

PACE Financing: Introduction and Key Questions for Local Implementation

Beth Conlin, Research Assistant, Nicholas Institute for Environmental Policy Solutions

Robert Allen, Research Assistant, Nicholas Institute for Environmental Policy Solutions

Todd Wooten, Director, Southeast Climate Resource Center, Nicholas Institute for Environmental Policy Solutions

Property Assessed Clean Energy (PACE) financing programs promote energy efficiency investment and renewable energy project development through low-cost municipal loans to property owners. These loans are property associated and frequently backed by municipal bonds.¹ While PACE programs have only been established in five communities, the model is being replicated nationally through federal and state funding. Supporters of PACE programs cite the potential for PACE outlays to be on the order of \$500 billion.² However, there are key issues with both the loan and the bond implementation that should be carefully reviewed and considered.

Despite being similar to numerous existing and established credit products, such as special-purpose district bonds and tax assessment bonds, PACE bonds are still a new and relatively unknown product. Municipal loan programs must create a sufficient pool of loans to satisfy the market while addressing concerns regarding uncertain returns in energy efficiency and utility costs, impacts on home values, and project quality control. Initial implementation has also taken place in unique communities with particular characteristics that may not translate to other municipalities. If these concerns are taken into account, PACE programs can be a useful tool for implementing urgently needed energy improvements in our built environment.

Special Note: *As this paper was being completed, Fannie Mae issued a lender letter indicating that it would not purchase or secure mortgages on properties with PACE liens senior to mortgages.³ This action appears to have stalled the majority of PACE programs around the country and the form of its resolution will have a significant effect on how PACE programs are constituted going forward. This overview focuses on key issues of PACE financing*

implementation at the local level and how federal and state governments can support local programs. However, anyone interested in developing or supporting PACE programs must investigate this key federal policy concern before determining if PACE implementation is feasible.

Introduction

PACE financing programs are implemented by establishing voluntary municipal financing districts comprised of noncongruous properties within a particular town, city, or county on which the PACE loan debt is established as a property lien. The establishment of these districts typically requires enabling legislation at the state level. The first PACE programs were enabled and introduced in California in 2008, and since then Colorado and New York communities have also established PACE programs. Recently, over twenty states have passed PACE-enabling legislation, and this number is expected to grow rapidly.⁴

Advantages

PACE financing is secured by a senior property lien equivalent to the cost of the approved energy improvements (accounting for other rebates and incentives, generally). The lien is considered equivalent to property tax assessments and in default would be higher priority than a mortgage. This seniority makes the bonds and loans relatively low in risk and, in turn, low in cost, but has been a controversial provision for mortgage providers. The property owner repays the loan to the municipality through their property tax bill. Loan terms are generally long, with communities usually offering up to 15- and 20-year loans. Most importantly, no down payment is required, removing the barrier of a large upfront cost of investment. Because the bonds are secured by and attached to the property and not the property owner, the debt service is transferrable upon the sale of the property.

1 Other names include Energy Financing Districts, Clean Energy Assessment Districts (CEAD), Contractual Assessments, Special Tax Districts, Special Assessment Districts, and similar terms (some terms from Fuller, Kunkel and Kammen 2009).

2 Congressman Steve Israel, "Rep. Israel Announces Introduction of Property Assessed Clean Energy (PACE) Bonds Legislation," News Release 111-074, October 19, 2009.

3 FNMA, Lender Letter LL-2010-06, May 5, 2010.

4 The Database of State Incentives for Renewables and Efficiency (DSIRE) regularly updates a map of states with PACE financing policies at http://www.dsireusa.org/documents/summarymaps/PACE_Financing_Map.pptx.

This structure has the following benefits:

- **Voluntary:** Only citizens participating in the program contribute to debt service payment.
- **Low cost:** Financing is secured by a lien on the property and amortized over a 15- to 20-year period. The bonds typically carry a low interest rate. The longer terms lead to lower loan payments with a target of monthly loan payments less than the value of energy savings.
- **Transferrable:** Like the technologies they finance and resulting property benefits, the debt is transferable from owner to owner upon sale of the property.
- **Clean energy business development:** PACE bonds and their associated districts promote clean energy businesses and employment in the local community.

of Realtors announced that the “national median existing single-family price was \$166,100, down 0.7 percent from the first quarter 2009 price of \$167,300.”⁶ Therefore, all five case studies are in communities with home values that are well above the national median.

