Expanding Solar Deployment Opportunities in the C&I Sector

An Introduction to Property Assessed Clean Energy (PACE)

Written by Members of the SEIA Finance Initiative, Commercial Real Estate Working Group

SEIA Solar Energy Industries Association®

Executive Summary

Despite enormous market opportunity, strong interest in corporate responsibility, and improving economics, solar deployment in the commercial and industrial (C&I) sector has been largely stagnant over the past 5 years.

The complexities of opening the C&I sector to broad solar deployment are based on a range of inter-related issues, including: the manner in which U.S. commercial real estate is often leased, which creates a "split incentive" among real estate owners and building tenants; unrated credit among small commercial entities; a lack of "tax appetite" or ability to monetize tax credits and depreciation benefits that are critical to solar project cost-effectiveness; and constraints of cash to invest in solar and other energy production or saving investments.

Property Assessed Clean Energy (PACE) is a financial tool that can overcome many of these barriers. PACE for commercial buildings, or C-PACE, has been approved via enabling legislation in 33 states and the District of Columbia. 40 distinct programs are now being implemented across 19 states.

PACE financing includes a range of benefits:

- *20 Year Financing*: PACE allows up to 20+ year financing terms that do not need to be paid-off upon a refinancing or sale of the property.
- *Solves Split Incentive*: PACE can mitigate the complex split incentive issue common in commercial real estate, particularly in so-called 'triple net leases' where tenants pay property taxes, energy bills, improvements, and other costs.
- *Property-based Underwriting*: based primarily on the property, not the borrower's credit, which may allow PACE providers to offer better terms than other funding sources.
- *Runs with the Land*: The PACE lien stays with the property, whereby payments generally transfer to the new owner without issue.
- *Frees up Cash*: PACE frees up cash so a company does not have to decide between installing solar or investing in projects that are closer to their core business.
- *Third-Party Ownership*: Entities without a tax appetite can utilize PACE with a third-party ownership structure which allows the developer to monetize tax incentives to subsidize the solar project.
- *100% Financing*: PACE can finance 100% of the project costs, including the related improvements such as necessary roof repair and replacement. Soft costs that are not eligible for the solar Investment Tax Credit (ITC) such as legal and broker fees are also includible in the PACE financing.
- *Works Well with Other Incentive Programs*: PACE can be utilized in conjunction with many existing tax credit and incentivized development programs.

Relative to other financing options, PACE can produce better cash flow on a cumulative and present value basis. In two analyses of current projects in California, PACE produced the best or highly competitive economic returns among competing consumer finance options where the end-consumer was able to monetize the tax benefits and when not (see Chapter 11, below).

Leading experts gathered at the PACE Strategy Summit held at Solar Power International 2016 identified key areas of potential industry coordination and outreach to expand PACE finance for solar deployment, represented in the following graphic:

Figure ES-2: Improving C-PACE Financing Landscape

Expansion, Education and Outreach

PACE can be elegant solution to certain market barriers. But one that requires a significant level of infrastructure development and market education. PACE requires a high level of education including among developers, real estate owners and realtors, mortgage lenders and capital market investors (i.e., entities that wrote or hold the mortgages), title companies, appraisers and others. SEIA can facilitate such education and outreach among the organization's membership and stakeholders that engage with our members to further the solar and PACE markets.

Streamlining and Consistency

Consistent and high quality practices among all actors along the PACE value chain could improve comprehension of and trust in the PACE model, including a faster and more consistent lender consent application and process. Fragmented legal environments and high variability across programs also represent barriers to the financing model. SEIA, PACENation, banking and real estate associations, and others could be working together to facilitate a clear and concise lender consent application and review process.

Additional Capital and Financial Products

Title, bond insurance, and more financiers to offer PACE and to do so at lower financing costs could open opportunities for the PACE financing model. Participants to the PACE Strategy Summit broadly agreed success will breed success, that as PACE legislation and municipal opt-in is more widely adopted, it will bring more comprehension and interest from stakeholders in the real estate, deployment, capital, and financial instrument space.

1.0 Introduction

The following paper was developed by SEIA's Michael Mendelsohn and Amir Yazdi and members of the SEIA Finance Initiative (SFI), Commercial Real Estate working group. SFI is a year-long effort dedicated to opening certain underserved sectors for solar deployment, including both small-medium commercial and municipal buildings and low-moderate income residences. SEIA would like to thank the array of contributors to this report, including:

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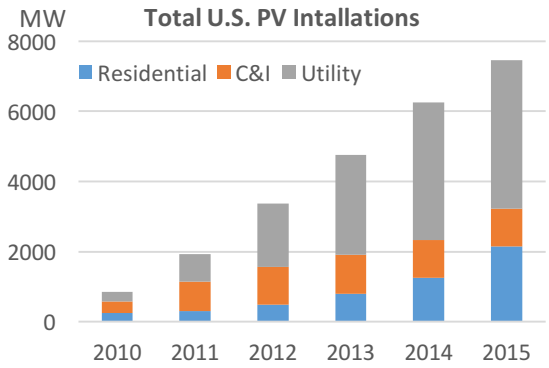
2.0 Solar Background

Rapid growth in PV installations has been driven by the falling cost of solar technology, state and federal programs such as the Solar Investment Tax Credit (ITC), and increasing ratepayer interest. From 2010 to 2015, yearly solar PV installations grew from around 850 megawatts (MW) to more than 7,200 MW (Figures 1 and 2). Over that period, residential and utility installations grew dramatically at roughly 60% and 75%, respectively, on average per year. Growth in non-residential systems – also referred to as commercial and industrial (C&I) or middle-market, however, has stalled and even been negative since 2012 after rising dramatically in the early part of the decade.



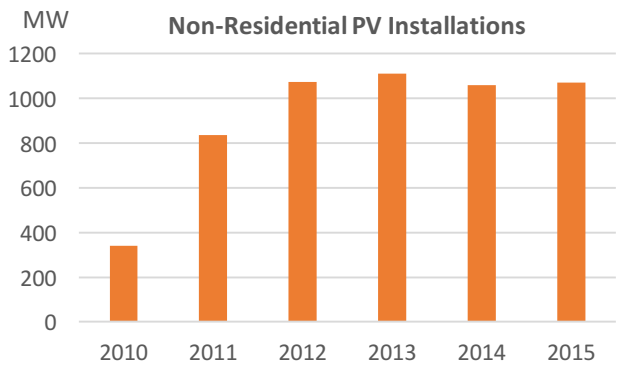


Figure 1: U.S. PV Installations 2010 – 2015; Figure 2: Non-Residential, or "C&I" PV Installations
Source: SEIA, GTM Research; U.S. Solar Market Insight®, 2015 Year in Review

This trend is expected to continue, with residential and utility-scale markets forecasted to grow quickly to 2020. Non-residential markets – including commercial, industrial, government, schools,

and non-profits – are projected to grow modestly (at least relative to the overall solar market) from about 1 gigawatt (GW) in 2015 to roughly 2 GW in 2020. Although perhaps a misnomer, we'll refer to the non-residential sector as C&I or commercial.

3.0 Potential of C&I Markets

On the surface, it seems strange that the commercial installation market has remained relatively stagnant. Fortune 100 companies have procured and deployed solar projects at a rapid pace, and the untapped market potential is still tremendous. Recent announcements by Google, Apple, Microsoft and others indicate a strong interest by Fortune 100 companies in procuring solar and other sources of clean energy. Thirteen large corporates signed the American Business Act on Climate Pledge in 2015, in partnership with the White House, to reduce greenhouse emissions. But many of these announced projects and pledged commitments have yet to be completed or met, and represent a minor fraction of overall energy use and solar potential.

