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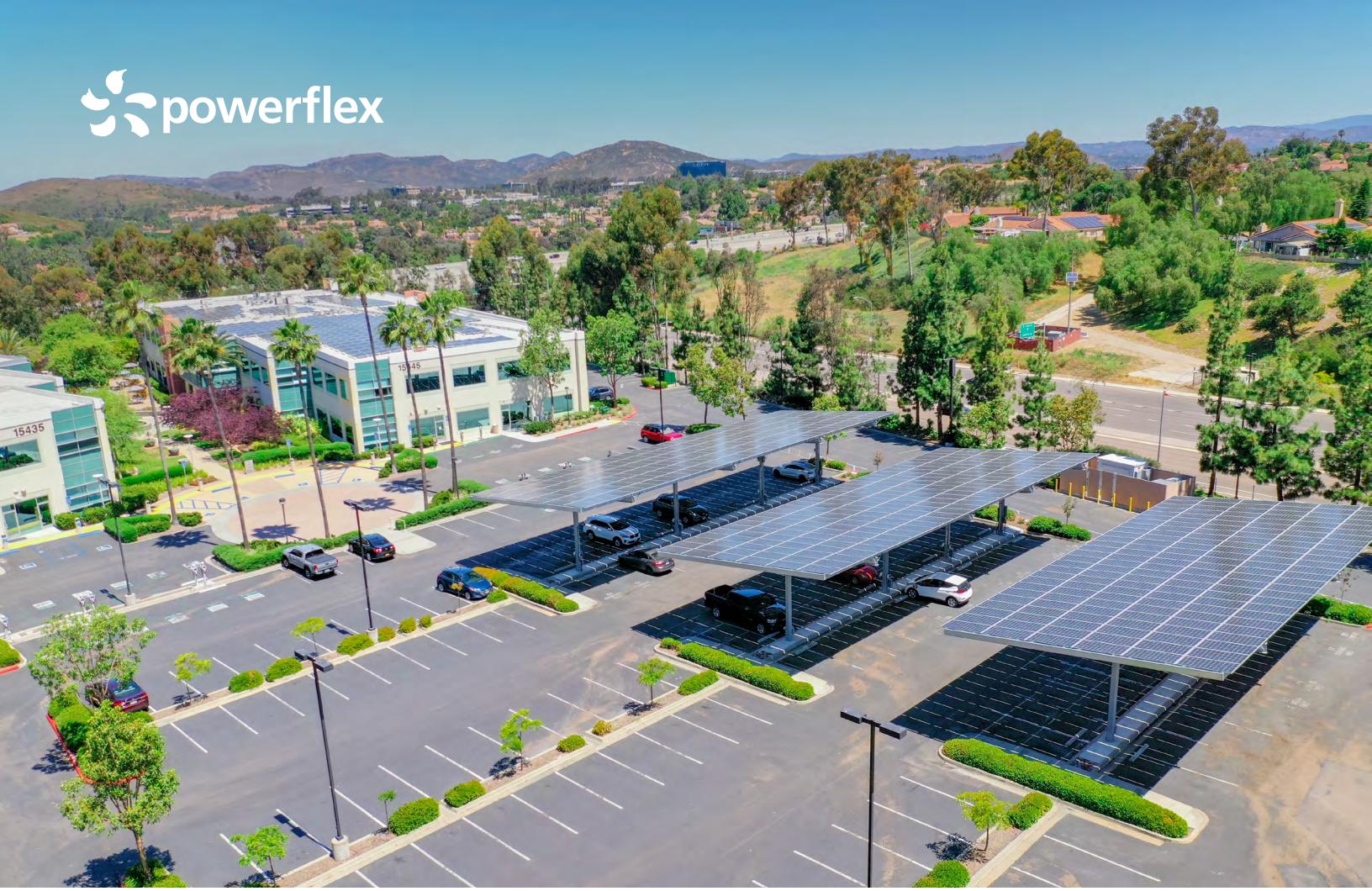

+ E-BOOK

Optimizing Multi-Tech Sites

How the PowerFlex X Platform Maximizes Solar, Energy Storage, and EV Charging Performance

13-MINUTE READ

Contents

Operations and facility managers are under pressure to do more with their energy infrastructure. They must shield themselves from utility price volatility, improve reliability, reduce emissions, and meet internal ESG mandates — all while keeping sites productive and primed for growth.

