CivicPACE: A Guide to the Use of Property Assessed Clean Energy (PACE) Finance for Nonprofit Organizations

Written by Members of the CivicPACE Team

DISCLAIMER

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ABOUT

About CivicPACE

CivicPACE is a U.S. Department of Energy (DOE) effort under the Solar Market Pathways program designed to make commercial Property Assessed Clean Energy (PACE) financing a reality for tax-exempt organizations and nonprofits. More information is at www.civicpace.org.

About The Solar Foundation

The Solar Foundation is an independent 501(c)(3) nonprofit organization whose mission is to accelerate adoption of the world's most abundant energy source. Through its leadership, research, and capacity building, The Solar Foundation creates transformative solutions to achieve a prosperous future in which solar and solar-compatible technologies are integrated into all aspects of our lives. The Solar Foundation is considered the premier research organization on the solar labor workforce, employer trends, and the economic impacts of solar. Learn more at https://www.thesolarfoundation.org/

About Urban Ingenuity

Urban Ingenuity provides innovative solutions to develop and finance advanced energy projects, building retrofits, and state of the art clean energy infrastructure. With special expertise in Property Assessed Clean Energy (PACE) financing and other tools of public and private financing, Urban Ingenuity brings new capital resources to support deep energy efficiency retrofits of commercial and multi-family buildings, and to support project development of clean-energy micro-grids, co-generation facilities, and solar installations. Learn more at https://urbaningenuity.com/

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Clean Energy Solutions, Inc. is an energy-efficiency and renewable-energy consulting firm focused on innovative solutions to the barriers of clean energy deployment. CESI consultants bring long experience to contracting, marketing, financing, and engineering of energy efficiency and resilience. Learn more at http://www.cleanenergysol.com/

About the U.S. Department of Energy Solar Energy Technologies Office (SETO)

The U.S. Department of Energy Solar Energy Technologies Office supports early-stage research and development to improve the flexibility and performance of solar technologies that support the reliability, resilience, and security of the U.S. electric grid. The office invests in innovative research efforts that securely integrate more solar energy into the grid, enhance the use and storage of solar energy, and lower solar electricity costs.

CONTENTS

Executive Summary

The lessons learned and best practices from the CivicPACE team work is featured in this CivicPACE Toolkit and Replication Guide intended for program designers and practitioners nationwide. Property assessed clean energy (PACE) can be an effective financing tool for solar development for tax-exempt organizations such as schools, churches, and multifamily affordable housing. Major takeaways from the CivicPACE team include:

- Tax-exempt organizations can finance through PACE. They can voluntarily accept a special tax assessment;
- PACE projects are financed with long-term debt (20+ years) so the payments on that debt are much lower than that of traditional, shorter term financing;
- PACE financing can cover 100% of project costs, including legal, permitting, operation, and maintenance costs;
- Projected energy savings typically exceed the debt service, so PACE projects are cash-flow positive from day one with no out-of-pocket expenses;
- Because PACE offers the same underlying security to debt as real estate taxes, it provides an exceptionally stable investment with minimal default risk. PACE is secured by the property. There's less concern about the credit of the borrower.
- The PACE lien is often not required to be disclosed as a liability on the balance sheet.
- The solar installation can be owned by the tax-exempt organization, or ownership can reside with a third party through a lease or power purchase agreement (PPA);
- In third-party ownership, the third party finances, installs, and maintains the solar system, providing power for a rate that is typically below the market rate. The third party benefits from the federal investment tax credit and other incentives, presumably passing some of those savings on to the property owner.
- PACE can be combined with a PPA to create a PACE-secured PPA or even a prepaid PACE-secured PPA.
- PACE can finance solar for affordable multifamily housing, including public housing properties in the HUD Rental Assistance Demonstration (RAD) program.
- PACE financing may be used in conjunction with private activity bonds (PABs), low interest rate bonds issued by a government agency for private purposes.

The following sections discuss these and related tools and techniques for PACE financing for nonprofit organizations.

Background

a. Introduction

This Toolkit and Replication Guide is meant to provide guidance to nonprofits, PACE administrators, installers, and policymakers on

- How to access PACE financing for nonprofits for solar projects;
- The available financing structures and options; and
- The costs and benefits of PACE.

It was prepared by the CivicPACE Team. The Team is a U.S. Department of Energy Solar Energy Technologies Office (SETO)-funded project of the Solar Foundation, Urban Ingenuity, and Clean Energy

Solutions, Inc. was formed to facilitate the use of Property Assessed Clean Energy (PACE) to finance solar installations on nonprofit properties. The team was formed in early 2015, when PACE financing was relatively new, and its widespread approval faced a multitude of obstacles. The applicability of PACE financing to non-taxpaying entities was unclear at the time, and examples of solar installations on nonprofit properties were rare. For nonprofits with an interest in solar, limited financing options were available. Self-financing and the now common power-purchase agreement (PPA), in which a third-party owns and operates the system, were not readily accessible in this sector.

The Team developed solutions to these major barriers and has put them into practice in Washington, D.C. and elsewhere. During the three years since CivicPACE was first proposed, both the solar industry and PACE financing have grown rapidly in scale and sophistication, such that the original barriers no longer pose the obstacles that severely limited early deployment. The process of using PACE to finance solar installations on nonprofit properties remains complex, however, and the market segment consequently remains under-served.

b. Fundamentals and History of PACE

PACE financing was first developed in Berkeley, California as a mechanism to make energy efficiency, renewable energy, and water conservation improvements accessible to a broader customer base. Since its inception in 2008, PACE-enabling legislation has been adopted in 33 states and the District of Columbia. PACE was originally most successful in the residential sector, but 'R-PACE' stalled in 2010 when the federal mortgage financial intermediaries, Fannie Mae and Freddie Mac, withdrew support. In contrast, PACE for commercial buildings (C-PACE), continued to grow, and by the end of 2017, PACE providers had financed over $580 million in commercial development, of which about a quarter has been deployed for renewable energy. In recent years, R-PACE activity has also resumed in certain markets, primarily California and Florida ($4.3 billion invested through 2017).[1] PACE-financed improvements not only include standard renewable energy and energy efficiency measures, such as solar energy and heating and air conditioning, but also seismic retrofits, hurricane preparedness measures, roof and other structural replacements, and water conservation.

PACE financing places an assessment or lien on a property to provide upfront financing for property improvements that are paid back through a line item on the property tax bill. Unlike traditional debt service, which typically relies on a customer's credit or other security interest, the PACE assessment remains with the property rather than the property owner. Property tax assessments have been widely used for infrastructure improvements such as sewer and gas line upgrades.

One of the key benefits of PACE is that projects are financed with long-term debt so the payments on that debt are much lower than that of traditional financing. PACE financing debt maturity typically lasts up to 20 years or more compared to under 10 years for most traditional financing. PACE financing can cover 100% of project costs, including legal, permitting, operation, and maintenance costs. Since projected energy savings typically exceed the debt service, PACE projects are cash-flow positive from day one with no out-of-pocket expenses.

Typically, the establishment of a PACE program requires two steps. First, a state must pass enabling legislation. Then, because most property tax systems exist at a municipal level, each municipality must

[1] *See* PACE Nation Market Data, available at http://pacenation.us/pace-market-data/.

pass a local ordinance to create a program. These municipalities can either administer the PACE program internally or contract with a third-party administrator (or multiple administrators). Often, there is the ability to "opt-in" to a statewide administrative structure. For example, some states, such as Connecticut, have set up Green Banks to administer programs for their localities. Other states, such as California, have set up authorities that secure PACE services on behalf of local governments who wish to participate. The program administrator promotes the program and works with public officials and the private sector to make the program a success.

c. Tax-exempt organizations use of PACE financing

A commonly-held concern at the initiation of CivicPACE was that nonprofit organizations (NPOs) could not be forced to pay property taxes since they are exempt from paying them. Initial efforts looked at *Payment in Lieu of Taxes* (PILOT) as an established mechanism to overcome this barrier. Although many jurisdictions have arranged PILOT assessments for nonprofits, the organizations are not obligated to make payments.[2] Thus, PILOTs are not useful for nonprofit PACE financing.

*NPO Exemption*s. A strong precedent was quickly found in non-ad valorem assessments, such as a Public Benefit Assessment (PBA). As previously mentioned, these mechanisms are commonly used to cover the costs of public services benefiting some, but not all, citizens (e.g., special sewer districts, fire suppression, flood control, parks, etc.). IRS 501(c)(3) and state tax exemptions do not apply to PBAs since they are voluntary *non*-ad valorem taxes.[3] The billings, collection, and penalties for PBAs, however, generally follow property tax procedures.

Security. To create the unique security structure which allows PACE to be relatively affordable, a lien for delinquent PACE payments must be senior to other debt on the property, including mortgage loans, as is typical of property taxes that are statutorily senior to all other property related debt. Senior mortgage lenders have considerable concerns about PACE because the tax lien is senior to their debt. Therefore, most PACE programs require the consent of existing mortgage-holders prior to an owner's participation in the PACE program to mitigate this concern.

By utilizing available assessment mechanisms that are not restricted by tax-exempt status, PACE providers are able to place assessments on a property equal to the debt service of the PACE improvements. That PACE assessment is collected in the same manner as a property tax, either through statute or contractual subordination, liens created because of unpaid PACE bills have the same senior lien status as liens for delinquent property taxes. Therefore, a nonprofit organization's exemption from standard property taxes does not prohibit it from accessing the benefits of PACE financing.

d. Precedents of PACE for Nonprofits

The CivicPACE team was able to help facilitate two pilot nonprofit PACE financed projects in the District of Columbia. The NPOs took advantage of the unique financing mechanism to install energy efficiency improvements and solar energy systems on their facilities. Additionally, since the beginning of the program in 2015, there have been several other nonprofit PACE financed projects across the country.

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[2] See CivicPACE: Enabling Policies & Procedure, available at http://www.thesolarfoundation.org/wp-content/uploads/2015/09/CivicPACE-Enabling-Policy-Report_June2015.pdf.

[3] An ad valorem tax is a tax whose amount is based on the value of a transaction or property.

These examples demonstrate the viability of the PACE assessment process for financing debt across PACE districts with differing ordinances and tax collection structures.

i. District of Columbia

In the District of Columbia, the DC PACE program offers financing to commercial, industrial, and multi-family property owners (defined as containing five or more dwelling units). Nonprofit buildings are also eligible regardless of whether they currently pay real estate taxes. Publicly owned properties leased to a non-governmental entity (which may be a nonprofit) via a long-term ground lease may be eligible.

As of fall 2017, five nonprofits have used PACE financing to improve their buildings in the District of Columbia. To participate, the nonprofits consent to have a special assessment placed on their property, which is separate and apart from their real estate taxes. The PACE assessment is like special assessments that the District has used to finance infrastructure projects, such as curb improvements or gas line hookups, to which nonprofits routinely are subjected.

In DC, PACE bills are issued at the same time as real estate taxes (twice a year) and due on the same dates, but in a separate (very similar) physical notice instead of as a line item on the property tax bills. Thus, property owners paying real estate taxes receive both a real estate tax bill and PACE assessment bill, while nonprofits only receive and pay the latter.

ii. Affordable Housing

The Phyllis Wheatley YWCA provides 84 units of affordable housing for women in need. The property is owned by an LLC, a joint venture between the YWCA and a for-profit developer. This ownership structure allowed the developer to benefit from low income housing tax credits (LIHTC). The developer managed the total rehabilitation of the property, which included PACE financing to secure approximately $700,000 in financing for energy and water efficiency upgrades as well as a 31 kW solar system. The debt service is now being paid back through the biannual PACE assessment. The projected savings will exceed the annual PACE payments by nearly $6,000, which will immediately accrue to the property owner for use of other structural improvements or programs that benefit the tenants.[4]

iii. Charter School

The PACE-financed solar and efficiency retrofit project at Elsie Whitlow Stokes Community Freedom Public Charter School (Elsie Whitlow) provided a DC public charter school with timely and valuable upgrades to a facility that supports 350 pre-school and elementary school students. The school financed 100% of a 35 kW rooftop solar PV array through PACE, allowing the school to retain ownership. Since Nonprofits lack sufficient tax liability to take advantage of the Solar Investment Tax Credit and the Modified Accelerated Cost Recovery System depreciation, many often need a tax equity investor to make the project viable.

