

Developing Manchester Airport Group's Electrification Strategy

Delivering an Integrated EV Charging Strategy for a Net Zero Airport Ecosystem

As the world moves toward decarbonisation, airports are poised to play a key role in transforming the transport sector. Electrifying ground transport – both landside and airside – offers a tangible path to reducing emissions, improving operational efficiency, and creating a more sustainable future for the aviation industry. By 2040, airports will evolve into energy hubs, powering not only aircraft but also electric vehicles (EVs), unlocking new business models and revenue opportunities.

For Manchester Airports Group (MAG), this transformation is a central part of its long-term sustainability vision. With the goal of achieving net zero operations by 2038 and an ultra-low emissions fleet by 2030, MAG recognised the need for a comprehensive and forward-thinking EV charging infrastructure (EVCI) strategy that could power the transition to electric ground transport without disrupting day-to-day operations.

MAG's Commitment to Sustainability: A Vision for the Future

MAG is one of Europe's largest airport groups, owning and operating Manchester, London Stansted, and East Midlands airports. Collectively, MAG serves more than 65 million passengers annually and handles more than 700,000 tonnes of cargo. MAG is committed to meeting growing demand for aviation sustainably, recently publishing its new Sustainability Strategy – "Creating a sustainable future for all."

By electrifying both passenger access and ground operations, MAG has set ambitious targets that go beyond reducing emissions – it aims to lead by example and acts as an industry leader in sustainable airport operations. This includes not only its own fleet but also enabling partners and users of the airport ecosystem to transition to EVs, from airlines and ground handlers to passengers and commercial operators.

With these goals in mind, MAG partnered with VEV to design and implement an EVCI strategy that would support the long-term vision while ensuring operational continuity and financial viability.

"What stood out immediately was VEV's depth of experience and expertise – not just in charging infrastructure, but in how to make it work operationally in a complex environment like an airport.

They understood the technical constraints and translated them into practical solutions. VEV brought together consulting and practical expertise – considering everything from vehicle types and fleet operations to power infrastructure and how to manage the transition effectively going forward."

Nick Woods

Chief Information Officer, MAG

The Challenge: Transitioning to net zero without Disrupting Operations

Transitioning to net zero airport operations is a complex undertaking, particularly for a large airport operator like MAG. The challenge lies not just in electrifying fleets but also in creating an integrated system that works across multiple locations with varying operational demands and constraints. Some of the key challenges included:



Space and Power Constraints

With growing airports and competing needs for space and energy resources, MAG's teams faced significant limitations in where and how they could install the required infrastructure.



Ecosystem Complexity

The challenge of electrifying MAG's own ground fleet was only part of the equation. The charging infrastructure needed to support a diverse range of vehicles – from airline ground services to ride-hail operators – while also considering the varying timelines, electrification plans, and infrastructure needs of these partners.



Future-Proofing vs Tactical Requests

While MAG needed to address immediate operational needs, they also had to make decisions that would serve long-term goals, ensuring the infrastructure investment would not only meet current demands but also accommodate future growth and technological advancements.



Maximising Commercial Potential

As a major capital investment, EVCI presented an opportunity not just to decarbonise but to also unlock new revenue streams. However, capturing this potential required a deep understanding of the market, potential charging opportunities, and how to integrate these into the business case.

VEV's Approach: A Collaborative, Data-Driven Solution

VEV applied its expertise in EV charging strategy and fleet electrification in the context of airport operations, to develop a comprehensive EVCI plan for MAG. VEV's approach combined technical expertise, operational insight, and collaborative stakeholder engagement to create a strategy that aligned with MAG's sustainability goals while ensuring day-to-day operations could continue smoothly.

The approach was built around four core pillars:

1. Modelling Net Zero Transport Operations

VEV developed bespoke models to simulate the airport transport ecosystem as if it were fully electric, down to a half-hourly level. This modelling took into account a wide range of operational data, including landing schedules, bus and coach timetables, and projected passenger growth.

