



Lessons in Commercial PACE Leadership:



THE PATH FROM LEGISLATION TO LAUNCH

FEBRUARY 2018



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Acronyms and Abbreviations

| | |
|----------------|--|
| CLTV | Combined loan-to-value ratio |
| C-PACE | Commercial Property Assessed Clean Energy financing |
| CSCDA | California Statewide Communities Development Authority |
| DMME | Virginia Department of Mines, Minerals and Energy |
| DOE | U.S. Department of Energy |
| DSCR | Debt service coverage ratio |
| DSRF | Debt service reserve fund |
| EPP | Investor Confidence Project's Energy Performance Protocols |
| ESCO | Energy Service Company |
| EUL | Effective useful life |
| IT | Information technology |
| JPA | Joint powers authority |
| LLR | Loan loss reserve |
| M&V | Measurement and verification |
| MAPA | Mid-Atlantic PACE Alliance |
| MUSH | Municipalities, Universities, Schools, and Hospitals |
| NASEO | National Association of State Energy Officials |
| NOI | Net operating income |
| OED | Utah Governor's Office of Energy Development |
| PACE | Property Assessed Clean Energy financing |
| PV | Photovoltaic (solar) |
| QA/QC | Quality assurance, quality control |
| R-PACE | Residential Property Assessed Clean Energy financing |
| SCEIP | Sonoma County Energy Independence Program |
| SIR | Savings-to-investment ratio |
| TRM | Technical reference manual |

Glossary

Enabling Legislation and Tax Mechanism

Assessment – Recording of a liability to the local government (i.e., payment obligation) in exchange for an investment that benefits the property owner – in the case of C-PACE, a property improvement usually involving energy enhancements. The assessment is secured by a lien on the property and obligates the property owner to repay the investment in the improvement.

Capital Provider – The entity that provides capital to complete a PACE-financed project. State, local, or quasi-public entities; financial institutions (e.g., banks and community development financial institutions); and specialty PACE providers can be program capital providers.

Lien – A legal right to a property in the event of non-payment of an assessment or other obligation (e.g., mortgage). A taxing authority places the lien to secure a special assessment and may assign the lien to another party.

Program Administrator – The entity responsible for PACE program implementation in concert with state and local enabling legislation and program guidelines. This may be the same entity as the program sponsor, but day-to-day program responsibilities are often fulfilled by a third-party program administrator.

Program Guidelines – The detailed operating rules and best practices of a program in compliance with state-enabling legislation. Program guidelines may be established by a public entity (or entities), by a decision-making body of public and private stakeholders, by a third-party Program Administrator, or through some combination of the three.

Program Sponsor – The entity responsible for establishing a PACE program, which may be a state office or agency, a local government, or a regional or quasi-public entity.¹

Property Owner – The person or entity that holds title to an eligible property.

Senior Lien – Gives the lienholder first claim to repayment in the event of nonpayment or foreclosure. With a few exceptions, PACE assessments are always senior to other non-tax, non-assessment liens.²

Special Assessment District – The physical area where assessments for PACE financing have been authorized. The Special Assessment District may cover an entire state, a locality, or an individual property.

Standardization – The principle of aligning PACE program design features across geographic areas to achieve consistency and economies of scale. Standardization may be achieved through the authority of state-enabling legislation or through informal coordination of stakeholders.

State-Enabling Legislation – Legislation passed by a state legislature authorizing the use of commercial PACE in the state. The legislation may be prescriptive in the program design parameters it sets out, or it may be silent on many program design parameters.

Financing Terms

Bonding – Capital for projects comes from public entities via bond proceeds, as distinct from direct funding by private capital providers. State, local, or quasi-public entities use their bonding authority to issue bonds and repay bondholders with the repayments from the PACE assessments on participating properties.

Closed Market Financing – The program relies on a dedicated provider of capital to fund PACE assessments, usually a dedicated third-party capital provider.

¹ Regardless of what entity is the program sponsor, the local government must be involved in the process.

² Although rules are state specific, C-PACE liens are generally junior to property tax liens and pari passu with special assessment liens.

Credit Enhancements – Tools that offer lenders protection against losses if a borrower defaults on its obligation or is delinquent in payment. They serve the purpose of reducing risk to capital providers and improving terms of financing (i.e., interest rate, duration of assessment). This is not a requirement of C-PACE programs and is not particularly common in C-PACE.

Determination of Project Qualification – The process – often performed by a program administrator – of reviewing project characteristics for the purpose of establishing adherence to program technical, financial and quality assurance guidelines.

Direct Funding – Capital for projects is provided by private capital providers (as opposed to bond proceeds). The capital provider's investment in the C-PACE project is secured by a financing agreement, giving it the right to receive repayments from the assessment on the property.

Financing Agreement – The written agreement between the property owner and the capital provider regarding matters related to the extension and repayment of project financing.

Mortgage Holder Consent – The process of gaining the express written consent from the mortgage holder of a property entering into PACE financing. In general, the mortgage holder is consenting to a more senior lien (corresponding to the PACE-financed project) being placed ahead of their lien (corresponding to the mortgage they hold). Also known as lender consent.

Non-Acceleration – In the event of a foreclosure or property sale, the full assessment amount is not due. If there is a foreclosure, the owner is only obligated to pay the arrearages (i.e., late payments); the subsequent owner is responsible for future remaining PACE assessment payments.

Non-Recourse – In the event of a foreclosure, the capital provider may require the local government to go to tax sale with the property securing the C-PACE obligation. But if the value of the property is insufficient to make the lender whole, the lender does not have recourse to any other assets of the property owner.³

Open Market Financing – Multiple capital providers participate to fund C-PACE projects. Some programs allow capital providers to apply to become qualified to lend through the program. Programs may prequalify an approved list of capital providers. Some programs allow property owners to arrange their own financing.

Pari passu – Different obligations are paid equally from a payment. For example, if a tax bill has a C-PACE charge and another special assessment charge, for a \$100 payment, \$50 would go to the C-PACE charge and \$50 to the special assessment charge.

Secondary Market Transactions – Capital providers with the initial rights to future proceeds from PACE assessments, also known as originators, may sell those rights (along with future proceeds) to another entity. This allows the originator to re-capitalize, or bring in additional capital, to originate more C-PACE-financed projects. Securitization is a type of secondary market transaction.

Underwriting – The process of due diligence whereby a capital provider, and in some cases the program administrator, evaluates project characteristics (e.g., financials, energy savings, possibly including an evaluation of the borrower) and makes a determination on whether the risk is acceptable. This term also may refer to the process of due diligence whereby a program administrator evaluates property eligibility and project quality assurance and makes a determination of project qualification.

³ In the same situation, a recourse loan gives the lender the right to seek compensation through other assets of the borrower if the value of the foreclosed property is not sufficient to cover the borrower's outstanding debt.

Executive Summary

Property Assessed Clean Energy (PACE) financing enables building owners to finance energy efficiency, renewable energy, and, in some states, non-energy building improvements through a voluntary special assessment on their properties. For commercial buildings, there are many benefits to using Commercial PACE (C-PACE) financing. Still, using C-PACE financing is a multi-step process and involves diverse stakeholders (see [Figure ES-1](#) for a simplified overview), and the process may vary depending on the state and policy context.

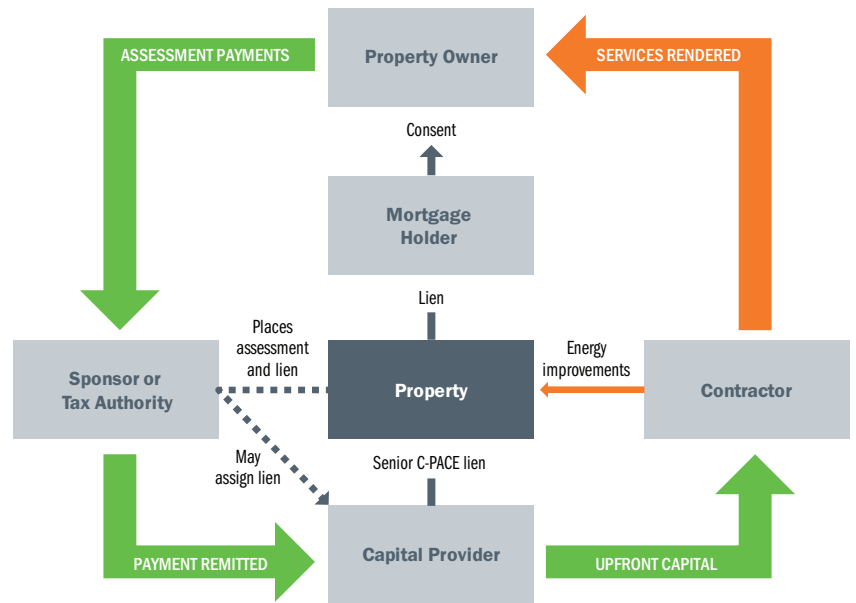


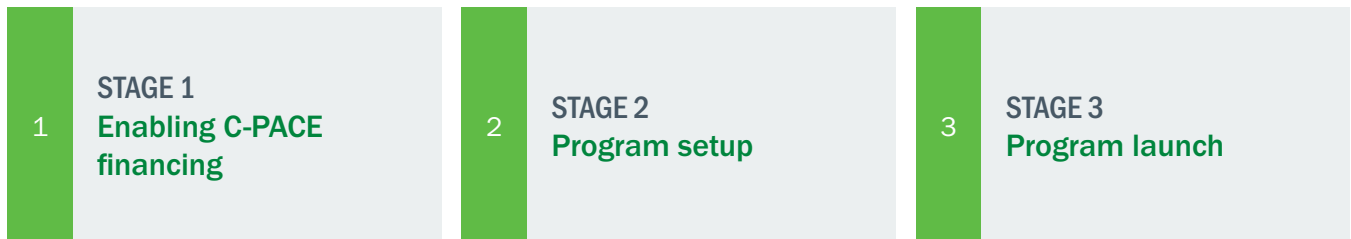
Figure ES-1. A simplified overview of the C-PACE process

Purpose and Audience

The primary audience for this report, *Lessons in Commercial PACE Leadership*, is state and local decision makers that seek an informed, objective perspective of what it takes to launch a C-PACE program. The report is specifically for those states with enabling legislation and program sponsors (i.e., state or local governments) that are looking to launch or join a C-PACE program.



The report is a starting point for understanding what approaches have worked to establish successful C-PACE programs. It examines the experience of programs across the country and provides insights for making the process smoother, and hopefully less cost and time-intensive, for new state and local governments sponsoring C-PACE programs. The report also provides a roadmap to key decision points on the path to setting up a program – the different paths taken and program models employed by those who have blazed the trail. The report is organized into three sections describing the decision points involved, options and considerations, and experience from the field:



Most existing resources on C-PACE focus on the basic value proposition of PACE financing or are based on particular state or local government structures.⁴ This report focuses on the decisions that must be made between the signing of C-PACE enabling legislation and program launch. The report also provides an update on the C-PACE market, which has moved quickly in recent years as administrative structures, funding approaches and markets evolve.

The structure of C-PACE as a special assessment can help overcome market barriers to the uptake of energy efficiency, such as owners' focus on short payback periods for efficiency projects (to maintain a positive cash flow), owner-renter split incentives and the common need to use cash to pay for a portion of the project up front. C-PACE's structure allows for long financing terms (some programs allow up to 30 years) reducing monthly payments and potentially resulting in a positive cash flow for the project. The special assessment structure allows payment obligations to be passed through to tenants under some lease structures and 100% of project costs can be financed. Since most PACE programs use private funding, it is possible to set up a PACE program without any cost, or minimal cost, for the participating municipality (PACENation n.d.). C-PACE investment can increase economic development, generate jobs, potentially increase a property's value and net operating income, and advance state and local energy goals.

To guide this report, Berkeley Lab recruited a Steering Committee largely comprised of program sponsors who have recently gone through the process of establishing a C-PACE program. Committee members shared the most important decisions they made during the set-up process and were interviewed about their experiences. Berkeley Lab also interviewed other C-PACE stakeholders across the country and conducted a literature review.

Over time, decision makers have found that the advantages of some approaches outweigh those of others, and newer programs have begun to rely on these more advantageous approaches. The report indicates where this is the case. The different models and approaches for C-PACE programs described in the report are presented as examples of different decisions C-PACE program sponsors have made, rather than as recommendations. Readers can review the implications of the various approaches and how they may or may not fit with a program sponsor's specific needs.

Decision Points Addressed

Leaders in Commercial PACE have shown different paths can be taken to launch a successful C-PACE program. Following lessons learned from these leaders, captured in this report, state and local governments can efficiently navigate the multiple decision points of setting up a C-PACE program. These decisions include:

What should enabling legislation address? (Section 1.1)

Enabling legislation provides the solid framework for how a C-PACE program can be successfully designed and structured. Important areas for legislation to include:

- Definitions and treatment of assessments
- Authorizations to set up special assessment districts, levy assessments, enforce and (potentially) assign liens, issue bonds, collect fees and engage third parties
- Requirements for consent from existing mortgage holders
- Program capitalization
- General categories of allowed improvements
- Underwriting or qualifying guidelines
- Guidelines on audits, energy savings projections, and measurement and verification

⁴ Appendix C provides a foundational list of existing resources.

What are the options for program administrative structure? (Section 1.2)

The program's administrative structure indicates what party or parties are responsible for various program administrative roles. The National Association of State Energy Officials has organized these structures into the following categories, some of which may be inherently more standardized than others.⁵ Program structures are:

- Statewide—One statewide program with one main administrator that allows local governments to opt into the program (the most inherently standardized model).
- State and local option—A statewide program coexists with local programs.
- Strategic state support—The state develops standard materials, protocols and offerings; localities use these as they see fit.
- Limited or no state support—State involvement is limited to enabling legislation; programs are locally or privately driven (the least inherently standardized model).
- Regional—Yet to be fully implemented, this model would create voluntary regional guidelines that different programs may adopt to help increase standardization.

A significant takeaway is that, regardless of program structure, even local governments with little staff capacity, funding or expertise often have options to launch a C-PACE program by joining larger programs or engaging private program administrators.

How can projects be capitalized and who can capitalize them? (Section 2.1)

- Projects are generally funded either through bonding (in which a participating bonding authority issues a bond to raise funds for a project) or direct funding (where a capital provider funds a project directly). Interviewees indicate that the market has moved toward a preference for direct funding, partly because of transaction costs involved with bonding.
- Programs can either be closed market, where one capital provider is the sole program funder, or open market, where multiple capital providers compete to fund projects. There are different approaches to the open market model which can impact competition, participant experience, cost and choice.

What and who can qualify for the program, and how can they be qualified? (Section 2.2)

Enabling legislation may lay out criteria for qualifying projects, and capital providers may have their own criteria for underwriting projects and building owners. Criteria may include:

- Financial limits (e.g., debt-service coverage ratio, combined loan to value ratio and C-PACE assessment to value ratio).
- Minimum savings-to-investment (SIR) ratio, generally a requirement that projected annual cost savings are greater than repayment installments. This can increase the net operating income of the building, attractive for both building owners and existing mortgage holders, but has transaction costs.

⁵ Interviewees noted that the C-PACE market is moving in the direction of more standardized offerings (i.e., programs in which standard materials, protocols and offerings are available for larger groups of stakeholders) and suggested that increased standardization is more advantageous for scaling C-PACE.

How are energy cost savings and other impacts estimated and documented? (Section 2.3)

Projecting and documenting energy cost savings may add costs to a project (e.g., the cost of an audit) but can demonstrate value and congruence with policy goals. Decisions may include whether to require an audit (and what level of audit) and whether to require or encourage a SIR ratio greater than one (i.e., annual savings exceed annual costs). These decisions may be complicated if C-PACE is authorized to cover non-energy saving building improvements.

