



+ E-BOOK

Better Together: The Benefits of Combining Solar Carports & EV Chargers

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Businesses are facing a double-sided challenge: Electricity bills keep rising while more employees and customers are showing up with electric vehicles and expecting a place to charge them. But there's a solution that tackles both issues head-on while making real progress toward sustainability.

When you combine solar carports with EV charging, you generate clean energy on site, give EV drivers a convenient place to plug in, and manage your energy expenses in the process. Commercial and industrial enterprises are moving on this strategy, with an average 45% planning to install solar or EV charging within the next 5 years, according to PowerFlex's State of the Industry Report.

But here's the real difference-maker: Instead of treating solar and EV charging as separate projects, forward-thinking organizations are combining them to drive better results at a lower cost. In this publication, not only will we explore the applications and benefits of solar carports and EV chargers, but also the advantages that can be leveraged when installing and operating the two technologies as an integrated renewable energy system.

Understanding EV Chargers for Commercial Applications

Before diving into how solar carports and EV chargers work together, it helps to understand the charging technology itself. Commercial EV charging installations fall into two main categories, Level 2 chargers and DC Fast Chargers. The right choice depends on how drivers utilize your facility and how long they usually stay parked.

■ Level 2 Chargers

Level 2 (L2) chargers deliver about 25 miles of range per hour and run on 240-volt power, similar to what large household appliances use. That might sound slow compared to fast chargers, but it's actually perfect for situations where cars sit for several hours. Think workplace parking lots where employees leave their cars all day, apartment buildings and condos where residents charge overnight, fleet depots where vehicles return at the end of their routes, and retail or hospitality locations where customers stay for a few hours.

L2 chargers typically pull anywhere from 7 to 19 kilowatts (kW), allowing you to install several units without upgrading your electrical infrastructure. For sites planning to install many chargers at once, solutions like PowerFlex's Adaptive Load Management®, which we'll explain in more detail later, enable large-scale deployments using the existing electrical capacity. For most commercial applications, Level 2 chargers hit the sweet spot between charging capability and installation cost.

■ DC Fast Chargers

DC Fast Chargers (DCFCs) are the heavy hitters of the EV-charging world, delivering 200+ miles of range per hour. They're built for situations where speed really matters, like along highways, in fleet operations with short turnaround times, and in busy retail locations.

DCFCs can draw 350 kW of power or more, resulting in higher equipment costs and more demanding infrastructure requirements. While DC Fast Chargers can still work well with solar carports — especially when paired with battery energy storage — Level 2 chargers are more typically used in this application.

■ Benefits of Onsite EV Chargers

Installing EV chargers delivers value that goes well beyond a handy place to plug in. The benefits show up across multiple areas, and they tend to compound over time as EV adoption grows.

EMPLOYEE & CUSTOMER RETENTION

EVs now account for around 9% of new car sales in the U.S. and are projected to reach 30% or more by 2030, which means demand for charging options is only rising. Employees increasingly view workplace charging as a valuable perk that saves them the hassle of hunting for public charging. For customer-facing businesses, charging stations create positive brand associations and can even extend customer visits.

INCREASED PROPERTY VALUE

Onsite EV charging can boost property value, especially for multi-family unit buildings and apartment complexes. Chargers are seen as an amenity for which real estate developers and landlords often charge a premium. As with other common perks like gym access, free parking, and doorman services, onsite EV charging serves as an enticement for new tenants to start renting on a property as well as for existing ones to renew their leases year after year.

REVENUE OPPORTUNITIES

Site operators can generate revenue by charging drivers a per-kilowatt-hour fee. Along with state-based incentive programs that provide funding for EV charging equipment, revenue from charger fees can help accelerate return on investment. There's also research backing up the wider business case of EV charging: One study of 140,000 California businesses found that simply having an EV charging station nearby boosted sales by 1.4%, adding up to \$6.7 million in additional revenue across those businesses.

SUSTAINABILITY PROGRESS

For companies that report their environmental performance to investors, regulators, or customers, EV charging infrastructure provides concrete progress they can point to. When company-owned fleet vehicles switch from gas to electric, onsite chargers directly support Scope 1 emissions reductions. The benefits extend to Scope 2 when chargers are powered by onsite solar instead of grid electricity. And there are Scope 3 benefits as well, since you're enabling employees and visitors to charge with cleaner energy instead of relying on grid power at home or at public stations.

Solar Carports: Maximizing Underutilized Space

Solar carports turn parking areas from passive pavement into productive energy assets that also provide vehicles and drivers with shade and shelter from the elements.