Key Aspects of PACE bonds

Possible bond markets

Key to the success of bond-funded PACE programs is finding a market for PACE bonds. The current markets for PACE bonds are local, regional, and state-based. In Boulder County, PACE bond purchasers were a mix of local entities, including local and regional pension and retirement funds; area banks; and high-net-worth individuals in the county. Although the bonds were avail-

Table 1. Characteristics of four existing PACE programs.

	Population	Density per Sq. Mile	Housing Units	Median Family Income	Loan Rate	Payback Period	Max. Loan Amount	Number Projects Awarded	Average Project Size (\$)
Berkeley, CA	110,000	9,800	46,600	\$86,000	7.75%	20 yrs	\$37,500	38	\$28,000
Palm Desert, CA	51,000	1,600	33,500	\$70,000	7%	up to 20 yrs	no max	206	\$36,000
Sonoma Co., CA	472,000	300	198,400	\$62,314	7%	up to 20 yrs	no max	584	\$27,000
Boulder Co., CO	300,000	400	123,000	\$84,000	varies*	15 yrs	\$50,000	393	\$19,000
Babylon, NY	220,000	4,100	74,000	\$84,000	3%	variable	\$12,000	169	\$7,100

* The rate was 6.68% in Boulder County's first round of lending.

Sources: “Guide to Energy Efficiency and Renewable Energy Financing Districts for Local Governments,” Renewable and Appropriate Energy Laboratory (RAEL), University of California, Berkeley, September 2009; quickfacts.census.gov; the Home Performance Resource Center, “Case Study: Sonoma County Energy Independence Program,” March 2010; and Gina Lehl, Sonoma County Energy Independence Program, e-mail message to the author, June 16, 2010.

Existing case studies and demographics

As of mid-2010, five existing PACE programs have distributed loans to their district members in the United States: Berkeley, California; Palm Desert, California; Sonoma County, California; Boulder County, Colorado; and Babylon, New York. Of those five, only Boulder County issued PACE bonds to fund the program. The other programs used revolving loans, general funds, enterprise funds, or third-party financing (alternate financing mechanisms are discussed in “Other Possible Funding Mechanisms” section below). See Table 1 for a comparison of the five existing case studies.

All five communities have a high median income compared to the U.S. median income of \$50,303.⁵ The median estimated home value of four of the five case studies is well above their state's median estimated home value (see Table 2). Berkeley is over double the state median home value and both Boulder County, Colorado, and Babylon, New York, are close to one-and-a-half times the state median home value. On May 11, the National Association

able for purchase by nonlocal entities, few outside of the greater Boulder County area invested in the bonds.

In their current iteration, PACE bonds are not attractive to national or international markets because of their low notional value and limited tax benefits. Additionally, large institutional investors will likely have limited interest in PACE bonds until large issuances are made. For example, a \$50 million issuance would equate to approximately 2,000 participants borrowing an average of \$25,000—high numbers for local participation and loan amount in many communities. The most likely source of large issuances for PACE programs will be aggregations of debt from multiple municipalities by a regional or state authority (loan aggregation is discussed below in the section “Possible federal and state roles”).

Two possible groups that could expand investment in PACE bonds beyond the local community are Socially Responsible Investors (SRIs) and university endowments.

5 DeNavas-Wait, Carmen, Bernadette D. Proctor, and Jessica C. Smith, “Income, Poverty, and Health Insurance Coverage in the United States: 2008,” U.S. Census Bureau, September 2009.

6 Molony, Water. “Home Prices Rising in More Metro Area, First Quarter Sales Up From a Year Ago.” National Association of Realtors. 11 May, 2010. http://www.realtor.org/press_room/news_releases/2010/05/metro_rise.

Table 2. Home values in PACE communities.

	Median Estimated Home Value	State Median Estimated Home Value	12-Month Change	% State Foreclosures
Berkeley, CA	\$597,900	\$292,798	-12.40%	0.10%
Palm Desert, CA	\$264,115	\$292,798	-6.85%	0.23%
Sonoma County, CA	\$316,292	\$292,798	0.47%	1.05%
Boulder Co., CO	\$297,849	\$199,386	5.02%	2.91%
Babylon, NY	\$384,002	\$260,370	0.34%	0.82%

Source: RealtyTrac.com.