Unfortunately, for most small schools and churches, tax equity investors are typically unwilling to consider projects of this scale, because legal and administrative costs are prohibitively high. In a market

[4] Phyllis Wheatley YWCA, http://www.thesolarfoundation.org/wp-content/uploads/2015/11/CivicPACE-Fact-Sheet-YWCA.pdf

such as Washington D.C., however, valuable Solar Renewable Energy Credits (SRECs) and high electricity prices can allow solar projects to be financeable even without tax credits, as was the case for Elsie Whitlow. This project design represents a viable option for nonprofits in similar markets that are looking to finance small-to-medium-sized solar installations while limiting transaction costs.[5]

e. The Untapped NPO Market for Solar

While there are now a growing number of examples of NPOs successfully taking advantage of PACE financing (largely for energy efficiency upgrades), it remains a largely untapped market for solar energy installations. The benefits of solar and energy efficiency can be significant for NPOs and affordable housing providers, who often own and occupy buildings for the long term. In addition, solar energy provides other societal, environmental, and health benefits. Onsite solar offers potential energy resilience (especially in combination with local storage) and has the potential to support local jobs, including low-income residents participating in one of several solar workforce training programs.

The economic benefits of solar are especially appealing to NPOs, which often have very constrained budgets for energy and other overhead expenses, as well as substantial deferred maintenance challenges. Solar PV systems can reduce electric bills and stabilize a NPO's electricity price over an extended period. Savings from solar depend a number of factors, including the compensation for excess electricity (net metering), the cost of electricity, and the cost of capital. As the costs for solar declines, solar becomes financially viable for an increasing number of properties. Community-based NPOs can use their savings to fund programs that benefit their constituents.

The nonprofit sector is a significant portion of the American economy and building stock. According to the National Center for Charitable Statistics, there are approximately 1.5 million charitable entities operating in the United States, and together they account for more than $5.17 trillion in assets.[6] There are over 300,000 religious congregations alone in the United States.[7] In major cities across the country, NPOs own between 2%-11% of the total property value (the number does not include mixed finance affordable rental housing).[8]

For example, one analysis found that in the District of Columbia, large (50,000 square feet or larger) nonprofit owned buildings in key sectors[9] with rooftops suitable for placement of PV systems comprise roughly 3% of the total square feet of all DC building stock.[10] As this analysis only considered large buildings and limited sectors, the true potential for rooftop solar on NPO-owned buildings is even larger. An energy efficiency study of the greater Cincinnati area conducted by the Greater Cincinnati Energy Alliance (GECA) in 2011 estimated that there were about 470 buildings owned by NPOs with at least

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[5] Elsie Whitlow Stokes, http://www.thesolarfoundation.org/wp-content/uploads/2016/10/CivicPACE-Fact-Sheet-Elsie-Whitlow_Final2.pdf

[6] National Center for Charitable Statistics. http://nccs.urban.org/data-statistics/quick-facts-about-nonprofits.

[7] National Center for Charitable Statistics. http://nccs.urban.org/data-statistics/quick-facts-about-nonprofits.

[8] *The Property Tax Exemption for Nonprofits and Revenue Implications for Cities*, The Lincoln Institute of Land Policy, November, 2011, http://www.urban.org/sites/default/files/alfresco/publication-pdfs/412460-The-Property-Tax-Exemption-for-Nonprofits-and-Revenue-Implications-for-Cities.PDF

[9] These sectors are Multi-family, Health Care, Educational, Religious, and Public Assembly.

[10] Markets represented are Multifamily, Health Care, Educational, Religious and Public Assembly. See "CivicPACE_DC_Solar Model.xls,"

25,000 square feet.[11] GECA did not evaluate the rooftop solar potential for these buildings, but an NREL study found 66% of total rooftop space for large buildings have PV potential.[12]

While the market potential is significant, penetration for solar remains relatively low for NPOs. Most NPOs fall into the small or medium commercial and industrial (C&I) sector, which has traditionally been a relatively difficult market for solar PV due to a broad range of challenges. Many C&I organizations are in a triple-net lease where they pay all real estate taxes and utility bills. This creates a split incentive problem where the property owner pays for any upgrade (*e.g.*, installing solar) but the tenant would realize the benefits of the improvements such as savings on electricity bills.

Additionally, a large portion of the C&I sector, *especially* NPOs, have unrated credit and lack a tax appetite to fully monetize tax credits and depreciation benefits that can offset a significant portion of a solar system's cost. On top of the traditional C&I barriers, NPOs are generally risk-averse, mission-sensitive, and hassle-intolerant. Some NPOs may have substantial percentages of their properties financed by through complex structures such as tax-exempt bonds with covenants (or bond counsel opinions) not conducive to on-site PV financing arrangements or tax credits with onerous investor approval requirements.

One potential solution for NPOs can be to participate in community solar, which does not require dedicating NPO property to PV installations. However, this requires either "virtual net metering" or a community solar program which are not available in all markets.[13] Community solar is discussed in more detail later in this report.

PACE financing is certainly a valuable solution for many of the barriers to solar penetration of the C&I market[14], and has many unique advantages to help realize the full potential NPOs.

2. Understanding CivicPACE

a. The Case for CivicPACE: Benefits of PACE for Nonprofit Solar

i. Credit enhancement

PACE offers financing for nonprofits that may otherwise have trouble accessing credit because the PACE debt remains with the *property* rather than the building *owner*. This means that the repayment obligation transfers with property ownership and thus, underwriting criteria focus more on the property rather than the property owner. Therefore, PACE offers the same underlying security to debt as real

[11] "The Energy Efficiency Market in the Greater Cincinnati Region," November 2011.
[12] According to one NREL study, the percentage of suitable roof space compared to total roof space for large buildings – buildings with more than 25,000 square feet – is 66%. See "Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment" p. 31, available at https://www.nrel.gov/docs/fy16osti/65298.pdf
[13] See community solar discussion in Section 5.
[14] See Expanding Solar Deployment Opportunities in the C&I Sector: An Introduction to Property Assessed Clean Energy (PACE), Solar Energy Industries Association Finance Initiative. Available at, https://www.seia.org/sites/default/files/resources/SEIA-CPACE_Expanding_Solar_Deployment_CI_Sector_April2017.pdf.

estate taxes, resulting in an exceptionally stable investment with minimal default risk. Even in the case of default, the tax lien, unlike a mortgage lien, is not accelerated so only the amount in arrears is due.

By providing 100% upfront, long-term financing and eliminating the need for traditional credit underwriting, PACE solves many of the key barriers that discourage community-based nonprofits from installing solar. Furthermore, a vibrant PACE program can reduce the cost of capital to drive down solar transaction costs. As the program scales up with more transactions, financial professionals become more knowledgeable and comfortable with PACE, making it easier to access to capital which in turn can drive down the cost of debt.

ii. Accounting for PACE (Balance Sheet Issues)

Because PACE financing is tied to a property, transferring to a new owner upon sale of the property is just like real estate taxes, and not tied to the credit of the borrower. As such, it often is considered off-balance sheet for the borrower.[15] When commercial entities consider financing options for property improvements, they need to consider how it will affect their balance sheet. Traditional debt typically shows up as a liability on the balance sheet, which can be difficult to justify for projects with a long-term return on investment. However, expenses such as property tax bills and operating leases are not typically part of the balance sheet.

While NPO financial decision-makers do not have to report to investors, many may own properties that have negative debt covenants or other restrictions that would not allow for the use of traditional balance sheet debt. Accounting professionals are typically consulted to determine whether the PACE assessment is considered off-balance sheet, and their opinions have varied. However, because PACE does not require corporate or personal guarantees and does not accelerate upon default, it is often considered off-balance sheet. Off-balance sheet financing can create liquidity for an NPO since it helps to keep their debt-to-equity ratio low. For example, this can be useful for larger nonprofits who want to preserve their rated bonding capacity for other purposes.

iii. Building Resiliency

PACE can fund improvements aside from solar and energy efficiency that are particularly important to many nonprofit properties. Many nonprofit churches, schools, and hospitals serve as gathering places for residents in times of emergency. It is especially important for these community-based organizations to be properly equipped to handle natural disasters such as hurricanes or earthquakes which cause a loss of power.

Florida PACE legislation, for example, permits funding of improvements designed to makes homes more hurricane-resistant, and California allows PACE funds to be applied for earthquake-resistant improvements. Other PACE programs can, and do, support PACE financing for “geographically sensitive” infrastructure improvements.

[15] *Can PACE be considered off balance sheet?* DCPACE FAQs, August 30, 2017, http://dcpace.com/ufaqs/can-pace-be-considered-off-balance-sheet/

When power goes down in a community, battery storage coupled with solar can help power NPOs so that they can provide services to their local communities in times of emergency. The addition of battery storage to a PV system may even provide additional financial benefits to the building owner depending on the utility tariff structure (demand reduction or time-of-use rates), regional transmission organization (RTO) territory, and specific location of the PV array (regarding frequency and voltage regulation services). Therefore, solar and battery storage can offer other benefits beyond resiliency for the building.

iv. Other Benefits

PACE can overcome the split incentive problem. As mentioned, this problem occurs when a property owner pays for an improvement, such as installing solar, but the tenant benefits (through lower utility payments). There is no incentive for the property owner to pay for solar. With PACE, tenants with a triple net lease save on utilities but pay additional taxes. Therefore, both the property owner and tenant have an incentive to install solar provided that the utility savings exceed the additional taxes (positive SIR).[16]

b. The How of CivicPACE: Structures and Innovations

There are several financing structures, both with and without PACE, that NPOs can use to install solar PV. These options are outlined briefly below. Each structure has both advantages and disadvantages and will vary in utility according to the preferences and characteristics of the site host. The subsequent section lays out important considerations for NPOs to consider when evaluating these various structures.

i. Direct Ownership

The simplest and most common structure for smaller commercial installations is direct ownership. The property owner purchases the system (or finances it through PACE or another form of debt), owns it outright, and reaps all benefits of the system including tax credits and renewable energy credits. The property owner also directly provides for any necessary maintenance and operation costs. Outright ownership of a PV system is not always the most beneficial arrangement, especially for NPOs which cannot claim tax incentives.

ii. Power Purchase Agreements (PPAs)

A PPA is an agreement where the solar company (sometimes called “third-party owner”) installs and owns the PV system and the customer purchases the electricity generated by the PV system at a specified price for a period (usually 20 years). The solar company is responsible for system maintenance

[16] Referred to as the savings to investment ratio (SIR). A positive SIR means that the utility bill savings exceed the taxes triggered by PACE financing.