What stakeholders are essential to engage? (Section 3.1)

Stakeholders should be engaged at each stage of the program process (enabling C-PACE, program setup and program launch). Strategies for engagement include websites, hosted events, informational material, direct outreach, social media, dedicated outreach staff, tax bill inserts and strategic partnerships. Important stakeholder groups to engage include:

- Community leaders – in particular, real estate and banking
- Local governments (e.g., elected decision makers and administrative staff)
- Building owners
- Contractors
- Utilities
- Capital providers
- Existing mortgage holders

What are the start-up and ongoing costs? (Section 3.2)

Unless funds are available for program start-up, those costs, along with ongoing operations costs (i.e., administrative processes, funding and quality assurance/quality control), will need to be recovered through program-generated fees. These fees may be structured as:

- One-time fees as a percentage of the financed amount (typically 0.2% to 5%)
- Annual fees as a percentage of outstanding balance (typically 0.25% to 3%)
- An “adder” to the assessment interest rate (typically 3% to 4%)
- Fees not charged as a percentage of costs (e.g., an application or title search fee)

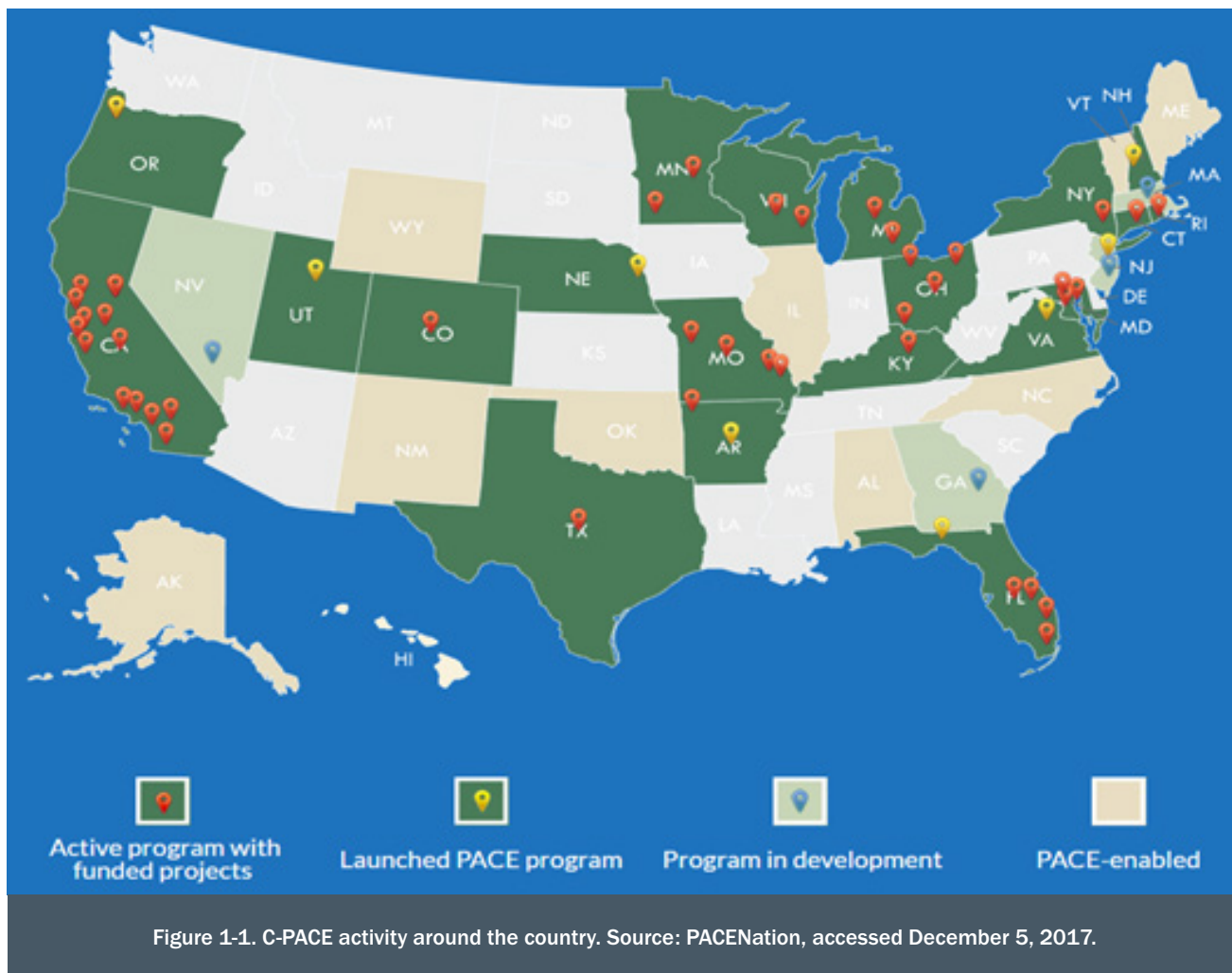
Many states have invested significant time, and in some cases taxpayer funds, to develop C-PACE programs. This report will help new program sponsors and other interested stakeholders in understanding the decisions made by entities that have launched programs and the tradeoffs involved. The lessons learned from C-PACE leaders presented in this report will allow the next generation of state and local governments to more efficiently and knowledgeably tackle the questions they need to answer.

Introduction

Commercial Property Assessed Clean Energy (C-PACE) financing has gained wide interest among state and local governments for funding energy efficiency and renewable energy projects as well as other property improvements such as seismic resiliency retrofitting (i.e., earthquake mitigation).⁶ PACE financing uses a voluntary special assessment placed on an individual property as a mechanism to repay financing extended for energy efficiency, renewable energy and other building improvements.

One or more C-PACE programs have launched or are in development in at least 22 states, with funded projects in 16 states (see [Figure 1-1](#)) (PACENation n.d.). At least \$521 million in investments have been made through C-PACE (an increase of more than 145% from a cumulative investment of \$212 million in 2015 and more than 50% from \$343 million invested as of the beginning of 2017) (PACENation n.d.).

Commercial and industrial buildings are responsible for over a quarter of primary energy consumption in the United States (EIA 2017). Efficiency improvements in these buildings could result in significant energy and utility bill savings. A number of market barriers to adopting energy efficiency must be addressed to unlock those potential savings. C-PACE can help overcome several of these barriers.



⁶ The commercial sector can be defined differently for different programs but may include commercial, industrial, multifamily and even institutional buildings such as religious and nonprofit facilities.

KEY BENEFITS of PACE for commercial buildings include (Caraghiaur, 2016):

- **Addressing common barriers to the uptake of energy efficiency**, such as:
 - *Split incentives* – Where commercial building tenants pay their own utility bills, and thus reap any efficiency savings, there is little direct incentive for building owners to invest in efficiency. Through PACE financing, costs and benefits can be shared between owners and tenants.⁷
 - *Uncertainty of tenancy duration* – Businesses do not want to over-invest in property improvements if the building will be sold before return on the investment is fully realized, nor do they want to continue paying for an improvement in a property if they sell the property. As a special assessment, PACE financing is tied to the property – not the owner – so the payment obligations can transfer to the incoming owner if the original PACE participant moves from the improved property. This transferability also supports longer loan terms.
 - *Upfront participant contribution* – Traditional bank financing often requires an equity investment by the borrower (e.g., 20%-25%), and generally covers only hard costs (e.g., costs of the installed measures), not soft costs (e.g., legal and engineering fees). PACE financing can cover 100% of both hard and soft costs for a project.
 - *Focus on short paybacks* – Property owners often require their investments in efficiency to pay back as quickly as possible to minimize the negative cash flow impact of the investment. PACE financing terms can extend to 20 years or longer, allowing smaller repayment installments than traditional loans with typical five- to seven-year terms. The resulting utility savings can be greater than the repayment installments, facilitating projects that increase net operating income (NOI).⁸ Additionally, annual or biannual C-PACE payments, as opposed to monthly loan payments, may improve project cash flow.
- **No personal or parental guarantees.** Traditional bank financing often requires a guarantee from the borrower or, for subsidiary companies, a guarantee from the borrower's parent company. C-PACE does not require personal or parent company guarantees because it is property-based financing.
- **Non-acceleration of the assessment.** C-PACE obligations do not accelerate – that is, the full assessment amount does not come due in the event of, for example, a foreclosure.⁹ If there is a foreclosure or sale, the owner is only obliged to pay the past due amount; the subsequent owner is responsible for future C-PACE assessment payments.¹⁰
- **Off balance sheet.** As a special assessment paid on the property tax bill, C-PACE arrangements could potentially garner off balance sheet treatment, meaning companies would not have to directly account for them as added debt on their books.¹¹

There are many good resources available on C-PACE (see Appendix C). Most of those resources serve as an introduction to C-PACE and its features or are specific to particular state or local government structures. However, the C-PACE market is changing quickly as different program and financing structures are gaining traction (see Appendix B), and many states have amended their enabling legislation to better align with stakeholder needs.

Establishing a C-PACE program is a multi-step process involving a number of stakeholders. The process varies significantly from state to state – and even from jurisdiction to jurisdiction – based on enabling legislation, other state laws, and program rules. State and local governments frequently ask about two very different processes: (1) How do we get a C-PACE program started in our jurisdiction, and (2) How do projects get financed with C-PACE?

⁷ This can be accomplished through a triple-net lease. Triple-net leases are arrangements in which tenants – not owners – are responsible for paying property taxes, utilities, and the lease. Since PACE financing is a special assessment that is paid back through the property tax bill, it can facilitate tenants (indirectly) paying for PACE improvements.

⁸ Net operating income is the building's revenue net of its operating expenses.

⁹ George Caraghiaur, Senior Fellow at PACENation and an expert in commercial real estate finance, believes that the three key benefits to C-PACE for commercial real estate owners and managers are: 1) non-acceleration, 2) addressing split incentives, and 3) its non-recourse nature (Caraghiaur 2017).

¹⁰ Arrearages are past due amounts that are still owed.

¹¹ Proper balance sheet accounting of C-PACE obligations can be complex and may vary based on jurisdiction or other reasons. To properly account for the balance sheet treatment of a C-PACE obligation, readers should consult an accounting professional.

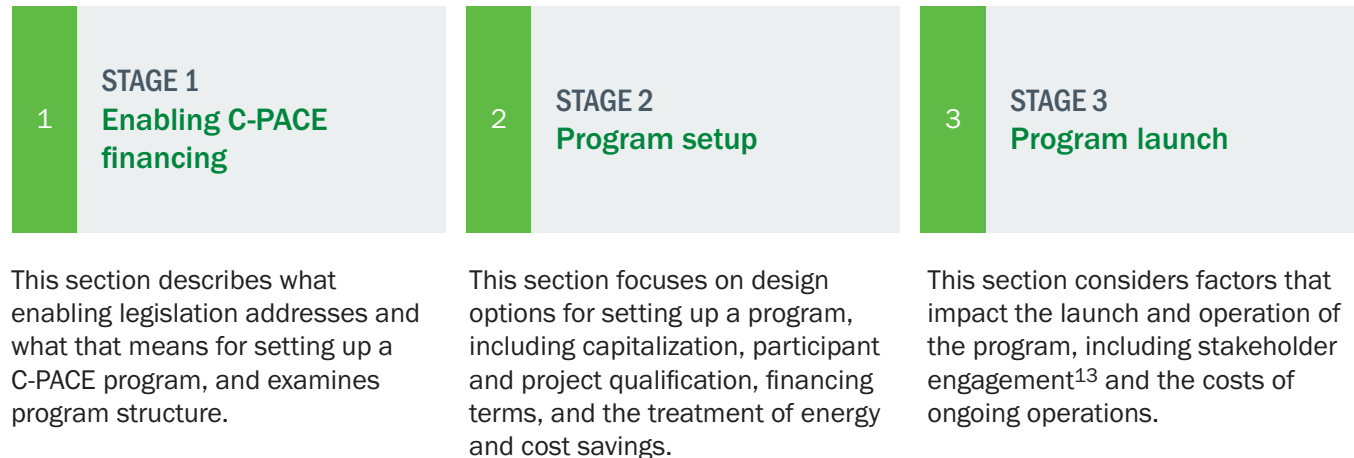
Lessons in Commercial PACE Leadership is intended to address the first question regarding creation of the *program*. Appendix A briefly addresses the second question related to execution of a *project* in terms of the project sequence and the role of various actors.

Standing up a C-PACE program involves a number of key decisions. This report provides a roadmap to navigate these decisions drawing from the experience of those who have blazed the trail. State and local governments, in partnership with private specialty firms experienced in C-PACE implementation and nonprofit leaders, have demonstrated an ability to launch various C-PACE program models. Stakeholders interviewed for this report note that certain approaches have gained prominence in the marketplace. In preparing the report, Berkeley Lab reviewed existing literature and background materials (general reports and surveys, program handbooks, enabling legislation, and requests for proposals for program administrators) and interviewed industry stakeholders (subject experts, capital providers, program administrators, and program sponsors).

The intended audience of this report is state and local decision makers that seek an informed, objective perspective of what it takes to launch a C-PACE program. Many states have adopted C-PACE enabling legislation but have discovered there is a significant amount of work post-legislation. This resource targets states with enabling legislation but no existing program; states that do not yet have enabling legislation but might be interested in adopting C-PACE with a better understanding of the long-term process and commitments; and thousands of local governments that may want to set up a C-PACE program for their jurisdiction.

Additionally, Berkeley Lab convened a Steering Committee for this report that is comprised of individuals who have been involved with the setup of C-PACE programs — both relatively new programs and those that are now more mature.¹² Steering Committee members provided guidance on top issues for program setup. In their view, stakeholder engagement and program set-up costs were the primary considerations. Members also were among those interviewed on a wide range of issues for the report and they reviewed a draft of the report.

The report is organized into three stages of program development:



Each section describes the decision points involved, lays out the options and considerations, and presents experience from the field. Appendix C provides resources for more information.

¹² See "Acknowledgments."

¹³ Although stakeholder engagement is discussed under Stage 3 – program launch – stakeholder engagement is vitally important at all stages of C-PACE program development.

1 STAGE 1: Enabling C-PACE Financing

State-enabling legislation forms the policy framework of the C-PACE program. This framework is normally a high-level description of a limited number of aspects of the program design. C-PACE programs must expand upon the details of this framework and establish guidelines on key program implementation features. Implementing the policy through defined guidelines and details is the responsibility of the program sponsor, i.e., the public or quasi-public entity responsible for establishing the C-PACE program.¹⁴ The sponsor may develop guidelines themselves, engage an advisory group to help, delegate guideline decisions to a third-party program administrator, or use some combination of these approaches, depending on specific state policy.¹⁵



1.1 What should enabling legislation address?

| What is this? | Who can do this? | What are the tradeoffs? |
|--|---|--|
| <p>Enabling legislation authorizes C-PACE financing in the state. At minimum, it creates the legal definition of a PACE assessment for that state (which may be a new concept or may piggyback on existing statutory definitions for special assessments). Because levying and collection of special assessments for public improvements are typically handled by local government bodies, enabling legislation generally describes a minimal role that local governments must play to enable PACE at the local level. Legislation may be prescriptive in the parameters it sets out or leave many program design decisions to program sponsors. It may also dictate what entity or entities are responsible for setting up the program, how the program may be structured, and how it can be capitalized.</p> | <p>The state legislature passes (and, as needed, amends) enabling legislation to establish the C-PACE policy.</p> | <p>More prescriptive legislation may provide a clearer path on specific program aspects for responsible entities and generally supports standardization of PACE in the state, but could inhibit local governments' or program administrators' ability to tailor those aspects for particular needs. Broader legislative language may be more flexible for program design, but leaves some major program development decisions to the program sponsor and may result in non-standardized programs coexisting in the same state.</p> |

¹⁴ In Texas, guidelines were developed by a group of stakeholder volunteers.

¹⁵ A limited selection of C-PACE third-party program administrators can be found online at [PACENation](https://www.pacenation.org/).

Local governments are generally authorized to finance publicly owned goods that have public benefits. Because PACE finances privately owned goods with public benefits, state legislation is generally needed to permit local governments to implement PACE programs (SCEIP 2012), often by defining and classifying certain building improvements as a public good or public improvement. The legislation that enables C-PACE in a state outlines the program design framework and sets limits on what can be done. Authorizations granted by the PACE enabling legislation usually build off of, and therefore may be somewhat dependent on, existing legislation that is not PACE-related.¹⁶

Legislation may be written broadly (allowing more flexible interpretation) or narrowly (more directive). For instance, some enabling legislation gives guidance for the entity that will be the C-PACE program sponsor, responsible for setting up the program.¹⁷ Utah is an example. Legislation in 2017 (S.B. 273) specifies that the state's Office of Energy Development will "administer and direct" the statewide C-PACE district, which municipalities can join. Cities and counties may still elect to establish their own programs (Utah State Legislature 2017). It is important for the program sponsor setting up a C-PACE program to understand what program aspects the enabling legislation has codified into law and what decisions it has left to state or local program developers to either specify in guidelines or leave to the market.

Although C-PACE enabling legislation can vary significantly from state to state, it is important to address certain program aspects (capital providers interviewed for this report noted that legislation lacking these elements has caused challenges for subsequent program efforts):¹⁸

- **Definitions and treatment of assessments.** C-PACE assessments may be given a new statutory definition or given the same statutory definition or classification as an existing statutory concept – for example, for special assessments, betterment assessments, real property taxes, etc. Either way, the definition of assessment clearly states:
 - The position (e.g., seniority) of the assessment¹⁹
 - The statutory treatment/process (i.e., remedy) if the assessment is not paid (e.g., assessment lien).²⁰ In states where this would differ among local jurisdictions, the state law should instruct local PACE regulations to address this aspect.
 - The assessment is not accelerated or extinguished in a foreclosure.²¹ This means the assessment is attached to and stays with the property – not the property owner – if the property changes ownership, even in a foreclosure, unless the seller pays off the lien first.
- **Authorization** for local government actors, state government actors, or both – to:
 - *Set up special assessment districts.* Special assessment districts are areas in which local governments can secure financing for or directly finance qualifying building improvements, by levying an assessment on properties that volunteer to participate in PACE.
 - *Levy assessments.* Assessments are obligations – secured by the property – to repay financing for qualifying building improvements.²²
 - *Enforce assessment liens.* Assessment liens may be enforced through existing processes for delinquent taxes or assessments or may be enforced through specific provisions detailed in the PACE law.
 - *Assign assessment liens.* Unpaid assessments are generally enforced through the imposition of a lien (see above definition of an assessment). The right to impose and enforce such a lien may stay with the entity that levies the assessment or may be assigned to a third party.

