

UNLOCKING THE BUILDING RETROFIT MARKET: COMMERCIAL PACE FINANCING

A GUIDE FOR POLICYMAKERS



Issue Brief

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EXECUTIVE SUMMARY

Deep energy efficiency retrofits in buildings are a cost-effective way to achieve significant greenhouse gas emissions reductions and energy savings. Despite the enormous opportunity in the commercial building sector, activity and investment in comprehensive energy retrofits has been largely focused in public and institutional buildings over the last 20 years.

Several well-documented barriers have stalled the retrofit market in the private sector. Market research indicates that lack of internal capital funds and access to external financing are the most challenging barriers.

New energy efficiency financing models have enormous potential to catalyze demand from both owners and lenders for clean-energy investment in buildings. Property assessed clean energy (PACE) financing is a model administered by local governments to allow property owners to undertake energy efficiency, renewable energy, and water efficiency projects without large up-front payments. Just as other land-secured financing districts are used to fund public purpose projects, PACE districts allow local governments to deploy capital for energy and water improvements in buildings. The outlay for projects is secured by a property lien and is repaid by the owner as a voluntary special assessment on the property tax bill over a 5- to 20-year term.

With authority from 23 states in the U.S., cities and counties may now launch PACE programs to advance environmental and economic development goals. While the residential market was the initial focus of many PACE programs, recent rulings from the Federal Housing Finance Agency (FHFA) have stalled programs in that sector. Therefore, commercial PACE has emerged as the most viable near-term opportunity to spur retrofit activity.

Despite the promise of PACE to mobilize commercial retrofit projects, the model is still in its early stages and is unproven at scale. This paper highlights the experience of leading commercial PACE programs under development and focuses on best practices that reduce risk to building owners and to commercial mortgage holders. Policymakers will also find advice on how they can launch PACE programs and similar financing initiatives to achieve significant economic and environmental benefits in their localities.

CONTEXT: BUILDING EFFICIENCY BENEFITS AND MARKET DRIVERS

Significant cost-effective energy savings remain untapped in the commercial building sector, which in the U.S. accounts for 18 percent of primary energy use, 36 percent of electricity use, and 19 percent of energy-related greenhouse gas emissions.¹ Comprehensive and deep energy efficiency retrofit activity and investment has been largely concentrated in the public and institutional sectors over the last decade, despite the significant opportunity for energy savings and greenhouse gas (GHG) emissions reductions in private-sector buildings. The current market for comprehensive building retrofits in the U.S. is about \$5 billion per year, dominated by public and institutional facilities. Based on a number of sources,² Johnson Controls estimates that 22 percent energy savings could be cost-effectively achieved across the entire stock of existing private-sector commercial buildings, resulting in an additional \$12 billion market annually over the next decade.³ At a rate of five direct jobs, five indirect jobs, and ten induced jobs for every million dollars invested, this

¹ U.S. Department of Energy (2009). "Buildings Energy Data Book;" U.S. Energy Information Administration (2010) "Annual Energy Review 2009." Table 12.3

² Nadel, S., Shipley, A. et al. (2004). "Technical, Economic, and Achievable Energy Efficiency Potential for US - A Meta-Analysis of Recent Studies," Washington, D.C. American Council for Energy Efficiency Economy (ACEEE).

³ Frost and Sullivan (2008). "North American Energy Management Services" Report # N337-F1.

incremental growth translates to 240,000 new jobs over that decade. Based on national-average commercial building fuel mixes and electricity emissions factors, some 128 million metric tons of carbon dioxide (CO₂) emissions would be avoided annually by the end of a decade – equivalent to the annual emissions from 28 coal-fired power plants.

Enhancing the energy efficiency and overall sustainability of existing commercial buildings creates budget relief in utility expenses, reduces CO₂ emissions and air pollution, alleviates strain on the electric power system, improves the health and productivity of occupants, and creates local high-quality job opportunities. For commercial building owners considering retrofit projects, the benefits can be substantial and immediate. Energy efficiency improvements can increase the owner's net cash flow and improve the property's appeal to existing and prospective tenants. Energy efficiency both pays for itself and positions the property to outperform its peers and generate higher returns.