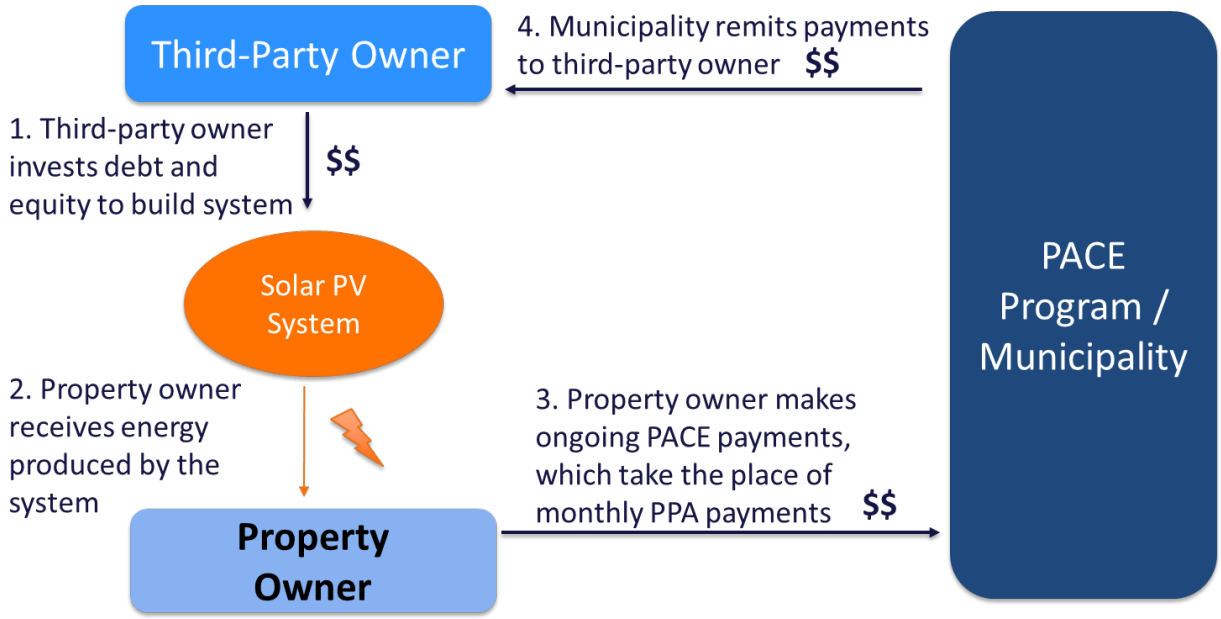
and performance. The customer does not make a capital investment and shows no debt on its balance sheets.

iii. PACE-Secured PPA

The "PACE-PPA" or "PACE-lease" is a structure that combines the third-party ownership of a typical PPA or solar lease (to monetize tax benefits) with the security, simplified underwriting, and long-term financing provided by PACE. There are two prevailing approaches to structuring PACE-PPAs and leases in the market today. In both approaches, the solar system is owned by a third party that makes an agreement to lease or otherwise access the roof space for the installation from the property owner. As in a standard PPA or lease, the third-party builds, owns, and maintains the system during the term of the agreement. However, a PACE payment replaces the traditional monthly PPA energy bill, thus providing added security and credit enhancement for the third-party investor.

There are two variants for how a PACE-secured PPA could work. One variation is much like a traditional PPA, but the property owner makes PACE payments that are then transferred to the third-party owner as shown in the figure below.

Figure 1, the PACE-secured PPA



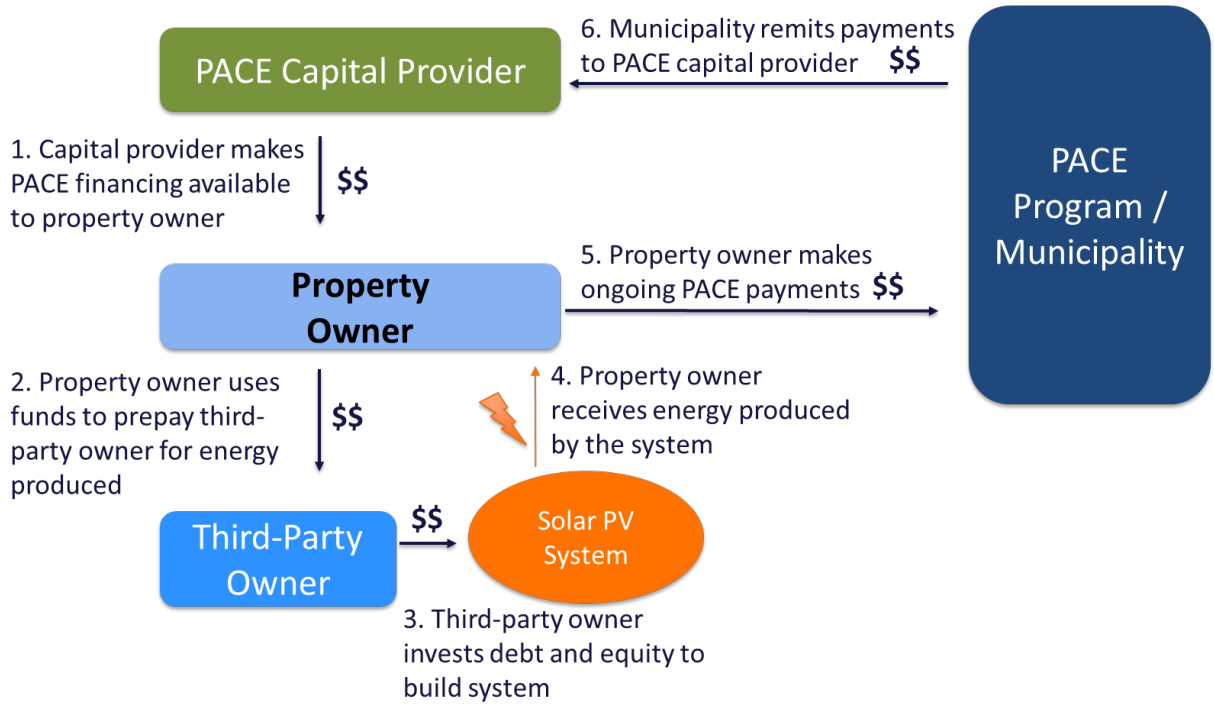
PACE-Secured Prepaid PPA

For the second variant, a PACE-Secured Prepaid PPA, the property owner pre-pays for the energy that will be produced during the entire PPA term, which is typically 20 years.

While the prepayment can theoretically be made from any source, this structure is most viable in situations where the site host can access separate long-term financing for the prepayment. Few can afford to prepay out-of-pocket. Thus, prepaid PPAs are well-suited for long-term financing. Instead of making monthly PPA payments, the property owner makes PACE tax payments that repay the cost of

the financed prepayment. These tax payments align with their utility bill savings, producing smooth cash flows.

Figure 2 illustrates the more complex transaction structure of a prepaid PPA using PACE financing.



For more information see a separate publication by the CivicPACE team, *Civic Power: A Primer on PACE-Secured Solar Power Purchase Agreements.*[17]

iv. Customer Self Generation Agreements and Leases

While PPAs can provide an excellent answer to monetizing tax credits for NPOs, they may not be permitted in some states or utility territories that prohibit the third-party sale of electricity. One solution is a lease or variation of a lease known as a Self-Generation Agreement (SGA). Originally developed in Virginia by Secure Futures LLC, an SGA offers many of the advantages of a PPA. It differs in that the customer is considered to "self-generate" electricity from equipment owned and operated as a service by the system developer. The customer pays a simple monthly service fee to the developer for owning, operating and maintaining the solar equipment, and the SGA developer guarantees the performance of the system per manufacturer specification and annual true-ups. The tax advantages to the developer are the same as a PPA and the PACE financing itself is like that of a PPA.

SGAs are very similar to leases. A lease, unlike the SGA, may exclude the annual true up based on a performance guarantee for a specific number of kWhs. Leases are primarily used in jurisdictions where

[17] *Civic Power: A Primer on PACE-Secured Solar Power Purchase Agreements*, The Solar Foundation, Urban Ingenuity, Clean Energy Solutions, January 2018; https://www.thesolarfoundation.org/policy-research/civicpace/

PPAs are prohibited, as the PPA is a more prevalent and recognizable agreement format and is more widely commercially available.

The first SGA was implemented in 2012 by Secure Futures LLC and the First Congregational Christian United Church of Christ in Chesterfield Virginia. Secure Futures owns and operates the solar energy system through a 20-year SGA between the church and a subsidiary of Secure Futures. In 2013, Secure Futures entered into a 20-year Solar Self-Generation Agreement (Solar SGA™) with the Harrisonburg, VA Housing Authority to install, own, operate and maintain a solar photovoltaic system on the roof of the Lineweaver Apartment Building – a 60-unit low-income apartment building.[18]

3. PPAs And Other 3rd-Party Ownership Issues

As noted above, third-party ownership and other innovative structures using PACE financing can provide substantial benefits to NPOs. However, property owners considering their options should carefully weigh both pros and cons of any proposed approach.

a. Ownership vs. Third-Party Ownership

Third-party ownership and financing are especially attractive to NPOs, which generally cannot access the tax benefits associated with the investment and ownership of solar systems, and which may be especially risk-averse, or capital constrained. Besides the convenience of outsourcing the solar development and ongoing maintenance, these arrangements allow the third party to access the federal investment tax credits permitted for solar developments. This lowers the cost of development, which presumably can be reflected in lower cost to the NPO.

These costs and risks, added to the "hassle factor," have driven the third-party market share of new solar installation and financing well above the host-ownership market share for larger (1 MW or larger) commercial installations. Just over half (53%) of the commercial sector develops solar through third-party ownership in 2018. It is projected to grow to 78% by 2021 for the commercial sector. However, for smaller (<1MW) commercial development, customer ownership remains predominant. About 30 – 40% of 2018 projects are third-party owned, although this proportion is expected to increase to nearly 50% by 2021.[19]

However, for entities with tax appetite, third-party ownership of solar installations is typically more expensive to the customer than self-financing and ownership, for the same reasons that leasing a car or executing an energy performance contract are. The third party must absorb risks, incur design and project management costs, as well as marketing and other transaction costs, and provide profit for investors. However, this conclusion does not consider substantial risks and costs that may be borne by a host facility that chooses to self-finance and own the installation. These could include, for example:

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[18] See Harrisonburg Housing & Redevelopment Authority case study at Secure Futures website, https://securefutures.solar/case-studies/harrisonburg-housing-and-redevelopment-authority/

[19] *Third-party ownership is expected to increase, but at different rates across segments*, GTM Research, April 26, 2018, https://www.greentechmedia.com/articles/read/commercial-solar-expected-to-be-78-third-party-owned-by-2021#gs.bIeHnhY

> the risks of design or installation errors, cost overruns, electrical interconnections, permitting, and equipment performance; and

> internal costs of approvals and budgeting, securing subsidies, design, procurement, project management, maintenance, and financing, which may in fact exceed the equivalent costs and profit of an expert provider.

For small projects, the costs, profit and risk considerations may offset the value of having a third-party monetize the tax credits. It would be helpful to find ways for the NPO to take advantage of such tax credits itself, despite being exempt from most taxes. In general, there are two ways to achieve this:

i. The NPO may have some tax liability of its own from "unrelated business income." The tax credit applicable to a solar development can be used to directly offset that liability.[20]

ii. The NPO may use a related or "friendly" tax-paying entity (that has profits to offset) to finance and own the solar installation, taking advantage of the tax credit to reduce the installation's cost. Using such an entity could obtain the advantages of a PPA without many of its drawbacks (the costs of marketing, risk assumption, contracting, and profit margins, and the hazards of contract negotiation).

b. Forms of Third-Party Ownership

PPAs and solar leases present substantial opportunities for NPOs, but only if they are allowed by state legislation and regulations. Strictly defined, PPAs are not permitted by state laws in at least six states, legally ambiguous in a dozen others, and discouraged by utilities in most. However, the leasing of solar panels (and storage) to customers who thereby generate their own power has been successfully practiced in most states.

For NPOs who determine that third-party ownership is the best fit, they must then consider different forms of the structure (i.e., PPA vs. lease), and whether PACE financing improves the transaction for them. The following paragraphs list some cautions for administrators and customers considering third-party solar installations, followed by some advantages of PACE financing in that context.

c. Third-party ownership agreement terms

Like entering into any agreement, it is important to understand common terms which describe the responsibilities for both parties. In third-party ownership, the project developer has an incentive both to protect their interest and to make the proposed transaction attractive enough to the customer to sell the service. Because of variations in local solar markets and PACE programs, there are many different forms of the legal agreements governing these transactions with different provisions. However, a number of common provisions can present challenges in any third-party arrangement (when combining third-party ownership with PACE). The customer, and the PACE Administrator if one is involved, should pay close attention to these terms for PPAs and leases.

Installation terms generally outline system specifications, system design approval, installation & engineering responsibilities, and commissioning and inspection rights. The system should not be commissioned and accepted by the host if these terms are not met. In most programs, PACE

[20] Publication 598 (01/2017), Tax on Unrelated Business Income of Exempt Organizations, IRS
Revised: January 2017

assessments or liens are placed on a property at closing, prior to construction. This can place some construction risk on the property owner, especially when installation is being managed by a third party. Therefore, the customer should make sure there is sufficient protection for them in case of delays or issues in the construction process, so that they do not end up taking on a payment obligation for a system that is built late or poorly.

