NREL NATIONAL RENEWABLE ENERGY LABORATORY Energy Analysis

Fact Sheet Series on Financing Renewable Energy Projects

Property-Assessed Clean Energy (PACE) Financing of Renewables and Efficiency

The *Recovery Through Retrofit* report (CEQ 2009)—a product of the White House Council on Environmental Quality, 11 federal departments and agencies, and six White House offices—identified property-assessed clean energy (PACE) financing programs as a means of removing barriers to expansions in the residential energy efficiency and retrofit market.

Under PACE programs, municipalities and counties form special tax districts to help property owners finance energy retrofits by allowing a property owner to place an additional tax assessment on his or her property.[1] Property owners who invest in energy efficiency (EE) measures and small renewable energy (RE) systems repay these assessments over 15 to 20 years via additional annual payments on their property tax bills.

State and local governments that implement the PACE model can address two major roadblocks to clean energy growth at the residential level[2]:

- **Lack of Capital:** Property owners often balk at the up-front cost of EE/RE improvements. While a portion of the U.S. population is willing to make the investment, most consumers are cautious about any investment, especially in the current economic environment. To finance EE/RE improvements, property owners have had to self-finance (e.g., get home equity loans) or rely on small-scale state or local government rebates and other financial incentives.
- **Hesitancy to Make Long-Term EE/RE Investments:** Because many homeowners move every 5 to 7 years, they might hesitate to make a long-term investment in a renewable energy system or energy efficiency improvements. However, PACE assessments are transferable, which leaves open the possibility for property owners to recoup their investment upon sale.[3]

This fact sheet outlines the primary benefits of PACE financing and the basics of implementing these programs with a focus on how they can be designed and funded.

PACE Financing Benefits

PACE is designed to address the two roadblocks mentioned by:

1. Eliminating large up-front costs for energy retrofits
2. Reducing concern about investment recovery when the property is sold, because the financing is tied to the property itself rather than to the owner
3. Converting an annual or semi-annual payment into a net monthly cost similar to that of other personal expenses (e.g., cable, cell phone service). Note that these are partially or wholly offset by electric bill savings.
4. Improving access to credit at a competitive, fixed interest rate; in addition, PACE assessment terms of 15 to 20 years exceed typical home equity loan terms.
5. Reducing the likelihood of a negative impact on the municipality's credit or obligation risk, and thus, not endangering other municipal programs.
6. Providing accessible EE and RE information and/or educational programs; moreover, the programs are sponsored by the municipality, which could engender more trust in the accuracy of the information as opposed to contractor-led programs (Bailey 2009).

PACE Financing Basics

The pivotal innovation of PACE is the creation of EE/RE assessments that are tied directly to the house and repaid via the property owner's tax bill. The assessment, which is secured by a senior lien on the property, does not require an up-front payment.[4] The lien provides strong debt collateral in the event the homeowner—or business owner—defaults on the assessment. Because the assessment and lien are tied directly to the property, they can be transferred upon sale. The basic flow of financing activity is shown in Figure 1.

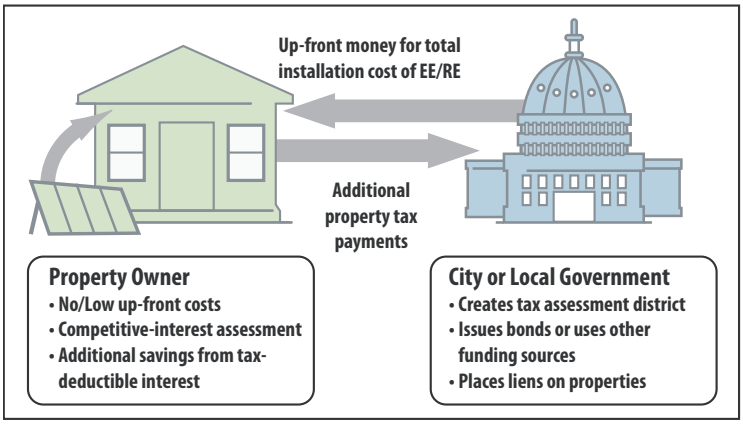
[1] Assessments are similar to loans in that they allow a property owner to pay off debt in installations over a long period of time. However, PACE assessments are not legally considered as loans.

[2] As of this writing, businesses are only eligible under the Sonoma County program. However, Boulder County will be opening its program to commercial property owners under the next round of funding in 2010.

[3] A property buyer may require that all liens be settled before the property is transferred from the previous owner.

[4] PACE programs often have application, reservation, and/or administration fees, some of which may need to be paid up front.

