

CASE STUDIES OF MULTIMODALITY PROJECTS IN AENA AIRPORTS



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CONTEXT: CLIMATE ACTION PLAN OF AENA

CARBON NEUTRALITY

Scope 1 + 2

Become a carbon neutral airport operator (2026) and lay the groundwork to achieve Net Zero Carbon (2040)

ACTION LINES:

- ✓ RENEWABLE ENERGY
- ✓ ENERGY EFFICIENCY
- ✓ **SUSTAINABLE FLEET**
- ✓ EMISSION OFFSETTING

SUSTAINABLE AVIATION

Scope 3

Acting as a tractor for other players in the aviation sector to accelerate its decarbonisation

ACTION LINES:

- ✓ CLEAN PROPULSION FOR AIRCRAFT
- ✓ EFFICIENCY IN AERONAUTICAL OPERATIONS
- ✓ **SUSTAINABLE GROUND HANDLING FLEET**

COMMUNITY AND SUSTAINABLE VALUE CHAIN

Scope 3

Improve the sustainability of the environment by collaborating with suppliers, tenants, transport agents and the community

ACTION LINES:

- ✓ **SUSTAINABLE MOBILITY**
- ✓ CLIMATE COOPERATION AND AWARENESS

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ACTION LINES IN SUSTAINABLE MOBILITY

CARBON NEUTRALITY

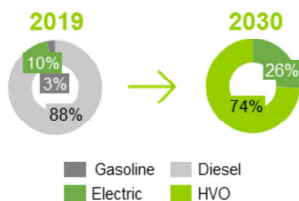


SUSTAINABLE FLEET

100% SUSTAINABLE VEHICLES BY 2026

- **Electrification** of 100% of passenger cars and 46% of vans
- Use of **sustainable fuels** in all other existing vehicles (e.g. trucks, coaches and off-road vehicles)
- Promoting sustainable mobility in airport fleet (**car sharing**)

Fleet of AENA (% of vehicles)



SUSTAINABLE AVIATION



SUSTAINABLE GROUND HANDLING FLEET

ACHIEVE 78% OF SUSTAINABLE GROUND HANDLING VEHICLES BY 2030

- Vehicle electrification and use of sustainable fuels **requirements** in Ground Handling vehicles
- Implementation of **electric charging points** to supply new electric vehicles
- Creation of a **working group** with the main ground handlers to facilitate the progressive implementation of sustainable initiatives

% of sustainable ground handling vehicles

2019	2026	2030
23%	44%	78%
Compared to 2019		
	21% ↑	55% ↑

COMMUNITY AND SUSTAINABLE VALUE CHAIN



SUSTAINABLE MOBILITY

PROMOTING SUSTAINABLE MOBILITY TO AND FROM THE AIRPORT

- Investment in **charging points** to promote sustainable transport to / from the airport
- **Promotion of sustainable mobility through pricing** in car parks (parking concept as a sustainable mobility hub)
- Establishment of **sustainability requirements** for Rent a Car / VTC / Car Sharing
- **Electrification of shuttles** used between terminals at Madrid and Barcelona airports
- **Collaboration with 3rd parties** to define sustainable initiatives (eg. group of mobility agents)

- % passengers/employees sharing transport means
- Nº of recharging points in ground side
- kWh consumed in recharging points
- Nº of parking spaces for car sharing

Main kpis

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MAIN PROJECTS IN SUSTAINABLE MULTIMODALITY PROJECTS

POOLING IN PALMA DE MALLORCA AIRPORT

Objective

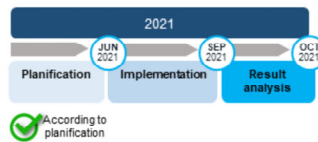
- ✓ Define the vehicle sharing procedure at an Aena airport
- ✓ Assess improvements in efficiency and reduction of emissions for network deployment

Location

- ✓ Airport platform limited zone avoiding congestion zones

Type of vehicles

- ✓ Pushbacks
- ✓ By predictability
- ✓ Without contact with passengers



Schedule

- ✓ Summer of 2021
- ✓ Operations planned according to previous season

Use prioritization

- ✓ Pool oversizing to ensure service continuity
- ✓ Additional TCR equipment available for contingencies

Economic compensation

- ✓ Distribution of income based on the monthly valuation of the equipment provided
- ✓ The pool will not earn or lose money

MAIN PROJECTS IN SUSTAINABLE MULTIMODALITY PROJECTS

TELEMETRY

Technology description

- ✓ In situ collection of measurements or other data at remote points and their automatic transmission to receiving equipment for monitoring

Objective

- ✓ To track the location of crucial GSE equipment, in order to improve turnaround times and efficiency as well as optimizing fuel use.



Data to be recorded

- ✓ Equipment position
- ✓ Instant speed
- ✓ Fuel consumption
- ✓ Route made

What should we obtain

- ✓ Route efficiency, fuel consume reduction, less emissions
- ✓ Reduced maintenance
- ✓ Tracking mileage and vehicle usage
- ✓ Improved safety

Moving in to the future

The future is always uncertain, but all the signs suggest that aviation telematics is set for dramatic growth. The technology is there as is the need. By reducing costs and streamlining operations, it can help ground crew to win their daily battles and improve their performances. Although the technology may incur a cost, the potential savings make this a valuable investment.

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MAIN PROJECTS IN SUSTAINABLE MULTIMODALITY PROJECTS

CARWATT

Decarbonising
mobility through
the circular
economy...today!

Convert fleet of long-life industrial and profesional vehicles from combustion to electric by:

Retrofitting vehicles

Design and production of small and médium series of electrification kits using reconditioned parts for the traction of the vehicle or its auxiliary units

Upcycling Li-ion batteries

Integrating battery modules from the automotive industry to produce battery packs equipped with a proprietary battery management system

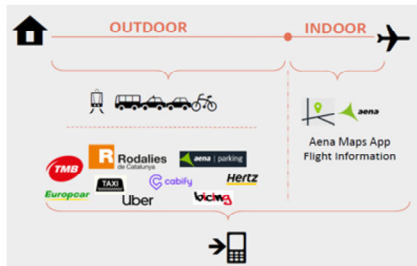


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MAIN PROJECTS IN SUSTAINABLE MULTIMODALITY PROJECTS

MEEP

MOBILITY-AS-A-SERVICE: All available transportation in a single app



KEY BENEFITS FOR USERS

- ✓ Planification of the full trip
- ✓ Control travel times
- ✓ Increase accessibility to airport
- ✓ Personalisation of trips
- ✓ Simplified payments

KEY BENEFITS FOR AENA

- ✓ Attracting digital customer
- ✓ Manage user flow through data
- ✓ Reduced environmental impact
- ✓ Become a leader in multimodal strategy

TASK	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.
Create customized solution at Meep App					TESTING	
Integrate Aena information (Flights and maps)						
Additional features (Timing to gate)						
Integrate Aena services (Parking, shuttle between terminals)						
Integrate external transport services (TMB, Rodalies, taxi, biking)						
Integrate commercial services (Rent a car, VTC, VT)						