

SOLAR INITIATIVE POLICY BRIEF



SOLAR BEST PRACTICES FOR CITIES IN THE SOUTH

Solar energy is an increasingly affordable way for cities to increase their use of clean energy, bringing a wealth of benefits to their citizens through lower electric bills, decreased pollution, fewer carbon emissions and good-paying local jobs. As the use of solar energy continues to expand across the country, many municipalities are interested in growing their local clean energy supply. Municipalities can develop policies and programs that support solar development in their jurisdictions for residents, businesses, and other organizations. Increasingly, municipalities are also able to take advantage of the benefits of solar energy themselves, installing solar PV systems on municipal property to decrease their energy bills and harness the other benefits of clean power.

By supporting local solar energy, municipalities can also assist low and moderate-income communities. Solar development brings jobs to the community, and by supporting solar energy, municipalities can help deliver the benefits of solar directly to its citizens who may be unable to install solar on their own roofs. Because low and moderate-income citizens pay a higher percentage of their income on electric bills, municipalities that support access to solar energy and the reduced electric bills that accompany it can offer direct assistance to these communities.

The best practices below describe ways that municipalities can finance and install PV systems on their own property. They also describe ways that municipalities can support the development of solar energy for those in their jurisdiction who are interested in putting solar on a home or business.

How Municipalities Can Go Solar

A municipality that is interested in solar energy should first consider establishing **ambitious and realistic renewable energy goals**. These goals can serve as a benchmark as the municipality plans solar projects and creates programs and policies that will support clean energy development in their jurisdiction. Cities and counties across the country have developed renewable energy goals that have helped these municipalities grow their supply of solar energy.

Highlights

In 2008, the **Phoenix City Council** approved a renewable energy goal for the city. The city aims for 15% of the electricity used by the city to come from renewable energy sources by 2025. The city plans to achieve this goal through renewable energy installations that are either city-owned or city-sponsored.¹

MUNICIPAL SOLAR FUNDAMENTALS

- Set ambitious clean energy goals
- Evaluate and rank potential solar sites
- Determine project size and scope
- Consider financing options
- Select project developer
- Assess additional regulatory requirements
- Oversee installation
- Harness the benefits of solar power

San Jose, CA has a goal of 100% renewable energy by 2022. The city plans to attain its goal through a combination of municipal projects and policies that help facilitate rooftop solar for its citizens.²

Denton, TX will work to achieve 70% renewable energy generation by 2019. The city plans to add wind and solar power to its existing renewable energy mix, and it will develop the Denton Energy Center to help meet its goals.



A municipality that wants to invest in solar on municipal property will usually do so in one of two ways: 1) it can enter into a power purchase agreement (“PPA”) or lease with a third-party owner, or 2) it can purchase the equipment either outright or using a loan. Both methods have benefits as well as certain limitations, but each will allow municipalities to access solar energy and the many benefits it provides.

Power Purchase Agreements

In a PPA, a municipality allows a third-party owner to install solar panels on municipal buildings or property that will receive the solar power. The municipality then pays the system owner for the power generated by the solar panels. PPAs provide municipalities with fixed, long-term rates, which make costs predictable. PPAs should be structured so that the amount of money saved annually by the municipality by using the PV system is greater than the annual cost of the PPA.

Because municipalities do not pay taxes, they cannot take advantage of federal and state tax incentives themselves.³ PPAs allow third-party owners to utilize those tax incentives and pass the savings onto the municipal customer. Although municipalities may also enter into solar leases with third-party owners, tax laws do not allow third-party owners to utilize tax incentives if they are leasing solar panels to tax-exempt entities like cities or counties. This usually makes solar leases more expensive for municipalities than PPAs. Municipalities may also favor PPAs because they allow the municipality to obtain solar power with little to no upfront cost. Additionally, third-party owners design, install, and maintain the PV system, further simplifying the process for the municipality. Municipalities may also consider purchasing the PV system from a third-party owner after that owner has utilized the applicable tax credits. The federal tax credit applicable to PV systems is claimed over the course of five years, and municipalities may benefit financially from buying out the PPA after tax credits have been fully utilized.