The Scope of Work includes a description of the system, including system size and location and auxiliary items like storage, energy efficiency, and electric-vehicle charging stations. Some NPOs may have additional design needs, like historic preservation restrictions, which should be addressed in this section. The agreement may also include a system-design approval clause where the company provides the customer with the proposed system design for approval before beginning installation.

Term and title provisions, to make the PPA qualify under PACE statutes regarding permanent affixation to the property and certain definitions (capital lease, personal vs. real property, etc.).

Term and early termination the agreement will list how long it will last along with options for renewal or to purchase the system at the end of the initial term. The agreement will also describe any early termination provision including early buy out and the cost for early buy out.

Payment and pricing terms. The agreement will include a payment schedule that shows any upfront payments and amounts owed at each PACE Assessment period. This section will also go over other pricing terms, such as price per kWh or monthly rate and any annual escalators which will be reflected in the payment schedule. Payment terms can vary widely between PPAs. Because PACE payments are generally fixed and annual or semi-annual (as opposed to monthly), special care must be taken to ensure that the PACE payments are aligned with the economics of the PPA. For example, underproduction is a risk to customers who use a PACE-secured PPA, because the PACE payments are fixed in the tax roll and due regardless of the system's performance. The fixed payments are often reconciled by scheduling an annual "true-up," which makes the site host whole for system underperformance.

Performance guarantees. PPAs and leases include a guarantee that the system will produce a certain amount of power each year. If the system does not produce the guaranteed amount of power, the solar company will compensate the customer at an agreed-upon rate.

Take-or-pay provisions. The customer agrees to purchase all the electricity generated by the system whether or not the electrical energy is needed.

Operations & Maintenance responsibilities. PPAs and leases should describe the solar company's responsibilities for monitoring, operating, and repairing the system to keep it in good-working order. The agreement will also typically require the customer to keep the premises in good shape and let the solar company access the system to perform any necessary checkups or repairs.

Ownership of environmental attributes, incentives, tax benefits, and rights to trade grid services. For leases and PPAs, the solar company retains any tax incentives or benefits because it owns the system. The customer typically must assign any Renewable Energy Certifications (a.k.a. "RECs" or "SRECs") produced by the system to the solar company as well.

Additional Benefits. A customer may negotiate to include additional benefits such as educational displays, press releases, and training.

Recently, industry groups have made important strides toward creating standardized approaches for integrating PACE and third-party ownership. In December 2017, the Solar Energy Industries Association (SEIA) published a template 'PACE-PPA Addendum,' intended to work with and modify the standard PPA template so it can work for PACE-secured PPAs. While this template was developed for the California market, and will require some adjustments to function in other states, it is an important step toward creating standardized transactions on a national level.[21]

d. Special benefits of PACE financing in third-party-owned installations

As noted in Section 2, PACE has many potential advantages for nonprofits. In addition to those general benefits, it can provide specific enhancements to third-party ownership structures for solar.

Scope. PACE can finance more than just solar (*e.g.*, energy efficiency) if those improvements fit within local PACE guidelines PACE can also cover pre-installation or "soft" costs. The additional improvements can also help pay for the system cost. For example, as discussed earlier, battery storage could generate additional income through demand response and the provision of ancillary services to the grid.

Residual value. With PACE financing, customers are in a better position to structure favorable buyout options. Often, a reserve for the buyout can be capitalized as part of the initial PACE funding, so that property owners do not need to provide additional cash to acquire the system.

Creditworthiness. As discussed above, NPOs that might otherwise not qualify for a PPA could be eligible for PACE-secured PPAs because of the inherent credit enhancement provided by PACE. Others who would be eligible for traditional PPAs may see improved pricing due to the reduced risk for the system owner.

4. Special Cases of PACE Financing

a. PACE and Affordable Housing Applications

As a recent study found, PACE has not been widely used in the affordable housing sector. Only 3.6% of the 1,151 C-PACE transactions identified in the study involved multifamily properties of which just over a third involved affordable housing.[22] There are a few reasons that uptake has been limited in subsidized low-income housing or tax credit projects, including the limited availability of longer-term and lower

[21] *PACE + PPA Addendum*, Members of the SEIA Commercial and Industrial Working Group. Provides an addendum to the previously developed standard PPA contract. Developed for California. Available for SEIA members at http://www2.seia.org/e/139231/esources-model-leases-and-ppas/27lc6k/207989050.

[22] *Commercial PACE for Affordable Multifamily Housing*, VT Energy Investment Corp., January 2018, https://www.veic.org/documents/default-source/resources/reports/veic-cpace-affordable-multifamily-housing-report.pdf?sfvrsn=2

rate financing through federally-backed products, and the complexity of transactions and number of approvals that would be required.

However, in specific situations, PACE, especially when paired with solar, can have significant benefits for the affordable housing sector. The following section discusses advantages of PACE in combination with certain Housing and Urban Development (HUD) programs.

b. The HUD Rental Assistance Program

The Rental Assistance Demonstration program (RAD) is a voluntary program offered by HUD and authorized by Congress as a demonstration to provide an alternative route for preserving public housing properties (1.1 million units nationwide). By converting public housing to privately-owned units with project-based assistance, RAD follows development and management approaches commonly used in the multi-family affordable housing sector.

Under RAD, a public housing authority (PHA) can act as its own developer, if it meets the lenders' criteria, or may involve nonprofit or for-profit partners. The PHA can maintain a role in ownership and management of the property, either owning it directly or through an affiliate, or with the selected development partner playing this role. Alternatively, if low-income housing tax credits are involved (as is common in RAD conversions), a new partnership or LLC takes ownership to allow the investor to monetize the credits, typically with the PHA or its designated development partner serving as the managing member of the LLC, and with the PHA maintaining control as defined by HUD guidance.

Inspired by the growing gap between PHA capital needs—estimated at $26 billion in 2010 and growing annually by $3.4 billion[23] — the program offers the Section 8 platform and its long-term funding contract as a more sustainable option. The Section 8 conversion option is available under either the project-based voucher (PBV), or the project-based Rental Assistance (PBRA) programs. They provide either 15- or 20-year contracts and the opportunity to mortgage properties, leverage Low Income Housing Tax Credits (LIHTCs), and access other sources of financing. In the spring of 2018, Congress increased the ceiling of RAD units to more than 250,000 units, extending the deadline for submitting a conversion proposal through the end of the year.

The long-term contracts, historically stable appropriations and private sector stakeholders in the legal, development and financing markets prompt many observers to predict that project-based Section 8 properties will receive more sustainable HUD subsidies for the foreseeable future than public housing has experienced in recent years or will see going forward.[24]

The HUD website (www.HUD.gov/RAD) offers a toolkit, featuring an inventory assessment tool, an application form, and all the requirements for compliance and issuance of a CHAP (a commitment to enter a Housing Assistance Payments Contract). To qualify, agencies must hold two resident meetings, gain formal board approval, assemble a development team, obtain letters from lender and equity providers, and engage a physical conditions assessment contractor. From application to closing, agencies should anticipate a six- to eighteen-month process, depending on the financing approach and the complexity of the project.

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[23] *Capital Needs in Public Housing*, Abt Associates Inc., 2010, https://www.hud.gov/sites/documents/PH_CAPITAL_NEEDS.PDF

[24] CLPHA Affordable Housing & Education Summit, 2017

Seven key features of the program account for how RAD changes the traditional public housing operating and financing model and how it expands the avenues for redevelopment of public housing units, including opportunities for PACE financing:

i. Under RAD, the *Declaration of Trust* (which prohibits or makes it difficult to borrow against the property) is removed and replaced with a *RAD Use Agreement* that restricts the property's use to the same purposes (serving low-income households in need of permanently affordable housing) while permitting the property to serve as security for debt.

ii. Mechanically, RAD takes the capital fund subsidy attributable to a project and adds it to the operating subsidy to arrive at the Section 8 HAP payment.[25] This increases the per-unit annual operating subsidy for the average project by about $1,500 per unit, which the PHA can use to support project debt or to contribute to a capital replacement reserve.

iii. In public housing, most projects have a large and growing backlog of unmet capital needs. PHAs are not receiving enough capital funds annually to fully address those needs. By recapitalizing and financing the upgrade or redevelopment of the property, RAD can address that backlog of unmet capital needs. PHAs' use of stop-gap measures to address this backlog of unmet capital needs is one reason that ongoing maintenance costs are typically 35 percent of the operating budget of public housing projects. By enabling PHAs to address unmet capital needs, RAD allows PHAs to reduce their use of stop-gap measures and to shift project resources to preventive maintenance. This increase in preventive maintenance should generate additional savings in the project's operating budget. These savings can support more debt for capital investment or build up additional reserves to address future capital improvement and replacement needs.

iv. Project recapitalization through RAD also allows PHAs to employ more energy conservation measures, such as water-saving devices, low-energy lighting systems, energy-efficient appliances, Energy Star-rated windows, and solar water heating. These measures can help reduce utility costs, which comprise 23 percent of the typical PHA's annual operating expenses, causing HUD's annual energy costs for public housing units to exceed $1.2 billion.[26]

v. The RAD program helps provide a project with a steady, bankable revenue stream through a long-term Section 8 HAP contract that not only locks in current levels of project subsidies (from the capital and operating funds) but

[25] There are the two streams of funding provided to PHAs. One assists with making capital improvements and another subsidizes operations. Capital funding is allocated based on the age, size, and estimated capital needs of each property; operating funds are based on the approved budget for the PHA, less the amount paid by the tenants.

[26] *Energy Efficiency in Affordable Housing*, EPA 2011

also provides a built-in annual Operating Cost Adjustment Factor (OCAF) that helps address inflation.

vi. The finances of each project are independent of other projects in the PHA's portfolio, which may lead to more efficient management practices.

vii. The RAD program facilitates and encourages the leveraging of limited HUD capital funding with other sources of capital financing, including private sector debt, LIHTCs, soft loans and grants, PACE financing, local funding, and (where projects qualify) Historic Tax Credits. As noted in the initial evaluation of the RAD Program submitted to Congress by HUD's Office of Policy Development and Research, RAD projects are leveraging $14 in non-PHA resources to every $1 in PHA (HUD) funds.[27]

Energy-related capital improvements whose annual utility savings exceed debt service costs provide immediate benefit to RAD property owners and managers because they reduce operating costs, thereby increasing net operating revenues.

While the historically typical vehicle for financing PV solar has been PPAs, there are additional economic benefits to coupling PPAs with PACE financing. These advantages accrue to building owners not limited to RAD properties, but RAD properties are among the potential beneficiaries.

c. PACE in the context of HUD financing

HUD issued guidance in January 2017[28] expanding on a California-based pilot and making PACE financing available for use in certain types of HUD-assisted multifamily housing. This includes projects financed with HUD-insured loans under Section 221(d) and projects that have project-based rental assistance contracts under Sections 8, 202, and 811. This guidance also specified a two-stage process through which HUD would review and approve PACE financing for eligible properties. As a first step, HUD will review the local PACE program to determine whether it conforms to HUD's required assessment procedures. To facilitate this review, a potential application must provide a satisfactory letter to the Regional Director from the locality or PACE administrator, which confirms the following operational elements of the PACE program:

- The PACE special assessment will be assessed by a state, county, or municipality pursuant to state law and sent with tax bills;
- Payments are collected with tax bills;
- At any given time, the only obligation is the semi-annual/annual payment(s) then or past due and payable, with no acceleration of the entire assessment amount;

[27] *Status of HUD's Rental Assistance Demonstration (RAD) Evaluation and Results to Date*, Econometrica, September 2014 http://www.huduser.org/portal/publications/pdf/RAD_Evaluation.pdf

[28] Housing Notice 2017-01, Administrative Guidance for Multifamily Property Assessed Clean Energy (PACE), available at https://portal.hud.gov/hudportal/documents/huddoc?id=17-01hsgn.pdf

- In the event of a default on payment of the assessment, the mortgagee receives timely notice and a reasonable opportunity to cure the non-payment;

According to the guidance, if the owner is unable to obtain the above letter from the locality/PACE administrator, an opinion from its counsel that confirms the above will be accepted for review. In addition to the letter from the locality, the applicant must also provide an opinion from the state's attorney general that the obligations are special assessments and treated in a similar matter as the real estate taxes. Once HUD has reviewed and provided a letter notifying the applicant and the locality of their approval, the applicant can move forward with a project-specific application, requirements for which are further outlined in the guidance.

