

An aerial photograph of a large, multi-story parking garage with a red and grey facade. The roof is covered with a dense array of solar panels. Several semi-trucks are parked in the lot in front of the building. The background shows other buildings and a street with cars.

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*Solar options for
municipality-owned
parking facilities.*



By Jon Sarno

Parking lots and garage rooftops offer expansive, un-shaded, and unobstructed spaces that are ideal for housing commercial-scale solar energy solutions. Solar photovoltaics (PV) have long proven a smart choice for parking facilities for a variety of reasons. With the growing trend of installing plug-in electric vehicle charging stations in some parking lots and garages, energy use and operating expenses have also increased, making solar PV parking lots a possible solution for facility owners looking to counteract the increase in energy demand.

UN SHINE

Some parking facility owners have taken the route of renting open lot space or unused rooftops to third-party solar developers to build solar installations. This is a way for facility owners to collect rent from the space and add a consistent revenue stream to the bottom line.

Shade structures are great additions to parking lots, offering numerous benefits that include the potential to hold solar panels. By installing energy-efficient LED lighting under the structures in place of often low-efficiency light poles, shade structures can help reduce lighting costs. In addition, elevated shade structures or carports help keep cars dry in inclement weather, provide security from sun and hail damage, and keep cars cooler in hot weather. But the structures can also be used as the racking system for a solar installation, maximizing the utility of the space by adding energy-producing value.

Local, state, and federal agencies are well-positioned to take advantage of solar energy. The combination of building ownership, long-term outlook, and superior credit ratings allows for a variety of potential financing options.

Because of its role as a public entity operating in part through tax revenues, Bexar County felt it would be inappropriate to apply for any municipal solar incentives that would offset a portion of the total installed cost of the solar energy installation; the county paid for the installation with its own funds. Ultimately, throughout the life of the solar energy system, Bexar will save more than \$600,000.

Municipalities and/or parking facilities without access to upfront capital have the option of financing a solar energy project through a power purchase agreement (PPA), which is a mechanism through which a third party pays for the installation of the solar system and takes on all finance, design, installation, ownership, and maintenance costs. This third party then pays the savings forward by selling the power back to the parking facility owner at a predetermined, economical rate.

The benefit of a PPA is that it allows parking facilities to enjoy the immediate cost savings and environmental benefits of a renewable energy system without the upfront costs, while third-party investors bear all financial risk and maintenance costs. When the agreement comes to a close, the facility owner has the opportunity to renew the PPA, purchase the system outright at fair market value, or have it removed at no charge.

Santa Clara County, Calif., chose to finance two of its nine parking lot solar installations via a PPA that allowed the county to go solar for no money down. One installation was built at the Valley Health Center parking lot in San Jose, and the other was built at the Gilroy Health Clinic in Gilroy. Both installations took advantage of expansive outdoor parking areas with elevated solar shade structures that do double duty, providing shade to more than 400 outdoor parking spaces.

The installations were built as part of Santa Clara County's commitment to using renewable energy at its facilities. Per the PPA agreement, the county is purchasing the clean, renewable energy that the installations produce at competitive rates that are less than what they pay the local utility.

The San Diego Community College District (SDCCD)



Municipality-Owned Parking Structures

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The County of Bexar, Texas, hosts a carport solar installation atop its parking garage. The county has implemented various energy conservation initiatives, and this solar energy system provides electricity to a few of the garage's onsite plug-in electric vehicle charging stations, as well as additional energy to the commercial offices located on the first floor of the garage. The project's design and material procurement was completed by Borrego Solar, and its electrical construction was completed by Triple R Electric.



is another example of a public entity using a PPA to install nearly three megawatts of solar without an upfront capital investment. Through the PPA, SDCCD was able to install elevated shade structures on four open asphalt parking lots at different community college campuses, and on the top floor of the parking deck used by the district office headquarters staff. The district is realizing an 18 percent savings on what it was paying their former utility, which is equivalent to approximately \$110,000 per year.

Renting

There are other ways to generate income through solar projects, including solar energy procurement programs focused on wholesale distributed generation (WDG). Such programs allow property owners to lease their unused rooftops or spaces to solar developers, which generates a guaranteed revenue stream at no expense and without operating risk, while increasing the property's resale value.

This is similar to leasing rooftop space to phone companies looking for space to host their cell phone towers. Here's how it works: instead of owning or leasing a solar energy system itself, parking lot and garage owners can rent a facility's rooftop to a solar project developer. This is, in effect, the same idea as having a tenant, only this one is not under the roof as much as it's positioned atop a parking garage or lot. WDG projects are small, wholesale generators that sell energy directly to the utility, rather than delivering energy to the user to credit a specific utility bill or meter.

The tenant—a solar developer, an independent third party, or a partnership between the two—installs and owns the solar installation. WDG mechanisms effectively align the interests of the tenant with those of the parking facility owner: the tenant obtains a contract to sell the clean energy to the local utility, then installs the system, generates revenue from selling energy to the utility, and pays rent to the facility owner for use of the space. This arrangement has no effect on facility




Solar installations on parking structures and over lots can save money and offer additional benefits to facility owners.

operations. With WDG projects, the lessor doesn't have to worry about how much energy is being produced or if the installation isn't operating properly, because their revenue is strictly tied to leasing the used square footage and not energy production.

Typically, WDG projects are located near a point of interconnection to the grid, such as on top of and/or near an existing building tied to the utility's power lines (either above or below ground). Parking facilities with large, flat, and un-shaded spaces, with solid infrastructures, and in close proximity to an existing point of interconnection to the grid are some of the most cost-effective locations to install WDG solar solutions.

Because not all properties are a good fit for WDG projects and because it can be difficult to work with utilities on permitting and interconnection, it's important to find a solar partner who has developed a track record of successfully developing WDG projects. The solar partner you choose should also have experience developing and constructing several megawatts (at a minimum) of rooftop and ground-mounted, commercial-scale solar energy solutions. They should also have immediate access to project financing, and should help address any site and permitting issues through a properly drafted lease.

Solar has proven to be an economical solution for parking facility owners and/or local governments and municipalities working to reduce their energy costs and tap into available resources and programs. With the right analysis of the opportunities and associated hurdles, and thanks to increasing federal and state mandates and support for solar becoming ubiquitous, solar is benefiting other parking facilities throughout the country. 



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