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SOLAR ENERGY & COMMERCIAL REAL ESTATE (CRE)

Insights for Your Investment Property



SolarKal
The Premier Solar Broker

Solar energy offers commercial real estate (CRE) property owners and managers an exceptional opportunity to boost cash flow by reducing utility expenditures, increasing rents, and increasing common areas maintenance (CAM) reimbursements. Installing a solar photovoltaic (PV) array also fosters closer connections with tenants and their client bases, facilitates lease extensions, and enables a sustainable footprint.

Evaluating the benefits, financing structures and operations of a solar facility can be a complicated process. This document informs the CRE industry about the opportunities of solar PV and helps them sort through the array of options and structures available.

Background

Installed solar costs have come down roughly 10% per year since 2001 for non-residential systems (including commercial, industrial, municipal and other non-profit property owners). The solar industry also refers to this as the Commercial & Industrial, or C&I, sector. As seen in Figure 1, costs for relatively small non-residential systems – up to 500 kilowatts (kW) in size – have declined from over \$10/watt in 2003, and are now often available for less than \$2.00/watt.^{1,2} A 500 kW system is large enough to provide most of the electricity for a supermarket.

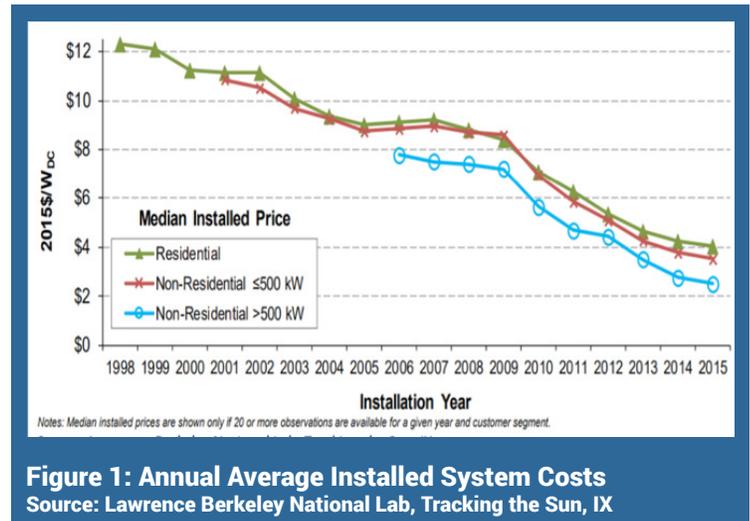


Figure 1: Annual Average Installed System Costs
Source: Lawrence Berkeley National Lab, Tracking the Sun, IX

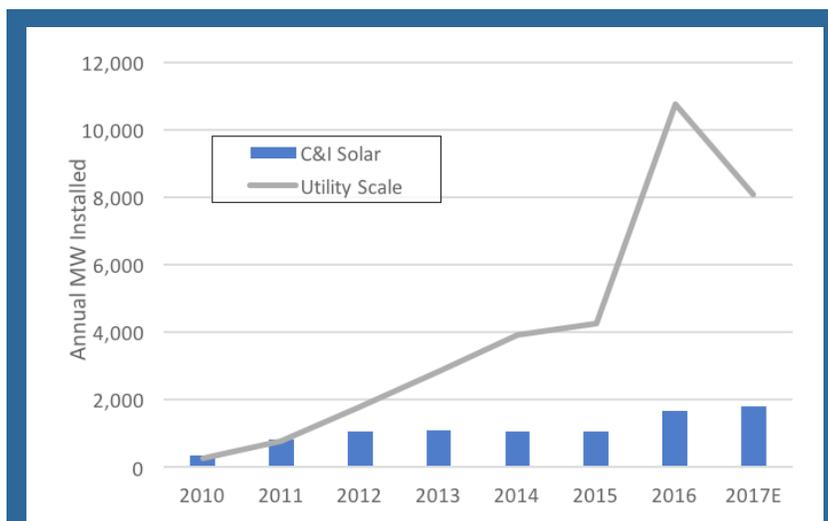


Figure 2: C&I vs. Utility-Scale Solar Installations
Source: SEIA, Expanding Solar Deployment Opportunities in the C&I Sector

As the price of solar has fallen, solar installations serving the C&I sector have grown to about 1,800 Megawatts (MW) per year – significant but well below the growth of utility-scale installations (see Figure 2) and the potential the CRE sector represents.³

To date, C&I solar has been predominantly deployed at or procured by Fortune 500 headquarters and retail outlets. However, large real estate developers have also been actively installing solar, including names such as Prologis, General Growth Properties, and Hartz Mountain.⁴