Highlights

In **Queen Anne’s County, MD**, government officials negotiated a twenty-year PPA with Solar City, a large rooftop solar company that provides PPAs. The county purchases the power for less than its cost of power from its utility. The installation saves the county \$230,000 a year, and over the course of the PPA, is expected to save the county \$4.6 million.⁴

In **Morris County, NJ**, the county partnered with a private solar developer to install PV systems on municipal buildings. The county issued municipal bonds to help pay for the project, and the solar developer built the projects and signed a PPA with the county. The project included 19 public buildings which each had 35-60% energy savings as a result of the project.⁶



Despite the success of these models, laws in some states have been interpreted by utilities to prevent municipalities from entering into PPAs.⁷ Currently, only 23 states, Washington, D.C., and Puerto Rico have specifically allowed third-party ownership models.⁸ In the Southeast, Georgia has led the way by passing a law that expressly allows PPAs for PV systems. In states that do not clearly allow PPAs, municipalities that wish to install solar should consider leasing or purchasing PV systems.

Leases may provide a good option for municipalities that are unable to pay the upfront cost of a PV system. As tax-exempt entities, most municipalities can enter into tax-exempt lease-purchase agreements. Also known as “municipal leases,” these agreements allow municipalities to lease solar energy equipment from a solar company at lower payments and longer terms than other leasing options. At the end of the lease term, ownership can be transferred to the municipal customer either outright or for a nominal fee. Alternatively, municipalities can enter into operating leases, which allow the municipality to lease the solar panels for a period of time and use the power produced by the panels. Although leases do not provide the tax incentives of PPAs, municipalities should consider leases as an alternative to PPAs and ownership if those options are unavailable.

Purchasing the PV System

Because municipalities cannot utilize federal and state tax credits, if they want to purchase a PV system to install on municipal property they must account for the entire cost of the project, either by paying for the system with municipal funds or by finding an alternative way to finance the system. Luckily, municipalities have access to a variety of financial mechanisms that can be used to finance a solar project. Ownership of the PV system also enables municipalities to generate renewable energy credits (or “certificates”) (RECs), which can be sold in existing state REC markets or retired to help cities meet their sustainability goals.⁹ In states that have REC markets, the owner of the PV system usually retains ownership of any RECs generated. PV ownership also helps to hedge against the cost of rising electricity rates, which have risen more than 70% in the last ten years.¹⁰ Municipalities that own PV systems benefit from the full value of the energy produced after the system has been paid for, and ownership also allows municipalities to use the solar panels for the duration of their useful life, rather than for a specific contract period.

Highlights

In **Knox County, TN** the county plans to install 5.3 MW of solar on various governmental buildings.¹¹ The county is purchasing the PV panels and will use TVA’s Dispersed Power Production (“DPP”) program to sell the excess generation back to TVA. The county is paying for the \$12.5 million system up front with proceeds from Qualified Energy Conservation Bonds (“QECCB”). These low-interest bonds allow the county to pay less interest over time. The estimated net cash flow to the county will be \$3,978 a year for twenty-one years. In year twenty-two, after the project is paid off, the estimated annual net cash flow will be nearly \$1.2 million, and over \$1.7 million by year thirty. The entire cost of the project and bond repayment is paid for through energy savings.



Clean Energy Bond Financing

Bonds provide a relatively low-cost source of funding for solar projects and can be applied in a variety of ways to help make PV systems more affordable. Municipalities can play an important role in the development of clean energy bond financing and can apply bond financing to facilitate both PPAs and ownership models.

Generally, a municipality will authorize the issuance of clean energy bonds, which will provide part or all of the funding for a solar project. The bonds are then repaid over a number of years. Repayment may come from PPA revenue, from energy savings, or from other forms of revenue generated by the project. There are a variety of bonds that could be implemented depending on the structure of the project.

- Federal bonds, such as Qualified Energy Conservation Bonds (“QECCBs”), that provide low-cost funding for renewable energy and energy efficiency projects may be available to municipalities.¹²

- The **Knox County, TN** project applied QECBs for the full cost of its solar projects. The ownership model provides for a long payback period, but allows the county to benefit from the full value of the PV system after the bonds are repaid.
- Alternatively, public bond agencies can issue municipal bonds to finance clean energy through public-private partnerships. This type of model may be structured in a variety of ways, but municipal bonds can provide advantages to the project developer and, in turn, to the municipality.¹³
 - The **Morris County, NJ** model described above implemented this type of bond financing.

