+ E-BOOK

Clean Energy Solutions for Airports

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Airports are among the most energy-intensive facilities in the world, as large international hubs can consume as much electricity as a small city while supporting tens of millions of passengers annually.

At the same time, the aviation sector contributes roughly 2–3% of global carbon emissions, with additional indirect emissions tied to airport operations, ground transportation, and facility energy use.

As pressure mounts from regulators, travelers, and corporate sustainability commitments, airports are uniquely positioned to lead the transition to cleaner, more resilient energy systems. From electrifying fleet vehicles to reducing reliance on fossil-fuel-based electricity, clean technologies offer a practical path forward.

In this e-book, you'll learn why airports and aviation facilities should prioritize onsite clean energy, the specific benefits of technologies like EV charging, solar, and energy storage; and the risks of delaying adoption. You'll also see real-world examples of how PowerFlex has helped aviation leaders implement integrated clean energy solutions that drive both operational and financial value.

Clean Technologies & Their Benefits

Clean technologies are particularly well suited for airports due to their large footprints, high and predictable energy demand, and extensive parking infrastructure. By combining EV charging, solar generation, and battery energy storage, airports can build a flexible, future-ready energy ecosystem.

EV Charging

As electric vehicle adoption accelerates, airports must adapt to meet the needs of passengers, employees, rental car operators, and fleet vehicles.

Installing a mix of Level 2 chargers and DC Fast Chargers ensures that airports can accommodate a wide range of charging behaviors — from long-term parking to quick turnaround needs.

Level 2 chargers are ideal for passengers leaving vehicles in parking structures for hours or days, as well as for employee parking. DC Fast Chargers, on the other hand, serve ride-share drivers, rental car fleets, and travelers who need rapid charging before departure or after arrival.

The benefits of EV charging at airports extend beyond convenience. Providing charging infrastructure enhances the passenger experience and strengthens brand perception among sustainability-conscious travelers. It also creates new revenue streams through EV charging station fees while supporting electrification of airport ground fleets, which can significantly reduce Scope 1 emissions.

Additionally, EV charging infrastructure positions airports to meet evolving regulatory requirements and building codes that increasingly mandate charger deployment.

Solar Energy

With expansive rooftops, parking structures, and open land, airports are uniquely equipped to host large-scale solar installations. Solar carports, in particular, are an ideal solution — transforming parking areas into energy-generating assets while providing shade and weather protection for vehicles.

By generating electricity on site, airports can reduce their reliance on grid power, lower energy costs, and insulate themselves from utility rate volatility. Solar installations also contribute to emissions reduction goals, helping airports meet sustainability targets and align with broader aviation decarbonization initiatives.

For operations teams, solar offers predictable, long-term cost savings. For sustainability leaders, it provides measurable progress toward ESG commitments. And for passengers, visible solar infrastructure reinforces the airport's commitment to innovation and environmental responsibility.

Energy Storage

Battery energy storage systems are the critical link that maximizes the value of solar and enhances overall energy resilience. By storing excess solar energy

generated during peak daylight hours, airports can deploy that energy when demand is highest or when grid electricity is most expensive.

This capability enables several cost-saving strategies, including peak demand reduction and time-of-use optimization. Energy storage can also support participation in demand response programs, generating additional revenue by helping stabilize the grid during periods of high demand.

Importantly, storage systems improve energy reliability. Airports cannot afford downtime, and integrating storage into a microgrid can provide backup power during outages — ensuring that critical operations such as terminals, security systems, and maintenance facilities remain functional.

When combined with EV charging and solar, battery energy storage creates a fully integrated energy ecosystem that is both cost-efficient and resilient.

Consequences of Not Implementing Clean Energy

Failing to adopt clean energy solutions can create significant operational, financial, and reputational risks for airports.

One of the most immediate challenges is the **inability to meet growing EV charging demand**. As more travelers switch to electric vehicles, airports without adequate charging infrastructure risk frustrating passengers and losing competitive advantage. Over time, this can negatively impact customer satisfaction and brand perception.

There are also **substantial financial consequences**. Airports that delay clean energy adoption may miss out on time-sensitive incentives and tax credits that significantly reduce installation costs. In addition, they forgo revenue opportunities from EV charging services and grid programs such as demand response. Rising electricity costs and peak demand charges further compound these missed savings.

Equally important is the **risk of failing to meet ESG goals**. Airlines, investors, and the traveling public are placing greater emphasis on sustainability. Airports that lag behind may struggle to attract partners, secure funding, or maintain stakeholder trust.

Finally, continued reliance on traditional energy sources exposes airports to **price volatility and grid instability**. Without onsite generation and storage, facilities remain vulnerable to fluctuating energy costs and potential disruptions, both of which can have serious operational implications.

How PowerFlex Helps Aviation Hubs Harness Clean Energy

PowerFlex is a leading clean technology solutions provider that delivers fully integrated energy systems tailored to the unique needs of large, complex facilities like airports. By offering a single-source approach, PowerFlex manages every stage of a project, from design and financing to installation and ongoing optimization.

At the core of our offering is PowerFlex X™, an intelligent energy acceleration platform that monitors and co-optimizes solar, storage, and EV charging assets. This helps airports not only deploy clean energy technologies but also maximize their performance and financial returns.

Here are some examples of PowerFlex's best-in-class clean energy solutions in action:

Los Angeles International Airport (LAX)

One of the busiest airports in the world, LAX faced increasing demand for onsite EV charging options from travelers, as well as mounting pressure to align with the City of Los Angeles' ambitious net-zero goals. This led LAX to partner with PowerFlex to design a scalable charging solution capable of supporting high utilization rates.

To date, PowerFlex has deployed more than 1,200 Level 2 chargers and 16 DC Fast Chargers at the airport, facilitating nearly 80,000 charging sessions and generating $230,000 in revenue.

PowerFlex implemented its patented Adaptive Load Management® technology that allows LAX to operate more chargers without requiring costly electrical infrastructure upgrades. By dynamically balancing charging loads in real time, the system ensures efficient operation while minimizing peak demand charges.

The result is a future-ready charging network that enhances passenger convenience, supports fleet electrification, and aligns with California's aggressive clean energy goals.

Signature Flight Support

Signature Flight Support, a global leader in private aviation services, sought to enhance sustainability and energy cost controls across its network of fixed-base operations (FBOs). PowerFlex worked with Signature to design and implement a multi-site solar energy strategy across 11 locations in Connecticut, New Jersey, and New York.

The 4.6-megawatt initiative included both rooftop and carport solar energy systems, each tailored to the unique operational and regulatory requirements of active aviation environments. PowerFlex expertly navigated FAA rules, including conducting glare studies and coordinating all installation activities to avoid disruptions to Signature's 24/7 operations.

Generating a combined 4.8 million kilowatt-hours of clean electricity annually, the solar energy systems reduce reliance on the grid, cut operating expenses, and bolster Signature Flight Support's commitment to making air travel more sustainable.

Talk to a PowerFlex expert today to discover clean energy solutions tailored to your airport's unique operational needs.

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 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.

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

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