According to a 2012 survey of commercial buildings from the U.S. Energy Information Administration (EIA), there are 5.23 million commercial buildings with a total of 84.9 billion square feet of floor space.[1] Small commercial buildings (less than 50,000 square feet) comprise the vast majority of all building stock in the U.S., both by number and square footage. Ninety-four percent (94%) of all buildings are classified as small commercial, and all together they consume 47% of energy in the building sector.[2] Although this is approximately twice as much energy as that used by the entire residential sector, current commercial installations represent less than half of residential solar installations by total capacity installed.[3]

Put in another perspective, the C&I sector consumes about 2,400 terrawatt-hours (TWh) of electricity per year, and in 2012, commercial buildings alone consumed 1,240 TWh of electricity.[4] It would require nearly 1,400 GW of solar generation capacity to meet the total C&I sector (assuming a 20% capacity factor), yet only about 5.4 GW has been built from 2010 through 2015.[5] Even accounting for the fact that utility-scale solar is resold to retail customers, including the C&I sector, there remains huge untapped potential.

Even with current historically low natural gas prices – and natural gas powering an increasingly large share of our nation's electricity – solar is at or near cost competitiveness with utility-provided electricity for commercial end-users. For example, analysis performed by Black & Veatch estimates the levelized cost of electricity (LCOE) of large-scale solar electricity ranges from roughly $60/MWh to $100/MWh ($0.06/kWh - $0.10/kWh) for most of the U.S. (see Figure 2). This analysis is for a 5 MW PV project with single-axis tracking.

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[1] http://www.eia.gov/consumption/commercial/data/2012/c&e/pdf/c13-c22.pdf
[2] https://www.nibs.org/news/209198/Small-Commercial-Buildings-Offer-Huge-Energy-Efficiency-Retrofit-Opportunities.htm
[3] 2015 SMI, 2,099 MW installed for residential vs. 1,011 MW installed for Non-Residential
[4] http://www.eia.gov/consumption/commercial/data/2012/c&e/pdf/c13-c22.pdf
[5] 2015 SEIA/GTM Solar Market Insight

These values compare favorably to average U.S. electricity prices of 10.6 cents/kWh for the commercial sector (and 7.0 cents/kWh for industrial sector),[6] although that value includes both the variable component (i.e., avoidable) and the demand component (generally not avoidable) of a commercial entity's rate structure. And the economics of solar will continue to improve as the costs for solar systems drop and efficiencies increase.

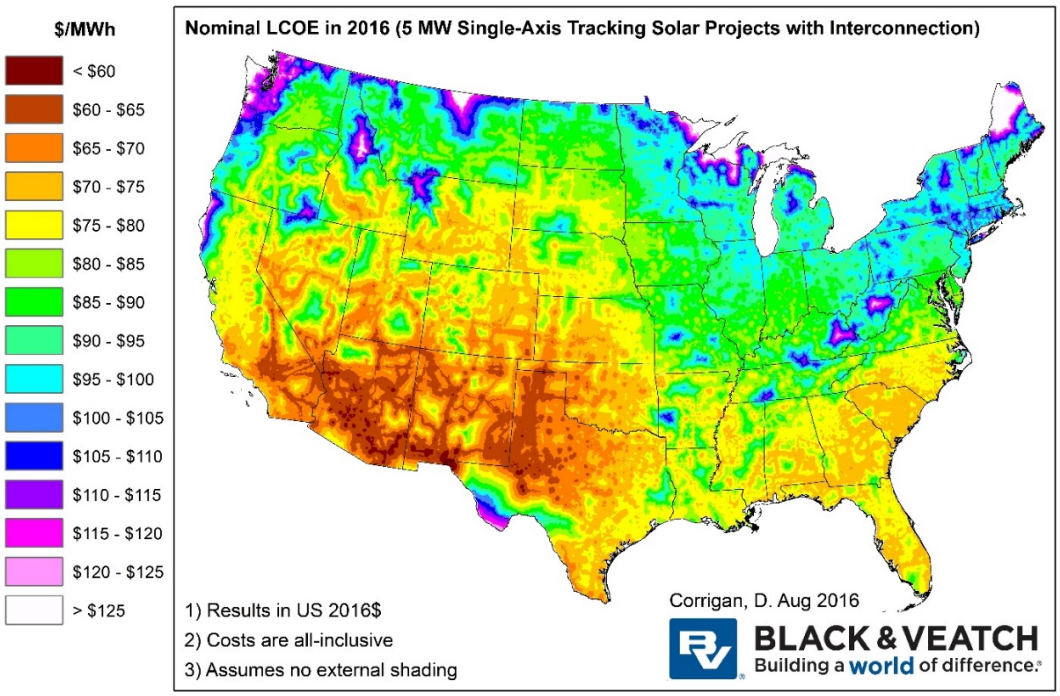

Figure 2: Solar Electricity Prices, Continental U.S.

Finally, a recent study by National Renewable Energy Laboratory (NREL), focused primarily on hotels, offices and warehouses, these building sectors could economically deploy 27 GW of solar capacity.[7] Assuming solar installation costs decline to DOE Sunshot 2020 targets for commercial systems ($1.25/Wdc), according to the NREL study, these three building sectors could deploy more than 100 GW in just a few short years.

4.0 Barriers to Going Solar

So, if companies have shown interest in solar technology and there is a huge potential market, why have installations stagnated?

[6] Source: U.S. Energy Information Administration, June 2016 data, https://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a. Accessed August 29, 2016.
[7] Heeter, J.; Bird, L., Expanding Mid-Scale Solar: Examining the Economic Potential, Barriers, and Opportunities at Offices, Hotels, Warehouses, and Universities; NREL. http://www.nrel.gov/docs/fy16osti/65938.pdf

A wide range of regulatory issues – such as cumbersome interconnection processes and disallowed or ambiguous allowance to third-party ownership structures – remain.[8] Key among regulatory issues are the rate design options available to C&I customers in a given market. Electric utilities emphasize demand (peaked on peak kW usage in a month or ratcheted over a series of months) in their commercial rates. Such rates undervalue solar net metering which generally offsets only the kWh usage portion of the bill at the retail rate. Some regulatory markets such as the major electric utilities in CA and CO provide solar-friendly Time of Use rates that values solar more closely than. Some notable municipal utilities (Austin Power, Ft Collins Utilities) provide a feed-in tariff to more properly value solar for C&I ratepayers.[9]

Even so, solar is on the cusp of cost-competitiveness in many areas of the country. Accordingly, the cost and terms of project financing, as well as its overall availability, is of critical importance to solar adoption. And due to an array of overlapping complexities, financing these projects can be very difficult.

First, most commercial entities do not own the real estate they inhabit. Instead, they lease the building space, and generally through some type of "net" lease structure. In commonly-applied triple-net lease situations, the lessee pays all pro-rata energy costs, taxes, and building upkeep fees. In those cases, building owners, or lessors, hesitate to pay for a system that primarily benefits the lessee. This split-incentive issue is one factor contributing to commercial solar's slow growth.

Second, the vast majority of companies have unrated credit or their credit – as rated by a major rating agency – is rated below investment grade, which makes financing large projects difficult. Solar projects are capital intensive, long-lived assets and thus require long-term financing to enable payments to be competitive against utility-provided power. The availability of such long-term financing is tied closely to the creditworthiness of the consumer, or offtaker. Historically, solar project financing has not been available for projects with offtakers that lack investment-grade credit (i.e., BBB- or higher), let alone for those without any formal credit rating.[10] Additionally, it is common for C&I real estate to change ownership and impossible to anticipate the credit of the next owner.

Third, non-profit entities and those without sufficient tax liability or "appetite" cannot monetize federal and state tax credits and depreciation benefits fully, thus negating a critical component of a project's value. More than 1.5 million organizations in the U.S. are considered non-profit.[11] Plus, one in five

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[8] Third-party power purchase agreements are disallowed in 9 states and ambiguous in another 15. Database of State Incentives for Renewables and Efficiency. http://www.dsireusa.org/resources/detailed-summary-maps/ Accessed August 11, 2016.

[9] SEIA works with state affiliated organizations to monitor and intervene where appropriate in major utility rate proceedings and also to educate and encourage state regulators to consider the value of solar applied to electric rates including for the C&I sector.

[10] Ameliorating that effect, alternative rating platforms are becoming more common in the market. Other financial structures such as capital leases represent additional alternatives that may not be hampered by the credit issues, but require shorter paybacks and are non-transferable. Overall, this issue remains a significant barrier in the solar project development landscape.