Approval criteria include factors such as loan-to-value and a savings-to-investment ratio test. Importantly, as Ballard Spahr indicated in their review, HUD allows applicants to adjust the property's budget numbers for utility costs and the project's utility allowances to account for the projected energy savings from the PACE financed-improvements in HUD Form 92547-A, the budget worksheet used by multifamily projects to set forth the project's income and expense projections. It also permits applicants to list special assessment payments as an eligible expense under the line item for taxes and insurance following the first year of the assessment.[29]

While this guidance has been in place for a year, a 2017 study by the Vermont Energy Investment Corporation found only one use case: a HUD-assisted project in California that underwent review in accordance with HUD's procedures under the California pilot. However, there is some evidence that other PACE programs will begin to explore this opportunity further. The Energize NY program, for example, has secured HUD's approval of the program's assessment procedures in advance of potential project level applications.[30]

In addition to the HUD-assisted properties covered in the 2017 guidance, there has been some consideration of PACE financing for public housing or projects with public housing authority (PHA) involvement. One example, the Phyllis Wheatley YWCA in Washington, DC used PACE as part of a multi-layer financial transaction in 2016. The property, which provides supportive housing to women, also entered into a contract with HUD for a long-term operating subsidy administered by the DC Housing Authority as part of the transaction. Thus, the project participants and the DC PACE administrator developed a unique inter-creditor agreement structure which allowed PACE to meet the concerns of HUD and DCHA.

This project used a local rent subsidy (as opposed to the HUD operating subsidy) to repay the PACE assessment, so there is not yet precedent for use of a public operating subsidy to repay PACE. However, as noted by Ballard Spahr, which was also involved in the YWCA project, the typical PACE financing structure likely satisfies the requirements for an energy performance contract under 24 C.F.R. § 990.185(a). Ballard Spahr also concluded that based on the determination by HUD's Office of Multifamily Housing Programs to permit the use of PACE financing in the programs overseen by that

[29] *Options for PACE Financing Alternatives*, Feb. 22, 2017, Ballard Spahr LLP
[30] Commercial PACE for Affordable Multifamily Housing, VEIC, Jan. 2018, https://www.veic.org/documents/default-source/resources/reports/veic-cpace-affordable-multifamily-housing-report.pdf?sfvrsn=2

office (i.e., those covered under the 2017 guidance), the Office of Public and Indian Housing, which oversees public housing and mixed-finance transactions, would likely be open to expanding financing for energy conservation measures to include PACE financing.[31]

Recognizing the popularity of PPAs for solar installations, HUD also modified part of its incentive package—the rate-reduction incentive[32]—to permit a public housing authority to retain 100% of the rate savings secured by a PPA if those savings are reinvested in additional energy efficiency measures. HUD also allows the authority to borrow against the future stream of savings, effectively monetizing those savings toward financing for additional energy efficiency measures. To take advantage of these incentives, HUD requires that an energy services company (ESCO) oversee the design and installation of all measures and guarantee the utility savings for the life of the project.

d. Tax-Exempt PACE: Lessons in Structuring Private Activity Bonds

PACE financing may also be used in conjunction with private activity bonds (PABs), bonds issued by a government issuer but the proceeds of which are used for private purposes. Because these bonds are issued by localities and other qualified issuers, they can provide a sort of credit enhancement and access more efficient capital, even though municipalities typically do not pledge their full faith and credit as they would for a governmental bond. Instead, the repayment is typically a dedicated stream of revenues.

Combining PACE and PABs offer another potential advantage – it can allow for certain qualified borrowers, including many nonprofits (under the Qualified 501(c)(3) bond program) and affordable housing developers (under the multifamily housing bond or mortgage revenue bond program), to access tax-exempt financing.[33] With tax-exempt bonds, interest paid to bondholders is not subject to federal income tax, and as a result, bondholders are willing to accept a lower yield, leading to pricing that can be significantly cheaper than taxable financing.[34] Thus, there is potential for localities and PACE programs to work with bond issuers to source tax-exempt proceeds to fund PACE products.

One example of such a PACE structure is the Far Southeast Family Strengthening Collaborative, Inc. ("FSFSC") project through the DC PACE program. The FSFSC project was working with the D.C. Industrial Revenue Bond (IRB) program, which is a branch of the Office of the Deputy Mayor for Planning & Economic Development (DMPED), to secure tax-exempt financing for the construction of a new headquarters. The bonds were being privately placed with United Bank, a local financial institution. To help fill a gap in the financing, FSFSC also used $2.2 M of PACE, which was issued on a tax-exempt basis in parallel with the IRB.

While tax-exempt financing has economic advantages, it is also complex from a regulatory and legal perspective and carries many more liabilities. The PAB process, because it entails issuance by a public

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[31] *Options for PACE Financing Alternatives*, Feb. 22, 2017, Ballard Spahr LLP

[32] HUD's energy performance contracting program for public housing was established by legislation as part of the 1987 Housing Act, HUD established regulations in 1991 that provide financial incentives for any utility-related investment that reduces consumption or lowers rates.

[33] IRS *Publication 4078, Tax-Exempt Private Activity Bonds*, https://www.irs.gov/pub/irs-pdf/p4078.pdf

[34] *Private Activity Bonds: An Introduction, Congressional Research Service*, March 2016, https://www.everycrsreport.com/files/20160330_RL31457_d2b66a3a84896985c646b06f03bcdebcc9dad790.pdf

entity, requires a public approval process. For certain projects, property owners must meet the "volume cap" for their project. Each state and the District of Columbia have a cap on the aggregate annual amount of private activity bonds that may be issued within a state in any calendar year on a tax-exempt basis, which is allocated to various issuing agencies. For certain types of PABs to be issued on a tax-exempt basis, the issuer must use a portion of the state's allocation. This typically does not apply to users of the Qualified 501(c)(3) bond program but does apply to tax-exempt housing bonds.[35] The IRS formula to set a state's volume cap is based on population, but is subject to a standard cap, so while some states do not usually run up against this cap, in others with large populations, the allocation is tight.

Importantly, the legal and regulatory requirements to document eligibility under the tax-exempt PAB programs are strict, requiring substantial due diligence and legal work on the front end and ongoing filings. For some, especially housing bonds, the ongoing reporting required to ensure continued compliance is particularly complex.[36] All this makes tax-exempt financing costlier to issue – although rates may be substantially cheaper, a project must be large enough that the savings on rate outweigh the higher transaction costs. Further, if users of tax-exempt PABs stop complying with the requirements of the financing, significant tax implications would occur. Lastly, PABs are a tool created by federal policy, making them subject to political shifts. At the end of 2017, a tax reform bill passed by the House of Representatives threatened to end the tax-exemption for qualified PABs, prompting outcry and a frantic effort to close transactions before the end of the year before the exemption was restored in a compromise bill and eventually passed by both houses and signed into law.[37] Although PABs seem safe for now, the debate highlights that the availability of tax-exempt bonds cannot be taken for granted.

e. Tax Implications for Solar and Tax-Exempt Financing

NPOs who have financed their properties using tax-exempt bonds (or who use tax-exempt PACE financing) must be cautious to avoid solar becoming a "bad use" of tax-exempt property, which can have significant tax implications.

Many NPOs produce income from activities unrelated to their charitable purpose, and it is generally taxable. For example, the value produced by solar energy installations on NPO properties may be considered taxable unrelated business income (UBI) in certain cases. The rules for dealing with solar UBI are relatively straightforward and should be consulted when considering PACE financing of solar installations.

A special case arises, however, when the installation is on a part of the NPO's property that was or may be financed by tax-exempt bonds, or by other lenders or contributors relying on the 501(c)(3) exemption. If the owner of such an installation is not tax-exempt (which would be the case with a PPA), or if the NPO sells the solar energy to another party, that part of the property may be used for "private

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[35] *CDFA Volume Cap Report, An Analysis of 2016 Private Activity /bond & Volume Cap Trends*, Sept., 2017, https://www.cdfa.net/cdfa/cdfaweb.nsf/ord/201708-2016VolumeCapReport.html/%24file/Volume%20Cap%202017%209.12.pdf

[36] Ibid, IRS *Publication 4078*

[37] *Private Activity Bonds and Stadium Bonds Saved in GOP Tax Reform Bill*, The National Law Review, December 21, 2017, https://www.natlawreview.com/article/private-activity-bonds-and-stadium-bonds-saved-gop-tax-reform-bill

business." In that case, the bondholders, lenders, or contributors (and bond counsel) have an interest that goes beyond the NPO's tax liability. Their own tax exemptions or deductions related to their loans or contributions could be denied or even recaptured if the property is found to be used for "private business." The definition and quantification of such private-business use (PBU) may be important to NPOs considering solar financing.

The following paragraphs discuss this issue in more detail. **This does not constitute tax advice, however, and the reader should consult his or her own tax counsel and accountants in determining the impact of this issue.**

The general rule is that PBU may not exceed 5% of the property's "use." The calculation of "use," however, is itself subject to calculation. For example, less than all the property's space may be used for private business; or the private business activity may not continue all the time; or some part of the financing may not have relied on the tax exemption; or the space used for PBU may have a much lower fair-market value than other parts of the property. These reductions from 100% "bad use" can be applied as ratios and multiplied together to compute the net PBU, which often can then meet the 5% limitation.[38]

This computation is discussed in further detail below.

i. For activities of a private business or for-profit user of the NPO's space:

IRS generally considers this "bad use," even if the income derived by the NPO from the for-profit user is negligible. However, an important "space" ratio applies: the NPO could permit bad use of 5% of its space for 20 years or 100% of its space for one year (on a 20-year contract).

ii. Definition of "space":

IRS generally uses square feet of usable space as the metric. Thus, the roof of a 20-story NPO building would be 5% of the bond-financed space, but the roof of a 3-floor parking garage would constitute 25%. However, there are two ameliorating considerations: (a) the actual square footage used by a solar installation will be substantially less than the total roof space available, so the ratio will always be smaller; and (b) the fair-market value (FMV) of the PBU space can be considered when calculating the ratio.[39]

iii. Financing ratios:

[38] A good example of such calculations can be found in the analysis done by the general counsel and controller's offices at Caltech: see the PowerPoint presentation "A Guide to Understanding PBU at California Institute of Technology," October 2012.

[39] Robert E. Cowden, Esq., Partner of Casner & Edwards in Boston and a specialist in nonprofit law: "Suppose you have a building of 5 floors of 1,000 sf each plus a flat roof of the same size. If all the roof were used, the bad use would be one-sixth of the total. We looked at this very question and scratched our heads at the issue of whether roof space should be counted the same as office space, since the fair market value of the former was so much less. We ended up getting an appraisal of the roof (very low, as you can imagine) and then included in the square foot analysis, both numerator and denominator, a much smaller number for the roof that corresponded to the deep discount in value. I can't cite any authority for this, but two sets of lawyers looking at it thought that there was logic to the approach."

If the facility was funded with only part of a bond's proceeds, or if it used bond funds for only part of its cost, then the % PBU calculation can include the product of those two ratios as well as the ratios discussed above. Often this will easily beat the 5% target.[40]

iv. For activities of the NPO itself:

Even in a building 100% financed by tax-exempt bond issues, its % of "private business use" (PBU) may be further multiplied by the % of "activity" constituted by the PBU. This "activity ratio" may be computed as the ratio of PBU revenue to total revenue generated by the building.[41]

f. Financing Stand-alone Solar Systems with PACE

NPOs who lack space for solar installations may elect to participate in community solar (see Section 5). If this option is not available, or not attractive for some reason, it may be possible to finance a dedicated solar system on land outside the contiguous NPO property. This has been done on agricultural land and large industrial sites, for example.