■ How Solar Carports Work

A solar carport is a steel or aluminum structure built over your parking area, with solar panels mounted on top. The panels shade and protect parked cars while generating electricity throughout the day. That energy can run your building's operations, feed your EV chargers, and charge batteries for later use. If there's energy leftover, the surplus can flow back to the grid in exchange for credits. Solar carports are engineered for local weather conditions and typically last 25 years or longer.

■ Types of Solar Carport Installations

The best configuration for your solar carport depends on site-specific factors like your parking lot layout, budget, and even aesthetic preferences. Each design type offers different trade-offs between cost, energy output, and the experience you create for drivers.

Single-tilt carports: The most cost-effective option, single-tilt carports use one post per canopy section and need less structural reinforcement than other designs. The panels angle toward the sun in one direction for maximum energy collection. If keeping costs down is your main priority, single-tilt delivers solid performance at the lowest price point.

Dual-tilt or inverted carports: Panels slope in two directions from a central peak, creating a roof-like shape. This design handles rain and snow runoff more effectively, and the peaked structure provides more clearance for larger vehicles like trucks and SUVs. You also get higher panel density per square foot of coverage, translating to more energy output.

Long-span carports: These structures stretch across entire parking areas with relatively few columns, which creates a more open feel. They offer the highest panel density while providing full weather protection for every vehicle underneath. If you want maximum energy generation combined with the best possible driver experience, long-span carports are the premium option. This design makes the most sense for corporate campuses, large retail centers, and industrial facilities with many employees.

■ Benefits of Solar Carports

Organizations that install solar carports typically see benefits in three categories, from instant operational improvements to long-term financial and sustainability gains.