[11] http://grantspace.org/tools/knowledge-base/Funding-Research/Statistics/number-of-nonprofits-in-the-u.s

large companies pay no corporate income tax – in part due to already available tax incentives, losses carried forward, or other mitigation strategies – and thus may not be able fully monetize the ITC due to lack of tax appetite.[12]

Finally, companies have limited cash to allocate among competing projects, some of which may be primary to the core business, such as building new stores versus installing solar panels. Financial capital and credit availability are limited resources, and companies want to conserve them for projects that fall neatly under their overall business mission. Although solar may reduce an operating expense (i.e., their energy budget), they would rather not eat into their capital budget to do so.

Together, all of these factors have contributed to the sluggish commercial solar market we see today.

5.0 PACE and Why it Works

One innovative tool to open up commercial markets is Property Assessed Clean Energy (PACE) financing. PACE enables building owners to pay for renewable energy, energy efficiency and other upgrades to their properties. When one finances a solar project through PACE, the financing is repaid through a line-item on their property tax bill. The annual property tax lien stays with the property, not the taxpayer, so when the property is transferred, the PACE payments are also transferred. Commercial PACE, or C-PACE, offers a number of critical benefits that help overcome the barriers to commercial solar development referenced above:

- PACE allows up to 20+ year financing terms that do not need to be paid-off upon a refinancing or sale of the property. This compares favorably to 5 to 7-year period for traditional loans and to mortgages which must always be repaid upon a sale.
- PACE can mitigate the complex split incentive issue. Unless there are prohibitive terms, or covenants, in the lease, lessees with triple-net leases will reimburse the owners for the project through their tax payments while those lessees also get the benefit of lower utility bills.
- Underwriting is based primarily on the property, not the borrower's credit, which may allow PACE providers to offer better terms than other funding sources.
- The PACE lien stays with the property – the payments transfer automatically to the new owner.
- C-PACE frees up cash so a company does not have to decide between installing solar or investing in projects that are closer to their core business mission.
- PACE can finance 100% of the project costs, including related improvements such as necessary roof repair and replacement, as well as the associated soft costs that are not ITC-eligible such as legal and broker fees. Roof expenses can otherwise kill or delay many solar projects.
- Companies without a tax appetite and non-profits can utilize PACE with a third-party ownership structure which allows the developer to monetize tax incentives to subsidize the solar project.

[12] http://www.cbsnews.com/news/20-percent-of-profitable-u-s-companies-pay-no-federal-income-tax/

- Because they are not always federally insured financial institutions, PACE providers can use expedited underwriting standards, allowing them to offer attractive terms and conditions with less paperwork, fewer covenants, and without personal recourse.
- PACE can be utilized in connection with most existing tax credit programs, including ITCs, historic tax credits, low income housing tax credits and new markets tax credit programs. Given the simple structure of a PACE transaction relative to most tax credit transactions, projects can obtain an additional source of capital without interfering with tax credit equity investments.

6.0 Commercial PACE Market Overview

PACE must be enabled with state legislation and then generally undergo a county or municipal opt-in process. State PACE legislation authorizes local governments – entities with ability to collect and enforce property taxes – to include financing for clean energy projects in tax assessments. Because each state has a unique constitution and laws regulating local government activities, PACE programs can differ dramatically from state to state and even between counties and cities in the same state.

As of August 2016, PACE legislation for commercial property has been adopted in 33 states and the District of Columbia.[13,14] However, only 19 states have active C-PACE programs with the ability to fund projects – represented through 40 separately-administered programs. Details of those programs are available as an addendum to this report at SEIA's website.[15]

States have different ways of administering the PACE program, ranging from private companies to joint power authorities, non-profit organizations, and non-government organizations. Residential PACE programs require significant oversight by the PACE administrator but this is not a requirement for commercial PACE programs due to more sophisticated negotiations, contractor licensing, and mortgage holder oversight.

[13] PaceNation, Q1 2016 Market Update, http://www.pacenation.us/wp-content/uploads/2016/06/Market-update-Q1-2016.pdf.

[14] Two other states – Maine and Vermont – have programs they call PACE but are not counted in this total programs that are being run do not adhere to their state's enabling legislation, do not place assessments on the benefitted property, do not involve municipalities for tax collection or enforcement, and do not place liens on property. Email conversation with Elyssa Rothe, PACENation.

[15] Available here: ___ . Table source: Abacus Property Solutions

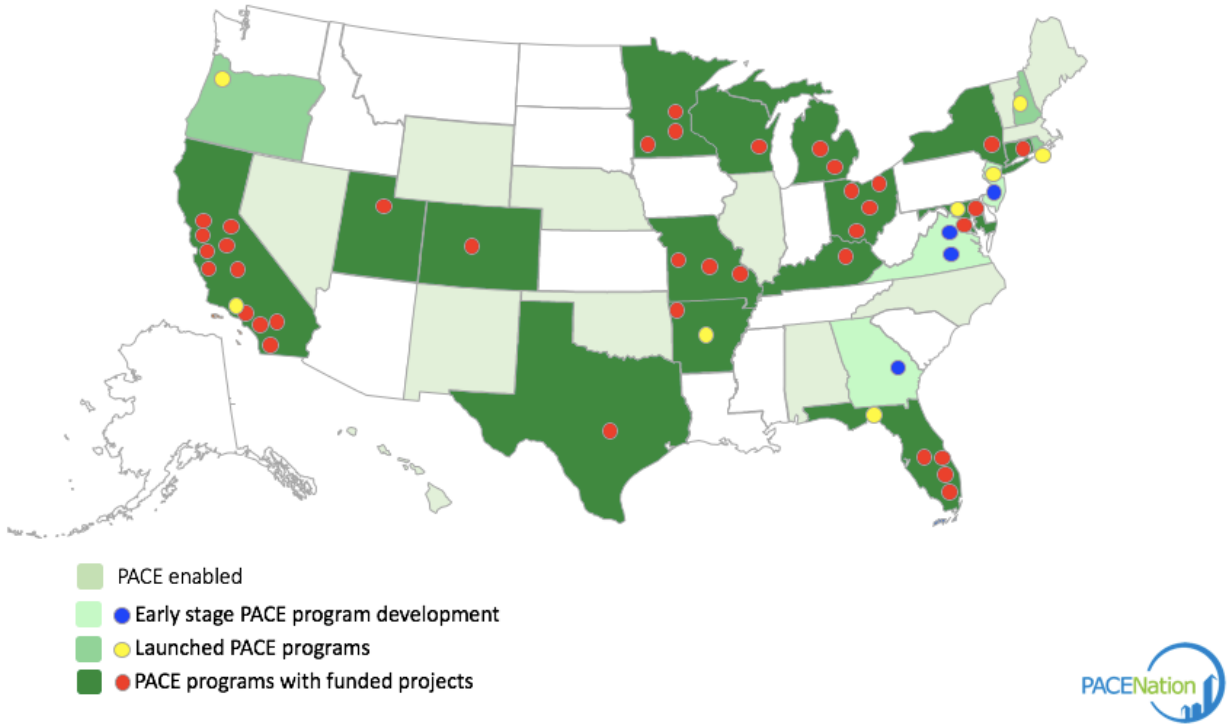

Figure 3: PACE Program Distribution in the United States
Source: PACENation

Property taxation to pay for civic improvements in the U.S. date back to colonial periods.[16] Voluntary assessments such as PACE – where the lien is created by an action of the property owner – have been attached to property taxes since the early 1800s. Improvements funded by voluntary assessments include a wide array of public investments, such as street lighting and fire stations.

The first tranche of C-PACE financings included six projects that closed in 2009, by the Sonoma County Energy Independence Program, for a total PACE financing amount of $3.4 million. Since then, the PACE market has grown to include organizations in related industries, including energy services, real estate owners and investors, capital providers, and local and state governments.