¹⁶ For example, laws which grant local governments the right to set up special assessment districts to raise money for publicly owned goods, such as roads, are the basis for enabling PACE special assessment districts. If an aspect such as the process for bonding is not delineated in PACE-enabling legislation, program administrators may have to rely on existing law for designing that aspect. Decision-makers should consult appropriate legal counsel.

¹⁷ In this way, legislation may implicitly give direction on what program administration structure can or should be used.

¹⁸ The capital providers interviewed suggest that if these issues are not addressed, the first step in starting a program could be amending legislation to make sure they are dealt with.

¹⁹ C-PACE assessments are typically senior to debt secured by the property. They are also typically *pari passu* or junior to all other property taxes and assessments.

²⁰ Capital providers suggested to the authors that, to participate in C-PACE programs and fund projects, they want strong legal security, and clarity and certainty about the lien enforcement process.

²¹ States without these provisions could have difficulty securing lender confidence.

²² Kevin Moyer of PACE Equity says that it is important that the assessment be treated as equal to other property tax assessments (Moyer 2017).

- *Issue bonds.* These are typically revenue bonds backed by payments from the C-PACE tax assessment. They are one option that can be used to capitalize projects. This is another way to secure a lender's C-PACE investment in a property.
 - *Collect fees to pay for program costs.* Fees help pay for non-project program costs (for more, see Section 3.2.2).
 - *Engage a third party.* Local governments are sometimes explicitly authorized to hire a third party to take on some (or most) program responsibilities, which may include facilitating financing.
- **Mortgage holder consent requirement.** Requires any existing mortgage holder to consent to a C-PACE assessment prior to the assessment being levied.
 - **Program Capitalization.** Specifies whether C-PACE financing be provided through private third parties, public bonds or both.
 - **General categories of improvements** that may qualify under the program (e.g., eligible project types and eligible building types).
 - **Underwriting or qualifying guidelines,** which may include obtaining consent from existing mortgage holders.
 - **Guidelines on audits, energy savings projections, measurement and verification standards,** and requirements for quality assurance and quality control of projects.

IMPORTANT QUESTIONS to ask about C-PACE enabling legislation

- **Does the law clearly define assessments, their position, and how they are enforced if not paid?**
- **Does the law specify or provide guidance on what entity is responsible for setting up the program?**
- **What guidance does the law provide on how the program should or can be structured?**
For example:
 - Is state-level administration authorized or required?
 - Is multijurisdictional or inter-local administration allowed – i.e., multiple local governments joining together to run a program or running a program through a joint administrator? If so, what powers do those administrators have (e.g., can they levy assessments, assign liens, or issue bonds)?
- **How can funding be raised?** For example:
 - Is bonding authorized? If so, by whom?
 - Can private capital providers participate? If so, can multiple providers participate?
- **What measures are eligible for C-PACE financing?** Are both energy and non-energy measures eligible? Are both existing building retrofit and new construction financing eligible?
- **What criteria must a project meet to qualify for C-PACE financing?** For example, must cost savings from the project be equal to or greater than the project cost?²⁴ What level of quality assurance is mandated? What requirements must program administrators comply with – e.g., requirements for producing forms and holding public hearings?

²³ Some enabling legislation may be unclear on this point. In Virginia, alleged lack of clarity has led to differences of opinion over whether statewide program administration is authorized (Farrell 2017).

²⁴ Requirements that cost savings be greater than project costs are commonly referred to as savings-to-investment ratio greater than one (SIR > 1).

Where decision-makers have realized that certain aspects of the program could be improved, they may recommend amending the enabling legislation or may work with legislators to update or pass new legislation. For example, enabling legislation in Connecticut initially only allowed a lien to be placed once project construction was complete. This significantly impeded project flow. Legislative amendments modified the requirement to enable lien recording upon execution of the financing agreement (for more see “Lessons from the field,” Section 2.1.3) (Lombardi 2014; McCarter 2017). Other examples of amendments to enabling legislation include (Clean Energy Solutions 2016):

- **Simple clarifications.** In addition to other changes, Colorado used legislation subsequent to initial C-PACE authorization to clarify notification requirements, utility rights, and bond approvals.
- **Adding categories of measures that are eligible under the program.** California amended legislation to allow water efficiency measures to qualify under C-PACE.
- **Changing how programs may be capitalized.** Utah added third party private financing options through an assignable lien to its program to overcome a challenge in its initial legislation which *required* municipal bond issuance.
- **Amending qualification criteria.** In September 2017, New York increased its allowed loan-to-value ratio (LTV) from 10% to 35% of the property’s value (Energize NY PACE 2017).

C-PACE program sponsors should understand what enabling legislation has empowered a jurisdiction to do or how it has limited what it can do. This significantly impeded project flow and legislative amendments were added to modify the requirement to enable lien recording upon execution of the financing agreement (for more see ‘Lessons from the field’ Section 2.1.3) (Lombardi 2014, McCarter 2017).

C-PACE program sponsors should understand what enabling legislation has empowered a jurisdiction to do or how it has limited what it can do.

LESSONS FROM THE FIELD

Prescriptive vs. flexible enabling legislation – A survey by Clean Energy Solutions of enabling legislation in 13 jurisdictions with C-PACE programs found that many common features, such as financial underwriting and categories of eligible measures, are generally prescriptive (forming the framework within which the sponsor develops the program), whereas others – marketing, financing, contractor management, and documentation of projects – are generally flexible, determined by participating localities (Clean Energy Solutions 2016). These decisions form the guidelines that sponsors will have to make themselves or delegate.

Amending legislation – A 2013 law in Colorado created a statewide C-PACE district, adding to 2010 legislation that created one for residential PACE. C-PACE program administrators found that several areas of the amended law, such as provisions for tax collection, were problematic. The legislature provided for amendments in 2016 that removed the prescriptive tax collection language, instead referring to existing laws (Scharfenberger 2017).

1.2 What are the options for program administrative structure?

| What is this? | Who can do this? | What are the tradeoffs? |
|---|---|---|
| <p>The program’s administrative structure dictates who can and will be responsible for different aspects of program administration. The responsible entity may manage some or all program administration roles, may share roles, or may hire third parties to fill certain roles.</p> | <p>Program administration may be managed by a state government agency, local governments (including two or more acting together or through a third party), a quasi-governmental agency, private entities, or nonprofit organizations. Some programs may fill different roles with different entities (see Table 1-1).</p> | <p>Benefits of certain structures may include economies of scale, the benefits of standardization, lower costs, reduced staffing needs, performance risk sharing, and alignment of tasks with available skills and capacity. Tradeoffs may include less local input and less flexibility for local needs, local nuances, and local goals.</p> |

Enabling legislation implicitly or explicitly frames a program’s administrative structure, and the program sponsor will need to work out the details in setting up a program consistent with the respective state statute. The National Association of State Energy Officials (NASEO) has organized the different models of C-PACE administrative structures based on the level of involvement of state government actors (e.g., state energy offices, green banks) and the flexibility afforded to local government participants. NASEO’s report lays out four models of C-PACE program structures currently in use: 1) statewide model, 2) state and local option program model, 3) strategic state support model, and 4) limited (or no) state support model (NASEO 2016). Additionally, at least one set of stakeholders is developing a regional model (see [Table 1-1](#)).

1.2.1 Implications of program structure

A key decision involving program structure is which stakeholders take on which responsibilities, to the extent these are not specified in enabling and other relevant legislation. There are a range of start-up and operating responsibilities that may fall on local governments depending on what program model is in place.

Enabling legislation dictates whether there is a statewide program structure and whether local governments will be able to establish their own program or will have to go through a statewide program. If no statewide program is available, local governments can launch and manage their own programs. They may take on all program responsibilities using their own internal capacity, may contract most or all program responsibilities to a private or nonprofit third party PACE program administrator, or may share program responsibilities with a third party program administrator. If available, they may be able to join a multijurisdictional or inter-local program, where multiple local governments participate in a program – or programs – offered by an organizing entity such as a joint powers authority or port authority. Local governments may also be able to ride on a cooperative procurement agreement that another local government has entered into with a C-PACE program administrator. The option to ride on another local government’s cooperative procurement agreement may be a function of existing state procurement legislation, or the option may be available as a result of the enabling C-PACE legislation. Arlington, Virginia, has set up a cooperative procurement agreement with a third party C-PACE program provider (Arlington County PACE Program 2017). Other local governments in the state are contemplating using the cooperative procurement agreement, which would mean they would not have to go through a request for proposals process, although they would still have to negotiate contract details with the program administrator.

1.2.2 Program structure options

[Table 1-1](#) compares different program structures. This organization is adapted from NASEO's 2016 report, *Accelerating the Commercial PACE Market*.²⁵ The categories are not strict characterizations of the different structures. Some programs may have features of more than one category and they may change over time.

Table 1-1. C-PACE program administrative structures (adapted from NASEO 2016)²⁶

| Model | Description |
|------------------------------------|--|
| Statewide | <ul style="list-style-type: none"> One statewide administrator (government agency or affiliated entity); may hire a third party to take on some or many of the program administrator roles Local governments opt into the statewide program; there are no locally-administered programs. Structure directed by enabling legislation Colorado, Connecticut, Rhode Island and Utah are examples of states using this program structure. |
| State and local option | <ul style="list-style-type: none"> Statewide program coexists with locally- or privately-administered programs Structure directed by enabling legislation (often allows multijurisdictional or joint programs) Implementation may or may not be statewide but is open to any locality that opts in. Michigan and New York are examples of states using this program structure. |
| Strategic state support | <ul style="list-style-type: none"> State gives guidance (e.g., technical assistance, model forms) to local and private program administrators Following the state guidance is not required; programs can access resources developed at the state level or operate as they see fit State agencies or state-level actors may be involved in stakeholder engagement. Texas launched under this structure and a number of other states have expressed interest. |
| Limited or no state support | <ul style="list-style-type: none"> No (or limited) state-level involvement Programs are locally- or privately-driven California and Ohio are examples of states using this structure. |
| Regional | <ul style="list-style-type: none"> Programs from multiple states collaborate to coordinate program standards across states. The Mid-Atlantic PACE Alliance – Maryland, Virginia, and Washington, D.C. – are in the process of coordinating for consistency across multiple programs in the three states. |

These different structures broadly fit on a spectrum that runs from more standardization to more diversity in various program aspects (see [Figure 1-2](#)). The main tradeoffs are the ability to tailor program design to address local needs, which structures allowing more local administration may facilitate, versus the efficiencies of lower costs and standardization that programs administered at higher levels may offer.²⁷

²⁵ For more on *Accelerating the Commercial PACE Market*, see https://naseo.org/data/sites/1/documents/publications/CLEAN_Master%20NASEO%20PACE%20Memo%202016-5-18%20FINAL.pdf.

²⁶ Appendix B provides a quick glance at program structures in use today with roles that the state plays and options for local governments under different structures.

²⁷ Specialty PACE capital providers engaged in the development of this report noted that standardization (or “uniformity”) is a top priority that they feel supports program success along with efficiency and financial sustainability.

The spectrum of existing C-PACE program structures.



Figure 1-2. The spectrum of existing C-PACE program structures. Certain structures may be fundamentally more standardized.

In the **statewide model**, C-PACE programs are run at the state level by a state entity, a quasi-state entity such as a green bank, or a third party. In this program model, local governments can only participate in C-PACE by opting into the statewide program. The functions of administration are handled at the state level, but some or all of the mechanisms of the financing process (e.g., levying assessments and servicing the C-PACE obligations) may be handled by either the state-level program administrator or by the local government in partnership with the state administrator.

Under the **state and local option model**, local governments may participate in C-PACE without joining the statewide program by setting up their own programs. In practice, local governments may have little incentive to take on the costs and capacity demands of standing up their own program if there is a statewide program available that will take on some or most of those responsibilities and costs.

In the **strategic state support model**, local governments may develop their own C-PACE program, but standardized statewide protocols and materials are available. In Texas, where this model is most mature, a nonprofit program administrator is available to run the standardized program. To date, 15 local governments offering C-PACE are using this model and the standardized processes and materials developed in the [PACE in a Box toolkit](#) (Heydinger 2017). Using this model reduces the burden on local governments to three primary responsibilities: 1) recording the lien on the property, 2) notifying property owners of their C-PACE repayment responsibility, and 3) collecting past due assessments. Texas's approach effectively furnishes a program that local governments can opt in to, letting them participate in C-PACE with minimal cost or effort on the part of local government staff.

The **limited or no state support model** gives local governments authority to set up C-PACE special assessment districts. The state has little or no other role. California, to date the largest C-PACE market, uses this model. Some local governments (e.g., Sonoma and Placer Counties) have developed and run their own C-PACE programs. Simultaneously, a number of joint powers authorities (JPAs) work with local governments across the state managing PACE programs, generally overseeing multiple private, third party program administrators who agree to follow the program guidelines of the JPA sponsor.²⁸ Local governments have the ability to opt into a JPA-managed C-PACE program.

The **regional model** structure is complementary to the models above and has yet to be implemented. The one market that is developing this program structure — the Mid-Atlantic PACE Alliance (MAPA) in Virginia, Maryland, and Washington, D.C. — will produce regional guidelines and marketing material that would give the state and local programs a path towards regional standardization. The guidelines would be voluntary and would not prevent states or local governments from developing their own program guidelines and protocols (Farrell 2017). This is not an enforceable agreement or program, but rather a collaborative approach to networking and collaborating across states to provide consistency across respective PACE programs. The goal is a larger, more seamless market which provides a strong signal to lenders, building owners, and energy services contractors and accelerates market adoption.

²⁸ JPAs are administrative structures designed to help local governments achieve economies of scale in certain administrative duties. In California, for example, they are authorized to issue bonds on behalf of the local governments and can provide this service for C-PACE programs. Issuing bonds is required under California PACE rules.

1.2.3 Roles and standardization

Because assessments, like property taxes, are levied at the local level, local governments have a role in each of the models outlined above, which may range from very minimal (e.g., establishing a C-PACE special assessment district, recording liens), to full administration of the program. Local governments have two basic choices in terms of how to participate:

1. **Run the program at the local level**, either administered by the local government as in the case of the Sonoma County Energy Independence Program (SCEIP), or with help from a third party program administrator as with Set the PACE St. Louis, or through a combination of these two approaches.
2. **Opt-in to a larger program** such as a statewide program; join other local governments using third party administrators (e.g., through a JPA, as many have done in California, or through a cooperative procurement agreement in which one local government contracts with a program administrator and other local governments use that same agreement to hire an administrator for their jurisdictions); or use a common program administrator applying the same general program options and guidelines (e.g., local governments that use Texas PACE Authority, a nonprofit program administrator).

Opting into a larger program or using a common program administrator offers standardization of program features. [Table 1-2](#) lists benefits of standardization for different stakeholders.

Table 1-2. Benefits of standardization for different stakeholders

| Stakeholder | Benefits |
|------------------------|---|
| Contractors | Those working across multiple jurisdictions only have to understand one C-PACE process. |
| Building owners | Owners with properties in different jurisdictions need only be familiar with one C-PACE process. Those with buildings in more than one place can take advantage of economies of scale, closing multiple projects in different localities under the same program. |
| Capital providers | Standardized products are easier to sell (i.e., more liquid) to secondary markets; due diligence costs are lower if paperwork and analysis is in a consistent format; it is easier to develop a set of comparable projects against which new projects can be evaluated. |
| Program administrators | There are greater efficiencies and economies of scale (e.g., costs for developing forms, contract templates, and marketing collateral can be spread over a larger customer base). |
| Local governments | The ability to opt in to a larger program allows the local government to shed some (possibly most) administrative responsibilities. |

1.2.4 Local Legislation

Because of the necessary and special roles of municipalities *vis-a-vis* assessments and the desire to make PACE optional for municipalities, after a state adopts enabling legislation, additional legislative action from the local government is usually required to enable PACE at the local level. In some cases, this may be as simple as passing a resolution to opt into an existing statewide or multijurisdictional program. In other cases, the state PACE law may instruct municipalities to pass a local law or ordinance addressing specific issues that should be clarified at the local level. In this case, municipalities often work together or with a third party to craft a standard form of local law that can readily be adopted by any local government, whether they opt into the same program administrative structure or not. In some states, local government processes may vary from jurisdiction to jurisdiction, which may make standardization inappropriate for those aspects of a C-PACE program.

LESSONS FROM THE FIELD

California and Connecticut. The two markets with more C-PACE investment volume than any other, California (started in 2009) at \$195 million and Connecticut (started in 2013) at \$101 million have used program structure models at the extremes of the standardization spectrum (PACENation n.d.).²⁹ Connecticut and California collectively account for 57% of the total C-PACE market in terms of financing volume (PACENation n.d.).

- California’s approach to C-PACE leaves development of programs to local governments with minimal state-level involvement – the limited or no state support model. The state has produced about 40% of the nation’s C-PACE volume (\$) to date. The market has seen a mix of local governments either develop their own programs or join JPAs that use private providers to run C-PACE programs. At least one local government, Sonoma County, employs both approaches. The SCEIP is a county-run program that is one of the most successful in the country in terms of number of projects completed. To expand consumer choice and funding capacity, to sustain program growth, and to help meet the county’s aggressive goals for reducing greenhouse gas emissions, Sonoma decided to use the County of Sonoma Public Financing Authority, a JPA, to allow private PACE providers to offer programs alongside SCEIP.³⁰
- The Connecticut Green Bank, a quasi-state agency, sponsors the state’s C-PACE program and uses a third party to assist with project origination and program technical administration to comply with the Connecticut legislation’s project technical review requirements. The Connecticut Green Bank oversees the program design, marketing, project approval and financial underwriting processes; local governments record the assessment, collect and remit the repayments, and assign the benefit assessment.³¹ The structure reduces local staff needs and can mitigate default risks for localities (NASEO 2016).