¹ Tracking the Sun IX, Lawrence Berkeley National Laboratory (LBNL), <https://emp.lbl.gov/publications/tracking-sun-ix-installed-price>

² SEIA and GTM Research, “U.S. Solar Market Insight Q4 2017”, available at <https://www.seia.org/research-resources/solar-market-insight-report-2017-q4>

³ SEIA previously estimated only 5.4 GW out of 1,400 GW of potential solar capacity to meet the C&I sector electricity requirements have been built as of 2015. See Expanding Solar Deployment Opportunities in the C&I Sector: An Introduction to Property Assessed Clean Energy, <https://www.seia.org/research-resources/expanding-solar-deployment-opportunities-ci-sector>

⁴ SEIA “Solar Means Business 2016” <https://www.seia.org/research-resources/solar-means-business-2016>

The CRE sector's diversity in types of ownership structures, building styles, and tenant arrangements and durations can make solar installations relatively complex multi-party transactions. It can also be difficult to quantify and allocate the benefits of solar, between tenants and landlords.

However, the solar and financing industries are working hard to standardize project structures that improve building owner's ability to demonstrate, capture and share the benefits of solar, and quantify and communicate these benefits to their tenants.

SEIA's Commercial & Industrial Working Group has developed [industry-wide model contracts](#) that balance risks and benefits between the project developer and the property owner. This pamphlet is designed to offer CRE entities and tenants a new perspective on the solar value proposition.

Property Owners Should Know the Following 9 Facts About Solar Energy

1. Solar Can Improve Property Net Operating Income (NOI) and Net Cash Flow (NCF)

Building improvements such as solar can improve property performance through two avenues: (1) raise top-line revenues, and (2) lower operating expenses.

Perhaps the most direct benefit of solar is its ability to immediately reduce operating expenses by lowering the building's annual energy bill. Energy accounts for nearly 20% of average office building expenses. By switching to solar, the building can [lower their electricity bill](#) by 20-40%, improving their margins and bottom line.

C&I Solar projects produce electricity at roughly \$0.06 - \$0.15/kWh based on a 20-year project life, location, and current federal and state incentives.⁵ This compares favorably to commercial retail electricity rates, which range from \$0.08-0.16/kWh nationally.⁶ In states where retail electricity prices are high and state incentives are robust (CA, MA, NJ and NY, to name a few), solar can offer especially strong economics to building owners.

Solar can also boost top-line revenues for landlords. LEED-certified buildings with solar and efficiency attributes produce higher rents and/or lower vacancy, according to the [Department of Energy](#). Tenants in sustainability-minded markets such as San Francisco, Boston and Denver want to represent their employees, brand, and customers in a socially-conscious manner and frequently seek out these attributes. Accordingly, properties with solar can command higher prices.

2. Solar Offers a Mechanism to Extend Lease Terms and Increase NPV

According to Billy Grayson, Executive Director of Urban Land Institute, an affiliation of 40,000 CRE owners, investors and other stakeholders, solar can provide tenants with a compelling reason to extend the terms of their lease. This in turn provides an opportunity for CRE owners to increase the NPV of their buildings.

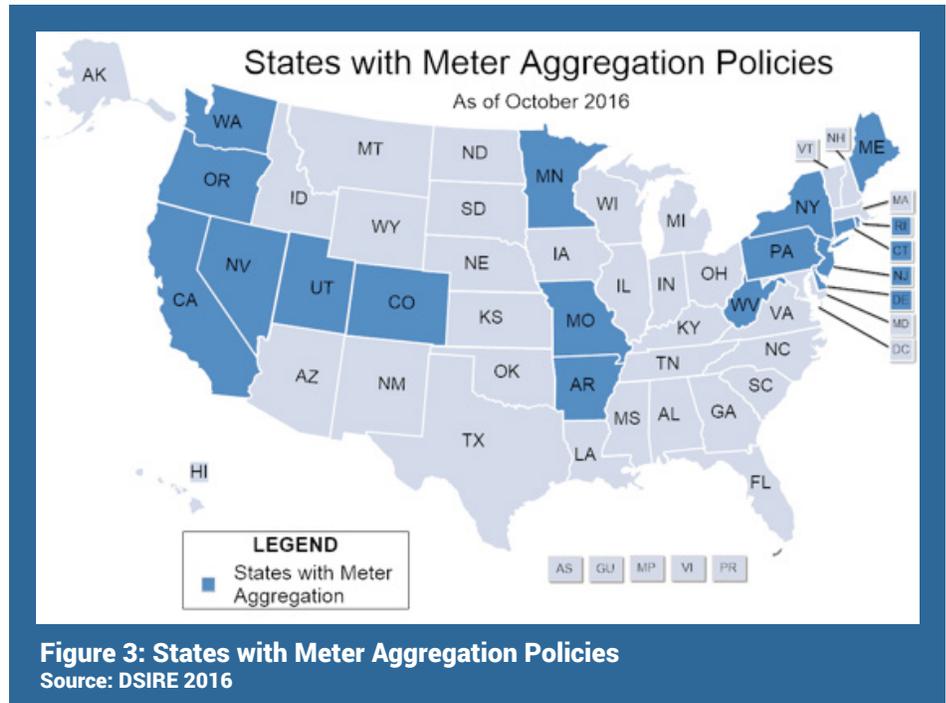
⁵ Based on [Lazard's 2017 Levelized Cost of Energy Analysis](#) and calculations using CREST model developed by National Renewable Energy Lab. Available at: <https://financere.nrel.gov/finance/content/crest-cost-energy-models>