Recognizing the benefits of energy-efficient buildings, some cities have adopted mandates for building labeling and disclosure, which require commercial buildings of a certain size to make ENERGY STAR ratings or a similar performance metric available to the public. These requirements, along with the growing trend of tenants seeking green office space, create a market risk for owners of less efficient properties. Even without regulation, portfolio managers and appraisers are already identifying wasteful buildings as high-risk and assigning lower values to them.

BARRIERS TO COMMERCIAL BUILDING RETROFITS

Despite the measurable benefits and an impressive return on investment, several well-documented barriers deter building owners from making energy efficiency improvements or installing renewable energy technology. These include:

- The up-front cost of efficiency measures and renewable energy systems.
- Real estate holding periods biased to favor short-term investments.
- Split incentives between owners and tenants.
- Lack of new real property to serve as collateral for investor security.

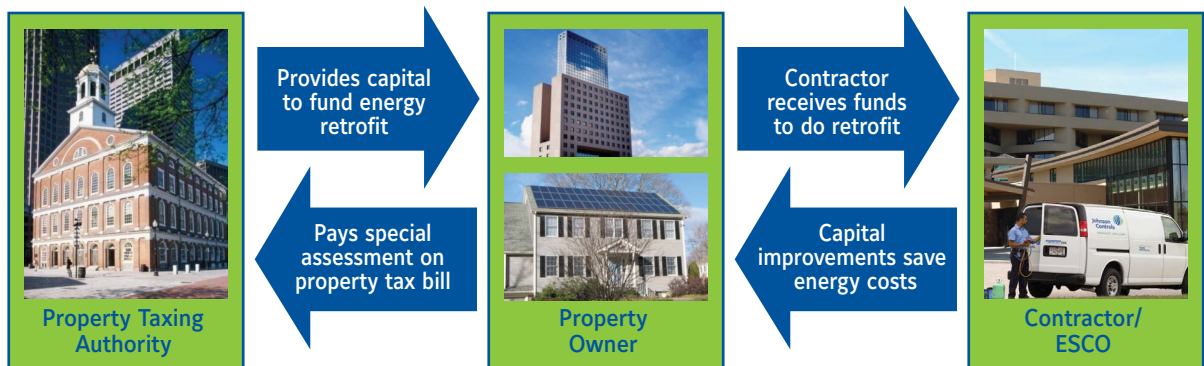
Up-front cost and the widespread difficulty of securing capital through a lender have been the main forces stalling the market. In a 2010 global survey conducted by Johnson Controls and the International Facility Management Association (IFMA), involving more than 2,880 executives with budget responsibility for their companies, 47% of respondents identified limited internal capital or insufficient ROI as the top barrier to implementing energy-savings measures.⁴ As a result, the market for private-sector building retrofits is considerably smaller than its potential. By addressing this widely recognized capital barrier, new financial models can have a huge impact on catalyzing demand from both owners and lenders for clean-energy investments in commercial buildings.

⁴ Johnson Controls and IFMA (2010) "Global Energy Efficiency Indicator 2010."

PACE FINANCING: A TOOL FOR LOCAL GOVERNMENTS

Several financial models address the concerns of key stakeholders to a varying degree, but one of the more promising models is tax-lien financing, commonly known as property assessed clean energy (PACE) financing. The PACE idea mimics a widely used funding model in which municipalities and counties set up land-secured financing districts to fund projects that serve a public purpose. In such models, the local government collects an additional assessment from properties within the district to amortize project costs over time. As more localities adopt carbon-reduction and energy-savings goals, PACE financing can be a critical tool for policymakers looking to promote efficiency in existing building stock. PACE is a scalable financing program that addresses many of the widely known barriers to clean-energy retrofits. It provides municipalities with a stool for achieving their energy and climate goals while creating jobs and stimulating commercial lending.

Figure 1. PACE Financing Model




PACE programs are authorized by state legislation that gives local governments the authority to create special land-secured financing districts and levy voluntary assessments for clean-energy measures. Property owners may voluntarily join these districts to fund energy efficiency and renewable energy improvements. The funding for the projects is secured by a tax lien (which may be senior to all other obligations on the property) and is repaid by the owner as a special line item on the annual property tax bill over a 5- to 20-year term.