Texas. In Texas, local governments are given broad autonomy as to how they set up their C-PACE program, with few required statewide procedures. However, with 254 counties and 1,454 local governments authorized to establish PACE programs, stakeholders knew standardization across programs would be important to the success of C-PACE (U.S. Census Bureau 2013). A nonprofit program administrator offers standardized materials and protocols (called “PACE in a Box”) and will run programs for local governments by request, including recording assessments. The result is that C-PACE in Texas is fairly standardized and centralized, allowing stakeholders across multiple jurisdictions to know what to expect when they participate in C-PACE (Heydinger 2017).

²⁹ Interviewees note that California is a much larger market than Connecticut and has been running C-PACE programs longer than Connecticut has. As a result, comparing the total investment of each does not give an apples to apples comparison of program penetration.

³⁰ Municipalities in Sonoma County can opt into the PACE programs offered by the Sonoma Public Financing Authority JPA.

³¹ Benefit assessments (or special assessments) are charges that local governments or other authorized entities record on individual property parcels to pay for public goods.

2 STAGE 2: Setup and Program Guidelines

Within the legislative framework, the program sponsor develops program guidelines. Many engage third party program administrators to manage at least some aspects of program operations. Third-party program administrators may also be tapped to assist or lead in fashioning these guidelines, which could shift significant work away from the sponsor. However, there are several reasons sponsors may want to lead the effort of establishing guidelines or be closely engaged in the process:

- They may be statutorily obligated to write program guidelines.
- They have been provided a budget to stand up the program and administer the day-to-day activities.
- They may prefer to have autonomy over the guideline development.
- There may be unique program aspects that are outside the competencies of the program administrator which the sponsor will handle.



This section provides an overview of the common decision points a program sponsor will have to consider when setting up a C-PACE program and the options available. The collective set of decisions made by a program sponsor through either development of program guidelines, or delegation of program operations to a third party administrator, constitute the program set-up stage. Decision points discussed below include project capitalization, qualifying properties and measures, and estimation and documentation of energy and cost savings.

2.1 How can projects be capitalized and who can capitalize them?

| What is this? | Who can do this? | What are the tradeoffs? |
|---|--|--|
| <p>Capitalization refers to raising funds for C-PACE projects. There are three important aspects of capitalization: 1) the funding mechanism (i.e., how capital is raised), 2) the capital provider (the entity that provides capital), and 3) the funding process (i.e., how capital is provided). Enabling legislation may dictate any or all of these.</p> | <p>Federal, state, and local governments, quasi-governmental entities, financial institutions (e.g., banks and community development financial institutions), and specialty PACE capital providers can provide capital. The funding process usually involves the building owner, capital provider, local government, or the special assessment district that covers the project, as well as the holder of the existing mortgage on the property. It also may involve the program sponsor or the program administrator.</p> | <p>Different financing structures have different costs and benefits in terms of expense (both cost and staff capacity), sustainability, timing of funding disbursement, lender involvement, and program administrator involvement.</p> |

Decisions about capitalization may have critical impacts on a C-PACE program. Decisions include whether the program should raise capital through bonding or direct funding, whether to allow multiple capital providers to participate or just one, how to structure the funding process to make it work best for building owners and other stakeholders, whether to include credit enhancements, and how to engage with utility incentive programs. Program administrators, to avoid negative reaction from local or national bankers associations, should require that existing mortgage holders provide consent for a building to participate in C-PACE.³²

2.1.1 Funding mechanism

The two main ways C-PACE projects are funded are direct funding and bonding.³³ Most new C-PACE programs rely on direct funding.

Direct funding. Under this approach, capital for projects is raised directly from capital providers (i.e., lenders). The lender's investment in the C-PACE project is secured by a financing agreement giving it the right to receive loan repayments from the assessment on the property (PACENation n.d.). This avoids bonding transaction costs and may be faster than bonding. While national specialty lenders have not shown strong interest in smaller projects (e.g., those less than \$100,000), they have been funded in Connecticut by the state's Green Bank and by small, private community development financial institutions, and other nonprofit institutions in select markets.

Bonding. Revenue bonds issued by an authorized entity, such as a local government or a JPA, are used to capitalize C-PACE projects. Some entities, such as a statewide C-PACE program administrator, derive their authorization to issue a bond through enabling legislation.³⁴ When a bond is issued, a tax assessment is recorded on the property (or properties in cases where the bond is funding multiple projects). Bond proceeds are paid back through the tax payments remitted by the property owner. The bonding process typically has high transaction costs. For example, each issuance has legal, sales, and financing costs. It also can be time-consuming, lasting 30 to 90 days (PACENation n.d.). Thus, bond issuance is usually reserved for raising larger amounts of capital. To justify these transaction costs, bond issuances may need to be \$500,000 or more.

C-PACE bonds are issued in two ways (programs that use bonding may employ both):

- **Single issue.** If a project is large enough that transaction costs are proportionately small, a bond may be issued for a single project. Typical costs for bond issuance range from about \$15,000 to \$25,000 (McCarter 2017). For large projects, this might not be a significant portion of the overall project costs. For example, on a \$2.5 million project, \$25,000 in bonding costs would only be 1%.
- **Pooling.** If a project is small enough that the costs of a single issuance would not make sense, the issuing entity may aggregate ("pool") applications for projects until there is sufficient dollar volume to justify issuing a bond. Pooling can spread out overall transaction costs and allow smaller projects to participate. However, it can also add uncertainty and delay for projects that need funding. It may take significant time to gather sufficient project volume to issue a bond, with the possibility that a sufficient volume of projects may not materialize.

³² Multiple stakeholders noted the importance of obtaining existing mortgage holder consent for C-PACE. DOE notes that commercial mortgages generally include a "due on encumbrance" clause that allows the mortgage holder to call the loan due if the property is used to secure additional debt. Further, this clause and the complexity of commercial mortgages are reasons that nearly all C-PACE programs require that participants obtain written consent from their mortgage holders (DOE 2013). A PACENation survey of mortgage lenders found that they do not generally oppose C-PACE but do support consent requirements (PACE Now 2014).

³³ George Caraghiaur notes that PACENation's check list for legislation includes allowing programs to access project capital from as many sources as possible, including any funds legally available to the sponsoring government; municipal bonds (taxable or tax-exempt), in conjunction with any source of credit enhancement; and funds provided directly by a third party.

³⁴ Project revenues provide the backing for revenue bonds (Investopedia n.d.). Revenue bond holders have no recourse to the full faith and credit of the issuing institution. Bonds may be bought by the general public, or by a single buyer or a limited group of buyers through a private placement. The buyers of the bonds are the ultimate capital providers for these projects.

2.1.2 Capital provider

Entities that provide capital for C-PACE programs include specialty capital providers (financing companies that specialize in PACE financing or have divisions devoted to PACE), financial institutions (e.g., regional banks, community development financial institutions, and commercial banks) and governments. For some projects, especially larger projects, multiple capital providers may be involved.

- **Specialty capital providers.** There are a growing number of firms that specialize in providing capital for C-PACE projects. These may be firms that were created to provide capital for C-PACE projects or dedicated C-PACE financing branches of larger firms.³⁵
- **Financial institutions.** Banks and other financial institutions may be interested in lending to C-PACE projects. Participation by local or regional banks can allow them to benefit from business generated through the program and stimulate local economic activity. Banks may not be familiar with C-PACE financing and may be concerned about the liquidity of C-PACE arrangements (i.e., how easy they are to sell and get off their books in order to replenish available capital and maintain their capital – and other regulatory – requirements), although a recent securitization comprised exclusively of C-PACE assets shows that secondary market sales that provide liquidity are possible (PR Newswire 2017).
- **Governments.** Governments can provide capital for a C-PACE program in five ways: 1) issue bonds, 2) use general funds, 3) use grant money, if available, 4) borrow from other agencies, or 5) collaborate with another type of capital provider. For example, for SCEIP, the county issues bonds and borrows from its other county departments. The Connecticut Green Bank, a quasi-governmental institution, has used its own funds to capitalize projects.³⁶





Entities that provide capital include specialty capital providers, financial institutions and governments.

[Table 2-1](#) shows that existing C-PACE programs have generally used one of two models to source capital for C-PACE projects: closed market or open market. A closed market relies on one capital provider. Open market programs allow competition among capital providers.

³⁵ Search specialty PACE capital providers online at [PACENation](#).

³⁶ In addition to providing capital for C-PACE projects, both Sonoma County and the Connecticut Green Bank also use private providers of capital, although Sonoma does so through a second PACE offering, not SCEIP.

Table 2-1. Closed and open market C-PACE programs

| |  CLOSED MARKET MODEL |  OPEN MARKET MODEL |
|---------------------------------|--|--|
| Definition and mechanics | The program relies on a single provider of capital to fund PACE assessments, usually dedicated third party capital. | Building owners can choose among multiple participating capital providers or seek a provider on their own. Capital providers may apply to become qualified to lend through the program. Programs may prequalify a list of lenders, and some allow building owners to arrange their own financing. |
| Advantages | <ul style="list-style-type: none"> • If government funds are available, the program may be able to set attractive terms, such as interest rates and closing fees. However, if a single third party capital provider is used, the terms may be set with no competition to inform them (SRS 2017). • Oversight and coordination can be easier. • All projects above a minimum finance amount that meet program underwriting criteria can be funded. | <ul style="list-style-type: none"> • Creates competition which is attractive to building owners and allows them to negotiate best market-based terms. • May provide building owners a better chance to find a provider interested in funding their project. • Can allow first mortgage holder (or other lender a building owner has a relationship with) to capitalize the C-PACE project • Can accommodate owner-arranged deals • Having more lenders means increased marketing, education and capital available for a broader range of project types and sizes. |
| Disadvantages | <ul style="list-style-type: none"> • Does not take advantage of competition to realize most efficient packages for participants and can result in higher rates, fees, and program costs • Potential pool of capital may be smaller and less sustainable than accessing larger capital markets • May limit breadth of project types and sizes | <ul style="list-style-type: none"> • Small projects potentially may not attract the interest of any lenders, although as the market matures financing smaller projects, e.g., less than \$100,000, are becoming more feasible. • May require more staff time to recruit and prequalify lenders and coordinate projects |
| Examples | <ul style="list-style-type: none"> • The less common model among state and local programs • Placer County, California • Multiple programs administered in Florida | <ul style="list-style-type: none"> • The more common model among state and local programs • Multiple programs including Connecticut, Texas, and Michigan |

The market trend is that recently established C-PACE programs use the open market model. Although in all open market arrangements the property owner may select the capital provider, how this is done varies widely, affecting both the level of choice provided to the property owner and the role of the administrator. Approaches include:

- Program administrators work with lenders selected by the property owner;
- Program administrators prequalify capital providers and allow property owners to apply to prequalified lenders;
- Program administrators list some capital providers – without preference – as examples for property owners that do not have relationships with capital providers, while also working with other capital providers selected by property owners;
- Program administrators may allow the participation of multiple capital providers but have one “preferred” provider that acts as a back stop to invest in projects that no other capital providers are willing to fund;
- Multiple program administrators, each furnishing capital themselves, participate in a C-PACE offering.

Some program models include more than one of these approaches. These different approaches could impact competition in the market and program participants’ experience, cost and choice.³⁷

2.1.3 Funding process

The funding process consists of three steps: 1) determining the source of funding, 2) determining how the funding is disbursed for the project, and 3) determining how it is subsequently repaid. The following are two important aspects of the funding process:

- **Who services the PACE assessment?** Local governments typically provide these services. Property tax collectors bill PACE participants, collect the assessment payments, and remit the payments to the capital provider. This process is designed to leverage the existing local agency property tax collection process and minimize incremental staff effort. More recently, some state programs have been authorized to take on some of these roles (e.g., Colorado, Rhode Island), freeing local governments of these responsibilities (McCarter 2017). In some cases, state programs or third parties have been given authority to levy assessments and collect payments. Some programs have begun allowing participants to repay lenders directly, sidestepping the tax collection process altogether while retaining the underlying delinquent tax assessment collection mechanism (e.g., Texas) (Heydinger 2017).³⁸
- **Timing of the funding process.** The timing of recording assessments, placing liens and disbursing funds can have significant consequences for a project. Some programs may have requirements, possibly codified in legislation, that project work be complete before the assessment can be recorded, before funds can be disbursed, or both. Either of these scenarios could make a C-PACE project untenable. Commercial energy efficiency projects could last three to six months or longer, especially in the case of new construction. If C-PACE funds cannot be disbursed until work is completed, the contractor will need to front the money or the building owner will have to secure bridge funding – which either party may be unwilling or unable to do. If a lien is not recorded on the property during the construction period, it puts the lender at risk because they have no security in the property during that time. This may deter lenders.

³⁷ Open market competition could also extend to the provision of some program services (e.g., forecasting project savings). Eventually, in mature markets with a clear, solid program framework and common rule book, an open market model could even potentially include competition among qualified program administrators.

³⁸ According to Brian McCarter at SRS, a C-PACE program administrator in several states, in the last year many lenders have been warming to the idea of lender-direct billing and collections (McCarter 2017).

LESSONS FROM THE FIELD

Closed market models. Early C-PACE programs in California tended to be closed market models. More recently, program sponsors are predominately launching open market models for a variety of reasons (see discussion of relative advantages above).

Open market models. A number of programs, such as the statewide C-PACE programs in Colorado, Connecticut, Rhode Island, Michigan, Utah, Texas and GreenFinanceSF in San Francisco, are using the open market model. Almost all of these also allow owner-arranged financing (Utah Clean Energy 2014).

Timing issues. Some programs have managed workarounds for challenges with lien and fund disbursement timing. For example, the Connecticut Green Bank found that construction period risk was a major barrier for lenders. Originally the C-PACE statute in Connecticut only allowed the lien to be recorded on the property once project work was completed. In response, the Green Bank decided to use its own funds, raised through the Regional Greenhouse Gas Initiative, to fund projects, with the goal of eventually selling the C-PACE loans to capital providers and revolving the money for additional loans (Lombardi 2014).

Pooling. In Phase 1 of Ann Arbor's C-PACE program, the program was capitalized using bond funding with a pooling approach. Once the program administrator had pooled \$540,000, it issued a bond. Organizing sufficient project demand to issue the bond took one and a half years, highlighting a limitation of the pooling approach (Utah Clean Energy 2014). The pooling model might be quicker for larger projects (which may offer larger dollar volume for bond issuance), but may cause significant delays for smaller projects.

2.1.4 Credit enhancement

A number of programs (e.g., New York, San Francisco, Ann Arbor, Connecticut, and Sonoma County) have chosen to provide a credit enhancement for their programs (Utah Clean Energy 2014). Broadly defined, credit enhancements are tools that offer lenders protection against losses if a borrower defaults on its obligation or is delinquent in payment (SEE Action 2014). In return, lenders may offer a lower interest rate or may be willing to, for example, use more flexible criteria in qualifying an applicant. C-PACE programs have used a number of credit enhancements:

- **Debt service reserve fund (DSRF).** A DSRF is a pool of funds designed to cover a lender when a borrower is delinquent on payments. Once payment is made, funds are returned to the debt service reserve fund. San Francisco, for example, offers a DSRF equal to 10% of the assessment, made possible through an earlier federal grant.
- **Loan loss reserve (LLR).** LLRs are pools of funds that lenders can tap to recover some portion of losses in the event of a default. The Energize New York C-PACE program has a \$1 million LLR.
- **Gap financing.** The Lean & Green Michigan C-PACE program has worked with Michigan's Economic Development Corporation to provide "gap financing" to help potential participants who have a lender interested in their project but who do not have adequate credit or collateral (Utah Clean Energy 2014).
- **General or moral obligation.** Placing a general or moral obligation on bonds used to capitalize C-PACE projects basically gives the lender (the bondholder) a payment guarantee by the issuer. It may improve the credit quality of the bonds or the loan, but it counts against the government's debt limits and can impact the government's credit (DOE 2013). This is rarely done in C-PACE programs.

Some programs may build up reserves for a credit enhancement (e.g., through fees), while others may use grant money or partnerships to offer them. For lenders, credit enhancements can make a C-PACE program or individual project more attractive. Administrators of self-financed programs may use them as a tool to manage the risk that participants will be delinquent or default on their C-PACE obligations. Credit enhancements are not a requirement to implement a C-PACE program.

2.1.5 Interaction with existing incentives

Utilities in most states run energy efficiency incentive programs that offer rebated or free energy audits and other energy measures. These audits can help in the initial stages of a C-PACE project. Incentives can help buy down project costs, making projects more attractive and potentially making it easier for projects to pencil out as cash flow-positive, which is often important for the property owner, or may be required by the program.