To meet most PACE financing requirements, however, the PACE loan principal must not exceed 20% (frequently less) of the assessed property value on which it is sited. To meet this criterion, either:

i. The property would have other uses[42] that increase its value, or
ii. The PACE financing would be a fraction of the "capital stack" used to finance the deal.

Thus, brownfields, which would otherwise be attractive solar system sites, will not usually qualify unless 80% or more of the total equity and debt is provided in addition to the PACE financing. The situation is analogous to financing a methane plant on a landfill – the pre-financing property value is likely very low unless it is attached to other property or assessments. If more valuable off-site property can be located and secured, however, the development of a stand-alone solar plant could meet other PACE financing criteria.

5. Community Solar Benefits for Nonprofit Organizations

Onsite solar is out of reach of many NPO facilities because of site limitations, risk intolerance, debt covenants, or other building-related concerns. However, nonprofit organizations and their clients/residents might be able to take advantage of the benefits of renewables by participating in off-site "community solar" photovoltaic (PV) projects. Though such projects have not been documented as of this writing, there may be situations in which PACE can support community solar projects that benefit

[40] *A Guide to Understanding Private Business Use*, California Institute of Technology, October 2012, http://finance.caltech.edu/documents/180-a_guide_to_understanding_private_business_at_caltech.pdf
[41] Caltech Guide
[42] It could be argued that the future stream of solar revenues could be monetized to yield a high value for the solar system; however, that value would approximate the PACE loan principal, unless an extraordinary design produces very high output per dollar of cost, or the assumed discount rate is very much lower than the debt interest rate.

NPOs.[43]

a. What is Community Solar?

Community solar means that PV arrays can be installed in a remote site, and not necessarily on a rooftop, if it is in the customer's utility service territory. An abandoned parking lot, field, brownfield, or other open space can host the installation. The power output is connected to the local utility distribution system, is sold into the grid and credited to each electricity customer in your pool, based on current electricity tariffs. Community solar can deliver additional value to consumers because offsite solar arrays can be larger, sited for optimal production (including tracking ability), and built to scale, rendering them up to one-third less expensive per MWh of capacity than an equivalent site-based rooftop system.

Community solar provides many of the same benefits as on-site solar, including electricity price reduction and contractual price certainty over an extended period, potential energy resilience, local community job creation, the freedom to choose an electricity provider, and the ability to exercise environmental stewardship. At the same time, it can help overcome many of the barriers that prevent NPOs from installing solar PV on their own property, because of:

- Buildings not suitable, in structure, orientation, or location
- Financing covenants or other restrictions that constrain non-mission uses of debt-financed parcels
- NPO Boards that assess risk at a much higher level than commercial properties
- Internal decision-making difficulty, reaching consensus among stakeholders, and management distraction and delays, all of which are often more arduous than in commercial organizations
- The cost of internal project management, which can be especially high and difficult to recover under NPO accounting rules

Community solar participation does not require NPO facility dedication, full project management, property risk, or agreement among as many stakeholders. In addition, community solar can be installed in otherwise unusable locations. Turning "brownfields" into solar "brightfields" may be an attractive use of PACE financing, appealing to political leaders. And, if the brownfield is close to where the utility grid needs upgrading or congestion relief, the "locational value" of its electric capacity can win utility support. This can turn sore spots into tax-producing properties when developed and financed by taxable, for-profit entities.

There is evidence that community solar participation by all building sectors/types can be successful where allowed by regulation and where the current cost of a kWh is high enough to warrant community solar development. Developers have shown creative enthusiasm for reaching this underpenetrated market and rapid growth is predicted. Over 400 MW (408 MW) of community solar were installed in 2017, up from 108 MW 2016.[44]

Where not explicitly allowed, several forms of community solar participation may yet be accessible. Several community solar business models have proliferated in recent years, as the market for those who

[43] The Colorado CPACE program is considering allowing PACE for community solar. See *C-PACE Program Guide, Colorado New Energy Improvement District*, version 4, 3/6/18, P. 12. https://copace.com/wp-content/uploads/CO_C-PACE_Program_Guide.pdf

[44] *Solar Market Insight, 2017 Year in Review*, GTM Research and Solar Energy Industries Association

cannot install solar on their roofs has been recognized. These models include at least the following arrangements that do not require utility or regulatory participation, can potentially be financed at least in part by a PACE loan, and through which developers can share the community solar economic advantages with NPOs:

- Private subscription or investment in community solar plants
- Membership in cooperatives that own and operate community solar plants
- Hard-wired "behind the fence" shared PV developed by NPOs or affiliates
- Islandable microgrid participation where solar is a major contributor to the generation base

Community solar can also be developed for tenants in a building with onsite solar. In this scenario, commercial property owners develop solar power and offer the electricity to their nonprofit tenants. The tenant organizations pay reduced, fixed-cost electricity rates while the commercial property owner benefits from the tax benefits.[45] The same benefits to nonprofit tenant organizations would accrue from their landlord's participation in a local community solar program.

Community Solar projects have also been approved in the most prevalent forms of HUD-subsidized housing. These two innovative means of financing solar installations (PACE and Community Solar) are relatively new to HUD properties but have been tested in several jurisdictions.[46] Combining them—using PACE financing for community solar installations to which nonprofit housing developers can subscribe—is the next logical step in this development.

b. PACE and Community Solar

Although originally envisioned for energy-efficiency improvements to real-estate properties, PACE has now been used for such investments as energy-efficient new construction and solar installations, where the "savings" are projected by modeling the utility cost displacements. The challenge in reconciling PACE with community solar is that PACE typically requires that the PACE-financed project results in savings to the property.

A logical question, therefore, is whether PACE can be used to finance community solar installations where the 'savings' (i.e., the avoided costs of purchasing electricity from the utility) may accrue to someone other than the property owner (i.e., the community solar site owner). One approach is to treat revenue from the community solar as an income stream accruing to the property owner, like renewable energy credits or other environmental attributes which can be considered savings or benefits of an onsite solar installation. Thus, PACE can be most widely used for community solar in programs with looser savings-to-investment ratio requirements or broader definitions of project savings.

For PACE to serve as a viable form of financing for community solar, two other factors must be considered. First, if a community solar installation is taking place on greenfield or brownfield site (as opposed to, say, a warehouse rooftop), the local legislation/regulation would have to allow PACE

[45] Not for Profit? Not a Problem, Solect Energy, http://solect.com/not-for-profit-not-a-problem/
[46] Mendelsohn, Mike, "Expanding Solar in Low-Income Communities: Lessons from Denver," Greentech Media, February 16, 2018

financing of new construction or greenfield sites, or at least not expressly disallow it. Alternatively, installation of solar PV on a greenfield site could be considered a retrofit application, regardless of whether a building already existed on the site. PACE will be a less useful tool for community solar in programs which place restrictions on PACE for new construction.

Second, many PACE programs limit the amount of financing a project can receive to a percentage of the property value.[47] For community solar installations, which are often installed on vacant land with low value, this can be a limiting factor. However, many programs also allow for this calculation to consider an "as-improved" or "as-complete" property value, which would be determined by an appraiser considering the value of the installed equipment and associated revenue in their calculation of the property value. Programs with stricter "PACE-to-Value" requirements, such as those that mandate the use of tax assessed property value in the ratio calculation, are less friendly to using PACE for community solar.

Notably, regulation typically requires that community solar subscribers are in the same utility territory as the site (or the same municipality). However, from a financing perspective, the community solar property does not have to be in same municipality or PACE program as subscribers, since it is the property owner of the community solar site who will take on the PACE financing.

c. Community Solar Ownership Models

The simplest way for NPOs to participate in community solar is for them to engage with a for-profit developer or community solar provider. Alternatively, a consortium or hybrid organization of NPOs might be set up to take advantage of the tax benefits while preserving the mission-oriented policy commitments of its members. The consortium could pass some of the tax benefits along to its NPO members in the form of a further reduced cost of a kWh, panel purchase price or lease payment.[48]

In yet another model, a charitable nonprofit organization accepts tax deductible donations to fund a community solar installation on its property. The nonprofit then enters a prepaid PPA with a for-profit developer using the donated funds to prepay the PACE-secured PPA. The excess power sold back to the utility could provide a credit against the electric bills of the charitable donors through virtual net metering.[49]

d. Recommendations for Municipalities, NPOs and PACE Administrators

As discussed, community solar presents an important avenue for NPOs to access the benefits of solar, and PACE represents a useful tool to help community solar reach its potential scale. The following suggestions could help accelerate the deployment of PACE for community solar, and correspondingly, help more NPOs participate in the market.

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[47] The CA PACE program's loan maximum is 15% of property fair market value. In VA and DC, it is set at 20%. The MD state regulation does not specify, but Baltimore and Arlington County have set the limit at 20%.

[48] *In Search of the Hybrid Ideal*, Stanford Social Innovation Review, Summer 2012, https://ssir.org/articles/entry/in_search_of_the_hybrid_ideal

[49] Community Solar Power: A Look at the Business Models Behind Community Solar Power, ACORE, June, 2016, http://www.acore.org/acore-blog/item/4249-community-solar-power-a-look-at-the-business-models-behind-shared-solar

Consider the advantages of locational value to distribution utilities and the regional transmission operator. Utility cooperation is essential in most forms of community solar.[50] In PACE jurisdictions with compatible regulatory policy, community solar may reach many more NPOs if pursued in cooperation with local distribution utilities.

Our recommendations include:

i. Identify developers installing successful community solar farms and subscriber contracts. The commercial discipline of earning a return on investment is driving innovation.
ii. Pursue aggregation of loads. Community solar offers become more attractive as the total subscriber load and its certainty increase.
iii. Adopt clarifications in ordinances to make community solar plants ("farms") explicitly financeable by PACE.
iv. Work with PACE Nation and other trade associations and advocacy groups to identify community solar opportunities and challenges, and to resolve them to the advantage of local NPOs.

[50] Although there are designs that can be implemented without net metering or new wiring arrangements, all community solar requires grid interconnection to achieve its value.

6. Appendix: The Economics of Solar for NPOs

The many NPO benefits of PACE-financed solar installations have been described above. In the end, of course, the total cost of self-generated solar energy must be compared to the cost of alternatives—future utility bills, a community solar subscription, PPA, SGA, or other options. The NPO management may want to figure other criteria into that calculation—environmental or social impacts, internal costs and benefits, etc.—but the basic financial cost comparison will always be part of the decision. That comparison is challenging enough in itself, involving many projections and calculations.

a. Parametric Financial Modeling

Although complex, one can analyze the economics of Solar for NPOs by constructing a parametric financial model that allows for inputs of the most sensitive and critical financial and technical variables. Regardless of ownership structure and tax credit appetite, such variables all affect solar system economics. These variables would include current cost of electricity, specifics of the applicable utility tariff, cost of capital/borrowing rate, the NPO's volume of electricity needed, the percentage of that need that can be met by site-based Solar PV, optimal solar site orientation, the type (roof, field, parking lot) and size of area available for PV, the proposed system installation cost and the availability of financial incentives and revenue streams (utility, state and federal).

Tax credit impact

When the availability and value of the 30% federal investment tax credit (ITC) is considered, the system ownership type and tax appetite can play a major and determinative role. Some NPOs may have profit-making activities that may make some or all the system cost eligible for the ITC, either in the first year of installation, or spread out over the 20-year ITC recovery eligibility term. If it has no such tax appetite, an NPO must consider the economic advantages of either the PPA or SGA (discussed above), which allows the developer to claim the tax credit and presumably pass at least some of its value along to the NPO -- in either reduced installation cost, lower PPA cost per kWh, or some combination of the two.[51]

Storage impact

In addition to the PV system itself, one can also consider the economic value of adding electricity storage capacity, a decision that comes with a different set of determinative economic variables. Battery storage can increase the attractiveness of a solar installation substantially, by extending the hours of benefit, providing back-up power during grid interruptions, and reducing demand charges for peak loads.