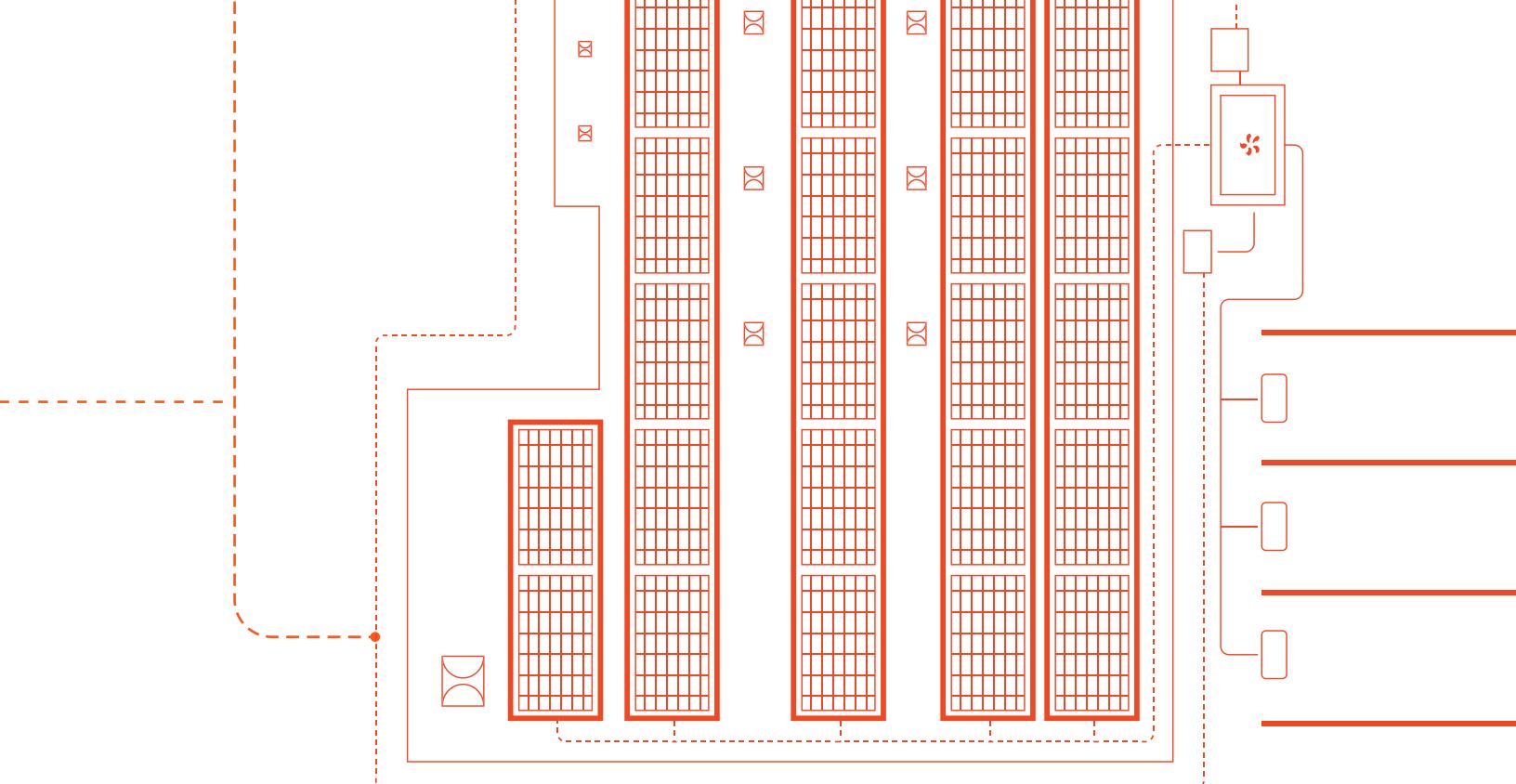
SPACE EFFICIENCY

Solar carports fit over parking lots and even on top of garages, utilizing existing property space without interfering with onsite operations. This is especially advantageous to businesses in urban areas where real estate is at a premium but large-scale parking areas are already present, as it eliminates the time and cost spent trying to accommodate equipment. And with the energy savings generated (discussed below), a solar carport can essentially turn parking spaces into monetized assets.

ENERGY SAVINGS

The energy generated offsets what you'd otherwise purchase from the grid, and those savings compound over the project's 25-plus-year lifespan. Solar carports generate energy during peak daytime hours, which is often when electricity rates are highest. That timing maximizes the value of every kilowatt-hour you produce. If your utility charges demand fees based on your peak electricity usage, carports can help reduce those spikes, especially when paired with battery storage.

Many organizations also qualify for incentives that improve the economics even further, like accelerated depreciation and various state or local programs. Incentive dollars combined with monthly electricity bill savings makes for a strong return on investment, allowing system owners to achieve payback typically within 5-7 years.



EMISSIONS REDUCTION

Carports are a tangible and celebrated initiative for organizations that track and report their environmental performance. A typical commercial solar carport system can offset a significant amount of greenhouse gases annually, helping you make measurable progress toward emissions-reduction targets. Solar carports are also highly visible to anyone who frequents your property, reinforcing your company's reputation as a steward of environmental sustainability.

EMPLOYEE & CUSTOMER SATISFACTION

Beyond generating clean electricity, solar carports improve the daily experience for everyone who parks at your facility. Vehicles stay protected from the weather, and shade keeps car interiors noticeably cooler during the summer months. Even non-EV drivers appreciate not having to climb into an overheated car on a hot afternoon. And there's also a hidden sustainability benefit: Cooler cars in the summer means drivers use less air conditioning, reducing gasoline consumption and tailpipe emissions.

The Benefits of Combining Solar Carports & EV Chargers

Solar carports and EV chargers are both fantastic investments on their own, but combining them creates benefits beyond what the two technologies can achieve when siloed. Here's why the combination works so well.

■ Energy Synergy

When solar panels generate electricity at the same location where EVs need to charge, that power can flow directly from the carport overhead into the vehicle below. This is true energy synergy. The electricity is genuinely clean, never touches the grid, and carries no carbon content whatsoever. Compare that to an EV charged at home or at a public charging station, where the power likely comes from a mix of sources that includes fossil fuels.

■ Cost and Time Efficiencies

Executing both projects together saves money compared to tackling them separately.

Single mobilization: Site preparation, equipment delivery, and crew coordination take place in a single well-planned effort for less disruption and lower costs.

Shared infrastructure: EV chargers mount directly to carport columns. The electrical panels, conduit runs, and grid interconnection points can serve both systems, so you won't end up duplicating infrastructure that could have been shared from the beginning.

Shared trenching and conduit: This is one of the biggest hidden savings in integrated projects. Both systems need underground electrical connections, and digging a single trench for combined conduit runs costs much less than doing it twice.

Streamlined permitting and interconnection: Many jurisdictions require separate permits and utility approvals for solar and EV charging installations. Combining them means one permit application, one utility interconnection request, and one set of inspections.

■ Better Experience for Drivers

Instead of plugging in at an exposed station in an open parking lot, drivers can charge under a covered structure that blocks rain, snow, and intense sun. They stay protected while connecting their vehicle, and their car stays cooler while it charges. As EV adoption continues to grow, charging availability and quality are becoming real factors in where people choose to work, shop, and otherwise spend their time.

Installing Solar Carports & EV Charging: Key Considerations

Before embarking on a combined solar carport and EV charging project on your property, there are various considerations that deserve attention early in the process. Below are some common things to keep in mind, all of which an experienced solar and EV charging provider can help you navigate.