The C-PACE finance market has had consistent growth since 2009, with especially high activity over the past two years (See Figure 4). According to PACENation, 795 commercial buildings have been improved nationally with $292 million in financing.[17] To put it in perspective, that's only about 10% of the residential PACE market in primarily one state, California. However, any comparison is likely premature given the extraordinary market potential, the novelty of the innovation, and the lack of familiarity among real estate owners, lenders, and commercial developers. Of those C-PACE deals completed, a little over half have included renewable energy improvements.

[16] R.H. Carlson, A Brief History of Property Taxes, IAAO Conference on Assessment Administration, September 1, 2004; http://www.iaao.org/uploads/a_brief_history_of_property_tax.pdf
[17] PACENation website, accessed October 13, 2016. http://pacenation.us/pace-market-data/

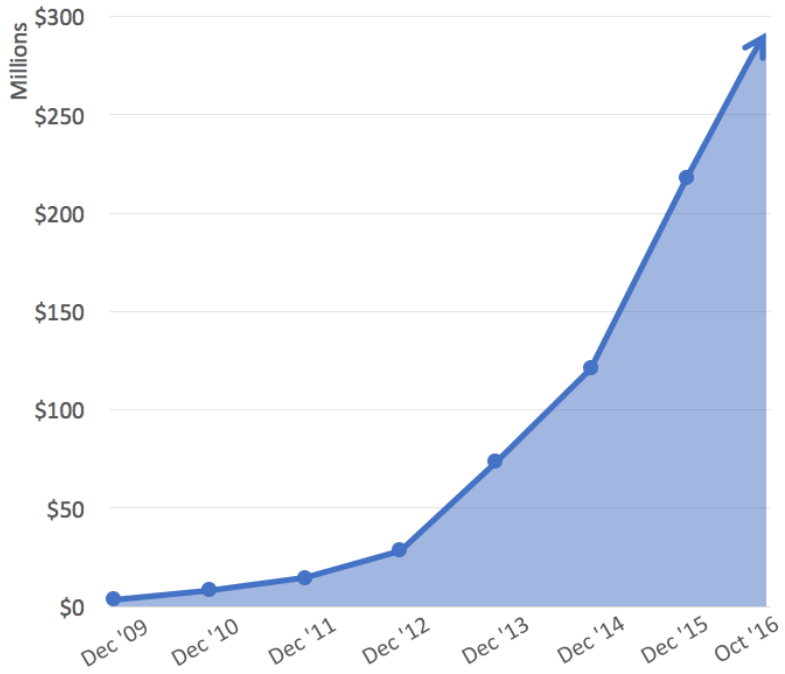

Figure 4: Cumulative C-PACE Financing
Source: PACENation

The bulk of C-PACE investment has been in a handful of states, with California leading the way in both number of projects and capital raised. Connecticut is considered a leader as well, particularly given its small size and lack of urban population. This is largely due to its commitment to PACE, via the Connecticut Green Bank, in administrative staff, direct funding, and credit enhancement. Ohio, Florida, and Minnesota round out the top 5.

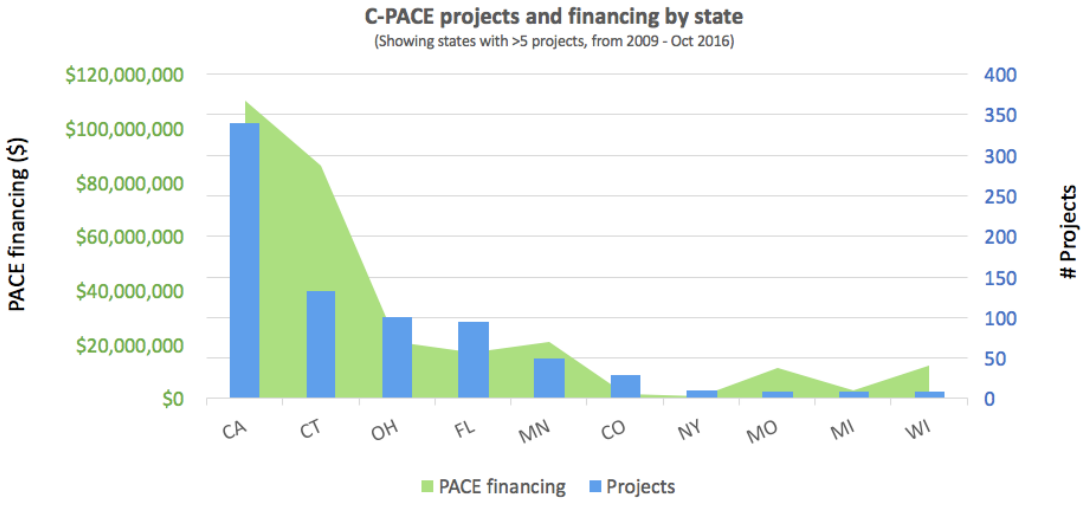

Figure 5: C-PACE Projects and Financing by State
Source: PACENation

7.0 PACE Program Components

State PACE legislation varies markedly from types of eligible measures to the program administration (discussed in more detail below). Some primary concepts to consider include:

Qualifying Improvements – The eligible technologies for PACE projects are outlined in each state's legislation and represent permanently affixed improvements under three categories: renewable energy, energy efficiency, and water conservation.

PACE Program Administration – Local government participation is critical, as only a governmental organization can place an assessment on a property. Application processing and approval is referred to as "program administration". The program administrator could be local governments, state government, or even a third party. More on this below.

PACE Project Funding – The state legislation will define eligible sources of PACE funding. Early PACE programs relied on government sources of capital where revenue bonds would be issued by a local government, an authorized authority, or a local development corporation. More recently, funding is primarily sourced from third-parties such as specialty finance companies, banks, and capital providers specializing in PACE financing. In California, and as recently established in Florida, for example, third-party capital providers contract with the municipality to send to the financier, or "remit", the collected taxes or enforce the collection of funds, if needed.

Funding Levels – Most state legislation allows PACE loans to fund 100% of a project's hard and soft costs, including audits, project development and application fees. The term or the weighted average term of the financing is usually restricted to the weighted average useful life of the improvements.

Lien – Normally, PACE financing places a lien on the property that is similar to property taxes and other assessments. In some states, the PACE lien is subordinate to property taxes but *pari passu* with other assessments or even subordinate to all previous assessments. Some states have passed PACE legislation that allows the assessment to be subordinated to a mortgage, but none of these programs have been successful at attracting capital or completing projects of any significant scale.[18] Those states will likely need to amend the legislation before a PACE program can get off the ground.

[18] Those states include for *residential programs*: Nebraska, Rhode Island, Maine, Oklahoma and Vermont, all of which have no active residential program. For *commercial programs*, Oklahoma and New Hampshire have passed subordinate lien legislation. In New Hampshire, a PACE program was launched with this constraint, but that program has no funded projects yet.

Lender Consent — A growing number of states require lender consent by the financial entity that holds the mortgage on the property. Commercial real estate mortgage holders can include commercial banks, the Small Business Administration (SBA), commercial mortgage-backed securities (CMBS), life insurance companies, specialty financiers, private lenders, or mission-oriented lenders. Five states do not require lender consent: California, Florida, Missouri, Georgia and Arkansas. This issue is discussed at length below.

Non-Accelerating – Importantly, the PACE assessment does not accelerate upon a tax delinquency. That is, a delinquency on billed property tax payments does not trigger the requirement for future property taxes. A default on property taxes will always trigger a default under the mortgage. When a mortgage holder forcloses there is generally a requirement to bring past due property taxes current but there is generally no requirement to accelerate the payment on future property taxes. In this sense, future property tax payments are structurally subordinated to a typical private mortgage.

While a PACE capital provider can likely speak best to some of these more complex issues with the mortgage holder, it will benefit solar developers to understand these primary concepts surrounding lender consent and the mortgage holder's perspective as you assess project origination and financing options.

8.0 Administration and Funding Models

Successful state PACE programs to date are those where state-supported administration or funding is available (Figure 6). High-energy costs are also relevant.