Finally, predictable solar generation revenue streams can be bundled together and sold to investors. This type of securitization can help to increase investment in renewable energy projects on a broader scale, which can help to decrease the cost of capital for municipal solar projects.

Grants and Other Funding Sources

State or federal grants may be available to municipalities as an additional source of funding. Grants decrease overall project costs, and unlike other types of financing, municipalities do not have to repay grants. The U.S. Department of Energy and state energy or environmental agencies often manage grant programs.

Highlights

The **U.S. Department of Energy** implemented the Energy Efficiency and Conservation Block Grant program in 2008, which provided \$3.2 billion to municipalities and other government entities for renewable energy and energy efficiency projects.¹⁴ Although the program is no longer accepting grant applications, it facilitated significant renewable energy and energy efficiency development for cities across the country.

In **Tennessee** the Clean Tennessee Energy Grant program provides funding to municipalities and utility districts for renewable energy, energy efficiency, and air quality projects. In **Memphis, TN** the city was awarded an \$80,000 grant that it will use to install solar panels on a city-owned building.¹⁵

While grants provide a source of free capital, grant opportunities may change as grant funds are allocated and grant application deadlines pass. Municipalities interested in grant funding should monitor grant availability to ensure that they are aware of opportunities and deadlines.¹⁶

Options for Solar Sites

Municipalities frequently install PV systems on municipal property rooftops or on other municipal structures such as parking pavilions or available on-ground locations. These locations can provide consistent solar exposure, and the energy generated can easily be used on-site or sent back to the grid. Most solar developers are also comfortable with and experienced in rooftop and other on-site installations.

However, municipalities should also consider alternative locations for solar installations. Brownfields—contaminated or potentially contaminated properties—can provide excellent sites for solar projects. Municipalities can use their own properties, such as old landfills, as sites for solar. Larger sites allow municipalities to take advantage of economies of scale, which can help to decrease project costs. Municipalities can also lease brownfield sites to solar developers, creating an additional source of income for the city or county.

Highlights

In **New York City**, a former landfill on Staten Island will be used to site a 10 MW solar project.¹⁷ The city will lease the land to a solar developer to build the project.

In **Boulder, CO** a Superfund site was used to build a 500 kW solar project that will be part of a community solar project serving Xcel Energy customers.¹⁸

Municipalities can also support the use of brownfields for non-municipal projects. Vacant properties, such as old gas stations with buried fuel tanks, may remain unoccupied and contribute to urban blight. Low and moderate-income communities are frequently disproportionately affected by these types of properties, and using these locations for solar projects can help deliver the benefits of solar energy directly to the community. These sites can also serve as locations for community solar projects, discussed below.

Municipalities can further encourage brownfield redevelopment by offering technical or financial support for site exploration or necessary cleanup.¹⁹ Municipalities should consult with state and federal environmental agencies to ensure that any necessary site remediation and structural analysis is successfully completed for municipal projects, and they should provide information to citizens about consulting these agencies as well.²⁰

Ways to Facilitate Solar for Citizens

Municipalities can take additional steps to facilitate solar energy growth for members of their community. The descriptions below outline some of these effective techniques.

PACE Financing

Property Assessed Clean Energy (PACE) financing is a tool that allows property owners to finance the cost of renewable energy, energy efficiency, and other building upgrades.²¹ Through PACE programs, municipalities provide funding to property owners for renewable energy or energy efficiency projects, and that sum is repaid through an assessment on their property tax bill over time. Meanwhile, the property owner saves money on the monthly energy bill after the project is completed. The repayment due becomes a lien on the property, and the tax assessment remains with the property rather than with an individual borrower.

Before a municipality may create a PACE program, the state must first pass enabling legislation. Currently 31 states and DC have PACE enabling legislation, including Georgia, North Carolina, and Virginia.²² Among those states there are 37 active (and developing) PACE programs, and more programs are in development.

PACE financing is available to both residential and commercial customers. Until recently, residential PACE was limited to property owners who owned their homes outright, without a mortgage. An August 2015 announcement by the White House and the Federal Housing Administration (FHA) indicated that the FHA will implement rules clarifying how PACE financing may be paired with federally-backed mortgages.²³ In addition, other financing options such as home equity financing may be available as alternatives to PACE. Whether applied to commercial or residential property, PACE financing can be a highly effective tool for property owners to install PV systems.