As one former bond trader said, “this is an easy story to sell [to a socially minded bond purchaser].” These investors could help transition PACE bonds from the local and regional levels to national and international levels. However, the investor must have a risk profile that includes new and generally untested products such as PACE bonds.

Bond rating and credit enhancements

The quality of the bonds will also be crucial to their success. A riskier bond carrying a higher interest rate will be more costly for the municipality. The bond’s riskiness is also represented by the bond rating given by independent rating agencies. A high bond rating will contribute to lower costs for a PACE program.

A PACE bond’s quality and bond rating depends on a number of factors that include but are not limited to: credit enhancement(s), district demographics, and district geography. For example, the two Boulder bond issuances, Series A and Series B, garnered a rating of “BBB” from Standard & Poor’s Rating Agency (S&P).⁷ After the county added a Moral Obligation to replenish the bond reserve fund in case of default, the rating was raised to “A.” Through a conversation with a representative from S&P, we learned that the agency did not rate the actual energy improvement district but rated the Moral Obligation provided by the County. The County of Boulder itself carries a rating of “AA+”, and the Moral Obligation rating was three notches beneath that at “A.” A representative of S&P stated that a rating agency looks at the individual bond issuances and the districts that comprise it rather than just the type of bond. Therefore, each issuance of PACE bonds will receive a unique rating based on the portfolio.

Fitch Ratings awarded a rating of “A+” to the Series C and D of Boulder County’s Special-Assessment bonds. According to their “Rating Rationale” and “Key Rating Drivers,” Fitch stressed the following:

- **District demographics:** “With good economic underpinnings, Boulder County maintains its above-average wealth, income, and economic and employment indicators.”
- **Political will and local support of program:** “[T]his newly established local improvement district and its stated purpose are broadly supported by the public.”
- **Limited financial exposure of municipality:** “County management uses its Moral Obligation selectively . . . [the] county’s financial exposure as defined through the Moral Obligation is fairly minimal as compared to the county’s financial reserves.”
- **Credit Rating of county and credit-worthiness of population:** “[S]tability in the county’s general credit standing and credit quality of the local improvement district.”
- **Tax sale mechanism:** “[T]he foreclosure process on delinquent properties is prompt . . . if not paid by June 30, all assessments become fully due and payable, moving towards a tax sale on November 1.”
- **Tax collection rate:** “[T]he county’s rate of collection on tax sales is very strong at close to 100%.”

Credit enhancements, like the Moral Obligation backing in Boulder, Colorado, are an important but not imperative component to PACE bonds. These enhancements, sometimes referred to as a “backstop” or “credit backing,” provide security to the investor in the case of default. Proper vetting of district applicants limits the risk to the municipality and increases the credit worthiness of the bonds. Credit enhancements for bond quality will likely have to be balanced against expansion of the loan pool, and these two aspects should be carefully balanced.

As more PACE bonds come to market, in all likelihood they will be rated like Special-Purpose Districts Bonds. According to S&P’s release on criteria for ratings of Special-Purpose Districts, the major considerations are:

- **District makeup and economic base:** an “assessment tied to a stable and diversified economic base”
- **Stable method(s) of assessment collection:** “special assessments collected at the same time and with the same foreclosure methods of ad valorem taxes are preferred”

⁷ Bond ratings descend from AAA, AA, A, BBB through C, and a rating of D for defaulted commitments. A plus or a minus indicates how the bonds stand relative to other bonds within the category. Source: Standard & Poor’s.

- **High value-to-debt ratio:** “typically above 7:1 for investment-grade ratings”
- **Lien position:** “a lien on parity with or ahead of ad valorem taxes is desirable”
- **Foreclosure and bankruptcy provisions:** “action should be taken on a timely basis to ensure that sufficient funds are available to make scheduled debt service payments [in the case of foreclosure, bankruptcy, or sales of tax certificates]”; this can be achieved by the employment of a debt service reserve fund
- **Term and redemption of bonds:** “debt service schedule is usually within the useful life of the project and improvements”⁸

Other possible funding mechanisms

This paper focuses primarily on the basic municipal bond issuance PACE program model (e.g., creating a special-assessment district and issuing bonds on the municipal bond market similar to Boulder County). However, some of the other case studies demonstrate other possible financing options. Other options using the special-assessment framework include, but are not limited to:

Private Funding. A special-assessment district is formed and a private financial intermediary (e.g., Renewable Funding⁹) issues microloans to the individual district members with funds raised through their own investors. Loans are then aggregated and issued on bond market at a later date when rates are favorable for the intermediary.