More successful programs are also more mature. California's program began in 2009, by far the oldest. Connecticut's program was launched in

A Bit More Depth: The California Market

The California PACE Market is complex. As background, tax-collecting jurisdictions can form a special tax district or join a joint powers authority (JPA), such as the CA Home Finance Authority, CA Enterprise Development Authority and the CA Municipal Finance Authority.

Roughly ten PACE lenders compete throughout the state, six of which also act as C-PACE program administrators via relationships with the JPAs. The six commercial programs and associated administrators include:

- Alliance NRG (Counterpointe Energy Solutions)
- CaliforniaFirst (Renewable Funding)
- Figtree (Figtree Financing)
- Hero (Renovate America)
- Samas Capital
- Ygrene Works (Ygrene Energy Fund)

These programs include up to hundreds of communities. To join, a community needs to be part of the JPA and then specifically opt-in to the associated PACE program.

Assessment interest rates can range depending on market rates, term length (tenor), assessment amount, etc.

Originators should expect PACE administrative fees of 3-5% for commercial projects, or fixed prices starting at $700.

Program specific info is available at the Association of Bay Area Governments: http://www.abag.ca.gov/bayren/pace/providers.html, PACENation: http://pacenation.us/pace-in-california/, and at SEIA: http://www.seia.org/research-resources/opening-under-served-commercial-properties-solar-deployment

2013. The Colorado, Texas and New Hampshire programs, in contrast, were launched in 2015 or later.

PACE administration models fall broadly into three categories: open market, hybrid or mixed market, and closed market, to be selected and implemented by the local municipality.

8.1 Open Market

In an open market PACE model, the building owners are responsible for selecting their own capital provider and contractor to install the project. The program administrator can assist by providing resources or making suggestions,

8.2 Hybrid Market

In a hybrid system, the property owner is welcome to use their own source of capital if they choose; however, the program administrator has a pre-approved capital provider to fund PACE projects. Although other capital providers can compete to finance projects that are originated independently, the designated capital provider has a distinct competitive advantage in this regard; they have been formally vetted, receive project leads directly from the local government, and are marketed through all outreach programs along with the program administrator itself.

A "Closed Market" Program Administrator's Perspective: Ygrene's Mike Lymere

The most mature PACE market in the U.S., California, has evolved from a small number of so-called 'closed markets' (i.e. one government jurisdiction and one PACE administrator/funder) to include multiple statewide programs that have this 'one-to-one' relationship between sponsoring government entities (i.e. JPA organizations) and private administration/funding firms.

The rationale for this 'one-to-one' structure is to provide expertise and resources to the government program sponsor, ensure that there is a strong legal and financing structure in place, and provide the processes and staff necessary to execute all facets of a PACE program and the long-term financing that is offered through it.

Administration and financing firms that are in these one-to-one relationships with government entities typically are under contract and obligated to provide these resources and services not only at the time of funding, but for the entire duration of the PACE financing – up to 25 or even 30 years. Few, if any, independent capital providers have developed this expertise or infrastructure.

8.3 Closed Market

In this model, the program exclusively arranges the financing and the contracting company to install the project. When the building owner wants to originate a project, they must approach the PACE administrator who will then provide the owner with a list of approved contractors. In this model, the program administrator is also the lender and issues PACE assessment commitments for the project. This structure is effectively a one-stop shop where the origination, underwriting, financing, and construction are all handled in-house.

In states where a statewide bonding authority is permitted, program administrators can effectively operate in overlapping geographic areas. By allowing multiple options within a territory, a certain degree of competition exists.

In addition, some of the program administrators provide closed market options with in-house financing such as Ygrene while others such as Renew Financial in their CalFirst

program offer an open market model under a dollar threshold, and dedicated capital for projects that meet standard underwriting guidelines. Even in so-called closed systems, however, property owners are free to work with their local lending institution to provide the PACE capital.

Some purely open market models - such as Lean and Green Michigan – have experienced challenges in generating deal flow, due to lack of funding to onboard jurisdictions quickly and market PACE to property owners. There are also programs – most notably Connecticut – that started out centralized but have moved towards an open market platform, where capital providers – in addition to the state funded Green Bank – are now providing financing. Connecticut would be classified as a hybrid model where both the state and outside capital providers fund PACE projects, with strong public financial support for program administration and marketing.

9.0 Ability to Open Under-Served Markets

Perhaps the most critical aspect of PACE is its ability to facilitate project financing in underserved sectors of the economy and commercial real estate owners and end-users who have limited means.

9.1 Non-profits

Community-based organizations often have constrained budgets, substantial deferred maintenance challenges, and very large unmet capital investment needs. Like small unrated businesses, non-profits are typically underserved in debt markets because of their credit. Non-profits cannot use tax credits, effectively adding to the cost of purchasing solar. In addition, some non-profits such as universities have restrictions on using their endowments to finance large capital improvement projects.

On the plus side, non-profit properties frequently have low debt levels, so PACE underwriting is simplified thereby increasing the likelihood of lender consent. And regarding use of tax credits, third-party monetization can take place via a PPA or lease if the state legislation allows for third party ownership of the system. In a Pre-Paid PPA arrangement, the PACE funds can be used to fully pre-pay for 20 years of PPA payments, thus substituting predictable PACE loan payments for future energy costs while allowing tax benefits to be monetized by the 3rd party system owner. Companies including Collective Sun and Urban Ingenuity specialize in facilitating these kinds of arrangements. In Connecticut, the Connecticut Green Bank worked with a leading national tax equity partner and a cohort of regional banks to create the CT Solar Lease 2 fund which, in part, provided financing for otherwise non-creditworthy projects by making use of a C-PACE benefit assessment lien as a credit enhancement.19 Connecticut Green Bank's CT Solar Lease 2 fund was unique because it allowed for a traditional PACE-secured PPA structure by which the property owner makes PPA payments along with municipal property taxes.

Therefore, for states that are in the process of adopting or amending PACE authorizing laws, it is important to make sure that the PACE authorizing statute either has affirmative language allowing third party ownership structures or, at least, not have any explicit preclusions.

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[19] Source: http://pacenation.us/pace-talk-pace-power-purchase-agreements-ppa-is-a-game-changer-for-connecticut-and-beyond/

9.2 Small Unrated Businesses

Companies with unrated credit own more than 90% of commercial real estate.20 Assuming that ownership is concentrated in small commercial buildings, buildings owned by companies with unrated credit would make up about 40% of the total electricity consumption by commercial entities. There is great potential in this sector.

In a traditional underwriting process, aside from the lender examining an entity's financial and credit history, the amount of the loan may trigger extra scrutiny or cost, such as requiring senior-level managers to sign off on the loan or using a Uniform Standard of Professional Appraisal Practice compliant appraisal. Property complexity (e.g., a mixed-use building) also affects the underwriting process and loan costs. Together, fees and other fixed transaction costs represent a proportionally higher amount with small loans, and there is a limit to what borrowers are willing to pay.

According to Jeremy Epstein of Harcourt Brown, who advised Colorado on development of their C-PACE program, for PACE to effectively reach this market, two program design elements may help: 1) allow projects to be bundled across multiple parcels or tax identifications but under single-ownership; and, 2) provide state or local seed fund to create a warehouse facility or similar structure to fund small (i.e., < $100k) projects that financiers typically won't spend their time on. Costs of structuring a warehouse facility may be recovered thru direct fees or on the interest rate spread once the warehouse cash flows are sold to larger investors.

9.3 Owner-Occupied Buildings

In owner-occupied buildings, the owner pays for all operation and maintenance costs (e.g., energy costs), so they have an incentive to reduce operating costs in order to increase net operating income. However, most owners have limited cash to allocate among competing capital expenditures. Core business investments – those that build revenue and market share – typically trump solar energy investments. Because an owner can use PACE to finance 100% of a solar project's costs, financing a solar system need not compete with core business investments.

9.4 Properties with Triple Net Leases

Under a triple-net lease, a lessee pays all energy costs, building insurance, improvements, and real estate taxes. If the lessor installs a solar system, they pay for the system and the lessees benefit from reduced electricity costs. Thus, lessors have little incentive to install solar because the return on their investment is negative. This split incentive – that the investment is made by the landlord, but financial benefits accrue to the tenants – helps explain why so few sustainability projects are undertaken by landlords at properties with triple net leases.