While some local PACE programs sell revenue bonds to fund a pool of projects, others allow building owners to arrange their own financing directly with a commercial bank and leverage the enforceability of the tax lien on the property as security for financiers. The security of the tax lien provides a solution to the inability of commercial building owners, who often lack investment-grade credit ratings, to secure any type of third-party financing for energy retrofits. Additionally, the lien is attached to the property, not the property owner, and therefore transfers with ownership. This allows owners to undertake deeper retrofits with greater energy and carbon savings and greater net present value, yet longer payback periods, even if the owner only plans to hold the building for a few years. In addition, the PACE model helps to overcome efficiency investment barriers in triple-net-lease tenant-occupied properties, because property assessments normally qualify as eligible pass-through expenses. Tenants ultimately benefit from the utility bill savings and bear the cost of the PACE financing payments. Because the savings are usually larger than the PACE payment costs, the tenants see net positive cash flow.

The tax lien model has quickly generated substantial excitement in the U.S.: 23 states have passed PACE-enabling legislation, and two others allow PACE through existing authority. As more districts implement PACE programs, best practices and different styles of the original model are emerging. Both the White House and the U.S. Department of Energy have released guidance and best practices for municipalities establishing programs and express strong support for the tax lien model for the residential and commercial sectors.

However, as of October 2010, despite the overwhelming support from the Administration, residential PACE programs were stalled due to concerns from the Federal Housing Financing Agency (FHFA), which views the senior lien provision as an unwarranted risk to federal home loan banks and questions levels of consumer protection. Fannie Mae and Freddie Mac reinforced the FHFA opposition with letters stating that PACE financing constitutes a default on residential mortgages they own. Stakeholders in residential PACE programs continue to work optimistically toward a resolution to allow PACE programs to resume, but the road ahead remains unclear and the early model may need to be modified. Meanwhile, commercial PACE programs continue to develop and grow.

Table 1. Energy Efficiency Barriers and PACE Model Solutions

Barriers	Solutions
Scarce internal capital budget	Spread cost over 5-20+ years
No access to or aversion to financing <ul style="list-style-type: none"> • No investment-grade credit rating • Lack of collateral assets that don't already fall under first mortgage • Inability to get mortgagee consent or lien waiver from securitized mortgage • Limited number of lenders experienced in financing energy efficiency/renewable energy retrofits • External third-party financing rates exceed internal cost of capital • Balance sheet debt ratio concerns 	 <ul style="list-style-type: none"> • Repayment security through senior lien position rather than borrower's credit • Backed by property, not by owner or equipment collateral • Local governments provide scale • Low rates due to senior lien position and/or publicly funded loan loss reserves • Accounting treatment may not consider PACE assessments a long term debt/liability
Uncertain holding period	Transfers upon property sale or tenant turnover
Owner/tenant split incentives	Qualifies as triple-net-lease pass-through cost without lease modification or renegotiation
Skepticism regarding whether promised energy savings/ROI will be realized	Contractor may guarantee savings via a performance contract

TWO VARIETIES OF PACE PROGRAMS EMERGING

Many communities developing PACE programs, including Boulder County in Colorado and Sonoma County in California, are using different approaches to reach different sectors. Johnson Controls recommend a two-pronged approach that entails separate PACE programs, one to meet the needs of residential and small commercial properties, and another intended for mid-size to large commercial and industrial properties. Residential and light commercial programs tend to use the pooled bond financing model because projects are too small to attract project financing. Additionally, the size of individual residences does not allow cost-effective measurement and verification on a project basis, so residential PACE programs are validated using statistically representative audits similar to those used in utility rebate programs.

Even though residential programs have not been able to go forward due to the FHFA concerns, commercial tax-lien financing remains a viable option because some existing commercial mortgage holders have consented to PACE program participation. These lenders recognize that clean-energy retrofits improve the value of their underlying property assets and also see a business opportunity as investors in PACE financing capital. As a result, a handful of commercial PACE programs remain active, and others are in development to launch.