Some C-PACE programs, such as GreenFinanceSF in San Francisco and SCEIP in Sonoma County, coordinate closely with utility incentive programs or encourage participants to use these programs (Utah Clean Energy 2014, Clean Energy Solutions 2016). Partnering with utility programs can be a significant channel for marketing the C-PACE program. Additionally, the cost-effectiveness tests used to qualify efficiency measures for utility incentive programs and quality assurance/quality control steps taken by these programs could be useful for C-PACE programs.

LESSONS FROM THE FIELD

C-PACE programs incorporate outside incentive programs in different ways. For example (Utah Clean Energy 2014):

- **Connecticut** - Utilities offer free commercial-grade audits.
- **Rhode Island** - C-PACE program administrator Sustainable Real Estate Solutions (SRS) collaborates closely with National Grid, the largest utility in the state, to coordinate with the utility’s incentive programs (SRS 2017).

2.2 What and who can qualify for the program? How can they be qualified?

| What is this? | Who can do this? | What are the tradeoffs? |
|---|---|---|
| <p>Qualification guidelines determine which properties, building owners and projects qualify, and what improvements are eligible for C-PACE financing. Capital providers may use additional criteria – financial underwriting – to determine whether or not to lend for a specific project.</p> | <p>Program administrators determine if projects are qualified for C-PACE financing based on enabling legislation, program guidelines, and contractual agreements with the program sponsor. Capital providers financially underwrite projects.</p> | <p>Qualification criteria could impact other aspects of a C-PACE program (e.g., if non-energy measures like wind hardening are allowed, it could impact how project savings are approached). Underwriting approaches across programs tend to be similar, but flexibility in some rules may allow more access to C-PACE funding with potential impacts on overall performance of the C-PACE portfolio. Using a third party for technical and financial underwriting could reduce C-PACE program staff needs.</p> |

Program qualifications fit into three categories: 1) qualifying properties, 2) qualifying building owners and projects, and 3) qualifying improvements (or eligible measures). Program sponsors may want to focus on a target category of properties, may be required to specify program qualifications for projects and building owners, and will need to determine eligible measures.

2.2.1 Qualifying properties

Enabling legislation and C-PACE program requirements tend to be flexible with regard to what types of properties may participate. However, commercial buildings vary significantly, which could have implications for program participation. Properties may differ by:

- **Property size.** Commercial real estate investors often categorize properties by size. Although most C-PACE programs have no restrictions on property size, property size may correspond to project size and larger projects may be more attractive to investors and involve manageable transaction costs.
- **Business type.** PACENation reports C-PACE investment volumes for 12 types of businesses (e.g., office, mixed use, retail, industrial, healthcare, hospitality, multifamily). Different types of businesses tend to rely more on C-PACE in different parts of the country. For example, to date in the West most C-PACE investment has gone to healthcare, retail and office buildings, whereas in the Southeast nearly 95% of C-PACE investment has been in retail and multifamily buildings (PACENation n.d.).
- **Property class.** For office buildings, which have seen the most C-PACE investment to date (see [Figure 2-1](#)), property class could mark different levels of risk and return and may correspond to differing levels of demand for C-PACE. Properties are often categorized into three or four classes (Class A through Class C or D) based on building age, tenant income, location, and other factors (Reality Mogul 2013). Class A, for example, includes properties with the newest buildings in more attractive areas than properties in other classes. According to Brian McCarter at SRS, a significant opportunity for C-PACE lies in Class B and C properties³⁹ that often have pent-up demand for capital intensive energy consuming equipment replacement, but lack the ability to self-fund the upgrades.

Categories can range from small commercial buildings to large industrial facilities to multifamily housing to MUSH⁴⁰ to agricultural buildings.

C-PACE DOLLARS FUNDED BY BUILDING TYPE

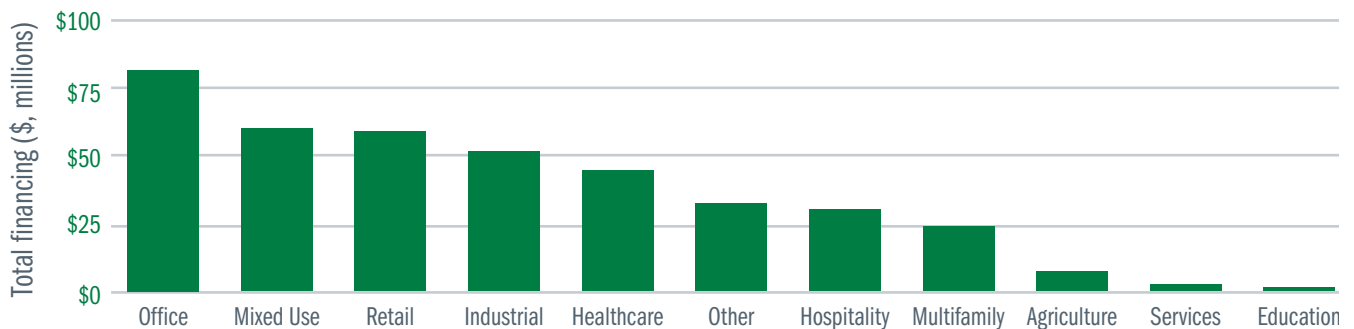


Figure 2-1. C-PACE investment by building type. A wide variety of building types use C-PACE for energy improvements; most C-PACE dollars are invested in office buildings. Source: PACENation, accessed December 5, 2017.

Differences in building size and type can have implications for C-PACE program qualification. Different business types may be focused on different energy efficiency measures. For example, owners of a retail space may be interested in a lighting control system, whereas an agricultural property owner may be focused on motors and variable-speed drives. Finally, certain classes of office buildings (Class B and C properties) may have more need for building upgrades, and thus more demand for, C-PACE than other classes. That could also have implications for underwriting and lender interest.

³⁹ Defining building classes is a term of art: Each class is generally defined in relation to other buildings in its market and in relation to buildings in other classes (Golden 2013). Class B properties are one level below Class A properties. They are not quite as new or as well maintained as Class A properties and may be located in less attractive areas. Class C and Class D buildings are older, have deferred maintenance, and are located in less desirable areas.

⁴⁰ MUSH stands for municipalities, universities, schools, and hospitals. The authors are unaware of any publicly-owned buildings that have used PACE financing. Properties leased by public entities may be eligible for PACE financing.

2.2.2 Qualifying building owners and projects

Programs may have one set of standard criteria to qualify which buildings and projects are eligible to participate in a C-PACE program. Capital providers may have their own additional criteria to evaluate feasibility, which may vary by project. Broadly speaking, program requirements for building owner and project eligibility tend to fall into a few general categories of requirements. Some requirements may be laid out in the enabling legislation. For example, the program verifies that the building is located in the special assessment district and confirms the applicant is legally eligible to participate in the program.

Common requirement categories for qualifying building owners and projects include:

Consent. Some form of mortgage holder consent or acknowledgment is typically required, with conditions varying significantly from program to program.

Ownership. Proof is required that the applicant is the building owner, which may be addressed through a title search. All owners must agree to the arrangement, and all owners may have to sign required documents.

Current on obligations. The owner must be current on taxes, mortgage payments, and potentially other obligations (e.g., utility bills). Some programs require a look-back period (e.g., no mortgage payment delinquencies in the past two years).

No outstanding grievances. The building owner must not be in bankruptcy, the building must not be in foreclosure, and there should be no involuntary liens on the property. Some programs may have a look-back period for this requirement.

Financial limits. In open-market programs where funding is coming solely from third party, private capital, capital providers, providers are generally given broad responsibilities to financially underwrite transactions. However, program administrators may set minimum financial limits to verify that C-PACE participants are able to repay their C-PACE obligations and to ensure that the participant has sufficient collateral to cover losses in the case of a default. Financial limits for PACE underwriting protocol vary based on what decision makers believe is in the best interests of consumers and may include the following:

- **Debt-Service Coverage Ratio (DSCR).** The DSCR is the ratio of a property's cash flow to its debt obligations due in the coming year. Properties with a DSCR greater than one should be able cover their current debt obligations (Investopedia n.d.).⁴¹
- **Combined loan to value ratio (CLTV).** CLTV is the total amount of debt secured by the property (including the PACE assessment), divided by the property value. Program guidelines may restrict projects from exceeding a certain combined (i.e., including other debt secured by the property) loan-to-value ratio, often between 80% and 100% (DOE 2013).

- **Assessment to value ratio.** This ratio is the dollar value of the PACE assessment to the assessed or appraised value of the property (DMME 2015). Virginia's Department of Mines, Minerals and Energy (DMME) developed a guide that suggests the ratio be no more than 20% (DMME 2015). Texas also uses 20%, and Connecticut and New York use 35%. Lower ratios may make it harder for smaller building owners, e.g., small business owners, to qualify projects.

Expected savings. C-PACE qualifying guidelines may include stipulations that the project demonstrate a reduction in energy consumption or production of renewable energy over baseline conditions, the term of the assessment not exceed the weighted average effective useful life (EUL) of the project, or both. Some programs encourage or require a project's savings-to-investment ratio, or "SIR", be greater than one – i.e., the total estimated cost savings exceed total payments. This can have two primary benefits:

- **Increases net operating income (NOI).** NOI is a property's revenue minus its operating expenses, including utility expenses and property taxes. If utility bill savings from a C-PACE project are greater than increased property taxes, NOI will increase, all else being equal. NOI is used to determine a property's capitalization rate, or rate of return. A higher NOI results in a higher capitalization rate, which makes the property more attractive to potential buyers.
- **Helps facilitate mortgage holder consent.** Demonstrating to mortgage holders the potential for a C-PACE project to generate savings in excess of annual operating expenses (thus increasing the building's NOI⁴²) provides an incentive to consent to the project. Even for projects in which expected savings do not exceed increased property taxes, C-PACE's long terms will probably impact NOI less negatively than other financing options. As a general principle, however, mortgage holders will need to be convinced that energy savings and utility bill projections have been produced by a professional and unbiased source.

⁴¹ Although administrators often ask that the DSCR be considered, an actual number is not typically mandated.

⁴² However, increased NOI is not the only reason for using C-PACE and not the only reason that building owners and managers invest in energy projects. George Caraghiaur, a Senior Fellow at PACENation, cites the example of lighting for a parking lot where security concerns may dictate the need for an investment rather than a desire for energy bill savings (Caraghiaur 2017).

2.2.3 Qualifying measures

The original rationale for allowing PACE was the public benefits resulting from renewable energy and energy efficiency projects. Although enabling legislation establishes general categories of what may be financed, program administrators or local governments generally provide guidance on the measures that qualify and may offer a list of eligible measures.⁴³ The U.S. Department of Energy (DOE) suggests that “eligible measures should be restricted to those that have a solid track record and, where possible, independent verification of their ability to save energy. The types of eligible measures can be expanded over time as the program administrator develops more knowledge and gains experience in evaluating projects and their actual associated savings” (DOE 2013). Where available, a state’s or utility’s technical reference manual (TRM) may provide a foundation for PACE programs to establish energy savings potential for a variety of different measures.⁴⁴

More recently, enabling legislation has provided for other measures – including resilience measures – such as water conservation, cool roofs, electric vehicle charging stations, energy storage, microgrids, combined heat and power systems, seismic retrofits, wind hardening and storm strengthening.⁴⁵

LESSONS FROM THE FIELD

Qualifying projects and measures. Commercial building owners are focused on cash flows. Therefore, C-PACE programs may focus more on a project’s overall forecasted savings than on the efficiency of individual measures and might be open to any measure that saves energy. For example, Connecticut’s C-PACE program requires a project’s SIR be greater than one (see Section 2.3.2) (Connecticut Green Bank 2016). The proposed project’s weighted average effective useful life (EUL) is the critically important criterion and determines maximum financing terms.⁴⁶ Although participants can choose a term that is shorter than the weighted EUL, the technical administrator of Connecticut’s program (SRS) notes that building owners typically select the maximum finance term given cash flow impacts C-PACE (McCarter 2017).

⁴³ Given the transferability of the C-PACE obligation to a subsequent building owner, enabling legislation generally limits qualifying measures to those that are affixed to the building.

⁴⁴ For more on TRMs, and a reference on available TRMs across the country, see the [SEE Action Guide for States: Guidance on Establishing and Maintaining Technical Reference Manuals for Energy Efficiency Measures](#).

⁴⁵ Note that some of these measures, e.g., storm strengthening, may increase project costs but provide no energy savings. Electric vehicle charging stations could actually increase a building’s energy consumption. This should be considered when developing project energy and cost savings guidelines.

⁴⁶ A measure’s weighted useful life is the “length of time a measure is expected to be functional” (Hoffman et al., 2015). When multiple measures are included in a project, the weighted average better reflects the EUL of the project.

2.3 How are energy cost savings and other impacts estimated and documented?

| What is this? | Who can do this? | What are the tradeoffs? |
|---|--|---|
| <p>Energy savings and energy cost savings (the resulting cost savings from reduced energy consumption) associated with C-PACE projects can be estimated during the project planning phase and tracked once the project is completed. Usually the focus of such analyses are energy cost savings, which are calculated by first determining a baseline energy consumption, and projecting the energy savings and associated cost savings from the proposed measures to be implemented. Once those measures are installed, actual energy consumption and energy cost savings can be verified against projections.</p> | <p>Contractors, program administrators, or third parties like Energy Service Companies (ESCOs) and engineering firms can estimate and track savings.</p> | <p>Energy savings are generally a goal of the public policy behind C-PACE programs. They are sometimes statutorily required in order to meet the public purpose defined by PACE-enabling legislation and may be important for underwriting and lender consent. However, accurately assessing energy savings can be challenging, adds some costs to any project, and may have limited value to building owners that have already implemented the project. On the other hand, energy cost savings assessments, as well as assessments of other benefits, can document the value of future investments by property owners and encourage policy maker, contractor, and lender support of C-PACE funded efficiency projects.</p> |

To date, most C-PACE projects are eligible for PACE financing because they are expected to reduce a building’s energy use which in turn should lead to cost savings on the utility bill and form the basis for the cost-effectiveness of C-PACE projects.

The following discussion focuses on the basics of estimating energy cost savings before or after a project is implemented. However, it is important to note that there are other benefits associated with efficiency investments for building owners, tenants, the servicing energy utilities, and society as a whole – and these also can also be the basis for implementing C-PACE programs and projects. These other benefits can also be documented, although usually not as easily as energy cost savings. Other benefits include lower water costs, increased property values, and higher rents and better retention (landlord benefits); improvements in comfort and productivity (tenant benefits); avoided transmission and distribution costs, energy price and reliability effects (utility system benefits); and local economic development and jobs (societal benefits).

Savings for renewable energy projects are based on metered energy generation, usually electricity generated from a solar photovoltaic (PV) system. Projecting cost savings for renewable energy projects is generally more straightforward, with the output of a PV system primarily only dependent on the number and ratings of selected PV panels and their location, orientation and shading. With the amount of electricity being reliably predictable, the main variable is how much electricity will be displaced from building consumption and how much will be sold back to the utility.

In contrast, an important challenge to estimating the impacts of efficiency projects is that energy savings and non-energy impacts resulting from efficiency actions cannot be directly measured. For example, the true impacts of efficiency projects are the difference between the amount of energy used relative to the amount of energy that would have otherwise been used (the baseline) had the building not had efficiency measures installed. This baseline is called the counterfactual scenario. In practice, it is impossible to observe how much energy the

C-PACE program participants would have used had they not been in the program “because at any given time a participant must either be in the program or not” (SEE Action 2012).

In addition, while it is difficult to reliably estimate the difference between current energy use compared to what would have been used in the absence of an efficiency project (the counterfactual baseline described above), cost savings, estimated relative to the borrower’s pre-project energy costs, can be even more difficult to project with precision, given the relative unpredictability of energy prices over time.⁴⁷ Since there is uncertainty in what would have happened absent efficiency improvements, documented impacts are always estimates. This in turn indicates that there must be a balance between the reliability of energy impact estimates and the cost of obtaining them.

Energy cost savings are important because they may help determine the extent to which energy savings may place borrowers in a better position to make C-PACE repayments⁴⁸ and can increase NOI.⁴⁹ Some programs use projected cost savings to underwrite projects, and existing mortgage holders may be convinced to grant consent for a C-PACE project based on the benefits of positive cash flow generated by a project through cost savings.

Estimation and documentation of energy savings and energy cost savings present three key decisions for C-PACE program design:

- Should energy audits be required?
- Should some level of projected savings be required for eligibility?
- Should savings impacts be documented and, if so, how?

2.3.1 Energy audits⁵⁰

Engineers use a building’s baseline energy consumption to estimate what energy savings and utility bill savings a project will generate. To determine the baseline energy consumption, an audit is helpful.⁵¹ Audits may include a review of energy consumption, a site assessment, an energy and cost analysis, and a summary report of findings and recommendations.

Audits can range from assessment of a single system in a building (for example, for a project involving only lighting efficiency and a minimal capital investment) to a rigorous, whole-building analysis, which could involve a major capital investment. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) categorizes three levels of audits. Level I includes assessing energy bills and a limited site visit to inspect the building. Level II includes more refined surveys of energy use and more extensive analysis of building characteristics, costs, energy use and potential energy savings. Level III includes Level I and II activities and adds equipment monitoring, more extensive data collection, and more comprehensive engineering analysis (Baechler, Strecker and Shafer 2011). Comprehensive audits like the ASHRAE Level III audit may be considered “investment-grade audits” (Pacific Northwest National Laboratory 2011).