This private funding model is arguably the most efficient: microloans are distributed as district members apply rather than waiting for all applicants to complete necessary paperwork. Convenience and efficiency, however, come with a price—this model may be a slightly more expensive option than a municipality taking on administrative and loan issuance roles independently. Examples of this model include BerkeleyFIRST in Berkeley, California, and the newly launched GreenFinanceSF in San Francisco, California.

Revolving Loan. Using seed money from city, county, or municipal funds (e.g., general fund, reserve fund) to establish a revolving loan pool. Loans are distributed from and paid back into the loan pool by district members through a special assessment.

The revolving loan is a streamlined option because it doesn’t require the involvement of a bond underwriter or private intermediary; however, it relies on an existing pool of funding or creation of a fund to provide the original

capital. Using existing funding may be difficult or impossible for cities and municipalities that currently do not have large cash surpluses. An example of a revolving loan program includes the Long Island Green Homes Program in Babylon, New York. Under the Babylon program, the definition of solid waste was rewritten to include CO₂ so that the city’s solid waste reserve fund could be used to seed the revolving loan program. Another example of the revolving loan model is Charleston, South Carolina, in conjunction with Abundant Power.

Key Aspects of PACE Financing

PACE bonds have tremendous potential, but are not yet a proven model and have only been implemented in communities with very specific characteristics and incentives. First, communities that undertook these programs generally have a cost per kilowatt hour (kWh) of electricity at or above the national average, so the return on energy savings has a much better chance of matching loan costs. Second, it is currently unclear how efficiency improvements or renewable energy installations will affect property value, and whether such concerns will limit program participation. Finally, most of the communities that have implemented PACE programs have been relatively affluent, active in energy and environmental programs, and subject to higher than average electricity prices. This may have helped these communities to offer a substantial loan pool, making the bonds potentially attractive to investors. By contrast, in southeastern United States, for example, electricity prices are lower than the national average and it is unclear whether there will be sufficient incentive in individual communities to generate the loan pool size necessary to create a marketable municipal bond. Given these concerns, it is uncertain whether the program scale in many cities and towns will warrant the significant administrative support required of local communities to implement PACE financing. PACE programs may be suited to certain types of communities, or require aggregation of PACE programs at the state or regional level.

The financial expectations for PACE loans

It may be a challenge for PACE programs to provide sufficiently attractive loans to borrowers, particularly in areas where loan costs will exceed energy savings unless the programs are heavily subsidized. Financial benefits will be key to encouraging widespread loan adoption beyond property owners with a strong nonfinancial interest in energy savings, and the U.S. Department of Energy (DOE) PACE program guidance strongly recommends a positive savings-to-earnings ratio as a program requirement.¹⁰

⁸ “Special-Purpose Districts.” Standard & Poor’s Global Credit Portal, New York: June 14, 2007.

⁹ <http://www.renewfund.com>.

¹⁰ U.S. Department of Energy, “Guidelines for Pilot PACE Financing Programs,” May 7, 2010.

In much of the United States, meeting this requirement may be more challenging than in the current PACE communities. In 2008, twenty-three states had average electricity prices under the national average of 10 cents/kWh.¹¹ PACE bond programs have been implemented in California, Colorado, and New York, where in 2008 average residential retail electricity prices were 14 cents/kWh, 10 cents/kWh, and 18 cents/kWh, respectively. Subsidies for PACE loans may be needed in many communities to assure that loans make fiscal sense, though these subsidies should take into account existing state and federal energy incentives.

