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MOBI2GRID

Pilot Experience about Electric Mobility in Galicia/North of Portugal Euroregion
Development projects area:

MOBI2GRID project is located in the Euroregion Galicia and Northern Portugal, being most of the project implemented in the major connecting roads between the two most important and industrialized cities of the Euroregion: Vigo and Porto. Such roads are the highways AP9 and A55 in Spain, A3 and A28 in Portugal. It is in this area where it has been developed the electric mobility corridor Vigo-Porto, covering about 150 km and is the first long-distance cross border electric mobility interurban corridor in Europe.

Extension of the Euroregion: 50,858.30 Km².
- Galicia: 29,574.40 Km².
- Northern Portugal: 21,283 Km².

Euroregion Population: 6,541,664 inhabitants.
- Galicia: 2,796,089 inhabitants.
- Northern Portugal: 3,745,575 inhabitants.
Project background: Collaboration CEIIA/CTAG
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**CTAG**: Technological centre of the car industry in Galicia. Technological Support for the car industry (car makers, suppliers and auxiliary industry in the area)

**CEIIA**: Innovation and excellence centre for the automotive industry in Portugal.

Collaboration since 2002 in several projects.
Focused on the car itself

Idea: To prove the capacity (knowledge, human and technological skills) of the Euroregion to design and build an urban electric car.
Project background: MobiOne (2008)

- Powertrain
- Exterior [new materials]
- Interior [multifunctional]
- Electronics [infotainment & ADAS systems]
- Chassis [new configurations]
MOBI2GRID (2010)

Focused not only on the car itself but on the integration of the car into a wider transport system and not just in Urban areas but in cross-border regions (get knowledge).

Idea: To speed up the adoption of the electric mobility in the Euroregion by implementing and integrating an interoperable system between Galicia and Northern Portugal and doing some testing in the Vigo – Porto electric corridor.

Schedule: January 2011 – June 2013
Mobi2Grid: Objectives and Activities

To establish the Euroregion as a pioneer in the adoption of electromobility through the implementation of an integrated and interoperable system between both regions and the execution of a pilot test with electric vehicles in the Vigo-Porto electromobility corridor.

Activity 1: Observatory of the electromobility in the Euroregion

Activity 2: Conception and development of the integrated and interconnected electromobility system

Activity 3: Prototyping of the cross-border mobility system for the pilot test

Activity 4: Proof and pilot experience in the cross-border electromobility corridor (Vigo-Porto)

Activity 5: Management and coordination

Activity 6: Communication
Electromobility observatory for the Euroregion Galicia-North Portugal

ELECTROMOBILITY OBSERVATORY

- New EV models & prototypes
- Associated technologies
- Charging infrastructure
- Demonstration projects
- Public plans, incentives, etc.

Information system to compile, analyze, filter and distribute the most relevant information for the Euroregion

Technology watching system

- To keep an updated knowledge about main advances in EV and associated charging infrastructure.
- To identify R&D and business opportunities in the Euroregion.
- To provide support to the policy decision process making.
- To raise public awareness about the benefits of electromobility.
- To align project activities with the main technological trends in electromobility, reaching not only regional but international impact.
Mobi2Grid overall technical concept

- Focused on the recharging infrastructure
- Focused on technical and social barriers and the testing of two electric vehicles in the pilot test.
Mobi2Grid pilot test

<table>
<thead>
<tr>
<th>Electric vehicle</th>
<th>User’s data</th>
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</thead>
<tbody>
<tr>
<td>Refrigeration systems: HVAC, high voltage cooling system</td>
<td>Driver identification</td>
</tr>
<tr>
<td>Brake and steering system: ABS, EPS, electrical vacuum pump</td>
<td>Driving data: vehicle speed, acceleration, brake, transit time</td>
</tr>
<tr>
<td>Lightning system: exterior lights (turn lamps, headlamps, parking lamps, fog lamps, tail lamps)</td>
<td>GPS</td>
</tr>
<tr>
<td>Lightning system: interior lights (room lamp, trunk lamp, map lamp, glove compartment lamp)</td>
<td>Odometer data</td>
</tr>
<tr>
<td>Traction motor system: traction motor, inverter</td>
<td>Driver's interactions with vehicle systems</td>
</tr>
<tr>
<td>EV battery system: State of Charge (SOC), voltage, current, temperature, estimated range, depth of discharge (DOD), State of Health (SOH)</td>
<td>Weather data (rain, fog)</td>
</tr>
<tr>
<td>Charging system: level (1, 2 or 3), charge port, energy (kWh), issues, cost</td>
<td>Tire pressure</td>
</tr>
<tr>
<td>Infotainment system</td>
<td>Number of occupants</td>
</tr>
<tr>
<td>Other systems: rear window defogger, heated rear-view mirrors, front and rear wipers, power windows, heated seats</td>
<td>Extra weight (packages in trunk)</td>
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</table>
Car-to-Infrastructure (C2I) applications

- Availability of charging points
- Distance to near charging points
- Road state
- Traffic conditions
- Adverse weather conditions