Figure 1. Basic PACE financing



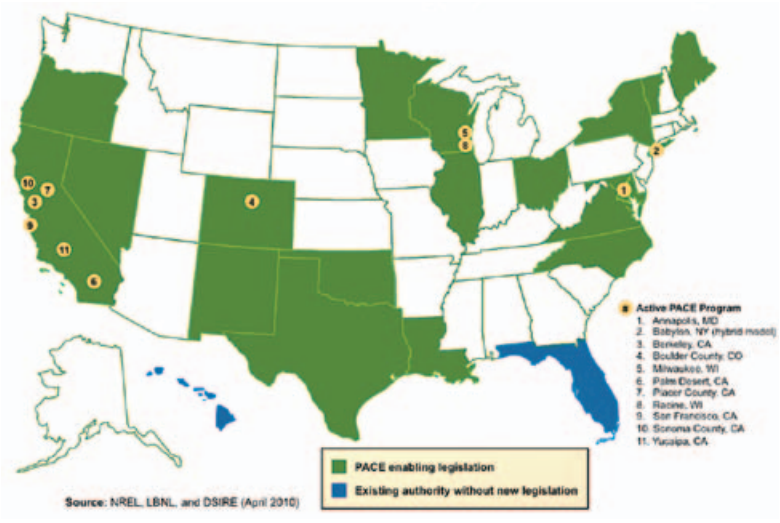
Once the project is complete, the property owner repays the assessment, usually over 15 to 20 years. However, the property owner will simultaneously experience reduced electric utility bills resulting from the EE/RE improvements. As with mortgages, the interest is tax-deductible for homeowners, although the principal is not.

A critical design element of the PACE model is the use of special tax districts known as clean energy assessment districts. These districts are regularly used in the financing of traditional local government projects (e.g., sewers and streetlights), and they provide two benefits for the localities. First, the special district shields the locality from risk, thereby ideally helping to protect its overall debt rating. Second, the special district allows the additional assessment to be placed only on property whose owners opt to participate in the program.

Federal Endorsement of PACE

Recovery Through Retrofit (CEQ 2009) identified three major market barriers to the widespread deployment of EE/RE technologies, one of which is access to affordable financing.

Figure 2. PACE legislation and programs in the United States



The interagency working group responsible for the report recommended providing program guidance to local government financing programs to address the financing barrier. The U.S. Department of Energy is also supporting PACE financing programs through technical assistance, webinars, and online resources for American Recovery and Reinvestment Act grantees that are pursuing long-term financing mechanisms for energy retrofits.[5]

The U.S. Department of Energy recently announced the release of $452 million in funds to 25 communities that received the grants as part of the competitive solicitation under the Energy Efficiency Block Grant Program. The funds can be used towards "innovative financing models to make these savings accessible, for example by offering low and no-interest loans that are repaid through property tax and utility bills" (U.S. DOE 2010), and can therefore be used towards implementing PACE programs.

State and Local Support for PACE

Designing a PACE program involves action at both the state and local levels. First, a state must establish laws enabling local governments to create special assessment districts that recognize EE and RE as public "goods." See Figure 2 for existing state legislation and programs. Next, each locality can pass ordinances creating assessment zones and authorizing lien creation and project financing. Finally, the locality establishes administrative and funding processes.

Options for Funding PACE Programs

A locality can choose from a variety of means to finance the assessments[6]: Table 1 summarizes the benefits and challenges of PACE funding strategies for current and forthcoming programs in California, Colorado, Maryland, and New York. Each of these localities designed its funding program to take advantage of its unique situation:

- Boulder County, Colorado, leveraged its high general obligation rating (AAA) to issue municipal bonds directly in public markets rated at A- (investment grade).
- Berkeley innovated by creating "micro-bonds." The city contracted with an aggregator (Renewable Funding, LLC) to periodically issue a series of small bonds at pre-determined fixed interest rates. Renewable funding, in turn, received third-party financing based upon the bond portfolios.
- Sonoma County and Palm Desert used available general funds.

[5] See http://www.eecbg.energy.gov/solutioncenter/financialproducts/PACE.html for webinars and information regarding technical assistance. Currently, there are 20 states with PACE-enabling legislation and five localities with active PACE programs, as shown in Figure 2.

[6] Although PACE programs have been deployed only at the municipal and county levels, state governments could develop similar programs, possibly improving the economics of the program (i.e., creating economies of scale, thereby reducing the administration cost per participant).

Table 1. Benefits and Challenges of Various Funding Sources for PACE Programs[a]