COMMERCIAL PACE BEST PRACTICES

As tax-lien financing programs continue to develop in the commercial sector, some key features stand out as best practices and create robust protections for all parties involved. These include:

Enabling the owner-arranged PACE financing model

To make PACE programs truly scalable for the commercial building sector, programs should allow building owners to arrange their own financing directly with a commercial bank and leverage the enforceability of the tax lien on the property as security for financiers. This enables building owners to negotiate rates, terms, conditions, and schedules that best suit their specific project needs, rather than waiting to lock in a rate through a bond. It also opens a wider channel of capital inflow compared to pooled bond models.

Figure 2 maps out the process of owner-arranged PACE financing. The process begins when the building owner engages an Energy Service Company (ESCO) to audit the property and develop a retrofit plan. The owner then submits the plan to the municipality for approval, in some cases along with a lien consent letter from the mortgagee. Once the municipality notifies the client of approval and records the assessment against the property, the client can negotiate financing from lenders on advantageous terms due to the security of the lien. The owner then enters into a performance contract with an ESCO, and the lender pays the contractor to perform the installation. The municipality assigns the assessment collection rights to the lender, and the building owner pays the assessments semi-annually or at an agreed-upon schedule.

Figure 2. Owner-Arranged PACE Process for Commercial Buildings



Requiring performance guarantees and contractor certification

Performance contracting is an internationally proven procurement method for reducing risk and enabling third-party financing for retrofit projects. ESCOs provide turnkey responsibility for the retrofits, including site audits, detailed design and engineering, business case analysis, installation, commissioning, and measurement and verification (M&V) in accordance with international standards. Most important, the ESCO assumes performance risk for the project in the form a long-term performance guarantee to ensure that volumetric energy savings materialize and are preserved over time. Performance guarantees have traditionally allowed owners to secure financing at attractive rates and terms from third-party financial institutions. The risk of energy savings not materializing is minimized because the ESCO guarantees that the units of energy are saved. In the event that energy savings do not materialize, the ESCO is required to pay the owner in cash or through additional improvements to make up the shortfall. This reconciliation process is used widely by the federal government, local and state governments, schools and industry and has been proven for over 25 years.

In the case of PACE programs, local governments might encourage or even require long-term performance guarantees. This protects property owners and existing mortgage holders by ensuring that the owners gain and maintain positive cash flow as a result of the project. Guarantees also help local governments ensure quality control and program satisfaction among constituents. An additional best practice is to require the transferability of the guarantee so that future building owners enjoy the benefit of the savings guarantee for the life of the PACE assessment.

To minimize risk for local governments, contractors working on PACE projects should have certification based on financial stability, technical expertise, and ability to provide energy guarantees for commercial projects. Communities can leverage National Association of Energy Services Companies (NAESCO) accreditation, federal- or state-approved ESCOs, or contractors with investment-grade credit to provide this assurance. Such contractor certification will improve the quality of PACE programs and support local workforce development goals.

Establishing stringent qualifications criteria to ensure early success

Local programs should evaluate applications using a set of minimum property qualifications to create confidence among lenders that the program minimizes owner default risk. The following minimum requirements are recommended:

- Borrower must be the legal owner of the property.
- Property must not be subject to any involuntary liens.
- Property owner must be current on property taxes and must not have been delinquent within the past five years.
- Property owner must not have declared bankruptcy within the past five years and must not be in bankruptcy, and the property may not be an asset in a bankruptcy proceeding.
- Property owner must be current on existing mortgages and have secured consent from the mortgage lenders before applying for financing through the program, if such consent is possible (e.g. nonsecuritized mortgage).
- Existing loan-to-value ratio should not exceed 85% before improvements.

Putting forth requirements to protect existing mortgage holders

Several requirements should be included to ensure that the PACE program does not put the existing mortgagee of the property at unnecessary risk, but rather puts the building owner in a better position to service the existing debt payments and increases the value of the mortgagee's underlying asset. The suggested PACE program requirements include:

- A maximum lien-to-property value ratio of 15% to ensure that any delinquent, uncured PACE assessment that is payable senior to the mortgage upon default is nominal in value compared to the outstanding mortgage.
- An expected savings-to-investment ratio (SIR) greater than one over the term of the PACE loan, so that only cost-effective and property-value-enhancing measures are included, and that these measures, as a comprehensive package, pay for themselves over the life of the assessment. All costs including financing costs should be included in this ratio calculation. This will improve the participant's ability to repay PACE assessments and other debt, such as mortgage payments.