That's why onsite clean technologies like solar arrays, battery energy storage systems, and electric vehicle chargers are becoming critically important. While any of these assets can create value on their own, combining them into a single integrated clean energy system unlocks enhanced, long-term benefits.

But as more organizations deploy multiple distributed energy resources, the challenge is no longer simply installation. It's deciding when to generate, store, and use energy to your advantage. The **PowerFlex X™ energy acceleration platform** is built to solve these challenges.

This e-book explains why combining solar, battery energy storage, and EV charging is essential for future-proofing operations — and how PowerFlex X helps organizations achieve the strongest possible outcomes.

Clean Technology Types and Benefits

Before exploring why integrated sites are so powerful, it helps to look at the three core technologies individually.

Solar Energy Generation

Commercial solar energy systems are designed to power large facilities such as office buildings, warehouses, hospitals, municipal properties, and industrial sites. These systems may be installed on rooftops, on the ground, or as solar carports. In every case, the concept is the same: Solar panels capture sunlight, generate direct-current electricity, and use inverters to convert that electricity into alternating current that the facility can use to help power its operations.

As a standalone asset, solar offers multiple advantages:

For one, solar reduces electricity costs by offsetting power that would otherwise be purchased from the utility. This is especially attractive for businesses, as utility rates are often volatile and tend to increase over time. A well-designed solar system can create long-term savings over the life of the asset, which is typically 25 years or more. Combined with solar tax credits and incentives, energy savings can improve project economics and shorten payback periods.

Solar also helps organizations become more energy independent. By producing electricity on site, facilities reduce their reliance on a grid that may be constrained by aging infrastructure, high demand, or extreme weather disruptions. With this increased independence also comes measurable ESG progress, as solar reduces a company's carbon footprint and contributes to sustainability goals.

For many properties, solar carports (also called solar parking canopies) add another layer of value. They turn existing parking areas into energy-generating assets while also shading vehicles, improving driver comfort, and demonstrating a clear commitment to sustainability. For municipalities, healthcare campuses, and commercial properties with large parking footprints, this can be an especially compelling option.

Battery Energy Storage Systems

A standalone battery energy storage system (BESS) stores electricity for later use. A typical BESS includes lithium-ion batteries, a protective enclosure, power conversion equipment, and software that controls charging and discharging behavior. In practical terms, a battery gives an organization the ability to choose when electricity is used instead of consuming it only when it is generated or purchased.

One key benefit of a BESS is energy arbitrage. Batteries can charge when electricity prices are low and discharge to power onsite loads when prices are high, reducing exposure to time-of-use rates. Stored energy can also help shave consumption peaks, reducing a company's monthly demand charges.

In addition to cost savings, battery energy storage can also open new revenue streams. Through demand response programs, organizations can receive financial compensation for discharging energy to the grid to alleviate strain during high-demand events such as heat waves.

Batteries are also essential for improving resilience. When incorporated into a microgrid, they can help support critical operations during power outages. This is highly valuable for healthcare environments, municipal facilities, and manufacturing and logistics sites where continuity of operations is essential.

EV Charging

With electric vehicle adoption on the rise, EV charging infrastructure is becoming essential across nearly all property types and driver use cases.

Level 2 chargers are ideal for situations where vehicles remain parked for several hours, such as at workplaces, healthcare facilities, or overnight fleet depots, as they provide steady charging without overtaxing infrastructure (when proper load management is deployed).

DC Fast Chargers (DCFCs) are better suited for high-turnover sites like rest areas along highways and logistics hubs with tight turnarounds. Providing a rapid power boost in minutes rather than hours, DCFCs typically require more robust electrical infrastructure to support their higher power needs.