Many C-PACE programs require or recommend some level of ASHRAE audit (Utah Clean Energy 2014). Some, such as GreenFinanceSF and



Audits may include a review of energy consumption, a site assessment, an energy and cost analysis, and a summary report of findings and recommendations.

⁴⁷ Assumptions can be made regarding fuel price escalation over time for underwriting purposes, but such estimates often vary from reality as prices actually change.

⁴⁸ Savings estimates should be placed in the context of a borrower’s overall financial picture, as many other factors can contribute to a borrower’s ability to repay a loan obligation, such as overall debt levels relative to net income.

⁴⁹ Using third party estimates in addition to contractor estimates can support program credibility, consumer protections, help prevent any backlash against program sponsors and help increase trust.

⁵⁰ Energy audits are sometimes called “energy assessments” or “energy studies” (Baechler, Strecker and Shafer 2011).

⁵¹ Energy audits may be required in C-PACE enabling legislation.

the Florida Green Finance Authority, require lower-level ASHRAE audits for projects under \$100,000 (Clean Energy Solutions 2016). For its technical standards, the Texas PACE Authority uses the Investor Confidence Project's (ICP) Energy Performance Protocols (EPP) for Standard and Large Commercial Facilities for the uniformity that EPP can offer across the state and even across the country (Keeping PACE in Texas n.d.).⁵² Other programs are flexible as to what type of audit is done, and some determine the necessity of an audit on a case-by-case basis (Utah Clean Energy 2014, Clean Energy Solutions 2016).

Generally, the cost of an audit depends on audit quality, comprehensiveness of the audit, the size of the building and other related factors. Comprehensive audits may be inappropriate and unaffordable for smaller, less sophisticated projects. Outside parties such as contractors, ESCOs, and engineering firms perform audits. Some programs include or recommend an independent third party review of the audit and cost estimates, which may reassure mortgage holders who must consent to allowing the C-PACE project. For example, the Texas PACE in a Box guidelines require a third party that is “wholly independent from” the property owner, lender, or energy or water provider to review the baselines and savings projections (Keeping PACE in Texas n.d.).

2.3.2 Savings-to-investment ratio (SIR)

Some programs require a minimum “savings-to-investment ratio” (SIR) in order for a project to qualify. These ratios typically require that the level of projected cost savings from a C-PACE project be sufficient to support repayment obligations – that, is the SIR must be at least 1.0.⁵³ Some programs require projected savings to exceed repayment obligations by a predefined amount.⁵⁴

When contemplating whether to incorporate SIR ratios into program design, several factors may be worth considering. First, from an underwriting standpoint, there is no formal evidence to date that SIR requirements correlate to improved loan performance, though having an independent party-calculated SIR that is presented to the owner and mortgage holder falls into the category of responsible due diligence.

Second, from a consumer protection standpoint, most C-PACE deals are typically relatively large transactions with relatively sophisticated borrowers.⁵⁵ Such borrowers may have a number of reasons to make energy improvements that are not fully captured in the project financials (e.g., occupancy comfort). Therefore, C-PACE programs may wish to consider giving borrowers the ability to move forward with a project regardless of whether the SIR is greater than one. A program could require only disclosure of the SIR, without making SIR > 1 a requirement of financing eligibility. Finally, for programs that allow measures beyond energy efficiency and renewable energy (e.g., seismic retrofits and storm hardening), minimum SIR requirements may not work or may need to be modified to address these other public safety benefits.⁵⁶

2.3.3 Documenting energy savings and other impacts from C-PACE: Evaluation, Measurement and Verification (M&V) of savings

Building owners, investors and existing mortgage holders may want to ensure that the energy savings undergirding the economics of C-PACE projects are actually realized (or potentially exceeded), and program administrators may want to measure and track progress toward their C-PACE program's energy and energy cost savings goals. Energy savings can be verified through measurement and verification (M&V) – i.e., verifying that installed measures perform as expected. Furthermore, documented track records of positive savings could attract more participants and demonstrate to other stakeholders the cost-effectiveness of C-PACE. Thus, C-PACE programs may include an evaluation, measurement, and verification (EM&V) component for determining the impacts, and cost-effectiveness, of individual projects or programs as a whole.

⁵² Virginia's voluntary underwriting guidelines also reference ICP protocols (DMME 2015). For more information on the ICP or EPP, see <http://www.eepformance.org/> and http://www.eepformance.org/uploads/8/6/5/0/8650231/energy_performance_protocol_-_standard_commercial_v1.0.pdf.

⁵³ Set the PACE St. Louis, Lean and Green Michigan, and Energize New York all require the SIR to be greater than one (Utah Clean Energy 2014).

⁵⁴ For example, Connecticut's C-PACE program requires a SIR greater than one. Connecticut's enabling legislation requires participants to obtain an energy audit. Wisconsin's enabling legislation requires that property owners obtain a guarantee of SIR > 1 from the contractor or engineer for projects over \$250,000 (Wisconsin State Legislature 2012).

⁵⁵ Charlene Heydinger of the Texas PACE Authority notes that, for smaller deals with less sophisticated borrowers, all practices that offer some consumer protections may reduce the fiduciary risk posed to program sponsors.

⁵⁶ Some programs allow seismic resiliency measures or storm strengthening, neither of which generate energy savings but which do add costs (and benefits) to a project.

For efficiency, EM&V is a process of assessing an energy efficiency program, including applying M&V and other methods to estimate program impacts – most typically energy and energy cost savings. However, EM&V can also include assessments of non-energy impacts such as avoided air pollution and job development.

EM&V methods for energy savings include (Franconi, et al. 2017):

- “... M&V methods applied at the building level, with results expanded to the program level.
- The use of deemed savings values, with installations and key parameters verified by the evaluator, but without direct measurement of site performance (thus deemed savings is not considered a true M&V approach) [deemed savings method].
- Analysis of consumption data for program participants and a comparison group to determine savings for the program as a whole, and not necessarily for any individual facility or measure. [comparison group method].”

To determine avoided air pollution and water savings, similar methods to the ones listed above for energy savings can be used by either directly assessing changes in water use or with the application of factors that simply convert energy savings to avoided air pollution. For other metrics such as those related to economic development, survey-based and structured expert judgment approaches are most commonly used.

Which EM&V method is appropriate for a project or program may vary depending on a number of factors, such as policy objectives, access to data, available budget, desired accuracy of the estimated impacts, which impacts are to be assessed, the time frame of the evaluation, and types of measures included. For example, to show how installed improvements are performing over time, San Francisco’s GreenFinanceSF program requires participants to use Energy Star Portfolio Manager, a free energy consumption tracker. Customers with more than 200 kW demand must also participate in PG&E Interact Services, a free service that monitors consumption on a near real-time basis. The City of San Francisco may access consumption data to “analyze project performance and gauge program effectiveness” (data accessed remain confidential) (GreenFinanceSF n.d.). In another example, the Connecticut Green Bank has funded whole-building data collection and project performance M&V for the state’s C-PACE projects since 2013.



Evaluation is the typical term associated with assessing programs (and program portfolios and policies). Measurement and verification (M&V), which involves methods associated with assessing project and individual measure impacts, uses site data collection and measurements. M&V is also one way that programs are evaluated. For example, M&V can be applied to a sample of projects, and the results extrapolated to the entire program population of projects. EM&V is often used as a catchall for all types of impact, process, and market evaluations, but is also sometimes associated only with impact evaluation, which includes the market impact portion of market evaluations.

3 STAGE 3: Program launch

The *benefits* of C-PACE – e.g., no upfront costs, long terms, transferability – are discussed in the Executive Summary and the Introduction of this report. However, regardless of whether program sponsors will assume program administration responsibilities or plan to retain a third party do so, sponsors should quantify the costs associated with setup and ongoing operations, and consider options to recover such costs. This section focuses on near-launch considerations and costs that need to be covered after the program’s launch – when the program begins operating and actively financing projects.

In addition, this section identifies key stakeholders that need to be engaged and offers strategies for engaging them. It will also be important to solicit continual feedback from stakeholders and incorporate that into ongoing program improvement.



3.1 Which stakeholders are essential to engage?

| What is this? | Who can do this? | What are the tradeoffs? |
|---|---|---|
| <p>Key stakeholders who need to be engaged in C-PACE programs include community leaders, municipalities, building owners, capital providers, contractors, utilities, real estate agents, environmental advocates, and mortgage holders. Engagement will be different for different stakeholders, but generally includes outreach, general promotion, marketing, training, and technical assistance.</p> | <p>Stakeholder engagement is generally done by the entity responsible for setting up a C-PACE program (i.e., sponsor), the C-PACE program administrator (if different) and, potentially, capital providers. Some engagement responsibilities may be delegated to third parties.</p> | <p>Stakeholder outreach, education and engagement can be time-consuming and demanding. It can also increase acceptance of C-PACE by mortgage holders, participation by local governments, and project volume. Engagement is crucial to closing on projects and achieving program goals.</p> |

Although this section is included in the “Launch” stage, engaging stakeholders is important at every step of the C-PACE program lifecycle, from developing legislation,⁵⁷ to setting up the program, to ongoing program operations. Stakeholder engagement is essential to building up a C-PACE program, particularly since C-PACE financing is less well known than other types of financing for commercial properties. Such outreach can be costly in terms of staff time and challenging in terms of reaching and convincing target audiences. Program sponsors must decide who to engage and how to engage them. [Table 3-1](#) outlines stakeholder engagement strategies that C-PACE programs have used.

⁵⁷ Three specialty PACE capital providers advised the authors that engaging capital providers before finalizing legislation and program rules will improve usage of the program.

Table 3-1. Examples of C-PACE program stakeholder engagement strategies

| Engagement strategies | |
|---|---|
| <p>Customizable collateral</p> <p>These are informational materials such as short videos, fact sheets, case studies, and frequently asked questions.</p> | <p>Website</p> <p>A program website can be a central location for outreach, materials, and program processes such as applications. Participating governments can also promote C-PACE on their websites.⁵⁸</p> |
| <p>“Lunch and learn” events for trade associations:</p> <p>Audiences include local government professionals, economic development officials, architects, commercial building owners and managers, legal professionals, financial institutions, and chambers of commerce.</p> | <p>Traditional marketing methods</p> <p>These include press releases, direct mail, email marketing, content marketing, and event booths at conferences and trade shows.</p> |
| <p>Meet and greet events for contractors and lenders</p> | <p>Contractor workshops, trainings, and other stakeholder conferences and events</p> <p>Either piggy backing on other events for contractors or hosting stand-alone events for C-PACE outreach</p> |
| <p>Social media</p> | <p>Digital newsletters</p> |
| <p>Dedicated staff assignments</p> <p>Designated staff can dedicate a portion of their time to outreach and marketing.</p> | <p>Tax bill inserts</p> <p>Because C-PACE is generally repaid on the property tax bill, some programs have used information inserts with property tax bills to promote the program.</p> |
| <p>Strategic partnerships</p> <p>An example is partnering with utility incentive programs.</p> | <p>Informational events for potential participants</p> |

For many state and local governments interested in offering C-PACE, the formation of an advisory board, task force, or similar decision-making body is a common next step once state enabling legislation is passed. Whether a state wants to pursue a statewide model or a local government is contemplating launching its own C-PACE program, a decision-making body is valuable to navigating the decision points preceding program launch. The primary purpose of a C-PACE decision-making body is to expand upon enabling legislation, build out program guidelines, make decisions related to program administration responsibilities, and conduct the entire process with opportunities for stakeholder input to ensure long-term success.

A decision-making body may be named in state enabling legislation (e.g., Colorado’s New Energy Improvement District Board), assembled at the discretion of a state or local executive (e.g., Utah’s CPACE Advisory Committee), or convened through a private sector champion (e.g., Texas’ Keeping PACE in Texas). Decision-making bodies may be composed of state and local officials, local banks and financial institutions, building owners, contractors, and prospective capital providers and program administrators.

⁵⁸ That is, if the participating government is not the program administrator. In that case, the program should already be on the government’s website.

Decision-making bodies may be assembled to achieve a single goal such as selecting a program administrator and then disbanded. These bodies may also be assembled to exist in perpetuity to serve as a mechanism for responding to market concerns or opportunities, and thereby have the ability to quickly initiate program changes when warranted. In many states, PACE enabling legislation has been modified on multiple occasions, which has been prompted by feedback gathered from a decision-making body. For example, Utah's C-PACE enabling legislation was modified by the Utah Legislature in 2017 after the Utah C-PACE Advisory Committee convened and offered recommendations in 2016 (Cuan 2017a).

CONTRACTOR TRAINING

Contractor training is important for C-PACE programs to maintain program quality and reputation, especially since many programs use contractor networks as a key means to promote C-PACE. Contractors can promote the program and drive program volume, but misrepresentation of C-PACE could damage a program's reputation and potentially deter eligible projects. Before program launch, contractors should be trained on what C-PACE is, its benefits, and the process. They should understand the underwriting requirements and know how to educate building owners about C-PACE and its benefits (PACENation n.d.). Program administrators and consultants have been used to train contractors (Clean Energy Solutions 2016).

For example, the SCEIP recognized early on the importance of contractor training. The SCEIP has partnered with a local workforce development agency to provide trainings and recruit more contractors (SCEIP 2012). The program now offers monthly trainings for all of their contractors, often done by conference call, including program updates. The trainings are also a way for program administrators to hear contractor feedback on the program. The Connecticut C-PACE program has hosted monthly, half-day, in-person contractor workshops for several years. These contractor education and engagement sessions have proven effective to recruit contractors and to drive recurring project originations.

Each stakeholder has different roles in the program development process and is important to the process for different reasons, so customized approaches to engagement are valuable. A few common approaches may be helpful in engaging multiple stakeholder groups: basic marketing materials that introduce C-PACE financing and explain the process and benefits, a website through which general and customized program information can be accessed, and an advisory committee that enlists members from each group of stakeholders. For example, in developing guidance on underwriting criteria, Virginia's Department of Mines, Minerals and Energy sought input from real estate, energy efficiency, banking, and local government stakeholders as well as others (DMME 2015).

Listed below, in order of which group may need to be approached first in the course of starting a C-PACE program, are several stakeholder groups that are important to engage.

Community Leaders

Who are they?

Community leaders can include local advocates and industry representatives, particularly the real estate and banking industries (SCEIP 2012).

Why are they important to the process?

They can raise awareness, build political support, and reach multiple stakeholders at an influential level.

Why should they be engaged?

Often programs need a champion. A community leader is a good candidate for that role.

What strategies have been used to reach them?

Strategies include direct outreach to local chambers of commerce, industry associations and representatives, including hosting events such as luncheons to introduce them to C-PACE financing.

Local Governments

Who are they?

Local governments that vote to enable C-PACE in their jurisdiction are comprised of decision-makers and administrative staff that will be required to implement parts of the C-PACE process (e.g., county tax offices). In some states, local governments may also be required to set up a special assessment district (or districts) to enable local building owners to use C-PACE. Administrative staff may be involved in a number of ways, such as recording assessments and liens and collecting and remitting payments.

Why are they important to the process?

Generally, regardless of the administrative structure of the program, local governments must choose to participate in C-PACE, either through opting into a state program, setting up their own program, joining other local governments in an inter-local program, or working with private C-PACE providers. If, for example, a building owner wanted to participate in C-PACE but the local government had no program, the local government would have to set up a program or join an existing program in order to participate.

Why should they be engaged?

Local governments may be unaware of C-PACE and its benefits or may need to understand the benefits before they are willing to implement a program. Depending on the structure of the program, staff may need to be receptive to taking on new responsibilities and trained to ensure successful program implementation.

What strategies have been used to reach them?

Strategies include direct one-on-one outreach to elected officials and relevant staff members, stakeholder meetings and information workshops.

Building Owners

Who are they?

Owners of commercial buildings that are currently in need of energy upgrades or may be in the future.

Why are they important to the process?

Building owners are the ultimate participants in the C-PACE program. They must understand the program and the value proposition of C-PACE for the program to be successful.

Why should they be engaged?

To develop projects, building owners must: 1) know about C-PACE financing, 2) understand it, 3) be certain of its benefits, and 4) get any needed help in the C-PACE process (e.g., assistance with the C-PACE program application, project development, mortgage holder consent, and finding a capital provider). If building owners navigate the process of securing capital without support from a C-PACE program administrator, it may lead to missed opportunities. Engagement also allows program administrators to better understand the needs of building owners in their jurisdictions and how their programs may better serve them.

What strategies have been used to reach them?

Customizable collateral (i.e., marketing media materials such as brochures) provides resources for building owner questions. A website can introduce building owners to the program and help them learn about it. It can house the customizable collateral, offer a place to complete process steps (e.g., an application), provide program updates, and facilitate communication between potential participants and program administrators, capital providers and contractors. Direct staff outreach can be valuable at any point in the process but may be crucial at some points such as during project development or when obtaining lender consent.⁵⁹ Depending on the market, traditional marketing may reach building owners, but informational events and tax bill inserts may be a more targeted approach. Strategic partnerships, such as with utilities or contractors, are perhaps the most common way for building owners to learn about the C-PACE program.