PACE assessments are repaid through a line-item on the tax assessments, so the lessee who benefits from the solar project lowering their electricity costs also pays the property tax. When a new lessee

[20] http://beedison.com/will-standardized-credit-assessments-for-unrated-off-takers-unleash-the-potential-of-solar-in-the-non-residential-space/

comes in, they take over repayment obligations. This solves the split-incentive problem, because now the entity who benefits from the lower utilities is also responsible for paying for the cost of the system.

9.5 Hospitality Industry

There is an increasing need within the national hospitality industry to reduce energy consumption, making PACE financing a very attractive product within this industry. In addition to solar improvements, hotel developments typically include energy efficient lighting, low flow plumbing, high efficiency HVAC and other upgrades. Traditional mortgage lenders often have strict underwriting requirements for hotel properties given the historical foreclosure rates and very high maintenance costs. PACE, on the other hand, is uniquely tailored to accommodate the needs of hotel developers to finance these energy efficiency and renewable energy improvements. Moreover, similar to triple net lease properties, hotel developers can elect to pass on the assessment pro rata to hotel guests as a below the line energy assessment.

9.6 New Construction

Solar systems on new buildings can be difficult to finance due to uncertainty of tenants, lease structures or energy consumption patterns and selected rate structures The Colorado C-PACE program allows for funding up to 15-20% of total new building costs (depending on test applied) to facilitate renewable energy systems or better-than-code energy appliances.[21] The PACE financing can represent a replacement for equity amongst the capital stack and be attractive to real estate developers and owners. It should be noted, however, that not all states with PACE enabling legislation permit the use of PACE on new construction.

10.0 Challenges to PACE

10.1 Lender Consent

Lenders who are familiar with PACE financing recognize that PACE improvements increase the value of their collateral and also increase their borrower's cash flow as a result of energy and efficiency savings. Notwithstanding these benefits, lenders also focus on the priority of the PACE lien given its creation through a tax assessment. In most states, PACE financing will place a lien on the beneficiary property that is senior to the mortgage holder's lien (but importantly, only for the portion in arrears, not the entire amount). Without their signed consent or acknowledgment, a mortgage lender may treat PACE financing as a violation of the existing credit facility, which may accelerate the mortgage repayment.[22]

Accordingly, education across the various stakeholder communities, analysis, and best practices are critical to improving availability and impartial consideration of PACE financing.

As mentioned, five states do not require lender consent: California, Florida, Missouri, Georgia and Arkansas. In those states, there are three different tools PACE capital providers may engage with

[21] Colorado C-PACE Program Guide, http://copace.com/wp-content/uploads/CO_C-PACE_Program_Guide.pdf

[22] Another reason the mortgage lending community perceives risk may stem from a Moody's announcement that asserted PACE poses a hazard to the credit quality of CMBS bonds, which represent long-term holding facilities for commercial real estate mortgages.

mortgage lenders. These tools may include at a minimum 'lender notification', then 'acknowledgment', and finally 'consent'.

With notification, the PACE administrator, with permission of the property owner, sends each mortgagee on the property a notification of PACE financing and lien recordation and that this is being done in accordance with all applicable laws and regulations.

In cases where the property owner (not the PACE administrator) has determined that their deed of trust and applicable law requires the lender to provide acknowledgement or consent, the administrator then supports that process with the necessary information and documentation. The reasons for supporting both acknowledgment (replying in the affirmative that the notification has been sent and received and is not being objected to) and consent (actively granting approval for the PACE transaction to proceed related to the subject property) vary but generally speaking, different mortgagees have different processes, legal interpretations, fall under different regulations, etc. and may prefer or require one form over the other.

It is important to note that PACE administrators do not provide legal advice (nor accounting or tax advice) to property owners and are not party to these deeds of trust. Since commercial deeds and mortgages are more likely to be negotiated than a typical residential agreement, it is often the case that they vary, making it difficult, if not impossible, to provide accurate advice. Not to mention professionally inappropriate on the part of the PACE administrator to do so.

Regarding lender consent, while it may appear to be a tough undertaking — after all, what lender willingly subordinates their security interest? — lenders are generally willing to consider giving their consent to PACE assessments. Lenders like property improvements that immediately increase a borrower's Net Operating Income, or NOI, a key concept in commercial real estate. This improves the value of their underlying collateral and the borrower has more cash available to make mortgage payments.

Mortgage lenders may want to perform independent due diligence on the proposed project and may require third-party review of a project's cost, savings estimates, and other relevant metrics to substantiate future cash flows. In addition to providing solid evidence, consumers of PACE finance should consider educating mortgage lenders about PACE before coming with a consent request. Once mortgage lenders become familiar with PACE and its mechanics, they are more receptive to granting consent. See text box: A Perspective on Real Estate Owner's NOI and Net Cash Flow to comprehend the waterfall of these concepts starting from gross revenues.

A Perspective on Real Estate Owner's NOI and Net Cash Flow:

Gross Rent
– Vacancy
+ Reimbursement of Common Area Maintenance (CAM)

Effective Rent
– Operating Expenses
(CAM)
(Taxes)
(Insurance)
(R&M)
(Administration)
(Utility Expenses)

Net Operating Income
– Replacement Reserves
– Tenant Improvement Allowance

Net Cash Flow

Part of the lender consent equation will center on lender perception of marketer competitiveness: some lenders want to keep their clients from moving to another financial institution willing to consent to PACE assessments. And other lenders may be interested in providing PACE financing themselves.

While most mortgage lenders do not categorically oppose PACE, consent is not automatic. Borrowers with poor financials or payment history, or a poor relationship with the mortgage holder face an uphill battle. Mortgage lenders have denied consent when the borrower provided unsubstantiated savings estimates. In some cases, consent was denied by lower-level management but granted when appealed to high-level decision makers. In most cases, the denials were driven by specific circumstances rather than any categorical opposition to PACE.

Some additional insight includes:

Gaining lender consent is often simply about education, trust and the relationship between the lender and the borrower. It's critical to have a motivated and supportive property owner in the request.[23]

The PACE assessment's absolute and relative size is important. Mortgage holders will be more receptive to projects that are smaller relative to the total property or size of the mortgage.[24] Minor projects may range from 1% to 3% of the building value or loan amount. At roughly 5% or more, requests for lender consent attract more attention and are subject to more scrutiny. At between 5% - 10% of the building value or loan amount, PACE projects may be subject to third party appraisals, engineering, or construction consultant reports. At 10% of the building value or higher, project developers should expect completion guarantees, reserve requirements, construction consultants, and other conformance expectations.

Standardized forms and analyses could help. Ask the mortgage holder if they've received a lender consent request before. A quality request will include a project summary, project rationale, specific measures and designs, estimated energy productions and cost savings, the amount and term of the PACE assessment, and financial data, such as cash flows with and without the assessment. The request should also incorporate primary industry metrics including projection of property net operating income NOI, Assessment to Value, Debt Service Coverage, Lien to Value, and/or the payback period, and covenant compliance calculations, if applicable.[25] It could add significant value to coordinate the lending, solar, PACE and other relevant communities develop standard lender consent forms and protocols.

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[23] Lender Support Study: Enhancing the Commercial Real Estate Lender Consent Process for PACE Transactions, PACENation (then PACENow), December 2012, http://www.pacenation.us/wp-content/uploads/2012/12/Lender-Support-Guide-12.28.20121.pdf

[24] Ibid.

[25] Ibid.

Comprehending likely solar facility production can also be critical to the lender consent process as well as to outreach to real estate owners, municipalities and others engaged in the overall PACE process. One concept may be development and/or consensus around standard industry tools and inputs to forecast lifetime project production. Another may be an industry database of solar system performance to see how similar projects have performed in the field. The oSPARC database[26] developed by NREL in partnership with industry standards association SunSpec may be a solution. The database offers users an opportunity to look at aggregated and anonymized actual field production, and could offer lenders and others critical insight into long-term solar technology performance.