Key outputs included:

- Energy requirements at full electrification
- Half-hourly charging profiles and peak demand patterns
- Optimal charger types and numbers for each use case

2. Designing the Future EV Charging Network

VEV scoped and designed the EV charging infrastructure to enable net zero transport operations across all MAG airports. This included assessing proposed charging locations, reviewing power availability and working with operations teams to design solutions which met demand, within operational, space, and power constraints.

VEV's team also collaborated with MAG's partners to identify the necessary grid upgrades and substation investments.

Key outputs included:

- Detailed site designs for charging locations across all three airports.
- Specifications and standards for the rollout of chargers
- Power availability, forecast consumption, and required HV network upgrades.

3. Shaping a 20-Year Investment Profile

VEV developed a detailed cost and revenue model for the charging network, factoring in both the initial investment and the long-term payback period. The phased investment plan covered the costs of infrastructure development, grid upgrades, and associated commercial opportunities.

Key outputs included:

- A clear, phased 20-year investment profile split by airport, emissions scope and level of net zero commitment.
- Payback and revenue models linked to commercial charging opportunities.
- A strong investment case for MAG's Board

4. Stakeholder Engagement and Ecosystem Enablement

VEV's collaborative approach involved engaging key internal teams and external stakeholders from airlines, ground handlers, and other airport partners. This helped to ensure that the strategy was aligned with the needs of all users and facilitated broad support for the programme.

Results and Impact: Positioning MAG for Success

With VEV's strategic guidance, MAG is now positioned to successfully execute its ambitious net zero goals. The EVCI programme has provided MAG with the following benefits:



Strategic Clarity

MAG now has a comprehensive understanding of the future EVCI requirements across all three airports, allowing for informed and prioritised decision-making that aligns with its net zero commitments.



Implementation Readiness

With detailed site plans, technical specifications, and identified grid investments, MAG is well-equipped to move forward with the rollout phase of the project.



Ecosystem Enablement

The strategy empowers MAG's partners – including airlines, ground handlers, coach operators and ride hail partners – to advance their own sustainability commitments, creating a shared vision of a sustainable airport ecosystem.



Organisational Alignment

The collaborative process has aligned MAG's team around a common roadmap, driving momentum for the next steps and providing clear direction for early investment decisions.

Outcome: A Future-Proofed Vision

This integrated EV charging strategy will not only enable MAG to achieve its net-zero goals but also support its long-term growth and enhance its leadership in the airport industry. By taking a data-driven, collaborative approach, MAG is ensuring that its transition to a sustainable, electric future is both achievable and financially viable.

“Our goal was to give MAG a clear roadmap to electrify all airport fleets. By working closely with their team, we assessed infrastructure needs, costs, and revenue opportunities – enabling a multi-year investment plan aligned with their Net Zero targets. Applying our EVCI and fleet expertise to such a complex airport environment was both challenging and rewarding.”

Sam Hoyland
Director, VEV

Insights for Airport Leaders

VEV's work with MAG offers valuable lessons for other airport executives considering how to electrify their fleets and achieve sustainability goals:

CEO

EV infrastructure must be a strategic priority to meet your net-zero goals while optimising space, power, and capital. It's key to positioning your airport as a sustainability leader to passengers, partners, and government.

CFO

EV infrastructure is more than a cost – it's a revenue opportunity. Charging services and lower EV operating costs can offset investments and strengthen the business case.

CIO

The energy transition is a platform shift. Managing your EV network demands end-to-end visibility, infrastructure control, and performance insights to meet operational and financial targets. Your charger and energy management platform will be a strategic decision, underpinning mission critical operations across your airport.

COO

EV charging is set to become airports' largest energy demand, potentially increasing total load by 50%. This will transform stable, predictable consumption into highly variable demand. You'll need a clear strategy to plan, procure, and manage this shift, with full control over local charging and energy assets. An intelligent energy and charger management platform with control over all electrons will unlock opportunities in grid markets and renewables and manage new risks around local load and fluctuating energy costs.

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can help you on your journey to
fleet electrification

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