⁶ EIA Average Price of Electricity to Ultimate Customers by End-Use Sector, https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a

Grayson was formerly Director of Sustainability at Liberty Property Trust, and noted “[s]olar gave us a reason to talk to a tenant who might be 4 years in to a 10-year lease. Because of PPA terms, we could reach out to a tenant with an offer to lower their energy costs by 30-50% and lock in a rate for the remainder of their lease that would never go up by more than 1% a year. all they would have to do is extend their lease from 6 to 10 years. If the tenant agreed and got a lease extension, we could book that future revenue, increasing the NPV of our building.”

3. Solar can serve common areas and individual tenants

Historically, solar on multi-tenant properties could only serve common areas. However, due to availability of meter aggregation or “virtual net metering” – a policy that allows customers to benefit from solar systems, even if they are not directly integrated to that system – and recent improvements in software capability, individually metered customers can benefit from commercial solar systems. As solar energy can be a platform for cost reduction, property owners can allocate this benefit to its tenants in certain jurisdictions (where that’s allowed by law or regulatory oversight).



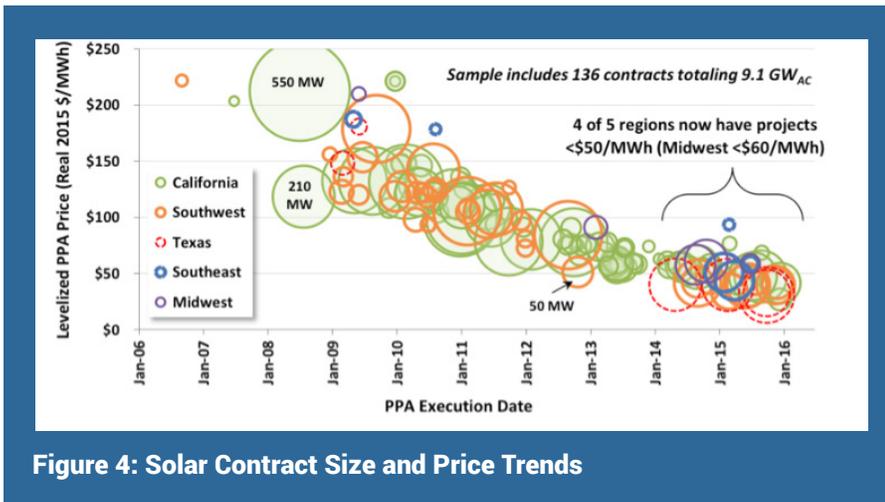
4. Hundreds of Companies and 140 U.S. Cities have Pledged Major Greenhouse Gas (GHG) Reductions (so far)

As of April 2017, more than half of the Fortune 500 have pledged to shrink their carbon and other GHG emissions, according to a [recent report](#). 96 global companies have set goals of [100% emission reduction](#), sometimes accounting for their customer’s emissions. Separately, city mayors and state governors are [pledging](#) to support the Paris Climate Accord and dramatically lower their carbon footprints. To accomplish all this, solar will be a primary strategy. Companies, municipalities, non-profits and others will be seeking real estate that is energy-efficient, self-sufficient, and powered by clean energy.

5. Solar is now cost competitive with utility power on an unsubsidized basis

Even if a building owner can’t install solar on its roof, it may still be able to benefit from larger-scale solar installations, as solar is now competitive at the wholesale level. The cost of solar energy has come down dramatically as implementation has soared. Tucson Electric Power made headlines in May 2017 when it procured solar power for \$0.03/kWh, a record low for the U.S.⁷ The trend in PPA prices is depicted in Figure 4.