10.2 Expanded Reach of Capital

As demonstrated in this report, the growth of PACE funding has increased significantly over the past six years. However, there are two challenges faced by PACE underwriters that must be overcome to further fuel this growth: access to lower costs of capital and a standardized approach to secondary market financing.

To obtain access to low cost capital, PACE underwriters – like solar installers – have turned to the capital, or Asset-Backed Securitization (ABS), market, also referred to as structured finance. ABS and similar structures pool cash flows from an array of assets which mitigate the risk of any single cash flow. When structured properly, they can attract a broad range of capital including that from pension funds, sovereign debt and other large money managers.[27]

Renovate America, the leader in the residential PACE market, has financed over $1.8 billion since 2013 with the help of eight ABS securitizations. Renovate America has proven that it can continually access lower costs of capital through the ABS market; after issuing its initial transaction at a yield of 4.75% in 2014, the company's most recent deal priced at 3.76%.

Renovate America's securitizations were made available to all Qualified Institutional Buyers under Rule 144A, a type of securities that balances asset liquidity with a moderate level of regulatory oversight. The private placement market represents another valuable avenue.

Private placements are issuances, generally debt, placed with a single entity such as insurance firm seeking long-term cash producing assets. In 2015, Ygrene tapped a private placement for $150 million.[28] That security was publicly rated with Kroll Bond Rating Agency providing a AA rating. Private placements can offer less regulatory oversight than Rule 144A issuances (and associated compliance-related costs) but also minimize the opportunity to trade that security (i.e., liquidity) which may limit certain investor interest.

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[26] oSPARC stands for the Open Solar Performance and Reliability Clearinghouse and was developed as part of the Solar Access to Public Capital program. The database is available at: http://sunspec.org/sunspec-osparc/

[27] Lowder, T.; Mendelsohn, M.; The Potential of Securitization in Solar PV Finance; http://www.nrel.gov/docs/fy14osti/60230.pdf

[28] PNR Newswire, July 23rd, 2015, available here.

To further open capital market investment opportunities, investors need greater insight into performance of the underlying assets, or collateral, on both technical and credit performance bases. The industry could also benefit from broader and more consistent education, outreach, and administration of the asset pool. Several entities, such as T-Rex, provide a standardized framework for financial asset management and deal structuring, thus facilitating ABS market adoption.

11.0 Analysis of Two PACE Financing Projects: With and Without Tax Appetite

11.1 Case 1: Tax Appetite Example

The first analysis is of a 490 kW solar PV carport project at a business in Northern CA. PG&E is the utility company. The business has 4 meters on different rate structures including both time-of-use (TOU) and non TOU rates. In addition, the business owner is a for-profit entity with a tax appetite, or ability to monetize the ITC tax credits and depreciation benefits directly. The solar company sized the system to reduce 90% of the business's electricity bill.

Size	Install Cost	Production	1st Year Electric Bill Savings
490 kW	$1,368,000	721,000 kWh	$182,200

Table 1: Case 1 Project Information

The financial analysis includes an assessment of PACE and 4 other purchase/finance structures available to the business owner: cash, loan, operating lease, and a Power Purchase Agreement (PPA).

Financing	Down Payment	Interest Rate	Term
Cash	100%	NA	
PACE	0%	5.9% fixed	20 years
PPA @ $0.14/kWh	0%	3.0% escalator	20 years
Operating Lease	0%	Fixed Payment	10 years with financed FMV buyout at end of term

Table 2: Case 1 Financing Options

Cumulative cash flows for the five financing options are shown in the following figure.

Discounted cash flow analysis is the standard investment rate of return technique with real estate investors, appraisers and bankers for multi-year, variable cash flow investments.
Figure 7 shows discounted cash flows over a 20-year period.

Assumptions:

- Tax Credits and Depreciation: The system owner takes the full 30% ITC, federal and state accelerated depreciation and the federal and state tax deduction on the interest component of the PACE and 10-year loan
- Increased savings: Any potential increase in tax liability as a result of an increased operating income due to the energy savings are not factored into the model.

- Interest Deductions: Potential tax deductions eligible for the interest component of the PACE financing are not factored into this model.
- Operating Lease Tax Impact: For the operating lease payments, we do not show any reduction in tax liability. Lease payments can be considered an operating expense and reduce tax liability.
- PACE Interest Rate: Is 5.91%
- PPA Buyout: Is made at the end of term at free market value.
- For all financing scenarios, utility rates escalate at an assumed 3% rate

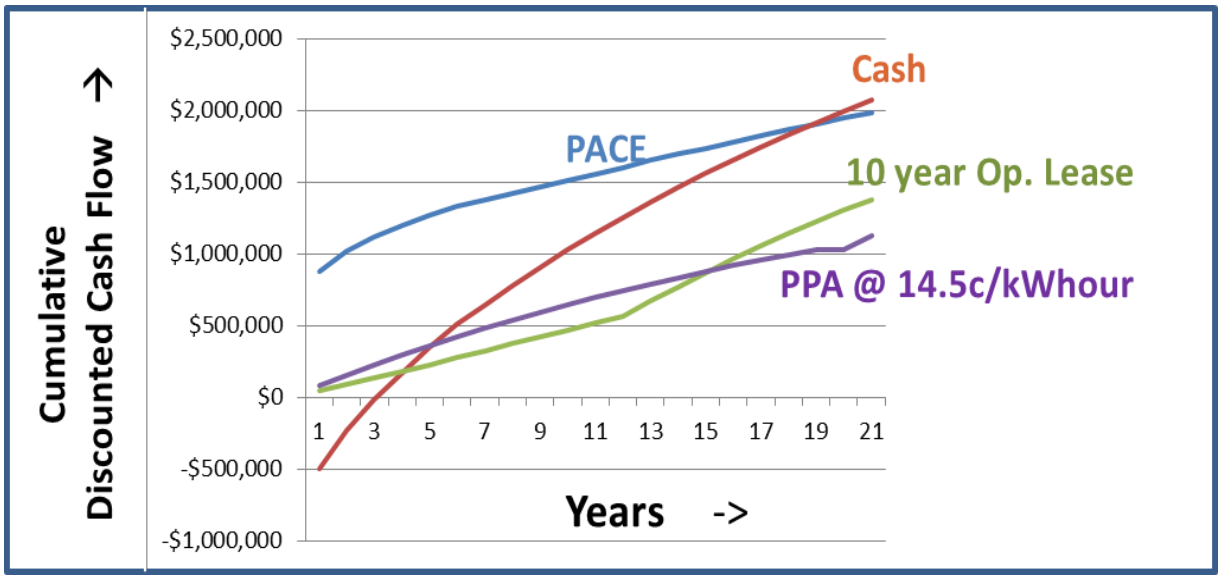

Figure 7: Case 1 Cumulative Cash Flow for Cash, PACE, Lease and PPA (relative to Continuation of Current Electric Utility Purchase Pattern)

For Profit PV Project – Cash Flow Comparison- Chart Description:

Cash: Paying 100% cash leads to the best cumulative cash flow, primarily because there are no financing costs. However, the cumulative cash flow does not 'catch up' with PACE until year 19 (at a discount rate of 8%, the Cash scenario would not catch PACE over the 20 year analysis). Further, the cash option utilizes significant working capital, the impact of which is not easily considered in this project-level analysis.

PACE: PACE has the optimal cash flows of any of the financing options over the first 18 years. Because PACE has a 20-year term, it allows for low annual payments. In this example, the utility bill savings are greater than the annual payments once the various tax credits are factored in.

Operating Lease: 10-year term with the buyout financed at the end of term. This is a true lease and the payments considered an operating expense and are therefore tax deductible. The customer cannot take the investment tax credit, but the lessor reflects this in more competitive lease payments.

Standard PPA: Market PPA pricing with 3% annual escalator. This is typically less favorable for a business as it requires a third party tax equity investor that seeks a return on the tax equity investment

but also assumes the system-production risk. The upside is that the owner only pays for powered delivered and has no responsibilities for maintenance. PPA contracts typically offer buy out provisions at 6, 10, 15 and at the end of the term.

