



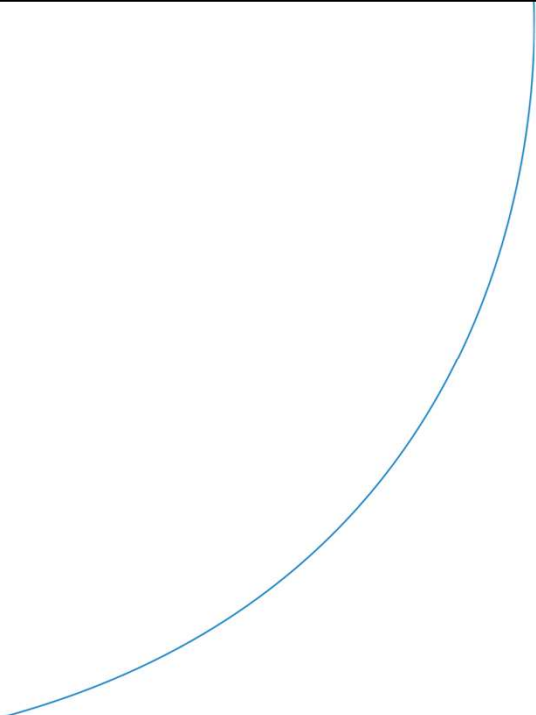
 Contra Costa County
Public Works
Department

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Financing Solar-Plus-Storage
: A Winning Combination for Getting to Zero

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Solar Financing



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Solar Financing Options – Public Entities



Cash Purchase

No recurring payments

- One-time cost
- Hardware owned by you
- Cost-free energy for system lifetime



Power Purchase Agreement (PPA)

No upfront investment

- No capital cost
- Hardware owned by a third party
- Payments for kilowatt-hour produced
- Energy rate locked for 20 – 30 years
- Financing cost subsidized by tax incentives



Lease/Loan

Fixed lease payment

- Zero or low up-front cost
- Hardware owned by you
- Lease payment for hardware and energy
- Lease/Loan duration, up to 15 – 20 years

Public Financing

For public entities with unique benefits

- Special incentives
- Tax-exempt leases
- Government subsidized loans

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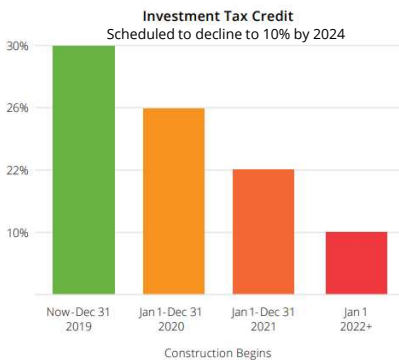
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The Solar ITC 101 The Federal Business Energy Investment Tax Credit

Developed to incentivize development of renewable energy sources

The credit, which is applied to a taxpayer's Federal income tax liability, is equal to a percentage of the eligible equipment cost, currently 30% for 2019 projects



Cost of Renewable Energy System	Max ITC Credit Through 2019	Reduction in Tax Bill
\$3,000,000	30%	\$900,000

A dollar-for-dollar tax reduction in the federal income taxes that an organization would otherwise owe. The ITC can not exceed the amount an organization owes in Federal Taxes .

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How tax-exempt organizations can capture ITC Savings

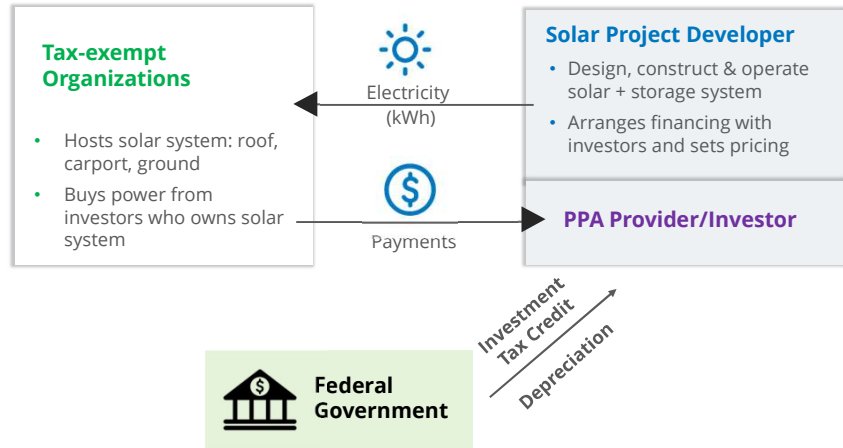


ITC is eligible for business paying federal tax
 How can tax-exempt organizations claim the highest ITC benefits before it expires?