⁵⁹ Such outreach can be conducted by both the agency staff or more typically by a third-party program administrator.

Contractors

Who are they?

Contractors develop the technical plans for efficiency projects, install the qualifying energy measures and educate property owners about C-PACE.

Why are they important to the process?

Contractors often maintain relationships with building owners and may know about potential unfunded projects that C-PACE could facilitate (McCarter 2017). Also, ensuring that quality work is being done through the program is important to attract more participants and maintain the reputation of the program.

Why should they be engaged?

Developing a network of registered and trained contractors can inspire confidence among participants, make it easier for participants to find a contractor, and help control the quality of work being done through the program. Some programs have leveraged contractor relationships and sales efforts to promote C-PACE programs.

What strategies have been used to reach them?

Workshops and trainings are often used to engage contractors, but events such as meet and greets can introduce them to C-PACE financing and the local program. Websites can answer questions for contractors, such as where the program is available and what measures are eligible, and can facilitate some process steps – for example, signing up and getting registered with the program.

LESSONS FROM THE FIELD | STAKEHOLDER ENGAGEMENT, PART 1

Reaching out to local governments. As part of establishing the C-PACE District, Utah’s Office of Energy Development will either reach out directly to local governments when building owners in that jurisdiction inquire about using C-PACE to fund a project or use a point of contact furnished by the building owner. OED will contact local government staff through an introductory email that brings their attention to the existence of the program, explains how it works and some of the benefits, and directs them to more materials (Dutton 2016).

Contractor networks. Program administrators may use contractor networks to promote C-PACE. Connecticut and other states have done this, leveraging contractors’ relationships with building owners and knowledge of the market (SRS 2017).

- Connecticut’s third party technical administrator has developed a database of efficiency and renewable energy contractors and regularly invites contractors it identifies as qualified to half-day workshops on how C-PACE can expand their business. Over time, 25% to 30% of contractors that attend workshops submit a C-PACE project application (SRS 2017).
- Contractor engagement is an ongoing effort. For example, Sonoma County holds monthly trainings or updates, sometimes done by conference call (Clean Energy Solutions 2016).
- An overview of C-PACE for Virginia recommends empowering contractors to promote C-PACE, but cautions that training must be high quality to ensure contractors do not misrepresent C-PACE financing generally or the program details (Clean Energy Solutions 2016).
- The Utah Governor’s Office of Energy Development (OED) originally maintained the required pre-approved contractor list per the state’s 2013 legislation but stakeholders found it challenging to enforce (for example, approving general contractors vs. approving each subcontractor on a given job). As an alternative, OED is considering a voluntary contractor registry instead to provide building owners with a ready resource for project development (Cuan 2017a).

Utilities

Who are they?

Utilities often run programs that offer incentives for energy efficiency measures and free or rebated building energy audits.

Why are they important to the process?

Utility incentives can bring down project costs, a benefit to all parties. Utilities may also provide free energy audits, which can substantially improve project design.

Why should they be engaged?

Utility incentive programs may be leveraged to promote C-PACE as a tool for funding projects (e.g., potential participants that inquire about a utility incentive, then learn about C-PACE financing), to initiate projects (e.g., through a free audit), and to provide a rebate to bring down overall project costs.⁶⁰

What strategies have been used to reach them?

C-PACE programs have used direct outreach to utility program managers and strategic partnerships.

Capital providers

Who are they?

Capital providers are investors who furnish the capital for projects, either directly or by buying bonds issued to fund the projects (see Section 2.1.2).

Why are they important to the process?

Capital providers make C-PACE projects possible and a C-PACE program sustainable.

Why should they be engaged?

Capital providers need to understand the C-PACE process, how C-PACE can benefit them (e.g., strong security), and how to participate. Program administrators also want to ensure that participating lenders are qualified and reputable. Also, by engaging capital providers early to verify the program design is tenable, decision-makers can maximize participation and stimulate competition in the market.

What strategies have been used to reach them?

Lender prequalification, participating building owner referral and website announcements are some ways C-PACE programs have engaged capital providers.

Existing Mortgage Holders

Who are they?

Existing mortgage holders are lenders who hold the outstanding mortgages on properties seeking to implement PACE projects.⁶¹

Why are they important to the process?

Debt arrangements typically contain covenants that require the building owner to obtain consent from the first mortgage holder in order to secure more debt through the property. Although C-PACE assessments may not technically be considered loans or debt, as a special assessment their liens typically take priority over other liens, even those assigned to first mortgage holders. Thus, many states require building owners to obtain written consent from mortgage holders before a C-PACE assessment can be levied.

Why should they be engaged?

Where consent is required, mortgage holders are key to getting projects done. Even where mortgage holder consent is not required, it is advisable to obtain it to build confidence and trust in C-PACE as a financing product.

⁶⁰ C-PACE may also be attractive for utilities to support their energy reduction or distributed energy resource goals and to complement their demand-side management programs. If they do not understand the benefits, utilities may oppose the establishment of PACE programs.

⁶¹ A number of different kinds of institutions hold mortgages on commercial buildings. These include (but are not limited to) local, regional, national and international banks, credit unions, government entities (such as housing authorities and municipal development corporations), insurance companies and specialized lenders.

Partners that understand C-PACE and efficiency help explain its benefits for mortgage holders. If mortgage holders understand C-PACE, they can be strong supporters of the program; if not they can be strong opponents.

What strategies have been used to reach them?

Involving program partners in consent discussions and program development is a best practice. Program administrators can explain C-PACE's benefits such as increasing the building's net operating income — and thus its value — and that improved tenant cash flow may help make mortgage payments more timely and consistent. Program administrators responsible for quality assurance and third-party project evaluators can give mortgage holders confidence in what to expect in terms of energy savings.

LESSONS FROM THE FIELD | STAKEHOLDER ENGAGEMENT, PART 2

Mortgage holder consent. Charlene Heydinger of the Texas PACE Authority says that support of the lender community for C-PACE is crucial. She notes that bank executives are members of chambers of commerce and economic development commissions. Banks need to be brought in early to the program development process to support, or at least not oppose, local C-PACE programs.

In 2013, PACENation surveyed PACE programs and consultants, senior mortgage holders, and investors on mortgage holder consent for C-PACE projects (PACE Now 2014). The survey revealed important findings for engaging mortgage holders:

- An internal champion at the lending institutions is an advantage for obtaining consent, and the PACE community should cultivate a point person at financial institutions.
- Lenders reported a strong preference for projects that quickly increase a building's NOI through energy savings. In addition, a common reason for denial of consent was mortgage holders' lack of expertise in underwriting the cash flows from C-PACE projects. Therefore, furnishing the mortgage holder with projected energy savings and cash flows comparing pre- and post-project forecasts may help in obtaining consent. An audit and third party review of the projected savings also tended to be part of successful requests for mortgage holder consent.
- Mortgage holders will have questions about the program that the program administrator or municipal official may be best able to answer. For example: What are the mechanics of the assessment? What happens in situations of nonpayment, delays in payment, and default (i.e., how is the mortgage holder protected)? What rights does the mortgage holder have under a C-PACE arrangement? Unfamiliarity with C-PACE was another common reason for denial, so involving a program expert in consent talks could be valuable.
- Attending mortgage industry conferences and local government meetings, and publishing in industry news sources, is helpful for outreach. Creating case studies highlighting benefits of C-PACE for mortgage holders is also beneficial.

Other tips. PACENation's "Start a C-PACE Program" webpage includes these tips:

- Some traditional marketing tools (e.g., billboards and other paid media) are not effective, targeted ways to reach commercial building owners. Luncheons for industry groups are examples of more targeted methods.
- When engaging commercial building owners, program administrators can prioritize by segmenting the market into buildings with deferred maintenance issues, buildings with high energy consumption, and building types that might otherwise be well suited for energy improvements.
- Although some specialty program administration firms offer web development services, there are low-cost and even free web development platforms that allow users to build their own website without knowledge of coding.

3.2 Ongoing operations and costs

| What is this? | Who can do this? | What are the tradeoffs? |
|---|---|--|
| <p>Ongoing operations are functions and responsibilities that require staff attention and cost money on a continuing basis.</p> | <p>Depending on the task and program structure, ongoing operations are generally managed by third party program administrators, state or local government agencies acting as program administrators, local governments and, sometimes, lenders. Management of ongoing operations can range from a local government taking charge of nearly all tasks, to local governments performing only a few duties that require no extra staff capacity, no use of taxpayer dollars and no risk to the treasury.</p> | <p>Depends on the function or responsibility. Delegation to third parties may enable C-PACE participation by local governments with insufficient capacity to manage the tasks, but also means less local government control on a case-by-case basis.</p> |

Program sponsors will need to decide how to pay for both set-up costs and ongoing operations. Understanding the demands (e.g., staff capacity, expertise) and the costs of ongoing operations (as well as set-up costs) is crucial to program planning and decisions about choosing third party administrators or opting into a larger program (see Section 1.2). The program sponsor must decide (within the constraints of the state's C-PACE law) who will take on responsibility for a number of ongoing tasks. Whether the sponsor takes on a given task – or whether it is delegated to an outside party – may depend on budget, internal capacity, internal expertise, and views on the role of government.

3.2.1 Ongoing operations tasks

Each task has associated costs as well as demands on staff. Entities responsible for launching a program (e.g., state and local governments) need to assess ongoing costs and determine what activities make sense to outsource and which may be better managed in-house.⁶² Broad areas of ongoing operations tasks include:

- Administrative processes** - These are the tasks that need to be performed for the program to function, such as application approvals, technical and financial underwriting, technical standards compliance, document development and updating, marketing, customer service, and IT activities such as website development and maintenance. They require staff capacity and may require some legal expertise (for development of some documents such as contract templates) or technical expertise (for IT needs and engineering for technical standards). Most can be done by state or local government agencies or third parties. Some C-PACE providers (i.e., third-party administrators) offer turnkey services that include some or most of these functions.
- Funding** - At a minimum, ongoing operations tasks associated with funding projects include servicing C-PACE assessments (billing, collections, and remittances) and recording a lien on the property. These tasks are generally performed by the local jurisdiction's tax assessor and clerk's office, although some program administrators (e.g., joint powers authorities and some statewide program administrators) may have authorization to conduct these tasks. More recently, in some jurisdictions capital providers have assumed responsibility for some of these roles, such as billing and collections.⁶³ When bonds are used, a set of tasks and costs are brought into play that will require legal and financial expertise.

⁶² Some tasks can only be done by a local government.

⁶³ For example, in Texas, local governments delegate the assessment collections to the project capital provider.

- **Quality Assurance/Quality Control (QA/QC)** - Some enabling legislation requires programs to state their plans for QA/QC. Texas is one example (Keeping PACE in Texas n.d.). QA/QC ensures that contractors are doing quality work. The process can help to instill confidence among participants and potential participants, avoid complaints, and maintain the program's reputation. It may include inspection of a contractor's first few C-PACE projects (or a subset of those), ongoing inspection of a portion of the contractor's projects, or a combination of these approaches. QA/QC is generally done by independent third parties. These parties need to have expertise in building science to understand acceptable work quality.⁶⁴ For example, in Texas an independent, third-party consultant reviews baseline and projected savings calculations to confirm the findings are consistent with the programs technical standards. A second independent third-party reviewer confirms that the project was installed correctly and is operating as intended.

3.2.2 Ongoing operations costs

Who is responsible (and absorbs costs) for each of these tasks depends on how program administration is structured and may also depend on how the program is financed. For example, programs funded through bond issuances will generate transaction, legal and financial costs for each bond issuance. If the program is able to issue bonds at a multijurisdictional or state level, economies of scale may make these costs more manageable than what they might be for a local government program alone.

User fees are often charged to cover ongoing operations costs such as servicing, overhead (e.g., staff salaries, rent, utilities, IT), title searches, costs of recording assessments, application processing, underwriting, closing, funding assessments, and expenses to cover delinquencies or defaults.^{65 66} However, fees are only generated once there is program participation, so they cannot provide initial start-up funding. Further, sufficient deal volume will need to materialize before fees can begin to fund ongoing operations.

There are four basic structures for C-PACE participant fees (typical percentages in parentheses) (Martin Fadrhonic and Kramer 2015):

- One-time fees as a percentage of the financed amount (0.2%-5%)
- Annual fees as a percentage of the outstanding balance (0.25% to 3%)
- An “adder” to the interest rate charged on the assessment (3% to 4%)
- Flat fees not charged as a percentage of the assessment or balance, such as application or title search fees

These structures may be used alone (e.g., Minnesota's program adds 0.5% to interest rates but does not charge other fees) or in combination (e.g., Texas charges a one-time 1% fee at closing and adds 0.25% to the cost of the assessment on an ongoing basis).⁶⁷ Because larger projects will produce more fee income (on a percentage basis), some programs (e.g., Connecticut, Michigan, and Missouri) have declining fee schedules as the project size goes up (Dutton 2016). Fees that program administrators charge may vary depending on the range of services they offer. For example, full service program administrators (those that offer everything from contractor management to coordination with capital providers to tools that evaluate project economics) may need to charge more than those that only offer minimal services.

A balance must be struck between increasing fees, which could potentially dampen demand by making C-PACE more expensive for program participants, and covering costs, especially in the case of lower deal volumes. Besides charging participating building owners, programs may also charge fees to contractors for participation and training, and may charge lenders fees for participation.

⁶⁴ DOE suggests programs develop a QA/QC plan to guard against fraud and coordinate with utility incentive program QA/QC efforts, have mandatory measurement and verification, and use licensed contractors that must submit building permits for measures that require them (DOE 2013).

⁶⁵ Depending on the jurisdiction, local governments may charge significant fees for tax collection (Greater Cincinnati Energy Alliance 2017).

⁶⁶ Third party administrator fees and all other fees should be fully disclosed to local governments and property owners.

⁶⁷ The one-time fee in Texas is 1% for projects up to \$5 million and 0.5% for projects above \$5 million.

3.2.3 Program set-up costs

Program investment volumes need to be sufficient to pay ongoing fixed and variable costs but also to repay program set-up costs – e.g., staff time spent on program development, building the program support infrastructure, developing collateral, hiring staff, using consulting services – while making sure that financing is still affordable enough to attract sufficient project volume to cover these expenses. The fact that programs could take significant time to establish (and to begin generating fee revenue) should be taken into consideration when contemplating setting up a program since funding for this stage will have to be secured beforehand. Higher fees could also impact the ability of smaller property owners to participate. It is important for program reputation that fees are transparent to participants and that program administrator fees are transparent to their clients, including fees for added services such as use of a program administrator’s proprietary software.

Interviewees estimated program set-up costs to be between \$250,000 to about \$500,000, although one program, Minnesota’s MinnPACE, reported minimal set-up costs.⁶⁸ Funds to support start-up can come from sources such as federal grants, foundation grants, corporate sponsorship, utility ratepayer funds and local municipal general funds (Clean Energy Solutions 2016). Some programs have been provided with in-kind staff time; others have had private program administrators take on much of the responsibility and cost for setup. Some jurisdictions have competitively procured a third-party administrator early in the set-up process. Program administrators procured in this manner are awarded exclusive rights to serve as the PACE administrator in that jurisdiction, and perhaps some amount of funding, in exchange for developing and launching the program in collaboration with the sponsor.

LESSONS FROM THE FIELD

FEES

Variable fee structure. Fees in the California First program vary based on the size and structure of the project. There are one-time application fees (currently waived), closing fees, and service fees, as well as ongoing administrative fees for billing, collection, disclosure reports, monitoring project funds, and tracking delinquencies. The program notes that the fees “will be disclosed and agreed to prior to financing” (CaliforniaFIRST 2016).

Cost categories. Chris Robbins of Clean Fund, a specialty PACE capital provider, categorizes costs covered by fees into program costs (ranging from 1% to 2.5%) versus financing costs (ranging from 2% to 4%) (PACENation n.d.).

PROGRAM SETUP

Utah. With the updates to the C-PACE program, the Utah Governor’s Office of Energy Development (OED) is incurring direct set-up costs and has dedicated substantial staff time to design and develop the C-PACE District, a state administrative function that is statutorily assigned to the office. OED recently selected Sustainable Real Estate Solutions (SRS), to inform the program design process and develop customized C-PACE materials to comply with Utah’s statute (Cuan 2017b).

Texas. Keeping PACE in Texas and the Texas PACE Authority, a nonprofit program administrator, invested significant staff time in setting up the program. Local governments can join with minimal set-up and ongoing costs. Local governments using the Texas PACE Authority as their program administrator have just three obligations: 1) recording the lien on the property, 2) collecting past due assessments if that becomes necessary, and 3) printing a notice of the assessment and including it with the property tax bill (the Texas PACE Authority prepares the bill) (Heydinger 2017).

Minnesota. The MinnPACE program administrator, the St. Paul Port Authority, uses an existing energy efficiency financing infrastructure from another program, which significantly reduced set-up costs. The program reports virtually no set-up costs (Klein 2017).

⁶⁸ Clean Energy Solutions found start-up costs ranging from \$225,000 (SCEIP) to \$600,000 (Clean Energy Solutions 2016). MinnPACE’s low set-up costs are largely due to using an existing efficiency financing infrastructure.