Cash Flow Benefits of PACE

The cash purchase option provides the most cumulative cash flow. The discounted cash flows, however, appear to favor PACE up to year 18. At a discount rate of 7% in the above-described scenario, PACE financing offers a net present value (NPV) of $1.98 million vs. $2.06 million for cash.

Cash	PACE 20 Yr	PPA 20 Yr	Op. Lease
$2.06	$1.98	$1.12	$1.38

Table 3: NPV of Solar Finance Option Benefits Against Business as Usual (Remain on Utility Power) – Case 1 ($MM)

For business owners, the financing decision is analogous to a typical residential purchasing decision on a house and looking to minimize payments: cash flow is a very important consideration.

11.2 Case 2: No Tax Appetite Example

Standard PPAs are a well-established tool for entities without tax appetite. Here we highlight a relatively new financing product referred to as a PACE PPA which is available in several states including California and Connecticut. PACE PPAs are pre-paid PPAs financed with PACE. The main advantages of a PACE PPA are that it provides an improved cash flow solution than a standard PPA and acts as a credit enhancement for entities which may not qualify for a standard PPA. With the PPA being prepaid, the system owner (the PPA company) no longer has to worry about whether the end-user will make their monthly payments over 20 years. There are several structures of PACE PPA available.

This analysis is for a solar carport project in Southern California, and the host has no tax appetite. Non-profits and for-profit entities without tax appetite are similar in that both require a third party financier that can monetize tax credits and depreciation benefits. Because the host entity lacks tax appetite, direct ownership options are not cost-effective alternatives. Therefore, we only compare the PACE PPA to a standard PPA. Both scenarios reflect execution of a buy-out option after year 5.

In both situations, the system is owned by a third party who takes all tax incentives (ITC and depreciation). The utility rate is assumed to increase at 3% per year.

Size	Install Cost	1st Year Production	1st Year Savings
655 kW	$1,970,000	978,000 kWh	$199,000

Table 4: Case 2 – Project Information

Financing	Down Payment	Interest Rate	Term
PACE PPA	0%	5.9%	20 year with buyout
PPA @ 15.3 cents/kWh With 2.99% escalator	0%	NA	6 year buy out

Table 5: Case 2 – Financing Options

PACE Enabled PPA

This specific structure uses 20-year PACE financing to cover ~70% of the project costs. The balance comes from the tax equity investor.

Standard PPA with Buyout

For the standard PPA, we have a 20 year PPA. The PPA rate, based on a market bid, starts at 15.3 cents per kWh and goes up 3% per year. This shows a a buyout in year 5 at the FMV. The buyout out is financed at current interest rates for a term of 7 years beyond year 5.

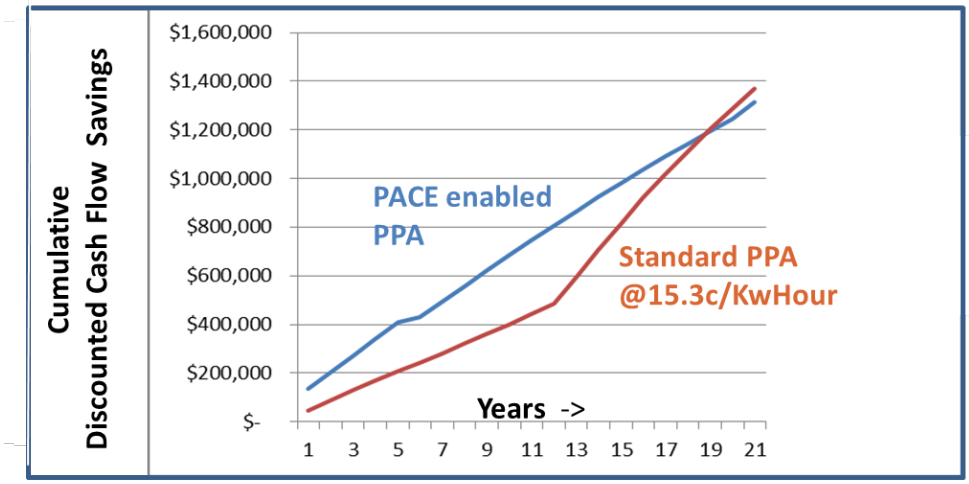

Figure 8: Cumulative Cash Flow Comparison for Standard PPA vs. PACE Enabled PPA (relative to Continuation of Current Electric Utility Purchase Pattern)

The benefits of the PACE PPA for the building owner/host include having the system owner use the 30% ITC to reduce the system's cost, financing the system without paying anything upfront, and repaying the PACE assessment at a fixed rate over 20 years.

From the tax equity investors perspective, this structure has a lower risk profile than a standard PPA as the investor is getting a considerable portion of the install costs 'up front' from the PACE financing and therefore the investor can offer more attractive terms. PACE acts as a 'credit enhancer' for the customer and enables more projects to be financeable. In addition, the PACE PPA offers a superior discounted cash flow up to year 18.

PACE PPA	Standard PPA
$1.245	$1.289

Table 6: NPV of Solar Finance Option Against Business as Usual (Remain on Utility Power) - Case 2 ($MM)

12.0 Going Forward

The following represents a summary of "takeaways" from an in-person Strategy Summit[29] designed to assess opportunities for market coordination and cross-industry outreach. The Strategy Summit focused on 4 areas: C-PACE Lender Consent, Non-Profits, Broadening the Supply and

[29] Held September 12th, 2016 at Solar Power International 2016

Understanding of PACE Financing, and Efficiency + Solar. Opportunities identified for PACE for solar deployment expansion include:

Going forward, leading experts gathered at the PACE Strategy Summit held at Solar Power International 2016 identified key areas of potential industry coordination and outreach to expand PACE finance for solar deployment, represented in the following graphic:

12.1 Expansion, Education and Outreach

PACE can be elegant solution to certain market barriers, but requires a significant level of infrastructure development and market education. To build out such infrastructure, states must create enabling legislation (that often requires improving revisions), programs must be developed, and municipalities and counties must opt-in to one or more programs thus requiring education at both the state and municipality/county level. Once the infrastructure is built, a high level of educational is required including among developers, real estate owners and realtors, mortgage lenders and capital market investors (i.e., entities that wrote or hold the mortgages), title companies, appraisers and others. There simply is no shortage of outreach requirements or opportunities. That being said, SEIA is in a great position to facilitate such education and outreach among our membership and stakeholders that engage with our members to further the solar and PACE markets.

12.2 Streamlining and Consistency

Interconnected to the education and outreach referenced, there is a strong need to facilitate consistent and high quality practices among all actors along the PACE value chain from State legislators to project developers and installers on the ground. Participants in the PACE Strategy Summit at SPI 2016 raised the need for a faster and more consistent lender consent application and process. Participants also complained of fragmented legal environments and high variability across programs. SEIA, PACENation, banking and real estate associations, and others could be working together to facilitate a clear and concise lender consent application and review process.

12.3 Additional Capital and Financial Products

Strategy Summit participants also complained of a lack of capital and financial products in the space. Title and bond insurance was raised on numerous occasions as well as the need for simply more financiers to offer PACE and to do so at lower financing costs. Participants broadly agreed success will breed success, that as PACE legislation and municipal opt-in is more widely adopted, it will bring more comprehension and interest from stakeholders in the real estate, deployment, capital, and financial instrument space.

13.0 Conclusion

The market for solar installation has enormous potential, but issues like split incentives between lessors and lessees, allocation of capital to core projects, and basic lack of knowledge about the solar market have hindered growth. Commercial PACE helps to alleviate all three of these issues through innovative financing and incentive mechanisms combined with proper outreach. Implementation of PACE financing throughout the country benefits solar companies by accessing untapped market potential, large and small businesses alike through decreased energy costs, local communities through cleaner energy sources, and even helps utilities to increase the percentage of renewable solar energy in their portfolio through PPA's. As far as eventually attaining an economy powered by renewable energy, PACE is an essential step in the process.

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