Highlights

In **Fayetteville, AR** the Arkansas Advanced Energy Equity Program (A2E2) provides PACE financing for commercial property owners and developers.²⁴ The program includes over 150,000 eligible products and ensures positive cash flow through energy savings.

In **St. Louis, MO**, *Set the PACE St. Louis* provides PACE financing for residential and commercial property owners.²⁵ The program is designed so that eligible homeowners see an immediate return on their investment, and eligible community associations may also develop a neighborhood “community solar” program, allowing residents to apply PACE financing for off-site solar projects that send power to their homes. For commercial property owners, property assessments may qualify as operating expenses, allowing owners to finance improvements without incurring additional debt.

Community Solar

Community solar (aka Shared Solar) takes place through the development of solar energy projects that provide power to multiple community members. Projects are typically located close to the community they will serve. Community solar allows participating customers to obtain solar energy and its benefits even if they are unable to install a PV system on their own roof. Community solar programs are usually developed by utility companies or third-party companies specializing in projects of this type.

While community solar programs are usually developed at the state or utility level, municipalities that are served by municipal utilities can help promote community solar programs. Municipal decision-makers can encourage the development of these programs by their affiliated municipal utility, or by advocating community solar programs with other utilities that serve their jurisdiction.



Highlights

In **Orlando, FL** the Orlando Utilities Commission developed a community solar program. The OUC is governed by a Board of Commissioners that includes the City Mayor. The program allows participating OUC customers to purchase solar energy from a shared PV system installed at the OUC’s main office building.²⁶

Bulk Purchasing Programs

A number of municipalities have established or supported programs that provide bulk purchase discounts for members of their communities. These programs, frequently called “Solarize” programs, allow citizens to take advantage of the decreased cost of bulk solar purchases, usually partnering with one or more local solar installers to provide rooftop solar energy at below-market prices. These types of programs are particularly useful because partner organizations help to facilitate the entire solar installation process, from an initial evaluation of solar potential, through installation and the utilization of federal and state financial incentives. Bulk purchasing programs may be developed and supported by municipalities or by independent organizations (often local nonprofits).



Highlights

In **Portland, OR**, the Solarize Portland campaign developed through a partnership of local neighborhood associations. With support from the U.S. Department of Energy’s Solar America Communities program, the City of Portland Bureau of Planning and Sustainability partnered with neighborhood coalition offices, Solar Oregon (the state American Solar Energy Society chapter) and Energy Trust of Oregon to provide community organizing, technical assistance, project management, and rebates in a popular grassroots-driven program. After three years of Solarize campaigns, Portland added over 1.7 MW of rooftop solar and established a strong, steady solar installation economy.²⁷

In **North Carolina**, Solarize North Carolina provides bulk purchasing in four North Carolina regions.²⁸ By working with local solar installers and partnering with other solar stakeholders, Solarize North Carolina is able to provide lower-cost solar power for participating members of the community.

Additional Regulatory Relief

There are a variety of steps that municipalities can take to provide additional regulatory assistance for citizens to install PV systems. For example, a large portion of the installed cost of PV systems is in “soft costs,” which stem from permitting, inspections, transaction costs, installation labor costs, and other nonhardware costs.²⁹ Municipalities have the opportunity to help reduce certain soft costs of solar project development, significantly improving the economics for rooftop solar and for larger solar projects.

Highlights

In **Chicago, IL** the city developed the *Chicago Solar Express* program, which reduces fees, decreases customer waiting times, and standardizes permitting and zoning requirements for both large and small solar installations.³⁰

In **San Jose, CA** the city simplified its permit application requirements for solar installations and significantly reduced individual permit costs.³¹

The City Council in **Denver, CO** reduced solar permits to \$50 dollars, where similar permits in other parts of the state cost up to \$500 dollars.³² **San Diego, CA** entirely waived fees for various PV solar permits³³ as did **Hillsboro, OR**.³⁴

Municipalities may also amend other local rules such as zoning ordinances and building codes to remove barriers to solar development. For example, zoning ordinances may be amended or established to allow for setbacks or building height restrictions that will help promote the installation of rooftop solar.³⁵ **Boulder, CO**’s city code establishes “solar access zones” which prohibit the construction of structures that would obscure existing or future solar panels.³⁶ **Clackamas County, OR**’s zoning ordinances provide for solar access for new development.³⁷ A solar advocacy organization in **North Carolina** has also published a model local permitting ordinance as guidance for municipalities.³⁸

Conclusion

By following these best practices, municipalities can support solar development on their own properties and can help facilitate solar development for individuals and businesses within their communities, bringing more clean, affordable solar power to its citizens.