A well-developed EV charging development with a mix of charger types can benefit site owners by:

- Improving employee and customer retention by making sites more convenient for EV drivers
- Increasing property value by adding a desirable amenity for tenants and visitors
- Strengthening sustainability by supporting emissions-free transportation
- Creating new revenue opportunities when organizations collect charging fees

For organizations that maintain fleet vehicles, the benefits can be even greater. Electric fleets can reduce fuel costs, lower maintenance costs, and help organizations prepare for stricter emissions regulations.

Why Combining Multiple Clean Technologies Is Crucial

Installing solar, storage, and EV charging as separate projects can certainly be beneficial for a business, but combining them into a unified system unlocks a much stronger set of financial and operational advantages.

Solar Value Retention

During the day, if a solar array generates more electricity than the facility needs at that moment, the surplus either goes to waste or is exported to the grid under a net-metering arrangement in exchange for a bill credit.

But with export rates on the decline in many regions, net metering is becoming a less lucrative strategy. Adding onsite battery storage enables site owners to retain the value of their solar energy by using it to power loads “for free” later in the day.

Reduced Energy Costs

While solar alone can reduce reliance on price-volatile electricity from the grid, an integrated solar-plus-storage system enables organizations to deploy additional cost-saving measures by strategically dispatching energy to take advantage of rate swings.

These strategies include charging the battery when rates are low and discharging the battery to power onsite loads when rates are high (energy arbitrage) and reducing peak electricity consumption to avoid demand charges (peak shaving).

When EV charging is added, the site can use solar generation to help power the stations, thereby reducing the amount of electricity purchased from the grid. As EV charging ramps up, the storage system dispatches additional energy to support the added load.

More Energy Independence and Resilience

Solar-plus-storage sites are better positioned to support themselves during outages or grid instability, especially when configured as an islanded microgrid that can operate independently of the utility grid.

If EV charging is integrated into a broader resiliency strategy, organizations may also prioritize charging for essential vehicles. This is especially important in sectors like healthcare, municipalities, and logistics, where downtime can affect patient care, public services, or route readiness.

Stronger Sustainability Outcomes

When solar arrays are paired with a battery energy storage system, organizations can extend the use of emissions-free energy beyond the initial time of generation.

Any solar energy that is produced in excess of what the facility needs during the day can be stored for use in the evening hours (a strategy called solar shifting). This allows a facility to leverage clean solar energy deeper into the day, even as the sun sets.

What's more, using that energy to help power onsite EV chargers makes electric vehicles "greener" than if they were charged with grid electricity alone.

Efficient Project Execution

Combining technologies can also improve project economics and logistics. When solar arrays, battery enclosures, and EV chargers are installed at the same time, many stages of the project lifecycle can be streamlined, including equipment procurement, permitting, trenching, construction, and interconnection. Ground needs to be broken once, timelines can be reduced, and the site experiences less disruption.

These time and cost efficiencies are quantifiable: For example, when integrating EV chargers into solar carports, PowerFlex saves customers nearly 40% on charger installation and reduces overall project timelines by 30%.

Enhanced Future-Readiness

An organization's energy goals aren't static; they evolve over time along with power needs, utility programs, and regulations. A standalone solar system may suffice today, but fleet EV chargers paired with battery energy storage may be necessary tomorrow. Proactively installing multiple asset types concurrently is much more cost- and time-efficient than deploying them individually down the road.

PowerFlex X: The Key to Multi-Tech Optimization

Solar, storage, and EV charging are most powerful when they work together, but optimization doesn't happen automatically. To unlock the full value of integration, organizations need a platform that can orchestrate all three. PowerFlex X does exactly that, and much more.

Four Systems in One

PowerFlex X combines the functionality of four distinct systems into one unified software platform:

- **Energy Management System (EMS)** coordinates energy generation, storage, and consumption patterns
- **Charging Management System (CMS)** monitors and controls EV charging infrastructure
- **Data Acquisition System (DAS)** collects and transmit real-time asset data
- **Distributed Energy Resource Management System (DERMS)** co-optimizes distributed assets for performance, savings, and revenue opportunities

For operations and facilities teams, this consolidation reduces complexity and improves visibility. Personnel need only to work out of a single interface rather than manage multiple disconnected applications.