4. Conclusion

C-PACE BENEFITS

C-PACE OFFERS A HOST OF POTENTIAL BENEFITS FOR STAKEHOLDERS INCLUDING THE FOLLOWING:

- Requires no upfront costs;
- Can address split incentives;
- Provides good security for capital providers (through a senior lien and the ability to transfer payment obligations to subsequent property owners);
- Can increase property value and net operating income for property owners; and
- Supports economic development — for example, C-PACE has supported nearly \$200 million of investment in California and over \$100 million in Connecticut (PACENation n.d.).

C-PACE program development is a multi-step and dynamic undertaking that ultimately can enable those benefits. In the course of compiling this report, several interviewees commented that there needs to be more information available about C-PACE. This report provides a new resource for those looking to set up a C-PACE program.

Enabling legislation sets a framework and policy within which a C-PACE program will be designed. The framework potentially lays out:

- What program structure is possible (some structures may be inherently more standardized and offer undemanding routes for local governments to participate in C-PACE);
- Which entity will be the program sponsor; and
- What decisions the sponsor will need to make.

This report lays out C-PACE program set-up decision points, options, and tradeoffs for program sponsors. These decisions points (e.g., how to capitalize projects, how to qualify projects, and how to estimate and document savings) comprise the guidelines that a program sponsor must adopt or develop.



There are common misconceptions about C-PACE that stakeholders hope to dispel. Through the lessons learned presented in this report, several misconceptions have been addressed:

- **“Commercial PACE and residential PACE are the same.”**

There are several important ways in which C-PACE differs, including larger construction scopes (which require different timing structures for payment disbursement and lien placement), the commercial sector’s greater focus on project cash flows – as evidenced in project qualification criteria (see Section 2.2.2), and the practice of mortgage holder consent (see Section 2 and Section 3.1). The commercial sector also benefits from close relationships between property owners and lenders.

- **“For local governments, setting up a C-PACE program will require more staff capacity, funding and expertise than they are likely to have.”**

Section 1.2 shows that in all program structures, there are ways in which local governments can participate in larger C-PACE programs, which take on many or most program responsibilities. That allows local governments to participate while dedicating minimal resources. Sections 1.2 and 3.1 show the vital role of market actors (e.g., third-party program administrators, capital providers) and how they can be instrumental in guiding program set-up decisions and greatly reduce the burden for local governments.

- **“It will be hard to find capital for C-PACE projects.”**

Multiple interviewees noted that there is an abundance of capital providers eager to invest in projects originating from well-crafted C-PACE programs, particularly specialty PACE capital providers.⁶⁹

C-PACE is growing and evolving rapidly. As programs gain experience with various design aspects (e.g., program structures, financing approaches, and M&V plans), more research into their advantages, disadvantages and distinctions will be needed.

⁶⁹ To better understand capital provider priorities for C-PACE programs, see *Elements of a Well-Designed C-PACE Statute and Program to Attract Private Capital and Foster Greater Transaction Volumes* (see Appendix C).

Works cited

- Arlington County PACE Program. “Cooperative Procurement Messaging.” Arlington County, Virginia, March 22, 2017.
- Baechler, Michael, Cindy Strecker, and Jennifer Shafer. *A Guide to Energy Audits*. Department of Energy, Pacific Northwest National Laboratory, 2011.
- CaliforniaFIRST. *CaliforniaFIRST Program Handbook for Non-Residential Properties*. California Statewide Communities Development Authority (CSCDA), 2016.
- Caraghiaur, George, interview by LBNL. (August 1, 2017).
- . *The Benefits of PACE Financing for Commercial Real Estate Companies*. PACE Nation, 2016.
- Clean Energy Solutions. “Statewide Commercial PACE Administrative Framework.” 2016.
- Colorado CPACE. *Capital Providers / How it works*. n.d. <http://copace.com/capital-providers/capital-providers-how-it-works/> (accessed July 5, 2017).
- Connecticut Green Bank. “C-PACE Program Guidelines, Version 5.” 2016.
- Cuan, Shawna, interview by DOE. (July 21, 2017a).
- Cuan, Shawna, interview by LBNL. (August 11, 2017b).
- DMME. *Final uniform statewide financial underwriting guidelines for clean energy loans made by localities under §15.2-958.3 of the Code of Virginia*. Virginia Department of Mines, Minerals and Energy (DMME), 2015.
- DOE. *Better Buildings Financing Navigator: Loan or Debt Financing*. Department of Energy (DOE), n.d.
- DOE. *Clean Energy Finance Guide: Chapter 12. Commercial Property-Assessed Clean Energy (PACE)*. U.S. Department of Energy (DOE), 2013.
- Dutton, Meghan. *Utah C-PACE Road Map: Status and Recommendations*. Utah Clean Energy, 2016.
- EIA. *U.S. Energy Information Administration: Total Energy - Monthly Energy Review (Data). 2.1 Energy consumption by sector*. Energy Information Administration (EIA), 2017.
- Energize NY PACE. “NY State Amends PACE Law, Making PACE Financing More Accessible.” *Energize NY PACE Newsletter*. September 2017.
- Farrell, Daniel, interview by LBNL. (August 25, 2017).
- Franconi, Ellen, et al. *The Status and Promise of Advanced M&V: An Overview of “M&V 2.0” Methods, Tools, and Applications*. Rocky Mountain Institute and Lawrence Berkeley National Laboratory, 2017.
- Golden, Troy. “Primer: Differentiating Class A, B, and C Office Space.” *Area Development*. 2013.
- Greater Cincinnati Energy Alliance. “Advancing C-PACE Financing with Regional & Statewide Administrators.” *ACEEE 2017 Finance Forum*. Chicago, IL: American Council for an Energy-Efficient Economy (ACEEE), 2017.
- GreenFinanceSF. *GreenFinanceSF: Program Handbook*. City of San Francisco, n.d.
- Heydinger, Charlene, interview by LBNL. (August 21, 2017).
- Hoffman, Ian M., Steven R. Schiller, Annika Todd, Megan A. Billingsley, Charles A. Goldman, and Lisa C. Schwartz. “Energy Savings Lifetimes and Persistence: Practices, Issues and Data.” Lawrence Berkeley National Laboratory, 2015.
- Investopedia. *Debt-Service Coverage Ratio (DSCR)*. n.d. <http://www.investopedia.com/terms/d/dscr.asp> (accessed July 5, 2017).
- . *Revenue Bond*. n.d. <https://www.investopedia.com/terms/r/revenuebond.asp> (accessed November 10, 2017).
- Keeping PACE in Texas. “PACE in a Box.” n.d.
- Klein, Peter, interview by LBNL. (August 3, 2017).
- Lombardi, Nick. “The Inside Story of How Connecticut Became So Influential in Energy Efficiency Finance.” July 8, 2014. <https://www.greentechmedia.com/articles/read/connecticut-is-becoming-very-influential-in-the-energy-efficiency-industry> (accessed 5 2017, June).
- Martin Fadrhonc, Emily, and Chris Kramer. “Commercial Property Assessed Clean Energy (PACE): A Deeper Dive into Program Administration.” Lawrence Berkeley National Laboratory, February 2015.
- McCarter, Brian, interview by LBNL. (July 19, 2017).
- Moyer, Kevin, interview by LBNL. (August 3, 2017).
- NASEO. *Accelerating the Commercial PACE Market: Statewide Programs and State Energy Office Participation in Property Assessed Clean Energy*

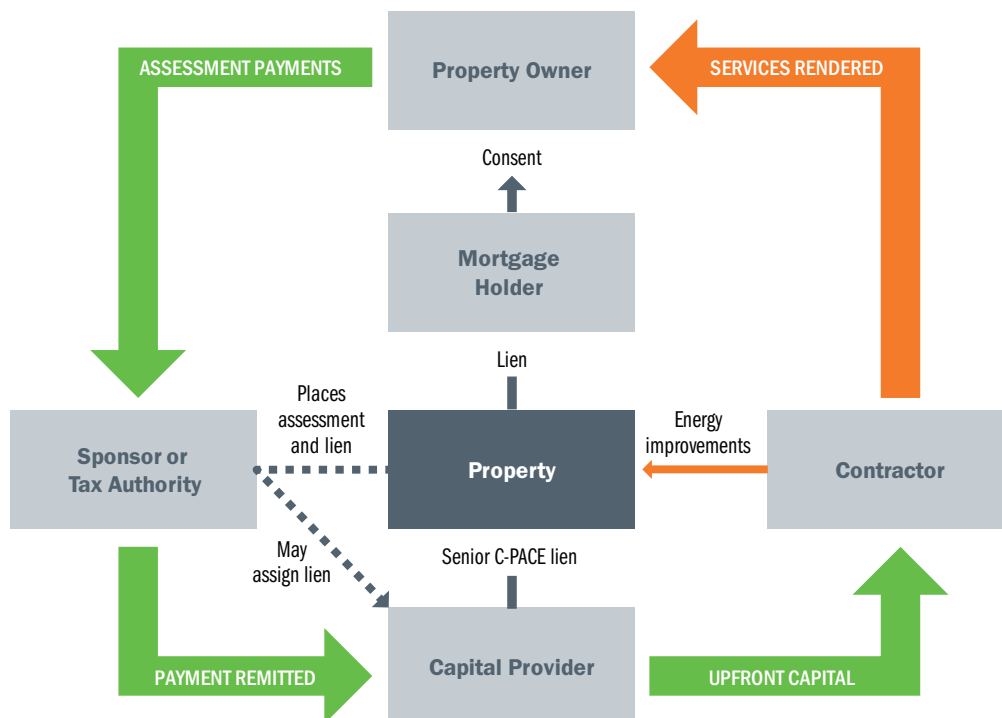
- (PACE) Financing. National Association of State Energy Offices (NASEO), 2016.
- PACE Now. *Lender Support Update: Senior Mortgage Lender Considerations of Commercial PACE Transactions in 2013*. PACE Now, 2014.
- PACENation. *How to Start a Commercial PACE Program*. n.d. <http://pacenation.us/start-a-pace-program/> (accessed July 14, 2017).
- . *List of PACE Programs*. n.d. <http://pacenation.us/list-of-pace-programs/> (accessed August 11, 2017).
- . *PACE for Municipalities*. n.d. <http://pacenation.us/pace-for-municipalities/> (accessed 22 2018, January).
- . *PACE Market Data*. n.d. <http://pacenation.us/pace-market-data/> (accessed January 8, 2018).
- Pacific Northwest National Laboratory. *A Guide to Energy Audits*. Department of Energy, 2011.
- PR Newswire. “Greenworks Lending Completes First Rated Securitization of Commercial PACE (C-PACE) Assets.” Cision PR Newswire, September 25, 2017.
- Reality Mogul. “What is Class A, Class B, or Class C property?” July 24, 2013. <https://www.realtymogul.com/resource-center/articles/what-is-class-a-class-b-or-class-c-property>.
- SCEIP. “Property Assessed Clean Energy (PACE) Replication Guidance Package for Local Governments.” 2012.
- Scharfenberger, Paul, interview by LBNL. (July 27, 2017).
- SEE Action. *Credit Enhancement Guide*. Prepared by M. Zimring, Lawrence Berkeley National Laboratory, State and Local Energy Efficiency Action Network (SEE Action), 2014.
- SEE Action. *Energy Efficiency Program Impact Evaluation Guide*. State and Local Energy Efficiency Action Network (SEE Action), prepared by Steven R. Schiller, 2012.
- Sherman, Genevieve. “Communication of Oct. 17, 2017.” October 17, 2017.
- SRS. *Commercial PACE Best Practices*. Sustainable Real Estate Solutions, Inc. (SRS), U.S. DOE Technical Assistance Program, 2017.
- U.S. Census Bureau. “Individual State Descriptions: 2012.” 2013.
- Utah Clean Energy. “Commercial PACE Across the U.S.” 2014.
- Utah State Legislature. “S.B. 273 Energy Development Amendments.” 2017.
- Wisconsin State Legislature. “2011 Wisconsin Act 138.” April 4, 2012.

APPENDIX A. How does it work? Project financing with C-PACE

State and local governments frequently ask about two very different processes: (1) how do we get a C-PACE program started in our jurisdiction, and (2) how do projects get financed with C-PACE? *Lessons in Commercial PACE: The Path from Legislation to Launch* is intended to address the first question regarding creation of a *program*. This appendix briefly addresses the second question related to execution of a *project* in terms of the project sequence and the role of various actors.

Project Sequence: C-PACE-financed projects, like most large commercial building projects, often takes more than a year from initial conception to project completion. For a mature program, securing and using C-PACE financing for a project should not significantly extend the project timeline beyond other financing options. The sequence of steps in a C-PACE project can vary from program to program. The general sequence is outlined in the figure to the right.

Project Roles: C-PACE financed projects are dependent on multiple actors and transactions among those actors. The figure below generalizes the typical C-PACE roles and transactions.



APPENDIX B. Program structure quick glance and options for local governments

Table B-1: The role of state government and options for local governments under various C-PACE programs structures.

| | Typical Role of State | PACE Program Administration | Local Options | Examples |
|--|---|---|--|----------|
| Statewide Model | Adopts enabling legislation; state entity often serves as the program sponsor, state entity may select a program administrator and may potentially take on some implementation responsibilities | One statewide administrator serving one statewide program | Opt-in to statewide PACE program | CT |
| State and Local Option Model | Adopts enabling legislation; state entity may serve as the program sponsor, and otherwise participates as market enabler | One administrator selected by a state entity serving each local government program, but allows for local governments to start their own program and use own administrator | Opt-in to statewide program, or create a local PACE program outside of statewide program | MD |
| Strategic State Support Model | Adopts enabling legislation, state staff may participate in decision-making body alongside private sector to facilitate standardized program offerings (e.g., standardized practices and materials) | One administrator is available to serve each local government program, but allows for local governments to start their own program and use own administrator Administrator may be a non-state entity well-positioned to serve as the de facto statewide program administrator (i.e., lacks formal state designation) | Use standardized program offerings (e.g., standardized practices and materials), or create a local PACE program outside of statewide program | TX |
| Limited or No State Support Model | Adopts enabling legislation | Multiple program administrators serve multiple jurisdictions; in some cases there are multiple administrators serving one jurisdiction | Opt-in to regional or joint powers authority sponsored PACE program, or create a local PACE program | CA |

APPENDIX C. Links to resources specific C-PACE topics

Table C-1: Additional C-PACE and related materials.

| SOURCE | TITLE | PROGRAM STRUCTURE (1.2.) | CAPITALIZING PROJECTS (2.1.) | PROGRAM QUALIFICATION (2.2.) | SAVINGS (AUDITS, SIR, M&V) (2.3.) | STAKEHOLDER ENGAGEMENT (3.1.) | ONGOING OPERATIONS (3.2.) |
|--|--|--------------------------|------------------------------|------------------------------|-----------------------------------|-------------------------------|---------------------------|
| DOE | Clean Energy Finance Guide, Chapter 12 | | ✓ | | ✓ | | ✓ |
| SEE Action Network | Credit Enhancement Overview Guide | | ✓ | | | | |
| DOE | C-PACE Primer | | ✓ | ✓ | | | |
| Utah Clean Energy | Commercial PACE Across the U.S. | | ✓ | ✓ | ✓ | | ✓ |
| PACENation | How to Start a Commercial PACE Program | ✓ | ✓ | | | ✓ | ✓ |
| Securities and Exchange Commission | Municipal Bonds: Understanding Credit Risk | | ✓ | | | | |
| Virginia Department of Mines, Minerals and Energy | Final uniform statewide financial underwriting guidelines | | ✓ | ✓ | ✓ | | |
| SEE Action Network | Guidance on Establishing and Maintaining Technical Reference Manuals for Energy Efficiency Measures | | | ✓ | ✓ | | |
| Pacific Northwest National Laboratory | A Guide to Energy Audits | | | | ✓ | | |
| DOE | Energy Savings Performance Contracting: The Investment Grade Audit | | | | ✓ | | |
| Investor Confidence Project (ICP) | ICP website | | | | ✓ | | |
| ASHRAE | ASHRAE website | | | | ✓ | | |
| PACENation | Lender Support Update | | ✓ | ✓ | | | |
| Sonoma County | PACE Replication Guidance Package for Local Governments | | ✓ | ✓ | ✓ | ✓ | ✓ |
| National Association of State Energy Offices | Accelerating the Commercial PACE Market | ✓ | | | | | |
| Petros PACE Finance, CleanFund, Greenworks Lending, Twain Financial Partners | Elements of a Well-Designed C-PACE Statute and Program to Attract Private Capital and Foster Greater Transaction Volumes | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DOE, LBNL | Commercial PACE: A Comparative Analysis | ✓ | ✓ | ✓ | | | ✓ |

Table C-2: Selected program manuals and guides.

| | |
|--|--|
| Texas PACE Authority | PACE Program User Guide and Technical Standards Manual |
| Keeping PACE in Texas | PACE in a Box |
| City of Milwaukee | PACE Financing Program Manual |
| Clean Energy Solutions | Statewide Commercial PACE Administrative Framework |
| Connecticut Green Bank | C-PACE Program Guidelines |
| Colorado New Energy Improvement District (NEID) | C-PACE Program Guide |
| California First | Program Handbook for Non-Residential Properties |
| Utah Governor's Office of Energy Development | C-PACE Program Guidelines |

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