YES! You can!

Power Purchase Agreements (PPAs) enable tax exempt organizations to capture savings

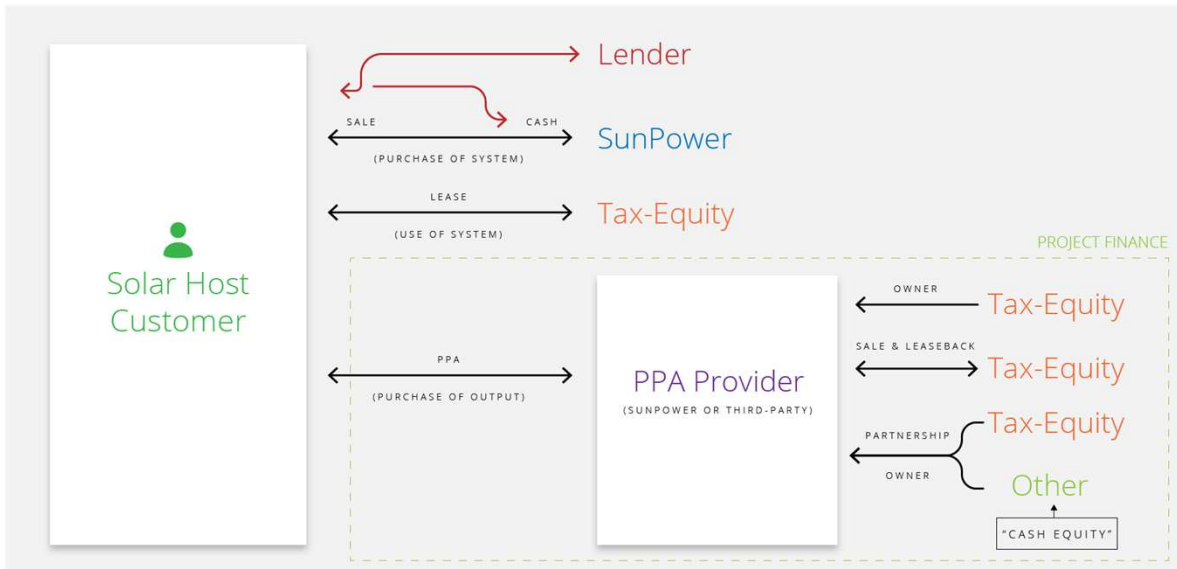


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Methods of Solar Acquisition

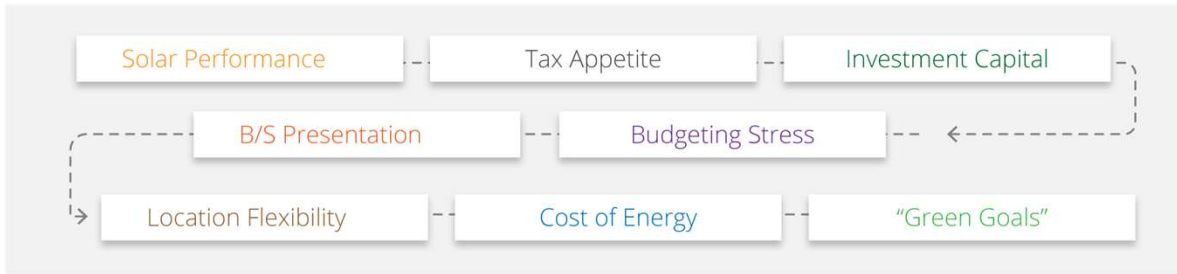


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Solar Energy Acquisitions Considerations



SOLAR ACQUISITION OPTIONS

REQUIREMENTS/CONSEQUENCES

I. Ownership: "Green", at potentially Lowest Cost	Performance Risk, Tax Appetite, Investment Capital, on B/S
II. Direct Lease: Low Cost without Tax Appetite	Performance Risk, on B/S
III. PPA: Avoids Performance Risk, Capital Lite, Off B/S	More Expensive