Site assessment: The most important factors are your parking lot layout, sun exposure throughout the day, your existing electrical system, and the available capacity at your main service panel. Shading from nearby buildings or trees can substantially reduce your solar production, so this needs to be evaluated early.

Match charger types to your users: Choosing between Level 2 and DC Fast Chargers hinges on the average dwell time of the people who park on your property, as well as the onsite electrical capacity. In many cases, deploying a mix of Level 2 and DCFCs along with intelligent charge management software can accommodate a wide range of driver needs while staying within power limits.

Plan for future growth: The number of electric vehicles in your parking lot two years from now will almost certainly be higher than it is today. Consider designing carport structures that can accommodate more panels and chargers later as your energy needs grow. In practice, this might mean oversizing conduit runs, adding extra electrical headroom, and leaving physical space to add more chargers in the future.

Understand the incentive landscape: Federal tax credits, state rebates, utility programs, and local incentives can dramatically improve your project economics. But these programs come with specific requirements, application windows, and funding caps. A partner who understands the full range of available incentives can help you structure your project to capture every possible benefit.

Choose the right financing structure: You can purchase solar carport systems outright, finance them through loans, or use power purchase agreements that require zero upfront capital. Each approach has different implications for your cash flow, your eligibility for tax benefits, and your long-term costs.

PowerFlex: Your Partner for Integrated Clean Energy

Not every solar or EV charging company can deliver a truly integrated solution. Many specialize in one technology or the other, leaving you to coordinate with multiple vendors and hope everything fits together in the end.

PowerFlex takes a different approach. As a full-service provider, we offer both solar and EV charging (and more), and manage the entire installation process from initial site assessment through design, permitting, construction, and ongoing operations.

■ Advantages of PowerFlex's Solar Carport & EV Charging Offering

When it comes to installing solar carports and EV charging in a single project, our approach delivers these key advantages:

Value-engineered carports: Our engineering team has refined carport designs across hundreds of installations, finding ways to streamline engineering, procurement, and construction without sacrificing durability or output.

Competitive equipment pricing: As one of the top commercial EV charging installers in the country, we have access to supply chains and competitive pricing through our global industry relationships — allowing us to pass the savings along to our customers.

Reduced Installation Cost & Time: By combining EV charger and solar carport deployment, we achieve **40% savings on charger installations and reduce overall installation time by 30%.**

PowerFlex X™ Energy Optimization Platform: PowerFlex X maximizes the performance of your solar and EV charging by co-optimizing assets as a single system versus siloed technologies.

■ Case Study

Sanford Burnham Prebys Powers Research With Integrated Solar Carport and Smart EV Charging Infrastructure

Sanford Burnham Prebys Medical Discovery Institute partnered with PowerFlex to deploy an integrated clean energy system incorporating solar generation and EV charging at its La Jolla research campus.

The project includes an 847-kW solar system that combines rooftop arrays with a solar carport that shades and protects parked vehicles while generating onsite electricity to offset grid consumption.

In parallel, PowerFlex deployed 50 Level 2 EV chargers for employees and visitors, enabling convenient workplace charging and supporting transportation electrification goals. These assets are coordinated through the PowerFlex X platform, which monitors and optimizes system performance.

At the charger level, Adaptive Load Management® algorithms distribute power in real time based on available capacity, driver schedules, and other factors — allowing more chargers to be installed while avoiding expensive electrical infrastructure upgrades and demand fees.

Thanks to PowerFlex, Sanford Burnham Prebys is expected to slash its utility expenses by \$7 million over the system's lifetime, as well as reduce its annual carbon emissions by more than 700 tons.



Ready to transform your property? Contact a PowerFlex expert to receive a customized solar and EV charging assessment for your site.

About PowerFlex

PowerFlex is a clean technology solutions company making the transformation to carbon-free electrification and transportation possible. Our adaptive energy optimization platform PowerFlex X™ monitors, controls, and co-optimizes onsite assets like EV chargers, solar, energy storage, and microgrids – reducing overall energy costs through patented algorithms that maximize distributed energy resources.

PowerFlex is the second-largest installer of commercial solar in the United States, with over 500 megawatts (MW) of total solar capacity plus 50+ megawatt-hours (MWh) of battery energy storage. Combined, our solar and energy storage projects offset 460,000 metric tons of CO₂ each year. We also manage more than 50,000 EV chargers nationwide, making us the second-largest EV charging provider in the U.S. in terms of Level 2 port management.

PowerFlex is backed by EDF power solutions and Manulife Investments.

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