Consumer risk perception

Property owners weighing PACE loans will be concerned about the impact of energy efficiency and renewable energy improvements on property value, as well as the opportunity costs of loan payment and a commitment to home renovation. Currently, it is not certain that energy efficiency improvements will provide a net increase in property values; there are few guidelines or current data on valuing these improvements.¹² Almost every publicly available estimate of the property value of energy efficiency stems from two ICF studies completed in the late 1990s.¹³ Property value impacts of renewable energy are more uncertain and may be deemed less attractive than other improvements. One rule of thumb for the appraisal value of a solar installation quantifies it at half of cost of the installation, as compared to 70%–90% for kitchen and bathroom improvements.¹⁴ Interestingly, of all of the property owners who applied to the Berkeley renewable energy program, 33% did not believe that the system would improve the value of their property.¹⁵

Property owner financial need

It has yet to be determined how effectively PACE programs are at targeting financing to property owners who would not make energy efficiency or renewable energy improvements without subsidy. The five pioneering PACE programs discussed earlier are based in higher-income communities, and an evaluation of the Berkeley program found that participants tended to be individuals in the

higher income brackets, with most making over \$100,000 per year. Furthermore, many who did not receive funding went forward with the improvements anyway.¹⁶ This raises the question of whether nonfinancial incentives could induce the same behavior among participants.

Loan pool requirements

In order to have PACE financing assessed with the property, regulations currently require that PACE programs be administered at the local level. However, it is uncertain whether individual local communities have sufficient loan demand to satisfy the requirements of the bond market. As previously discussed, the bond market demand requires a bond offering of a certain size, generally in the tens of millions of dollars or more. Policymakers should consider whether their community has sufficient demand for energy financing. Key characteristics that may affect demand for financing include but are not limited to the total population of a district, population of credit-worthy borrowers, community attitudes towards energy improvements and public financing, local energy prices, and the size of expected energy efficiency gains. Communities with existing PACE programs have unique characteristics that affect the loan pool size and quality. These characteristics include:

- high per capita incomes
- high property values
- high energy costs
- a precedent of strong local leadership in energy and environmental programs¹⁷
- high program visibility as an initial implementation of this novel financing strategy

Another option to achieve the quantity of loans necessary for the creation of a PACE bond issuance is loan aggregation. This would entail creating pools of loans across numerous communities; this could potentially help smaller communities attract the interest of large institutional investors. However, this aggregation may or may not be allowable under state and local law. In North Carolina, for example, aggregating loans at the regional or state level is unprecedented and requires enabling state legislation. Other states can track two key cases of statewide aggregation that are being implemented in Colorado and California. California established a \$50 million reserve fund to back \$500 million to \$1 billion in PACE program loans and has given the state

11 U.S. Energy Information Agency, “Average Residential Price of Electricity by State, 2008,” <http://www.eia.doe.gov/cneaf/electricity/epa/fig7p5.html>.

12 Alexandra Marks, “Green Building Costs not always included in home appraisal,” *Christian Science Monitor*, April 7, 2010.

13 Rick Nevin and Gregory Watson, “Evidence of Rational Market Valuations for Home Energy Efficiency,” *Appraisal Journal*, October 1998; and Nevin and Watson, “More Evidence of Rational Market Valuations for Home Energy Efficiency,” *Appraisal Journal*, October 1999.

14 Michael Copeland, “Go green, a smart home improvement,” *CNNMoney.com*, October 31, 2006. http://money.cnn.com/2006/10/24/magazines/business2/newrules_gogreen.biz2.

15 City of Berkeley Planning and Development Department, *ibid*.

16 City of Berkeley Planning and Development Department, *ibid*.

17 Boulder and communities in Sonoma County were rated in the top 75 “Smarter Cities” for their population size by the Natural Resources Defense Council (<http://smartercities.nrdc.org/rankings/large>), Palm Desert was featured in the *Wall Street Journal* for its comprehensive energy programs, and similar programs have been adopted in Babylon, as cited by Fuller, Kunkel and Kammen.

Treasurer's Office power to aggregate loans for bond issuance.¹⁸ In Colorado, the legislature just established a centrally administered statewide special-purpose district in which counties can choose to participate.¹⁹ Aggregating loans is a key policy question for possible state legislative action, and states may include such language in their PACE enabling legislation.

Municipal administrative requirements

Municipalities and counties interested in PACE programs should realistically estimate the administrative requirements, particularly as PACE Best Practices are just being established. The issuance of municipal bonds, specifically special-purpose district bonds, and loans requires significant upfront administrative investment, and municipal experience in special-purpose districts may vary widely. PACE program proponents estimate the timeline for initial implementation of PACE bond programs to be between 6 and 12 months.²⁰ The administrative burden of special district approval will vary widely, and may require a signed petition or referendum.²¹ Loan and bond maintenance will also require additional staff commitment over the program life or require contracting.

