How-To Guide
FOR SCHOOLS GOING SOLAR

INTRODUCTION TO SOLAR FINANCING

HIGH SCHOOL SOLAR EDUCATION PROGRAM, PHILADELPHIA, PA | CREDIT: SOLAR STATES

Solar Financing Options

There are a wide variety of ways that schools can finance a solar project, and this resource will introduce some of the more common ones.

When reviewing different financing options, the school or district should compare the options available for both third-party ownership and direct ownership.

BENEFITS OF THIRD-PARTY OWNERSHIP

- No upfront capital costs
- No maintenance costs
- Pay less than utility retail rate
- Immediate and long-term cost savings

BENEFITS OF DIRECT OWNERSHIP

- Potential for greater energy savings than third-party ownership
- Opportunity to add solar into construction projects and building upgrades

Third-Party Ownership

More than three-quarters of the cumulative solar capacity installed on schools nationwide was funded through a form of third-party ownership. The advantage of third-party ownership is that the third party finances, builds, owns and maintains the system, so there is little or no upfront capital investment. These arrangements are typically structured as power purchase agreements (PPAs). In a PPA, the school agrees to pay the solar company an agreed-upon rate for the solar power generated by the system that is typically below the market rate. The rate may or may not escalate over the typical 15-to-25-year life of a PPA. The agreement can include options for the school to buy the panels at certain points during the contract term or after it ends.

Another advantage of a PPA is that the solar developer can, as owner of the system, benefit from federal tax incentives such as the solar Investment Tax Credit. Because of their tax-exempt status, the schools do not receive these benefits directly. However, the third-party owner receives the tax benefit, presumably passing on some of the savings to the school by offering a favorable rate in a competitive bid.

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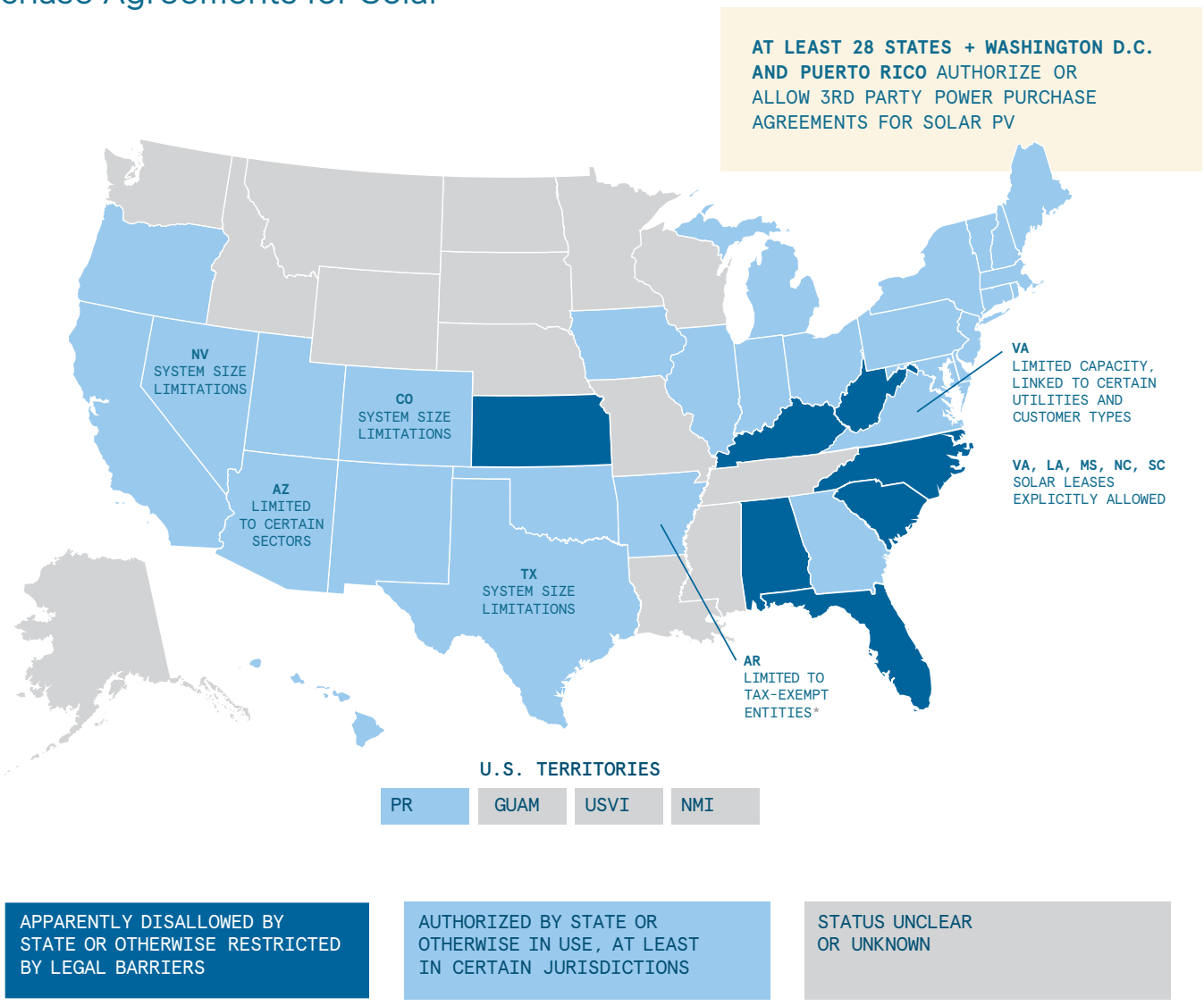
However, third-party ownership is currently only allowed in 28 U.S. states and DC.[4] The states that allow third-party ownership account for 91% of the installed solar capacity on schools. The remaining 22 states only provide 9% of the solar installed by schools. To determine if your state allows third-party ownership, go to the NC Clean Energy Technology Center's DSIRE database at dsireusa.org/resources/detailed-summary-maps to find a map of states with third-party solar power purchase agreement policies.