Modeling the levelized cost of solar vs. other options

The solar parametric financial model[52] accounts for all these variables. It can calculate and compare a levelized cost of energy ($/kWh) for a PV system vs. utility bills or other offers, under various user-constructed development scenarios (PPA, direct ownership with no ITC, partial ITC, etc.). All of the input variables are in the "System Inputs" sheet, with additional battery storage system inputs available

[51] Another possibility (for larger NPOs or a consortium) may be to form a taxable special-purpose entity to develop and own the solar assets, as described below.

[52] See attached Excel-based model "PV Ownership vs. PPA LCOE Calculator 1-3-16."

to the user in the "Storage Input" sheet (if the user selects "Yes" from the drop-down menu in that sheet).

All inputs require a reasonable range of values, which will vary for each project-dependent geographic location, utility territory and tariff structure, equipment selected and specifics of system design and use.

Explanation of variables in the model.

The key variables, with their reasonable range of values and relative economic importance, are as follows:

Current Cost Per kWh: This cost range depends on the utility territory and applicable tariff. Typically, it will range from $0.07/kWh (e.g., in states with high percentages of hydro generation) to as much as $0.30 (e.g., in island territories like Hawaii). In most instances, low utility rates (7 to 9 cents/kWh) make it difficult for either a self-owned or developer owned PPA PV project to be economically viable. Availability of the full ITC in year one, however,[53] and lucrative and vibrant SREC markets could overcome a low cost of energy (discussed below). Current utility rates in the $0.20/kWh and higher range may make solar PV an attractive economic value regardless of investment tax credit and solar renewable energy credit (SREC) value and availability.

PPA Price per kWh: In most cases, an offered PPA price per kWh should be less than what one is currently paying the utility; otherwise, there is little economic value to the customer. A customer may agree to a higher than current price if they want to claim environmental benefits due to the reduced carbon and other emissions resulting from renewable energy production. The economic model sets the PPA default value at one cent below the owner's current cost of energy. Of course, the user may override (reduce) that value and generate greater PPA economic value.

Utility Price/PPA Price/Other Expenses Escalation Rates: Utility rates generally increase over time, especially over a 20-year term. The US Energy Information Administration[54] estimates annual rate increases for all energy commodities in all regions of the country. These estimates can serve as a baseline rate at which to escalate both the value of energy saved, and, in a PPA or SGA,[55] the purchase price escalation rate incorporated into the Agreement. Both escalation rates can have a noticeable effect on project economics, especially when in the range of 5% or greater. In addition, either ownership type has risk associated with these estimates. It is even possible that energy costs could de-escalate, particularly in the early years of the contract term. Other escalation/de-escalation rates may be applicable, such as O&M costs, but are not likely to have a determinative effect on the economic value. The model allows for separate escalation rates for utility tariff and PPA costs per kWh.

PV System Installed Cost: Current average installed costs are typically tracked by the industry, and by government laboratories, in dollars per watt. Costs have declined rapidly over the past ten years but the rate of decline has decreased, such that current costs are unlikely to decrease by more than 5% per year

[53] Availability of the solar ITC is currently due to expire in 2022 for any system not yet operational.
[54] US Energy Information Administration, www.eia.gov/outlook/steo/report/electricity.php
[55] Note PPAs and some lease arrangements are explicitly disallowed in some states (e.g., VA, MA) but forms of self-generation agreement may qualify for PACE financing.

over the next few years for most NPO-scaled systems.[56] Although the one-dollar-per-watt "barrier" has recently been broken for utility-scale installations in special circumstances, NPO managers can expect to pay in the $2 to $3 per Watt range for flat roof- or ground-mounted systems, depending primarily on size, mounting difficulty, and location. That cost includes all material and labor, but does not include any costs for roof repair, structural improvements, insurance, or annual operations and maintenance costs.

Regarding PPA pricing, the model cannot analyze the developer's true cost imbedded in their offered PPA price. (Developers have varying costs of capital, material purchase discounts, the ability to aggregate utility services revenue across projects, and profit margin goals.) The model can be used, however, to evaluate the overall reasonableness of PPA offers by constructing an estimate of the cost of direct ownership for comparison. In that exercise, an NPO should assume the developer will take full benefit of the ITC in the first year of project cash flow.

Annual Operations and Maintenance (O&M) and Insurance Costs: National average annual and site-specific ranges of O&M and system insurance costs factors are also tracked by NREL in the Cost of Renewable Energy Spreadsheet Tool (CREST).[57] O&M costs are expressed in annual dollars per kW of installed PV, and insurance is expressed as a percentage of installed cost. Average O&M cost has been declining rapidly: "Based on a compilation of published reports, Andy Walker from the US-based National Renewable Energy Laboratory (NREL) estimates that, for old solar PV systems, O&M was on average $20 per kW a year, whereas now it is closer to $7.50 per kW a year. I think O&M costs are about half of what they were ten years ago,' he says."[58]

Of course, one of the advantages of a PPA is that the property owner does not have to budget for O&M expenses over the 10- to 30-year life of the PPA.

ITC, ITC Recovery Period and Depreciation: In late 2015, the 30% (of qualified system costs) federal solar renewable energy ITC was extended through 2019, decreasing to 26% in 2020, 22% in 2021 and finally to 10% in 2022 and beyond. For simplicity, the LCOE model permits user entry of either 30% or 10%. Note that, for an NPO wishing to own the system and with some tax appetite due to limited for-profit revenue, but not enough to take credit for the full value of the ITC in the first year of cash flow, the ITC can be spread out over any period of years up to 20. In essence, some portion of the value of the credit must be financed up front and some interest expense carried on that amount. Obviously, the availability of the ITC is a major economic driver in favor of PV installation, so much that a PPA/SGA may be the only viable economic choice. The LCOE model only allows for full recovery of the ITC in year one.

The more complex computations in the NREL CREST model include the ability to factor in federal straight line and accelerated MACRS depreciation (revenue) on various expenditures. However, these savings require specific details on equipment. Furthermore, it is unlikely that an NPO will be able to directly benefit from those deductions, so they are not included in the LCOE model.

Estimated Annual Solar Renewable Energy Credit (SREC) Value: Certain states have set renewable portfolio standards (RPS), which require electricity utilities operating in their states to provide a specific percentage of their electricity generated from renewable sources. RPS requirements are commonly

[56] Estimates in this section are based on published research by NREL, the Berkeley Laboratories, The Solar Foundation, and the Solar Energy Industry Association, all of whom continue to post evolving data regularly.
[57] NREL, "CREST" User Manual v.4 and NREL - Energy Analysis – Energy Technology Cost and Performance Data
[58] Quoted by Heidi Vella in *Power Technology,* 31 May 2016

tracked by industry and government sources, because they change frequently and are critical to renewable-energy growth.[59] To meet these requirements, electricity providers obtain renewable energy certificates (RECs), which serve as proof that they have either produced renewable electricity themselves or paid someone else who is producing renewable electricity for the right to "claim" the electricity. RECs created by solar PV are referred to as SRECs (one SREC is created for every MWh of solar electricity produced) and are traded to utilities and others on the open market at prices that may vary from year to year depending on the changes to REC goals and the ability of the utilities to meet them in any given year.[60] Future anticipated SRECS can also be sold, typically at some discount from present prices.

There are obvious risks one takes in counting on the future value of SRECS to pay for their solar investments. Solar developers will account for this risk in some way in arriving at their offered PPA price. Some NPOs want to claim environmental benefits (carbon footprint reduction, etc.) from the solar production. Unfortunately, selling an SREC in the open market either directly or indirectly (by assigning ownership to the PPA developer) allows the purchasing utility to produce that MWh in any way they see fit so the environmental benefit may not materialize. Moreover, once an NPO sells the SREC, it sells its claim for making an environmental contribution.

When available, SRECS can have a dramatic effect on the potential economic value of solar PV, perhaps so much so that an NPO may be able to forego the ITC value altogether. The market value of SRECs is highly volatile, however. As examples, in mid-2017, in the District of Columbia SREC values were in the $500 range with projections of value in the hundreds of dollars for years to come. Massachusetts SRECS were worth about $270 in 2017 but are being replaced in 2018 by the new "SMART" program, under which energy and incentives are combined in a single pricing system. By contrast, Maryland SRECS were worth $20 in 2016, but dropped to about $7 in mid-2017. The LCOE model calls for just one input value in year 1 that remains constant for the project term. The user considering taking on the SREC risk should research the current and estimated future value of an SREC in their location by consulting the SREC Trade website and other web-based sources.

Finance Rate/Cost of Capital: The LCOE model allows for one interest rate input that sets the loan interest rate and the owner's cost of capital/discount rate at the same value. The spread between loan rate and discount rate can be significant with the loan rate being perhaps less than the discount rate if low-interest solar loans or PACE loans are available to the owner. Finance costs are built into the developer's PPA/SGA price and are not typically revealed to the customer.

Loan Term: Solar PV and PPA terms typically range from 10 to 20 years, sometimes limited by state statute. Longer terms spread out the debt repayments and better match tax credit streams to loan term but may increase interest rates and the risks associated with energy escalation rates and anticipated SRECs value.

b. Running the Model - Example Cases

To assist users of the model, several "runs" have been conducted with their results (from the "Outputs" page) shown below. A typical case was used for these runs (the user can specify any other reasonable case): a 100kW, roof-mounted system using PACE financing but requiring no roof or structural

[59] See, for example, current RPS reports by Berkeley Labs (lbl.gov), DSIREUSA, and EIA.
[60] SRECS.com; http://www.srectrade.com/srec_markets/

modifications, and assuming 1,200 kWh annual production per kW (typical of north-eastern U.S.). Then worst-case, midrange-case, best-case, and special-case exercises were run, using assumptions that might typically be made in such cases. (The "special case" is for a Special Purpose Corporation set up to capture tax advantages that may not be available to NPOs.)

Following the print-out of each result, conclusions and observations are presented.

1. "Worst" Case:

Current Cost /kWh	$0.09	Escalation Rate	3%
Financing Rate/Discount Rate	6%	Loan Term (years)	20
System Install Cost /Watt	$3.50	ITC Eligible?	NO
SREC Value	$0.00		

Outputs:

20 Year NPV of Cash Flow	**($238,288)**				
TOTAL INVESTMENT (amount "financed")	**$350,400**				
Savings-to-investment Ratio	**0.320**				
20 Year IRR of Cash Flow	**-4.47%**				
(1) Annual Levelized Cost: at:	6.00%	Discount Rate			
Total system cost less any State or utility incentives, over 20 years) =				$17,520	per year
Inverter & other replacements, levelized =				$323	" "
Other maintenance cost (labor, materials) =				$1,608	" "
		TOTAL ANNUAL COST =		**$19,451**	" "
(2) LESS Revenues & offsets:					
Electric energy savings, net of degradation, levelized:				$7,536	" "
SREC sales: expected production =	2,289	MWh		114	" "
X projected SREC prices, levelized =	$0	per MWh		$0	" "
Demand charge reduction, average per year =					" "
ITC assuming average annual UBI of at least:	$350,401	per Year		$0	" "
Other revenues and offsets = **				$0	
TOTAL ANNUAL REVENUES =				**$7,536**	" "
NET ANNUAL COST =				**$11,915**	" "
(3) Levelized Net Cost per average annual kWh produced =				**$0.104**	per kWh

(4) Comparative Levelized Cost of Self-Generation per average annual kWh produced =	**$0.170**	per kWh
(5) Compared to projected levelized utility charge:	**$0.121**	per kWh
Compared to likely PPA price /kWh:	**$0.107**	per kWh

In this scenario, an NPO without benefit of the ITC and any available SRECs, this project does not make economic sense for any owner to pursue. The levelized cost of a solar kWh would be $.05 greater than the utility rate and the IRR would be negative. However, if the current (utility) cost per kWh were as high as 14 cents (with all other assumptions the same), the solar savings would reduce the user's levelized energy cost to about a penny less than the utility rate. That would make the economics roughly like a likely PPA offer.

