to pay for administrative costs.

## METRICS AND FEEDBACK

**Performance (as reported by the City of Berkeley):** Out of 40 approved applicants, 13 photovoltaic installations were completed using Berkeley FIRST financing by the end of the pilot program. The remaining applicants did not complete their Berkeley FIRST funding requests. Specific reasons for not completing the funding requests were not provided for this study, but possible factors include:

- Program interest rates above what some homeowners expected and higher than some commercially available home equity loans or contractor financing
- Additional cost to the property owner of complying with pre-existing City of Berkeley conservation ordinances (measures that could not be financed through Berkeley FIRST)
- Economic factors (high cost of financing and installations)

One local solar installation company reported that the long initial planning period for the program (about a year) dampened demand for solar installations in Berkeley, presumably because many potential customers were waiting for the program to launch before purchasing a photovoltaic system. Due to the limited number of application slots available, many of those who waited were not able to receive Berkeley FIRST financing.

In a follow-up survey of program applicants conducted by the City of Berkeley, several applicants who withdrew from the program reported installing photovoltaic systems using other financing options; all reported that exposure to the Berkeley FIRST program had influenced their decisions to invest in solar energy. In some cases, local solar

installers were able to offer financing that better matched the applicants' needs (including lower unsecured commercial interest rates) after those applicants had come to them through the program. This suggests that the program may have helped increase adoption of photovoltaic systems even among those who ultimately decided not to use program financing.

Other cities and funding districts have established larger financing funds, enabling them to offer lower interest rates and save on administrative costs.

The low Berkeley FIRST application fee (\$25) may have encouraged initial applications from uninformed homeowners who did not have a full understanding of how the program worked and what the interest rates would be. Some programs require a higher application fee and/or mandatory attendance at education sessions outlining the details of the program.

Due to the low number of completed projects and the high administrative costs that resulted from the small scale of the program, the City of Berkeley discontinued the Berkeley FIRST program after the conclusion of the pilot phase. The city now has plans to join larger PACE financing initiatives at the county or state levels.

## RECOMMENDATIONS

**Funding:** High interest rates can be a significant impediment to adoption, so funding districts should strive to minimize costs and keep interest rates as low as possible. Instead of establishing separate small-scale PACE initiatives, programs should look to launch or join larger-scale efforts that pool resources and negotiate lower rates.

**Homeowner Education:** PACE financing may work well for some homeowners, while more traditional forms of financing are better for others. Pre-application education efforts could help homeowners determine whether PACE financing is the best solution for their needs. Also, comprehensive program education can help to clearly convey requirements for participation, especially home improvement measures that do not qualify under program guidelines.

**Program Structure and Planning:** A long planning period can temporarily reduce demand as property owners wait for proposed financing and incentives to become available. To avoid this problem, program design should be fast-tracked as much as possible without compromising the quality of the program. Program designers also should be wary of launching programs as pilots. A better approach is to implement a first round of funding with the expectation that ongoing funding will be made available

### SUMMARY OF RECOMMENDATIONS

- Keep interest rates low, join larger-scale programs
- Conduct homeowner education activities to refine the applicant pool
- Launch a permanent program, with different funding stages
- Reduce the allowed installation time
- Require homes to meet efficiency standards before providing subsidies or financing for renewables

in the future. Adjustments can be made mid-program, without having to completely stop and restart.

**Installation Time:** Programs should stipulate a shorter time period for installation, so if some early applicants decide to opt out of the program, their funding allocations can be made available to other applicants.

**Loading Order and Efficiency:** Programs should implement a loading order that requires energy efficiency measures to be completed as a precondition for funding solar installations. A loading order that prioritizes efficiency measures maximizes the cost-effectiveness of energy retrofits, so including efficiency measures in PACE financing programs can significantly increase individual and program-wide energy savings.

## SOURCES

This report is based in part on interviews and communication with Billi Romain, Sustainable Development Coordinator for the City of Berkeley; Daniel Lambert, Sustainable Energy Programs Manager and Berkeley FIRST Program Manager; and Eric Nyman, Sales Manager for Sun Light and Power. Additional information was culled from online research and from draft program evaluations completed by the City of Berkeley and Renewable Funding, LLC.

Interviews and background research were conducted for the Home Performance Resource Center by Coby Rudolph.

### **Publications:**

City of Berkeley Office of Energy & Sustainable Development. *Berkeley FIRST Initial Evaluation* (2010)

[www.ci.berkeley.ca.us/uploadedFiles/Planning\\_and\\_Development/Level\\_3 -  
Energy and Sustainable Development/Berkeley%20FIRST%20Initial%20%20Evaluation  
%20%20final%20\(2\).pdf](http://www.ci.berkeley.ca.us/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/Berkeley%20FIRST%20Initial%20%20Evaluation%20%20final%20(2).pdf)

Renewable Funding, *Berkeley FIRST Program Report* (December 2009)

### **Program-Related Web Sites:**

Berkeley FIRST Program Application Site: [www.berkeleyfirst.renewfund.com](http://www.berkeleyfirst.renewfund.com)

City of Berkeley Office of Energy & Sustainable Development:  
[www.ci.berkeley.ca.us/SubUnitHome.aspx?id=15404](http://www.ci.berkeley.ca.us/SubUnitHome.aspx?id=15404)

Renewable Funding, LLC: [www.renewfund.com](http://www.renewfund.com)



The Home Performance Resource Center is a national 501(c)(3) nonprofit organization formed to conduct public policy and market research in support of the Home Performance industry. The Resource Center develops research materials for policymakers, energy program managers and industry stakeholders to promote job creation, economic recovery, lower household energy bills and deep reductions in residential carbon emissions through improved home energy efficiency.

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