

PROJECT

ELVIRE

ELectric Vehicle communication to Infrastructure, Road services and Electricity supply

Funding: European (7th RTD Framework Programme)

Duration: Jan 2010 - Mar 2013

Status: Complete with results

Total project cost: €9,241,628

EU contribution: €5,192,756



Call for proposal: FP7-ICT-2009-4

[CORDIS RCN : 94384](#)

Background & policy context:

Taking into account that to date, in Europe, 73% of all oil is consumed by transport, the introduction of Electric Vehicles is considered being of high urgency. However, in order to be ready to embark on E-driving, customers need to be free from concerns of becoming stranded because of lack of power. This project focuses on the development of an effective communication and service platform that helps drivers to manage the charge of their Electric Vehicle and enables efficient use of sustainable energy.

Objectives:

For EVs, the development of an interactive electric energy ICT Service interface between the vehicle and its electricity infrastructure is of utmost importance, next to creating effective business models. The rationale of this project is to contribute significantly to neutralize the driver's 'range anxiety' and encourage the customers to embark on fully electric road transport. Therefore the objective of ELVIRE is to develop an on-board electric energy communication service platform for realistic use-cases including the relevant external communication and services. For this purpose the following actions will be taken:

- select representative use-cases according to realistic scenarios and business-models
- identify and develop those off-board ICT and services needed to comply with the use cases
- develop Prototypes for the on-board Communication and E-energy service unit, and
- verify all integrated sub-systems on prototype level and demonstrate the proof of concept.

Great emphasis is placed on the openness of the Electricity-service platform granting access to multiple players maintaining the customers choice. ELVIRE will become crucial to future electric road transport by closing the gap between vehicle technology and the off-board E-ICT and service environment. ELVIRE will have a strong impact by strengthening competitiveness, energy efficiency and reduce emissions and improve by promoting electrification.

ELVIRE will address a system that will anticipate and be aware of both users' charging needs and the state of the grid. Thus, it would be a smart system providing new functionalities and new business opportunities at the interface between the car and the energy supplier.

Methodology:

The project will start with the definition of the representative mission and the most relevant business models. Based on these specifications, a two-pronged approach will carry on addressing the core research and development activities of ELVIRE: the development of both an on-board Driver Assistance Systems and an external electricity management service.

On-board services will rely on a Driver Assistance System that connects to the computers of the grid operators and identifies which utility is running the nearest local power plug. An on-board charging and metering device will have to monitor the EV's energy status and compare it against the predicted

energy required to reach the destination. These new in-vehicle technologies will support the driver and navigate him safely throughout the E-Infrastructure, toward the most appropriate power plug.

External services will rely on an electricity management system which will process the vehicles' data and combine them with information from the electricity infrastructure and service offers. Then, reliable and secure information will be returned to the driver 'in real-time', allowing him to choose between several offers regarding information, service handling and accounting. The extension of existing facilities will be scrutinised. Emphasis will be placed on the 'openness of the Electricity-service platform', granting access to multiple players and maintaining the customers' choice.

It is a declared objective of ELVIRE to run a representative validation test, putting on trial the internal and external systems and their seamless interaction. Issues concerning privacy and security requirements are also core aspects throughout the project.

Parent Programmes:

[FP7-ICT - Information and Communication Technologies](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Lead Organisation:

Continental Ag

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Organisation Website:

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EU Contribution: €998,000

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EU Contribution: €0

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EU Contribution: €285,392

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Organisation Website:

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EU Contribution: €1,153,623

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Organisation Website:

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EU Contribution: €365,976

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EU Contribution: €189,000

Erasmushogeschool Brussel**Address:**

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EU Contribution: €57,000

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EU Contribution: €408,000

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EU Contribution: €386,750

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EU Contribution: €432,000

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EU Contribution: €653,028

Lindholmen Science Park Aktiebolag**Address:**

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Organisation Website:

<http://www.lindholmen.se>

EU Contribution: €263,987

Technologies:

Information systems
Eco-Drive app

Development phase: Research/Invention

Key Results:

The study does not demonstrate any final results yet as it is still ongoing. However, after the first year a periodic report was published, which summarised the results and the work performed so far. The main activities and results of the 1st year are:

- Detailed scenarios and use cases from the point of view of the average Electric Vehicle driver are defined, aimed to reduce drivers' range anxiety and promote widespread use of Electric Vehicles, taking into consideration the energy services needed to support the driver on his journey. The defined use cases were analysed, with regard to the implementation of the Control & Management Centre (CMC). The uses cases were also analysed with regard to the implementation of the Communication Management Platform (CMP).
- A preliminary evaluation of the impact of Electric Vehicles to the current automotive industry business model is presented. Relevant literature was summarized and interviews were conducted with industry experts. The findings and a common business model framework was used to evaluate more stakeholders in the Electric Vehicle industry, such as utility companies, suppliers, infrastructure providers. Each stakeholder's role in the value chain, their contribution to the overall solution and interdependencies between stakeholders was analysed.
- An analysis was made of the communication between charging components and the electricity infrastructure supporting the Electric Vehicle services given to the driver. The infrastructure includes charge spots, allowing recharge of the vehicle's battery, based on a managed 'smart charge' programme, and battery switch stations, allowing quick battery replacement extending driving range without having to wait for the battery to recharge.
- Possible new e-mobility services and billing of charging events were analysed. If electric vehicles are to gain acceptance, users should have the possibility to charge their car battery at whatever charging station available, regardless of which provider operates it, and receive one monthly bill

coming from the service provider.

- Requirements for the interface between the Communication Management Platform (CMP) and the utility were analysed.
- Requirements analysis and defined specification of technical requirements of the Electric Vehicle Communication Devices (EVCD), as well as first development of most effective EVCD concepts, to handle and process Electric Vehicles internal and driver defined data, as well as to ma

Strategy targets

Innovating for the future: technology and behaviour: Promoting more sustainable development

Documents:

 [Publishable Summary M1-M15 \(Other project deliverable\)](#)

STRIA Roadmaps:

Cooperative, connected and automated transport, Transport electrification, Smart mobility and services

Transport mode: Road transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Digitalisation, Decarbonisation

Geo-spatial type: Other