2. Mid-Range Case:

Current Cost /kWh	$0.12	Escalation Rate	3%
Financing Rate/Discount Rate	5%	Loan Term (years)	20
System Install Cost /Watt	$3.25	ITC Eligible?	NO
SREC Value	$50.00		

20 Year NPV of Cash Flow	**($75,836)**
TOTAL INVESTMENT (amount "financed")	**$325,200**
Savings-to-investment Ratio	**0.767**
20 Year IRR of Cash Flow	**2.19%**

(1) Annual Levelized Cost:	at: 5.00% Discount Rate				
Total system cost less any State or utility incentives, over 20 years) =				$16,260	per year
Inverter & other replacements, levelized =				$366	" "
Other maintenance cost (labor, materials) =				$1,761	" "
		TOTAL ANNUAL COST =		**$18,387**	" "
(2) LESS Revenues & offsets:					
Electric energy savings, net of degradation, levelized:				$11,000	" "
SREC sales: expected production =		2,289	MWh	114	" "
X projected SREC prices, levelized =		$31	per MWh	$3,595	" "
Demand charge reduction, average per year =					" "
ITC assuming average annual UBI of at least:		$325,201	per Year	$0	" "
Other revenues and offsets =	**			$0	

TOTAL ANNUAL REVENUES =	**$14,595**	" "
NET ANNUAL COST =	**$3,792**	" "
(3) Levelized Net Cost per average annual kWh produced =	**$0.033**	per kWh
(4) Comparative Levelized Cost of Self-Generation per average annual kWh produced =	**$0.129**	per kWh
(5) Compared to projected levelized utility charge:	**$0.161**	per kWh
Compared to likely PPA price /kWh:	**$0.148**	per kWh

In this scenario, an NPO without benefit of the ITC, but with the benefit of $50 SRECs over the loan term, a lower installation cost per Watt, and $0.12 current cost of a kWh, this project makes marginal economic sense for any owner to pursue. The levelized cost of a solar kWh is $.033 less than the utility rate and the cash flow's internal rate of return is a positive 2.19%. (The net present value of the project still shows a negative $75,000 because an assumed 5% discount rate is applied to the 20 years of future savings.)

In this scenario, the levelized cost differential is greater than a likely PPA offer.

3. "Best" Case:

Current Cost /kWh	$0.17	Escalation Rate	3%
Financing Rate/Discount Rate	4.5%	Loan Term (years)	20
System Install Cost /Watt	$3.00	ITC Eligible?	NO
SREC Value	$150.00		

20 Year NPV of Cash Flow	**$205,696**
TOTAL INVESTMENT (amount "financed")	**$300,000**
Savings-to-investment Ratio	**1.686**
20 Year IRR of Cash Flow	**11.18%**

(1) Annual Levelized Cost:	at: 4.50% Discount Rate				
Total system cost less any State or utility incentives, over 20 years) =				$15,000	per year
Inverter & other replacements, levelized =				$390	" "
Other maintenance cost (labor, materials) =				$1,901	" "
		TOTAL ANNUAL COST =		**$17,292**	" "
(2) LESS Revenues & offsets:					
Electric energy savings, net of degradation, levelized:				$16,327	" "
SREC sales: expected production =		2,289	MWh	114	" "
X projected SREC prices, levelized =		$98	per MWh	$11,248	" "

Demand charge reduction, average per year =				" "
ITC assuming average annual UBI of at least:	$300,001	per Year	$0	" "
Other revenues and offsets = **			$0	
TOTAL ANNUAL REVENUES =			**$27,576**	" "
NET ANNUAL COST =			**($10,284)**	" "
(3) Levelized Net Cost per average annual kWh produced =			**($0.090)**	per kWh
(4) Comparative Levelized Cost of Self-Generation per average annual kWh produced =			**$0.053**	per kWh
(5) Compared to projected levelized utility charge:			**$0.228**	per kWh
Compared to likely PPA price /kWh:			**$0.215**	per kWh

In this scenario, an NPO without benefit of the ITC, but with the benefit of $150 SRECs over the loan term, an even lower installation cost per Watt, and $0.17 current cost of a kWh, this project makes obvious economic sense for any owner to pursue. The levelized cost of a solar kWh is $.17 less than the utility rate and the IRR is a positive 11.18%. (Thus, the net present value of the project's cash flow is over $200,000, figured at a 4.5% discount rate.

In this scenario, the levelized cost differential is much greater than a likely PPA offer.)

This Best-Case scenario, even at 6% interest and $50 SREC value, yields the following, still beating the utility rate by almost $0.12/kWh:

20 Year NPV of Cash Flow	**$11,241**
TOTAL INVESTMENT (amount "financed")	**$300,000**
Savings-to-investment Ratio	**1.037**
20 Year IRR of Cash Flow	**6.43%**

4. Mid-Range Case with a Special Purpose Corporation (SPC):

An NPO could create a SPC to own the asset of the solar installation. Stocks are sold by the SPC to willing members of the organization who get all the tax advantages, and a steady annuity. An administrator is selected to create the company, structure the agreement, collect money from the nonprofit and distribute it to the stockholders and return tax documentation. This administrator can be an accountant or attorney.[61]

Creating a SPC to take advantage of the ITC has the following effect on the mid-range case economics presented above:

20 Year NPV of Cash Flow	**$114,638**

[61]See "New financing methods could make solar more viable for nonprofits," Solar Power World, March 21, 2016. https://www.solarpowerworldonline.com/2016/03/new-financing-methods-make-solar-possible-nonprofits/; also see further discussion in Section 8, below.

TOTAL INVESTMENT (amount "financed")	**$227,640**
Savings-to-investment Ratio	**1.504**
20 Year IRR of Cash Flow	**5.78%**

(1) Annual Levelized Cost:	at: 5.00% Discount Rate				
Total system cost less any State or utility incentives, over 20 years) =			$11,382	per year	
Inverter & other replacements, levelized =			$366	"	"
Other maintenance cost (labor, materials) =			$1,761	"	"
	TOTAL ANNUAL COST =		**$13,509**	"	"
(2) LESS Revenues & offsets:					
Electric energy savings, net of degradation, levelized:			$11,000	"	"
SREC sales: expected production =	2,289	MWh	114	"	"
X projected SREC prices, levelized =	$31	per MWh	$3,595	"	"
Demand charge reduction, average per year =				"	"
ITC assuming average annual UBI of at least:	$325,201	per Year	$4,646	"	"
Other revenues and offsets = **			$0		
TOTAL ANNUAL REVENUES =			**$19,240**	"	"
NET ANNUAL COST =			**($5,731)**	"	"
(3) Levelized Net Cost per average annual kWh produced =			**($0.050)**	per kWh	
(4) Comparative Levelized Cost of Self-Generation per average annual kWh produced =			**$0.046**	per kWh	
(5) Compared to projected levelized utility charge:			**$0.161**	per kWh	
Compared to likely PPA price /kWh :			**$0.148**	per kWh	

The levelized cost of a solar kWh is $.125 less than the utility rate (a differential higher than current cost) and the IRR is a positive 5.78%, with a positive NPV. The cost of setting up and administering the SPC is not included in this analysis.

Any of the above scenarios would be augmented by the inclusion of grid services revenues that may be available with the inclusion of battery storage, which can also be analyzed in the LCOE model.

c. Model Conclusions and Lessons

Attractive project economics are primarily dependent on the presence of the following:

- Ability to qualify for 4% to 6% PACE financing (loan to value ratio, mortgagee approval, meeting other program criteria, etc.), or other low-interest financing in that range.
- Availability of flat roof space with minimal shading, requiring no upgrade to accommodate the desired kWh output and at least 25 kW of PV
- Current utility cost of a kWh in the 12-cent or higher range.

- SRECs with an average value of $50 or more over a significant portion of the loan term.
- Some way of taking advantage of the ITC, either by establishing an SPC, or by entering a third-party PPA/SGA.

Using PPAs/SGAs under PACE to capture tax benefits

PPAs/SGAs provide a means to avoid the upfront capital costs of installing a solar PV system as well as simplifying the process for the host customer. In addition, at least in theory, some portion of the value of the federal ITC is passed on to the system host/NPO by the third-party developer. Analysis of the specifics of each project and PPA price offer is necessary to value the true tax-benefit economic advantage.

Future markets as subsidies sunset

The success of future markets will rely on reduced installation cost per watt, less expensive installation methods (bracketing), plug and play systems reducing labor time and cost, streamlining of permitting and utility approvals, energy storage to retain more PV production behind the meter, grid services revenue, demand reduction, adaptability to tariff changes to preserve revenue stream, community solar revenue due to oversize systems compared to host load (if possible), and selling/assigning extra production to either the third party or an off-site customer, etc., among other developments.

Changing tax appetites and new ways of capitalizing

The federal Investment Tax Credit (ITC) is claimed against the tax liability of residential and commercial investors in solar energy. The residential and commercial ITC are both equal to 30 percent of the investment in eligible PV systems that commence construction through 2019. The credit then is reduced to 26 percent in 2020, and to 22 percent in 2021. After 2021, the commercial and utility credit will be reduced permanently to 10 percent, while the residential credit is eliminated. As of the writing of this guide, there are at least 2 years remaining to begin construction and take the full 30 percent credit. It is assumed that over time, as the price of solar panels and associated equipment drops due to technical improvements and sales volume, that the ITC will no longer be necessary to drive system economics.

As the ITC expires, other revenue/savings streams could take its place over time. The EPA's Clean Power Plan would have financially incentivized renewable and efficiency energy investments, especially in low-income communities where many nonprofits operate. In its place, many states are striving to implement their own version of carbon-reduction based financial incentives. If these carbon taxes are levied against all consumers' billed energy consumption, additional economic benefits will accrue to each kWh of solar PV production (as well as reductions attributable to energy efficiency gains.)

PV system grid services revenue may be available from the provision of PV distributed energy resources (including storage and load control) and grid regulation services, such as demand response, capacity markets, frequency regulation, and Volt/VAR optimization, for regional transmission operators (RTOs) and local utilities. Aggregators who, for a fee, will handle the contractual and technical interface with the utility/RTO often package such services. The location and size of the PV system, the PV tariff structure, the presence and size of battery storage and state legislation/regulations all play a role in determining the potential value of these revenue streams. The PPA provider may include this

aggregation service in its contract but may not take all the risk that these revenues will be available for the full term of the agreement, as the tariff structure, state regulations and the distribution system's need for such services can all fluctuate over time. When available, these revenues can have a substantial impact on the system ownership economics and/or the PPA per kWh price offered.

Revenue from provision of these services may be considered taxable income for an NPO-owned system, but it is also likely that ITC credits can be spread out over a total of 21 years for tax purposes. Of course, the full cost of the installation would have to be financed in year one and repaid with interest over the loan term as opposed to being immediately netted out of the cost up-front. In addition, federal legislation has been proposed that would make the full cost of the battery storage equipment eligible for the ITC as well regardless of the source of electricity used to annually charge the batteries. (Currently at least 75% of the annual charging energy must be drawn from the PV panels and not the electricity grid.) The developer/PPA provider would be faced with the same charging criterion.

In the special case of nonprofit-owned HUD-financed properties, an understanding of HUD regulations and "RAD" conversions are important.

d. The future of SRECs and other revenue sources

Although well established in many states, the volatility of SREC markets has made them an unreliable tool for developers, for PACE administrators, and for NPOs considering their own investment in solar installations. Regulators and legislators in several states, as well as some utilities, have proposed the replacement of these tradable commodities with a more rational renewable-energy purchasing program into which public policy considerations can be built with clarity and predictability. A recent, comprehensive example is found in the Solar Massachusetts Renewable Target (SMART) program.

SMART will replace the existing SREC program in Massachusetts and may be a model for other states. A significant advantage of the new SMART program is long-term certainty of the costs and benefits, due to stable incentives. In contrast, the SREC market relies on market forces that are always fluctuating, making it very difficult to predict the SREC value of a solar installation over a long-term period. The SMART program may also include a new on-bill crediting mechanism, similar but more expansive than the current net metering option. Such a feature would enable customers to benefit from solar installations sited remotely, i.e. away from their property.

Nonprofit managers are advised to track the progress of initiatives like SMART, as well as the declining ITC, the markets for grid services, and the emergence of carbon credits or taxes, as they attempt to forecast supplements to direct solar savings.