

Smart Charging

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01 BASIC PROJECT INFORMATION

Project name	Smart Charging
Partners involved	Brussels Airport Company ENGIE Laborelec
Implementing airport / site	Landside parking area at Brussels Airport.
Period tested	June 2024-Sept 2026
Project lead / contact	Engie Laborelec

02 OBJECTIVE

What are we trying to solve or tackle with this project?

Test how airports can expand EV charging without creating unnecessary grid peaks or poor driver experience. The project combines fast and slow chargers with software-based load balancing to optimise charging priorities, local grid constraints, user needs and cost/peak-power exposure.

Success criteria (optional):

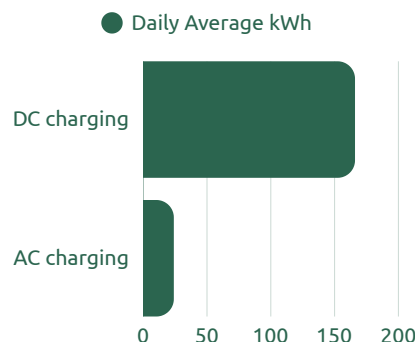
Validate technical connectivity between chargers and load-balancing software.
Demonstrate power shifting without harming users.
Measure charging volumes and assess potential for scalable airport EV infrastructure.

03 APPROACH (HOW WE TESTED)

Test set-up & method

A landside testbed combined fast (DC) and slow (AC) chargers with the load-balancing platform (SMATCH) and an OCCP broker (LYNK) that allows different back-end systems to communicate.
The software optimised charging based on grid limits, consumption, slow/fast charging priorities and driver expectations.
Charger data and balancing behaviour were monitored to assess scale-up potential.

Data & measurement



KPIs:

Total energy charged
Average daily energy charged

Peak power reduction:
charging power shifted by 50% during a 3–12h period.

Risks & mitigations

Complex backend/cloud connections across suppliers.
User acceptance
Complex technological solution to extend power shifting with market peak-price information.

Limitations

The test mainly validates technical feasibility and early usage patterns.
Broader impact depends on higher charger utilisation, reliable integrations, market signals, grid constraints and investments required for full-scale development.

04 RESULTS & IMPACT

Key results

The Smart Charging testbed showed that software-based load balancing can help airports manage EV charging growth. Fast charger use exceeded expectations, averaging 166 kWh/day compared with a 90 kWh/day estimate, while slow charging was close to forecast at 22 kWh/day.

The system demonstrated a 50% shift in charging power over a 3–12h period, showing potential to reduce peak loads and grid impact. The main value is a relatively low-cost, retrofit-capable optimisation layer that can support airport-wide electrification.



05 RATINGS (QUICK ASSESSMENT)

Deployment Approach

How standardised is the solution: can it be deployed off the shelf, or does it require extensive customization?

Off The Shelf Custom-Built

Investment Magnitude

From low-cost deployment to major investment.

Low Investment (less than €10k) High Investment (more than €15mio)
OPEX ☐ CAPEX

Sector Readiness

From non-existing or emerging standards, regulations, and certification pathways to fully established industry practices.

Emerging Framework Established Framework

Innovation Maturity

How does the solution score in terms of maturity, from low TRL experimental/pilot-stage to high TRL market-ready.

Experimental Market-Ready

Operational Impact

Does the innovation deliver targeted improvements or rather drastically transform processes and/or operations.

Incremental Improvement Transformational Change

Notes

For other airports, smart charging is most relevant where EV uptake is growing faster than grid capacity. It can reduce peak-power pressure if supported by good charger data, backend integration, user-friendly rules and future links to energy-market signals. It provides a cloud based alternative for retrofitting existing systems with physical energy management systems.

06 NEXT STEPS / RECOMMENDATION

Recommendation:

Continue and scale: extend the testbed toward a broader connected setup including market signals, grid limits and more representative usage.

Next steps:

- 1) Expand monitoring as charger usage grows.
- 2) Improve backend integrations between chargers, software and energy systems.
- 3) Add market/peak-price signals to optimisation.