- An assessment term that does not exceed the average useful life of all measures included in the project.
- Performance guarantees.

Ensuring a proper integrative design sequence

Programs should set a minimum project energy savings requirement (e.g. 20% savings) and should require a loading order where a minimum level of energy efficiency must be achieved before the installation of renewable energy systems will be financed. For example, the proposed commercial PACE program in Los Angeles, which is expected to launch by mid-2011, requires applicants to undertake projects that will achieve the greater of an Energy Star score of 70 or a 10% improvement from baseline consumption before renewable energy installations will be eligible for financing.

Targeting portfolios of properties initially

Taking a portfolio approach, rather than selecting projects on a case-by-case basis, allows the program to achieve maximum scale, while balancing risk as the program gains traction. In most circumstances, commercial office buildings belong to a real estate investment portfolio. Engaging the leadership of a portfolio of buildings creates a larger market than targeting property or facility managers for each site.

Creating a loan loss reserve fund

Federal, state or local governments can provide modest public funding to leverage significant private investment by seeding loan loss reserve funds – credit-enhancing mechanisms that make lenders more likely to participate in providing PACE financing. The loss reserve fund covers bridge payments to lenders in default situations. Because only delinquent payments (typically 1-2 years) must be cured upon default, the bulk of the assessment survives bankruptcy, and the remaining balance and future payments are assumed by the new property purchaser. This results in roughly 10 times more leverage of government funding compared to a guarantee program for unsecured energy efficiency loans.

While initially seeded with government funding through a state energy program or local energy efficiency community block grants, the reserve fund could be replenished on an ongoing basis through a small surcharge included in each PACE assessment.

Sources of reserve funding are most commonly being developed at the state level. For example, in April 2010, California passed legislation establishing a statewide PACE Reserve Program that lowers financing costs for businesses and residences making energy improvements through retrofits. The state-financed loss reserve, administered through the California Alternative Energy and Advanced Transportation Financing Authority, was created with \$30 million from the Renewable Resources Trust Fund.

Requiring ongoing measurement and verification for program-wide validation

Quality assurance through ongoing measurement and verification ensures that the program achieves its energy savings and GHG reduction goals, and that the expectations of building owners and financial lenders are being met. Local programs should require that the energy savings be measured and verified according to the Efficiency Valuation Organization's International Performance Measurement and Verification Protocol (IPMVP), and that savings be guaranteed by a licensed, experienced, reputable and creditworthy contractor. Data on the effectiveness of commercial building efficiency retrofits will drive future retrofit decisions and help bring the PACE model to scale. It will also continue to improve the financing process by providing more security for potential retrofit lenders.

The City of Melbourne, Australia, has created a new Environmental Upgrade Charge (EUC) program for financing energy retrofits in commercial buildings using a variation of the PACE model. Melbourne's program has some important features that may be replicable and scalable in other parts of the world.

Best Practices: Commercial Sector First, Private Financing, Deep Retrofits

As part of its Zero Net Emissions by 2020 Strategy, Melbourne has launched a 1200 Buildings Program that aims to retrofit 1,200 existing office buildings to reduce energy use, save water, and lower carbon emissions. Deloitte estimates that a successful 1200 Buildings Program will create up to 8,000 green jobs and generate up to \$2 billion of private sector investment in Melbourne over ten years.

To kick-start this initiative, the Victorian Parliament passed an *amendment to the City of Melbourne Act* on Sept. 14, 2010, allowing the Melbourne City Council to administer a commercial building retrofit financing model. The council may now enter into environmental upgrade agreements (EUAs) with commercial property owners seeking up-front financing for projects that improve energy, water and environmental efficiency, and with the financial institutions willing to fund these retrofits. Following approval of the EUA, the private lending body advances funds to the building owner to undertake the project. The owner or occupier pays an ongoing environmental upgrade charge (EUC), levied by the council, that practically matches the principal and interest. Payments are then passed on to the lender.

Melbourne's building retrofit program will **target non-residential properties** and uses **an owner-arranged financing model**. This allows property owners to seek out a commercial lender independently to secure attractive rates and terms specific to the project, with assurance of the EUC from the city council. In addition, the program's approach is unique in targeting portfolios of properties instead of single-building retrofits alone.