Funding Source	Bond Funding Mechanisms		Other Funding Mechanisms		
	Public Bond Offerings	Micro Bonds	Bank Loans	General Funds	Municipal CO_2 Waste Revolving Fund
Program example	Boulder County, CO	Berkeley, CA (only photovoltaic systems)	Annapolis, MD, Phase II (program pending)[b]	Sonoma County, CA	Town of Babylon, NY (only EE)
Initial funding amount	Issued $9.75 M—authorized $40 M	$1.5 M for the pilot phase[c]	$1.5 M[d]	$21.28 M[d]	$3.19 M[d]
Interest rate	5.2% (income-qualified); 6.68% (open assessment category)	7.75%	Unknown	7%[e]	3%
Benefits	▪ Local government's balance sheet not used ▪ Temporary financing from bond aggregator not needed	▪ Can be tied to administrative role ▪ Aggregator serves as a good staging area for converting assessments to commercial bonds ▪ Does not affect balance sheet of local government	▪ Banks have experience securitizing loans/assessments (e.g., mortgages) ▪ Access to large pools of capital ▪ Faster deployment, less complexity, and lower cost compared with issuing bonds	▪ Third-party financier not involved. ▪ Funds easily accessible	▪ Quick startup ▪ Liens are placed on properties only if a borrower defaults on payments
Challenges	▪ Assessments are issued before interest rates are known ▪ Lien placed on property before installation (i.e., risk that the installation is not done) ▪ May need borrowers to fund debt service reserve, which would increase up-front costs for program participants ▪ Local government may need to offer moral obligation, which could hurt their credit rating if they are not able to meet the obligation	▪ May require boutique investor to purchase assessments in tranches (pools) ▪ A bank warehouse line of credit is only an option for the third party administration or if the state or local government puts up a moral obligation. Either way, there has to be a party willing to take the risk. ▪ Likely that only big banks might be willing to provide warehouse credit ▪ More complex to implement but easier to scale to demand	▪ High interest expense ▪ Requirements for guarantees and other covenants can complicate and delay program implementation ▪ Loan term is typically limited to 10 years or less	▪ Locality at higher risk by self-funding ▪ Funds—where they exist—are inherently limited ▪ Potential to negatively affect credit rating ▪ Many local governments may not have sufficient general funds to launch a program	▪ Need to reconstitute waste fund as applying to carbon emissions or other pollutants than can be mitigated through EERE ▪ May not be expandable ▪ May not be replicable

[a] DOE (2009) was the primary source for program characteristics in Table 1. The benefits and challenges were identified in part by analysts with NREL's Strategic Energy Analysis Center with input from Fuller (2010) on the entire contents of the table and Weaver (2010) on the Annapolis program.

[b] Annapolis will launch Phase I of the EZ program in 2010, which is funded at $325k by grant money from the Maryland Clean Energy Center and will provide 50 assessments for homeowners. The interest rate for Phase I is unknown but is expected to be about 6% to cover administration costs. Phase II will be funded by bank loans.

[c] Note that $1.5 million was allocated for the pilot phase to finance 39 installations. However, only 13 assessments were completed, and thus the assessments did not exhaust the initial funding amount (Berkeley FIRST).

[d] Zimring, M.; Fuller, M. Existing and Emerging PACE Programs. Forthcoming Clean Energy Financing Policy Brief. Lawrence Berkeley National Laboratory.

[e] Sonoma County staff, personal communication with Bethany Speer, January 2010

- Babylon took advantage of an existing municipal waste funding program by classifying carbon dioxide as waste to fund EE assessments.
- Annapolis, Maryland, is partnering with local banks for funding for Phase II (program forthcoming).

PACE Design Considerations

Before adopting one of the program examples described here or designing its own program, a locality must first consider its financing situation and the program's goals and objectives. Additional considerations include intended program size, municipal bond ratings, targeted interest rates, willingness to work with an aggregator, level of comfort with risk, and the amount of interest in partnering with third parties that will need access to tax records.

Another important design element is the timing of the construction, funding, and lien assignment. Boulder issued bonds, received financing, and assigned the assessments and liens simultaneously with the start of project construction. Berkeley, on the other hand, assigned the liens and assessments at the completion of project construction and certification. Babylon followed Berkeley by assigning the assessment at the completion of construction, but they chose to assign the liens only when (and if) a default should occur. Each methodology provides benefits and challenges in terms of funding and administration that should be considered in program creation.

PACE programs can address major barriers to EE/RE deployment both by providing capital for the up-front investment and allowing for the investment to be transferred upon sale of the property. However, local governments must consider the benefits and challenges associated with alternative designs. Localities that consider beforehand all the programmatic elements mentioned—from program size to third-party partnering—will be better situated both to support EE/RE deployment to qualifying home and business owners and to avoid unwelcome political or financial repercussions.

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Additional Resources

Berkeley Calculator (http://rael.berkeley.edu/berkeley/calculator/): Estimates of cost savings under Berkeley's clean energy financing program

Boulder ClimateSmart Loan Program (http://www.bouldercounty.org/bocc/cslp/cslpintro.html): Resources for homeowners and policymakers who are looking to create PACE programs

Database of State Incentives for Renewables and Efficiency (DSIRE) (http://www.dsireusa.org/incentives/index.cfm?SearchType=Property&EE=0&RE=1): State-specific financial information for property tax assessed/PACE programs

Financing for Energy Efficiency and Renewable Energy (http://www.eecbg.energy.gov/solutioncenter/financialproducts/PACE.html): PACE resources from the EECBG program

Guide to Energy Efficiency & Renewable Energy Financing Districts for Local Governments (http://rael.berkeley.edu/sites/default/files/berkeleysolar/HowTo.pdf): Step-by-step guidance for local governments that want to implement PACE programs

Policy Framework for PACE Financing Programs (http://www.whitehouse.gov/assets/documents/PACE_Principles.pdf): The Obama-Biden administration's course of action for PACE and requirements for receiving federal funding for PACE

Contacts

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