Monitor, Control, Optimize, Report

Beyond system consolidation, PowerFlex X streamlines the main tasks that go into effectively managing a multi-tech site:

MONITOR

The software provides real-time visibility into energy production, storage behavior, charging activity, and site consumption patterns. Automated alerts notify users of issues so they can be promptly addressed, enhancing reliability.

CONTROL

Operators can manage and coordinate energy assets according to site constraints, power demand, utility pricing, and business priorities without being physically present at the site. In the case of EV charging, stations can be remotely started, stopped, and even updated with the latest firmware.

OPTIMIZE
Instead of letting solar, storage, and EV charging operate in silos, PowerFlex X co-optimizes them using real-time data and historical learnings. Assets are dynamically orchestrated based on changing site and grid conditions to maximize operational, financial, and environmental outcomes. To ensure interoperability and flexibility, PowerFlex X is designed to be hardware agnostic — integrating with existing infrastructure, regardless of OEM.

REPORT
With extensive data fields and reporting capabilities, the platform helps organizations support ESG disclosures, incentive requirements, internal benchmarking, and performance reviews with minimal effort.

By integrating these capabilities into a single portal, PowerFlex X simplifies the daily workload for facilities teams into a cohesive and efficient workflow.

Powered by Adaptive Load Management

One of the most important capabilities within PowerFlex X is PowerFlex's patented **Adaptive Load Management® (ALM)** technology.

ALM intelligently distributes charging power across individual EV chargers in real time while accounting for site power limits, vehicle needs, driver schedules, and utility cost constraints. This is far more advanced than basic charging systems that simply split available power evenly or prioritize vehicles by order of arrival.

With ALM, vehicles that need to leave sooner can receive charging priority, while total site power draw remains within desired limits. This helps prevent system overload, avoids expensive peak demand charges, and supports a better user experience for drivers. By adaptively managing charging demand, PowerFlex can support up to 10 times more ports versus conventional installations while saving customers up to 60% on implementation costs.

For fleet use cases specifically, **PowerFlex X™ Fleet+** extends these capabilities with scheduling tools, telematics integrations, vehicle state-of-charge visibility, location tracking, and configurable alerts. This helps fleet managers preserve uptime by ensuring vehicles are charged according to route needs, not simply plugged in and left unmanaged.

The Cleantech Integration Lab: Multi-Tech Optimization in the Real World

PowerFlex's **Cleantech Integration Lab** in Mountain View, California, serves as a compelling real-world example of how integrated clean technologies can work together under the management of PowerFlex X.

This is not a theoretical demonstration. It is a functioning office and warehouse site that combines rooftop solar, battery energy storage, Level 2 and DC Fast Charging, and hardware from multiple OEMs into one coordinated environment.

What makes the Lab especially valuable is that it showcases both integration and optimization. PowerFlex X monitors solar performance against modeled expectations, orchestrates battery dispatch based on site load and grid conditions, and uses Adaptive Load Management® to allocate charging power across onsite EV infrastructure according to real-time needs and constraints.

The site demonstrates several critical truths for facility operators:

- Multi-tech integration is practical, not hypothetical
- Hardware-agnostic interoperability is achievable
- A single control platform can simplify complexity
- Detailed telemetry can support operations, compliance, and reporting
- Solar, storage, and EV charging deliver more value when managed together

Interested in learning more? Contact us to schedule a free tour of the Cleantech Integration Lab to see the value of multi-tech installations in practice.

The Bottom Line on Multi-Tech

For today's operations and facilities leaders, the clean energy transition is no longer about selecting one technology at a time. The most resilient, efficient, and cost-effective sites will be those that combine solar, battery storage, and EV charging into a single coordinated system that's optimized for performance and financial returns.

Book a demo with PowerFlex to see how PowerFlex X can help your organization maximize the performance of solar, battery energy storage, and EV charging.

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About PowerFlex

PowerFlex is a clean technology solutions company making the transformation to carbon-free electrification and transportation possible. Our energy acceleration 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 CO_2 each year. We also manage more than 70,000+ 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.

Visit powerflex.com for more information, and connect with us on LinkedIn and YouTube.

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