State Policies on Third-Party Power Purchase Agreements for Solar



CREDIT: DSIRE, JUNE 2019

Only 7% of installed solar capacity at schools was funded by a direct purchase through cash, loans, bonds or other mechanisms.

Direct Ownership

In direct ownership, the school is directly responsible for the financing, development and operations of the system. Unlike with a PPA, the school will see direct reductions on their electricity bill based on what the solar energy system produces. Direct ownership often generates the highest return on investment, especially if the state has favorable public incentives and financing options. With direct ownership, the district will likely secure traditional financing through mechanisms such as bonds and capital budgets. Schools will typically need to first determine if the solar system will be part of a larger school expansion or building improvement capital campaign. In those cases, the larger components of the funding package will likely drive the financing approach.

Traditional financing may require the district to put together a package of grants, loans, rebates, and solar renewable energy certificates (SRECs), and more information is available below on such options. While such funding sources can offer a higher return on investment to the district, creative financing efforts can be time consuming and costly, as the district must negotiate with various funding sources to secure commitment and bear the cost of financial advisors and issuance.

The financing efficiency of the various mechanisms described here changes over time as tax benefits and other incentives, project costs, and market changes come into play. Some of the preferred school financing vehicles for direct ownership include general obligation bonds, revenue bonds, tax-exempt lease purchases and energy services performance contracts (ESPCs).

GENERAL OBLIGATION BONDS

A general obligation (GO) bond is one type of municipal bond that is backed by the general revenue and credit of the issuing government entity. They are repaid from general revenue, such as fees and tax collections. Local jurisdictions issue GO bonds typically to fund projects, such as government buildings, roads and schools that don't have a revenue source. Because of the high transaction costs for bond financing, solar development is typically combined with other capital improvements. Since GO bonds encumber the taxing authority's debt capacity, they often require a public referendum.

SOLAR RIBBON CUTTING - TUSCON USD, AZ | CREDIT: CONSTELLATION

REVENUE BONDS

Revenue bonds are municipal bonds that are paid back from earnings of the facility acquired or constructed with the issued bonds. Examples include projects that generate revenue, such as parking garages, toll roads, utilities and higher education. In this case, the bond proceeds fund the system, and the energy cost savings are used to repay the principal and interest due to bondholders. Since repayment depends on the success of the project or projects funded, investors typically require a higher interest rate than for general obligation bonds. But because they don't typically encumber the government's debt capacity, they usually don't require a public referendum.