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Solar + Storage



Integration of Storage with Solar is becoming standard

- Pairing Storage with Solar can increase savings, "hardens" the energy supply and makes the system more adaptable to changing energy market conditions
 - 35% of SunPower pipeline projects include Storage with an upward trend
- Primary Storage Value Drivers:
 - Demand Charge Management (peak shaving)
 - Energy Shifting (energy arbitrage)
 - Self consumption (reducing solar exports)
 - Local incentives for Storage (SGIP, SMART, NYSUN)
- Storage is eligible for ITC if "integrated" with Solar – to decrease cost of Solar + Storage
- Contracting methods for Solar + Storage financing are evolving to account for:
 - Tax requirements
 - Operation and performance

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[Case Study]

Contra Costa County Solar-Plus-Storage Project



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Contra Costa County Solar-Plus-Storage Project



Overview

System information

Solar 3.7MW + **Storage 1.5MW/3MWh**

Offset approximately 68% electricity use
Save \$16.5 million in energy costs over 25 years

Total Sites: 10
1 in Richmond, 7 in Martinez, 2 in Antioch



Estimated first-year energy production:
6,162,643 kWh

Solar energy generated is enough to:

Power **760** homes
with electricity for
one year

and is expected to offset greenhouse gas emissions equal to:

10.6 million
passenger vehicle
driven miles

OR

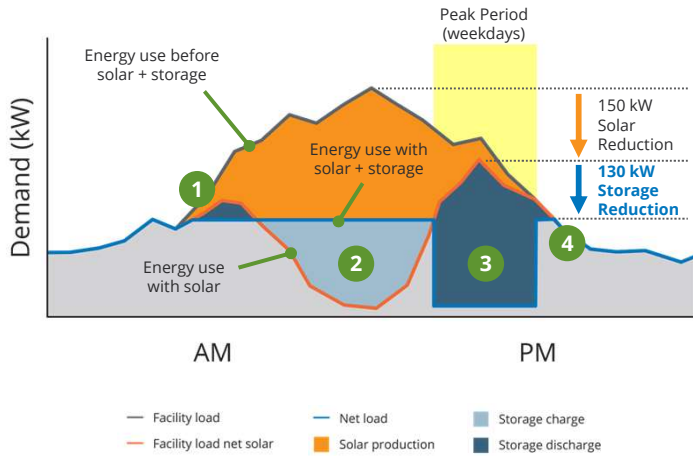
Carbon absorbed by
5,129 acres of
U.S. forests annually

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HOW IT WORKS: Demand Charge Management + Energy Arbitrage



- 1 Storage discharges to hold down demand before solar ramps up
- 2 System charges mid day when energy is cheaper (\$0.10/kWh)
- 3 Discharges to virtually eliminate energy usage during the Peak Period (\$0.30/kWh)
- 4 Storage continues to discharge after the peak period to keep demand down into the evening

\$33,000 Annual Energy Savings

- 638 kWh shifted (1,000 kWh x 85% RTE x 75% discharge)
- \$0.20 / kWh price difference
- 260 weekdays / year with Peak Period

+ \$67,000 Additional Demand Savings

- All Hours Demand Charge Rate: \$20/kWh
- 380 kW solar + storage reduction x \$20 = \$5,600 / month

\$100,000 Total Annual Savings

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Contra Costa County Solar-Plus-Storage Project

Primary Storage Value Drivers

Main Drivers for integrating storage with solar

- Demand Charge Management (Peak Shaving)
- Energy Shifting (Energy Arbitrage)

Local incentives for Storage



- Self Generation Incentive Program (SGIP) Step 2 @ \$290/kWh of installed storage capacity
- Option S – a new storage friendly rate that increases customer savings for PG&E customers

30% Solar Investment Tax Credit



- Safe Harboring PV modules for 30% ITC for both solar and storage

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Contra Costa County Solar-Plus-Storage Project

Economics



	Business as Usual	Solar Only	Solar + Storage
LOCATION Contra Costa County, CA	Utility Rate Tariff E-19 Secondary	E-19S Option R	E-19S Option S
UTILITY INFO PG&E E-19 Secondary	Solar Installation Size 0 kW	1215 kW(dc)	1215 kW(dc)
	Battery Size 0 kW	0 kW	1,500 kW / 3,000kWh
	Annual Demand Charges \$415,153	\$220,595	\$137,443
	Annual Demand Charge Savings \$0	\$194,557	\$277,710
	Annual Energy Charges \$584,431	\$462,260	\$386,567
	Annual Energy Charge Savings \$0	\$122,171	\$197,865
	Total Bill Savings \$0	\$316,728	\$475,574

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Thank You



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