End Notes

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- ³ Until the end of 2016, federal tax credits and accelerated depreciation are available to finance roughly 35% of a solar project’s installed cost. In addition, many states have tax or other financial incentives that may be applied in addition to federal incentives.
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- ⁵ Solar City, “Town of Glastonbury Solar Project,” <http://www.solarcity.com/commercial/government-solar-projects/town-of-glastonbury>.
- ⁶ Clean Energy Group and Council of Development Finance Agencies, *Clean Energy Bond Finance: Morris Model*, available at [http://www.cdfa.net/cdfa/cdfaweb.nsf/ord/cebfi-model--morris.html/\\$file/cebfi-model--morris.pdf](http://www.cdfa.net/cdfa/cdfaweb.nsf/ord/cebfi-model--morris.html/$file/cebfi-model--morris.pdf).
- ⁷ U.S. Department of Energy, “Third-party Solar Financing,” http://apps3.eere.energy.gov/greenpower/onsite/solar_financing.shtml.
- ⁸ Jeff Bingaman, et al., Stanford Steyer-Taylor Center for Energy Policy and Finance, Hoover Institution Shultz-Stephenson Task Force on Energy Policy, *The State Clean Energy Cookbook* 54 (2014), available at <http://media.law.stanford.edu/organizations/programs-and-centers/steyer-taylor/State-Policy-Report-low-res.pdf>; Georgia is the only SELC state that expressly permits parties to engage in solar PPAs. South Carolina explicitly allows leases.
- ⁹ In the Southeast, North Carolina is the only state with a REC market, created as a result of the state’s Renewable Energy and Energy Efficiency Portfolio Standard.
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- ¹¹ Knoxville News Sentinel, *Solar Panels Get OK on County Buildings*, (May 26, 2015), available at http://www.knoxnews.com/news/politiknox/solar-panels-get-ok-on-knox-county-buildings_09213267.
- ¹² See U.S. Department of Energy, “Qualified Energy Conservation Bonds,” <http://energy.gov/eere/slsc/qualified-energy-conservation-bonds>.
- ¹³ Brookings-Rockefeller, *Clean Energy Finance Through the Bond Market: A New Option for Progress* at 6, available at <http://www.brookings.edu/~media/research/files/reports/2014/04/clean-energy-bonds/cleanenergyfunds.pdf>. The Morris Model combines the tax monetization benefit of third-party ownership with low cost capital in the form of public debt.
- ¹⁴ U.S. Department of Energy, “Energy Efficiency and Conservation Block Grant Program,” <http://energy.gov/eere/wipo/energy-efficiency-and-conservation-block-grant-program>.
- ¹⁵ Memphis Daily News, *Lichterman Nature Center to Go Solar with Rooftop Array* (July 11, 2015), available at <http://www.memphisdailynews.com/news/2015/jul/11/lichterman-nature-center-to-go-solar-with-rooftop-array/>.
- ¹⁶ The U.S. Department of Energy lists available opportunities for renewable energy and energy efficiency-related funding on its website: <https://eere-exchange.energy.gov>.
- ¹⁷ Clean Tech Media, *Staten Island Cashing in on Solar Power* (Sept. 2014), <http://cleantechnica.com/2014/09/10/staten-island-cashing-solar-power/>.
- ¹⁸ U.S. Environmental Protection Agency, “Marshall Landfill,” <http://www2.epa.gov/region8/marshall-landfill>.
- ¹⁹ The City of Portland’s Brownfield Project assists landowners, community members, and organizations in the redevelopment of brownfield sites. See City of Portland, “Portland Brownfields Project,” <https://www.portlandoregon.gov/bes/35008>.
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- ²¹ PACENow, “What is PACE Financing?” <http://www.pacenow.org/about-pace/>.
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- ²⁶ Orlando Utility Commission, “Community Solar” <http://www.ouc.com/environment-community/solar/community-solar>.
- ²⁷ National Renewable Energy Laboratory, *The Solarize Guidebook* (2012), available at <http://www.nrel.gov/docs/fy12osti/54738.pdf>.
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