⁷ See “TEP to buy solar power at under 3 cents per kWh”, Christian Roselund, PV Magazine, <https://pv-magazine-usa.com/2017/05/23/tep-to-buy-solar-power-at-under-3-cents-per-watt/>



Historically, this has only been true for large projects that provide an economy of scale in design, construction, and operation. However, recently this trend is starting to filter down to smaller projects and become available to the CRE industry through procurement participation in a larger project via a community solar project, municipal purchasing (sometimes referred to as community choice aggregation), or other off-site procurement.

6. Solar+Storage is increasingly cost-effective and can offset demand charges

Batteries and other forms of energy storage are quickly improving in capability and decreasing in costs, changing the economics of solar+storage particularly for states that are implementing supporting policies. Hawaii and [California](#) have implemented direct incentive programs that strongly benefit the economics of storage implementation. Behind them are a myriad of states: Oregon, New York, Massachusetts, and Maryland have developed target storage implementation goals so far.

7. Federal and State Incentives

Commercial Solar is eligible for a variety of federal and state incentives that lower the overall cost of going solar. The main federal incentive is the Investment Tax Credit (ITC), a credit for 30% of the total system cost. The owner is also allowed to depreciate the system under the 5-year Modified Accelerated Cost Recovery System (MACRS), subject to certain conditions. Many states also have different incentives, including rebates, renewable energy credits, and financing programs. When added up, these incentives can be used to cover 45%-80% of the overall cost. Finally, even if an owner can't take advantage of these tax benefits directly, third parties can often monetize them in different ways and still reap the benefits. See SEIA's [Guide to Federal Incentives for Solar Energy](#) for more details on tax treatment for different financing structures.

8. CRE owners can structure the solar energy costs and benefits in a variety of ways

Taking advantage of solar benefits can come through a range of structuring mechanisms between a CRE owner and the property tenants:

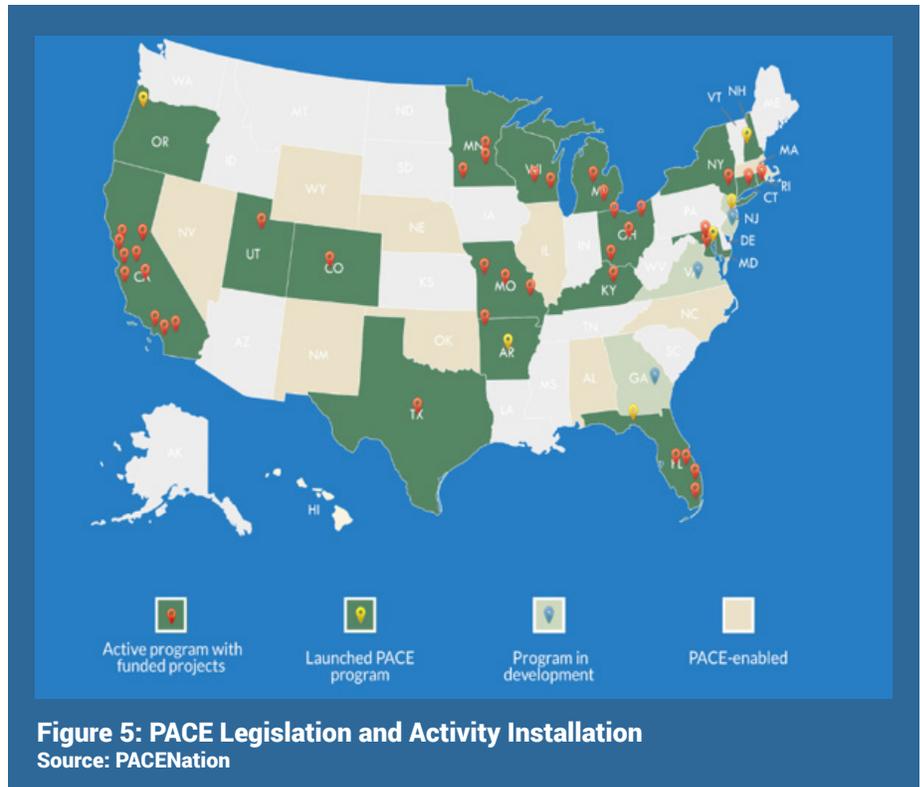
1. CRE owner takes all the income and sells power back to the grid. The tenant is not involved. This mechanism is employed by warehouse-leader Prologis.
2. CRE owner signs all benefit (and all responsibility) to tenant, and requires solar lease or PPA to be co-terminus with current lease.
3. CRE owner splits the costs and benefits with tenant. This structure can provide the tenant a better rate on electricity and CRE owner gets a little rental income. The CRE owner keeps liability/responsibility for solar, possibly beyond end of current tenant lease.