In its first phase, the Melbourne program will target top-tier nonresidential property owners that have an investment grade credit rating, that have 10 or more sites totaling more than 5,000 square meters of floor area in their portfolio, and that spend \$500,000 or more on energy each year. While these conditions limit participation to 35 percent of the city's building stock, they will enable a rapid launch with lower administrative costs and better likelihood for long-term success. Early projects will provide case studies and technical resources that will widen the market later. Applicants must also demonstrate that plans for retrofits will achieve **at least 20 percent energy use savings**. That criterion promotes comprehensive retrofits rather than simple, piecemeal improvements that may eliminate the potential for cost-effectively reaching deeper levels of savings later down the line.

PACE PROGRAM MODIFICATIONS OR ALTERNATIVES

Some alternate approaches to the basic commercial PACE model may be more appropriate in certain customer or regulatory environments. While these mechanisms do not address the full scope of barriers as comprehensively as the basic PACE model, they are promising solutions, particularly when they incorporate some of the best practices discussed above.

Subordinate-lien PACE

Some state and local governments are examining or implementing subordinate-lien PACE programs. Making the assessment for retrofit project payback secondary to mortgage obligations addresses the most visible concern of the FHFA and federal home loan backers. Interest rates will be 2 to 4 percent higher with a subordinate lien, which limits the appeal of the offering and significantly increases the costs of the energy project. However, under these terms, some financial providers may find PACE investment opportunities with a greater risk/return profile to be more attractive. In addition, if the primary mortgage holder provides the financing, as many have expressed interest in doing, the lien seniority issue disappears. Overall, fewer investors might participate, but the subordinate-lien option still addresses several key challenges in the commercial retrofit market, including bankruptcy concerns.

Credit Risk Loan Guarantee

Regardless whether PACE financing is available, establishing a federal or local loan guarantee program to cover credit risk on ESCO projects would leverage public funding to ramp up private investment in building retrofits on a large scale in the commercial real estate sector.⁵ The credit guarantee fund provides first-loss protection against credit losses incurred by the investment vehicle and enables capital inflows into the sector, while lowering the cost of capital. A credit program that defines the components of an energy savings performance contract (ESPC) separates performance risk from owner default risk and creates a fund guaranteeing lenders against owner default risk under commercial ESPCs.

The legislative proposals for a federal credit-risk loan guarantee program under consideration would lower interest rates, would give risk-averse institutional lenders security in their investment, and could work without the ESPC component. For example, a federal commercial retrofit loan guarantee program might issue a guarantee not to exceed 90% of the project cost. Assuming a \$12 billion/year commercial retrofit market with an average owner default risk of 5% and technology risk of approximately 5%, the total federal exposure to capture the full opportunity would be \$1.08 billion. If loan guarantees are combined with energy savings performance contracts, where a qualified ESCO takes on the technical and performance risk in the form of a contractual savings guarantee, the loan guarantee would cover only the 5% owner default risk, reducing federal exposure to \$540 million. A loan guarantee that targets a specific component of project risk – owner default versus contractor default – is the most efficient and cost-effective way to provide assistance to the commercial retrofit market. The purpose of a credit program is to reduce the cost of capital and address owner default risk. Lenders want to provide financing, owners want to retrofit their projects, and ESCOs want to provide retrofit services, but capital is needed to facilitate these relationships and activities. This fundamental market failure to finance commercial building retrofits is directly addressed with commercial retrofit loan guarantees.

⁵ See Christmas, J. (2010) "The Business Case for Expanding Title XVII to Provide Federal Guarantees behind Owner Default Risk under Commercial Energy Savings Performance Contracts."

Due to the lack of new collateral inherent in energy retrofits, governments may need to modify seniority rules. Current loan guarantees available for renewable and nuclear energy under the Section 1705 program give the federal government full seniority over major assets. In an efficiency guarantee structure, the rules could be written such that the government would have no claim on an original mortgage, but would be senior or *pari passu* to secondary or “mezzanine” loans.