TAX-EXEMPT LEASE PURCHASES

Schools are also somewhat unique in their ability to enter into a tax-exempt lease purchase agreement. Also known as a "municipal lease," this financing mechanism allows some local governments or districts to lease solar energy equipment from a solar company at lower payments and longer terms than other leasing options. Lease payments to the solar company are low because, like a municipal bond, the company, as the investor, is not taxed on the interest they receive through repayment.

These agreements are usually not considered long-term debt, with lease payments made from operating rather than capital budgets. Unlike a true lease, title is granted to the school district when the lease is signed.[5] Therefore, neither party can take advantage of federal solar tax incentives through these arrangements. In considering this option, schools should weigh the benefits of low tax-exempt interest payments and a longer lease term against alternatives, such as PPAs, that do allow for tax incentives to be passed on to the solar company.

ENERGY SERVICES PERFORMANCE CONTRACTS

Energy services performance contracts (ESPCs) can provide schools with another cost-effective means of investing in solar. Through these agreements, customers contract with an energy services company (ESCO) to assess the current energy use at one or more buildings and to propose a package of energy conservation measures to reduce consumption. The ESCO provides a customer with a guaranteed level of performance for these energy upgrades and ensures a minimum level of cost savings. A portion of these energy cost savings is used to compensate the ESCO for the energy upgrades, with the remainder retained by the customer.

While ESPCs have typically involved energy efficiency measures with a relatively short payback (such as energy efficient lighting, building envelope improvements, etc.), these contracts can also include upgrades with a slower payback, such as solar PV. In states that allow for third-party ownership, tax-exempt customers, such as public schools, could enter into a PPA with the ESCO for the solar PV system to be included as part of the performance contract. This allows for the customer to invest in solar with little or no upfront cost and for the ESCO to take any available tax credits and pass their value on to the customer.

CREDIT: TUCSON UNIFIED SCHOOL DISTRICT, AZ

VISIT

The U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy website at Energy.gov/eere/slsc/energy-savings-performance-contracting to learn more about ESPCs.[6]

Solar Incentives

DSIRE®

VISIT
NC Clean Energy Technology Center's DSIRE database for a comprehensive list of federal, state and utility incentives.

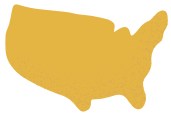
dsireusa.org/resources/detailed-summary-maps

No matter which financing mechanism your schools uses, you should make sure to identify any applicable financial incentives that might support your solar development. However, because of the tax-exempt status of public schools and the local nature of some of these programs, not all options will be available in every case.

For information on specific incentives or programs for which your school may qualify, check with state renewable energy offices and organizations, other solar schools, and local solar professionals.

RICHMOND PUBLIC SCHOOLS SOLARBRATION, VA | CREDIT: NEED & DOMINION ENERGY

Listed below are three different types of solar incentives that may be available:



FEDERAL INCENTIVES

The federal incentives only apply if the school is financing through third-party ownership, such as a PPA. The two primary federal incentives supporting solar are the Investment Tax Credit (ITC) and the Modified Accelerated Cost-Recovery System (MACRS). The ITC currently provides a federal income tax credit equal to 26% of total installed system costs for commercial solar systems, including projects at schools. The ITC is available provided that construction starts by 2020, after which it will decrease to 22% in 2021, and 10% thereafter. Meanwhile, MACRS allows nonresidential solar customers to recover the value of investments in solar equipment through accelerated depreciation deductions on federal taxes.

STATE INCENTIVES AND FINANCING

Many states offer some form of incentives or other financing options for solar. Common incentives and programs include tax credits, deductions or exemptions with as well as grants, loans or rebates. Solar renewable energy credits (SRECs) create opportunities for revenue in states which mandate renewable energy through their renewable portfolio standards (RPS) – requirements for investor owned utilities to derive a certain percentage of their retail electricity sales from renewable sources by a target year. These SRECs represent the environmental or nonenergy attributes of solar electricity, and the district can use them to offset greenhouse gas emissions. If SRECs are available in a state, they can be traded and sold and provide system owners with a significant revenue stream. When sold, the purchaser then receives credit for offsetting the greenhouse gas emissions.[7]

UTILITY INCENTIVES AND FINANCING

Utilities may also offer consumer grants, loans or rebates for solar energy. Some utilities provide performance-based incentives (PBIs) for their solar customers. Rather than being based on the cost of the investment in solar (as is the case with grants, loans or rebates), PBIs are tied to the amount of electricity produced by a solar energy system. This provides an incentive for installers and system owners to focus on proper installation, maintenance, and performance of their systems. For example, some utilities arrange to purchase all the electricity produced by an eligible solar energy system at a rate higher than the retail price of electricity. In these “buy all, sell all” arrangements, solar customers receive larger total payments as their systems generate more electricity.