9. Solar can be financed through a variety of mechanisms, many with immediate cash flow benefits

There are many financing options available for solar, many of which are flexible and can be matched to the building owner's specific situation. Solar generally requires a long-term contract or similar commitment and a mechanism to take advantage of key tax incentives – the investment tax credit (ITC) and accelerated depreciation benefits. The capital to monetize these tax benefits is often referred to as tax equity. The availability and benefits of various financing platforms often depend on the answers to a variety of foundational questions.

Solar financing for commercial real estate generally falls into one of 4 buckets, but with a range of variability that may be negotiated:

1. Power Purchase Agreements – the solar financier raises the necessary Tax Equity and other capital, develops and maintains the project, and charges a pre-set fee per unit of energy (\$/kWh). Historically, this option has been limited to highly rated-credit entities based on a 20-year contract. SEIA recently refined the [standard industry PPA](#), greatly simplifying the transactional process.
2. Operating Lease – Operating Lease structures allow for quick ownership of the solar asset and can provide the Tax Equity necessary to monetize the tax benefits.



3. Self-finance – Companies that have available financing, tax appetite, and the right economic drivers can self-finance a system, sometimes backed with bank debt supported by the system assets.
4. Property Assessed Clean Energy (PACE) - Commercial PACE, or C-PACE, is available in 19 states + DC currently, with more state programs in development. PACE financing is tied to the property, not the end-user or property owner. Therefore, it's not reliant on the owner's creditworthiness. Some other specific attributes include:
 - a. **Solves Split Incentive:** PACE can mitigate the complex split incentive issue common in commercial real estate, particularly in so-called 'triple net leases' where tenants pay property taxes, energy bills, improvements, and other costs.
 - b. **Runs with the Land:** The PACE lien stays with the property, whereby payments generally transfer to the new owner without issue.

- c. **Generates positive cash flow:** Because of its secure nature as a tax assessment, the tenure of PACE financing is typically 20 years and can be as long as 25 years, matching the useful life of solar assets, and making it possible to generate positive cash flow.
- d. **Frees up Cash:** PACE frees up cash so a company does not have to decide between installing solar or investing in projects that are closer to their core business.
- e. PACE by itself does not monetize the tax benefits, can be cumbersome to initially deploy in new geographies, and requires specific administrative fees relevant to the structure.

These numerous benefits to solar will vary depending on the state you're in, and the size and type of building you have. Calculating how much solar energy a roof can produce, the value of the energy, and the impact on total economics benefits depends on many variables. Some examples include total roof size, obstructions on the roof, geographical location, energy load, and local building codes. Generally, a flat roof commercial building can utilize 50%-90% of its total rooftop, equating to an approximate estimate of 10 kWh per square foot of rooftop. Depending on building usage this can offset 20%-100% of a building's energy usage. In the table below, you can find rough estimates per building function, but it is recommended to use a solar professional to conduct an analysis as the actual numbers can vary scientifically based on the variables above.

	Energy Usage Per Sq. Ft. Per Year ⁸	Solar Availability (Produced per Sq. Ft.) Per Year ⁹	% Energy Offset
Supermarket ¹⁰	47.5 kWh	10 kWh	21%
Retail	17.1 kWh		58%
Health Care	24.1 kWh		42%
Warehouse & Storage	5.2 kWh		100%
Office	14.5 kWh		68%

Standard Contracts and Best Installation Practices

SEIA has worked with dozens of law firms, development entities, financiers, and real estate associations and owners to develop a suite of model documents to facilitate low-cost solar transactions. The C&I PPA document was designed specifically to enable transferability of the property and provide reasonable cost and risk allocation among the parties involved.

SEIA is currently developing other contract forms – all available for free [here](#).

SEIA also offers best practices in system installation in order to reduce uncertainty in build quality and therefore long-term production capability. Those best practices are available [here](#).

⁸ <https://www.eia.gov/consumption/commercial/data/2012/c&e/cfm/c21.php>

⁹ <http://www.lightsonsolar.com/solar-basics-kw-and-kwh/>

¹⁰ <https://www.eia.gov/consumption/commercial/data/2012/c&e/cfm/c21.php>

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Celebrating its 43rd anniversary in 2017, the Solar Energy Industries Association is the national trade association of the U.S. solar energy industry, which now employs more than 260,000 Americans. Through advocacy and education, SEIA® is building a strong solar industry to power America. SEIA works with its 1,000 member companies to build jobs and diversity, champion the use of cost-competitive solar in America, remove market barriers and educate the public on the benefits of solar energy.