HOW TO IMPLEMENT A PACE PROGRAM

The following steps outline a basic process for local governments to follow in implementing a tax-lien financing program. Because PACE programs are run on the local level, there are different styles of implementation for the various elements, including program administration, underwriting criteria, source of funds, eligible measures, and quality control.

1. Find out if your state has passed PACE-enabling legislation and pursue legislation if needed

Local governments need authorization from the state legislature to collect special assessments for energy efficiency or renewable energy improvements on private property. Legislation often defines the process for launching local programs, so this may be the first critical resource for setting up a PACE district. See the [Institute for Building Efficiency website](#) for an up-to-date U.S. map of PACE legislation by state that includes live links to the enacted legislation.

2. Identify lead staff and advisors

Local communities can manage PACE programs in-house or seek additional capacity through third-party program administrator partners. Partners can have turnkey responsibility for all processing and management tasks or may be pulled in for specific expertise. Providers of PACE services include:

- Renewable Funding
- Abundant Power
- Powerhouse Service Inc.
- Strategic Development Solutions
- Wisconsin Energy Conservation Corporation
- FSL Financial
- HK Climate Solutions LLC
- Urban Atlantic

3. Conduct a feasibility study and design the program to meet specified goals, with input from stakeholders

It is important to define the public purpose goals of the program, including GHG reduction targets or economic and workforce development goals. Market research and analysis is required to estimate the potential program size and the level of capital required. Additionally, stakeholders and potential partners should be engaged when determining these goals and designing key program elements, such as eligible efficiency and renewable improvements and means for quality control. Working with the community and inviting input from stakeholders during the early stages of development allows staff to gauge buy-in and begin educating potential partners and applicants.

4. Develop a network of private capital providers

Programs directed at mid-size to large commercial and industrial sites should apply the owner-arranged PACE financing model, which enables property owners to negotiate their own terms using the seniority of the tax lien as security for financiers. Under this model, conveyance of the note is between the private lender and the property owner only, and the municipality is involved only to arrange for the levy of the assessments. Program staff must first conduct outreach to providers of capital to raise awareness and gauge interest in the program. The local government must then solicit commitments to participate in the program (e.g. letters of support). Staff might also issue an RFP to create a pool of pre-qualified commercial PACE lenders.

In addition, states may have existing financial incentives for efficiency and renewable energy, such as public benefit charges or rebates, which enhance PACE financing by offsetting some of the project costs. The *Guide to Energy Efficiency and Renewable Energy Financing Districts for Local Governments*, prepared by the Renewable and Appropriate Energy Laboratory (RAEL) at the University of California, Berkeley, discusses financing elements in greater depth.

It is expected that with a robust program, interest rates will range from 5 to 8%. Over time, rates will come down as the program gains market acceptance, more data becomes available, and a securitization market develops.

5. Create special tax assessment districts following state legislation procedures

The city council or local governing body most likely needs to approve various elements of the program proposal. The process for creating the financial district will vary from state to state and county to county.

6. Launch and market the program

Once the program is ready to be launched, marketing and outreach should include as much detail as possible about the energy and additional benefits from energy efficiency and renewable energy improvements, as well as information on the cost of financing and available incentives.

7. Perform quality assurance and program measurement and validation.

To ensure that projects funded by the program meet and sustain energy savings and GHG emissions reductions, administrators should require that savings be measured and verified according to the IPMVP protocol. It is recommended that the program evaluate licensed and credible contractors who perform M&V services ahead of time and maintain a list of approved providers as a resource for building owners and lenders.

CONCLUSION

Some 80 billion square feet of today's U.S. building stock will still exist in 2035. To reach energy savings and GHG reductions goals, inefficiencies and energy usage in existing private-sector commercial buildings must be addressed. The PACE financing model overcomes many of the barriers that now prevent deep energy retrofits in this sector and can be a key facilitator in unlocking this market. According to a baseline forecast scenario in a report by Pike Research, \$2.5 billion will be invested annually in financing for retrofits in commercial properties through PACE by 2015. This investment would create 50,000 new jobs and prevent 8 million metric tons of carbon dioxide emissions. Under an aggressive market forecast scenario, which accounts for federal and state legislative backing of PACE, those amounts would at least triple. For local governments, the additional benefits of increased tax revenue and job creation can be substantial and do not require excessive spending.

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