The quality of property improvements implemented by local programs will be a paramount concern and will require significant staff time committed to building inspection and communication with property owners and contractors. Defective construction or projects that do not deliver on efficiency or energy generation estimates may irreparably harm the reputation of PACE programs and be a potential legal issue for municipalities.

Further, significant and successful PACE funding programs will create an increase in local demand for contractor services. Significant short-term increases in demand can be associated with a decrease in construction quality, as was seen during recent real estate booms, as high demand actually decreases pressure on contractors for quality work and inspectors become overwhelmed by the volume of construction projects.²²

18 Debra Kahn, "California establishes \$50 million fund to back local retrofits," *ClimateWire*, April 26, 2010. See also California S.B. 77.

19 John Stroud, "The New Energy Jobs Creation Act is signed into law," *Glenwood Springs Post Independent*, June 12, 2010. See also Colorado HB10-1328.

20 Fuller, Kunkel and Kammen, "Guide to Energy Efficiency and Renewable Energy Financing Districts for Local Governments," Renewable and Appropriate Energy Laboratory (RAEL), September 2009.

21 Interview, Tobin Fried, Sustainability Coordinator, City and County of Durham, NC, January 5, 2010.

22 David K. Bradford, "Construction Defect Claims: A California Problem Goes Nationwide," *Advisen Front Page News*, April 16, 2006; Ky Plaskon, "Las Vegas Building Boom Plagued by Construction Defects," *National Public Radio*, June 20, 2005, [http://www.npr.org/](http://www.npr.org/templates/story/story.php?storyId=4710462)

The federal policy framework for PACE programs recommends strong quality assurance, which as programs expand will require the rapid addition of staff for program administration and inspections. Federal evaluation of the actual return on efficiency and energy generation improvements can improve initial estimates given to consumers. When appropriate, building commissioning can also assure that energy efficiency improvements are properly functioning after construction.²³

Municipalities will need to decide the extent to which they will be involved in property owner-contractor transactions, and the first programs have varied in their involvement. Some communities are involved in certifying contractors and dispute resolution, including Babylon, New York, while others depend upon existing licensing programs and property owner supervision of the contractor. Programs such as Babylon's improve quality assurance, but may be challenging to scale to a large number of property owners in a single community.

Possible federal and state roles

While PACE is a locally based policy, there is increasing momentum for federal and state support. The DOE has recently funded 25 locally based efficiency programs through the State Energy Program and Energy Efficiency Block Grants. In total, communities will receive up to \$452 million, which many will use to implement PACE financing among other financing, education and efficiency implementation programs in a wide variety of communities around the country. The DOE evaluation of these projects should provide significant lessons for future implementation of PACE, and DOE has pledged credit support and continuing program guidance for PACE programs.²⁴ Aside from DOE support and stimulus funding, credit support enabling legislation has been filed independently in Congress and passed the House as part of the American Clean Energy and Security Act of 2009, otherwise known as the Waxman-Markey climate bill.²⁵

Federal loan guarantees would allow interest rates to be subsidized in order to compensate for any negative savings-to-earnings ratios, opportunity costs, and perceived property and financial risk. Loan guarantees could cause a decrease in the quality of the loan pool and program quality, concerns which need to be monitored.

[templates/story/story.php?storyId=4710462](http://www.npr.org/templates/story/story.php?storyId=4710462).

23 Mills et al. "The Cost-effectiveness of Commercial-Buildings Commissioning," Lawrence Berkeley National Laboratory, December 15, 2004.

24 U.S. Department of Energy, "Policy Framework for PACE Financing Programs," October 18, 2009.

25 H.R. 3836, "To authorize the Secretary of Energy to provide credit support to enhance the availability of private financing for clean energy technology deployment," 1st Session, 111th Congress.

State involvement in loan subsidy or as an organizer of aggregated loans may also be appropriate in some regions. The performance of recently established state-wide programs in California and Colorado could provide guidance on the best method of aggregation, both legally and administratively. State aggregation of municipal loan issuances into marketable bond packages may be a sustainable way to make this useful financing tool available to a large and diverse pool of communities seeking to address their energy challenges.