CREDIT: ACTON-BOXBOROUGH REGIONAL SCHOOL DISTRICT

SOLAR + STORAGE IS CHEAPER THAN SOLAR ALONE

In Massachusetts, the Acton-Boxborough Regional School District offers an example of how solar and storage can lead to greater cost savings than just solar alone.

The district is constructing a new **177,000 square foot** elementary school that will have rooftop solar, operated under a power purchase agreement, along with **4MWh** of battery storage.

If the school district had opted for solar alone, the school's energy cost would be **9 cents/kWh**. With the addition of energy storage, which can be monetized in the market, the cost falls to **4 cents/kWh.**

Financing Solar + Storage

Costs for adding storage to a solar energy system vary dramatically depending on the complexity of the system.

According to a study from the National Renewable Energy Lab, the costs of microgrids range from $2 - $4 million/MW. However, the pioneering school districts that are building microgrids are generally not paying for this on the taxpayer dime, but instead taking advantage of grants, utility partnerships, tax incentives, third-party ownership, and revenue from selling power back to the grid so that the project becomes cost neutral or reduces overall energy costs.

Energy resilience systems can be financed in a similar fashion, using no-money down models. Sometimes called microgrid-as-a-service, resilience-as-a-service or energy-as-a-service, these approaches are generally designed to either reduce a school's monthly electricity costs or deliver electricity at a rate no higher than what it would otherwise pay to the local utility — while adding the resilience benefits. The as-a-service approach also removes the need for schools to devote staffing to operating these sometimes complex systems. Instead, the installer generally owns and operates the microgrid. In addition, newer software-driven microgrids undertake many functions autonomously, and installers can monitor the microgrid remotely.

CREDIT: U.S. DEPARTMENT OF ENERGY, AMY KIDD

FLORIDA HOSTS THE FIRST WAVE OF SOLAR + STORAGE AT SCHOOLS

Florida's SunSmart Schools and Emergency Shelters program was the first mass deployment of solar with battery back-up on schools that double as emergency shelters in the United States.

More than 115 schools in the state received 10-kW photovoltaic (PV) solar systems with battery storage, totaling over one megawatt of solar power. The project was funded by the American Reinvestment and Recovery Act of 2009. Florida's State Energy Program received the $9.8 million grant from the federal government, as well as $900,000 in matching funds from Florida utilities.

The technologies achieve cost savings in several ways which largely involve their ability to leverage their relationship with the electric grid and its frequently changing prices. Sophisticated systems monitor electric grid pricing and then operate their on-site power to achieve the lowest costs. For example, schools may charge their batteries when grid prices are low. Then when electricity prices rise, they stop using grid electricity and instead rely on the battery.

They may also participate in demand response, a program where the local utility pays the school to reduce its energy use during times when the grid is under strain, such as a severely hot or cold day. The school reduces its use of grid power by relying instead on its own on-site system during these periods.

In addition, the school may sell output and services from its on-site system. For example, the grid sometimes needs quick injections of energy when supply and demand are out of balance. Microgrids, nanogrids and solar plus storage systems can supply this energy and are paid for doing so.

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4 "Third Party Solar PV Power Purchase Agreement PPA," June 2019, Database of State Incentives for Renewables and Efficiency: NC Clean Energy Technology Center, https://www.dsireusa.org/resources/detailed-summary-maps/

5 Merrian Goggio Borgeson and Mark Zimring, *Financing Energy Upgrades for K-12 School Districts*, Lawrence Berkeley National Laboratory, April 2013, https://energy.gov/sites/prod/files/2016/03/f30/financing-energy-upgrades-guide.pdf

6 Learn more by downloading the guide "Energy Savings Performance Contracting: A Primer for K-12 Schools," at https://www.energy.gov/eere/slsc/energy-savings-performance-contracting

7 More information on SRECs can be found via SRECTrade (www.srectrade.com) and Flett Exchange (www.flettexchange.com).

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