Partners

- Göteborg Energi - Regional Electric Utility
- Ericsson - provider of communications and IT systems and services
- Volvo Cars (VCC) - provider of passenger cars
- Viktoria Institute - IT research institute, part of Swedish ICT

Project history

The project concept, of using intelligent infrastructure for controlling the charging of electric vehicles, was first initiated by Viktoria Institute in November 2008 in a meeting with Göteborg Energi. The idea was suggested to Ericsson and Volvo Cars some months later. The first meeting with all partners was held in April 2009 where the project idea was further developed. The pre study project was initially funded by the partners followed by funding by Region Västra Götaland and Göteborg Energi Research Foundation.

Project vision

To stimulate the market introduction of electric vehicles by making them easier to own and use, enabled by an intelligent infrastructure, supported by information and communication technology (ICT).

Project goals

ELVIIS is a research project with the overall goal to develop a prototype platform that enables communication between the vehicle, the car owner / driver and the network owner / distributor (and even third-party service developers, operators, road authorities, etc.).

The ELVIIS-project has the following sub goals:

- To identify cross-industry barriers for large scale market penetration of electric vehicles.
- To identify the demands and possibilities an intelligent infrastructure creates regarding functionality for the user.
- To identify new business opportunities and technical solutions for power suppliers, the car industry and telecom service.
- To define scalable system architecture for an intelligent infrastructure for electric vehicles, that is suitable for an international market.
• To develop suitable services, like billing and charging, and implement them on the platform.

**Long-term goals**

The long-term goals of the project are:

• Contribute to the reduction of green house gases (e.g. carbon dioxide), reduced emissions, reduced oil-dependence, and less noise, partly by enabling faster mass introduction of electric vehicles and partly by enabling more energy efficient road transport and sustainable mobility.

• Integrate the charging of Electric Vehicles as an important part of operating a smart grid to smooth the peak energy demand, making the grid more efficient and cost-effective. It also supports the expansion of wind power in Sweden.

• Enabling the creation of business models where new players can develop value-added services.

• Develop excellence in Sweden as a breeding ground for new research initiatives, innovation and enterprise.

• Increase the Swedish competitiveness by positioning Swedish industry in an important area for the future.

**Project results**

The ELVIIS project has resulted in:

• A scalable system architecture for an intelligent infrastructure for electric vehicles, that is a part of Ericsson’s architecture and strategy of 50 Billion connected devices (where cars are themselves devices).

• An understanding of the merits of having energy metering in the car itself. This solution differs from others suggested, where the meter is in the charging point or in the charging cable. There are several advantages of having the meter in the car:
  
  o All existing ordinary power outlets can be used to charge the car and still making it possible to bill the car owner.
  
  o The costs for the electric charging infrastructure are kept to a minimum since all existing power outlets can be used. Expensive intelligent charging poles are kept to a minimum.
  
  o There will most likely be more charging points than electric vehicles in the society. For this reason, the meter should be in the vehicles to keep the total costs for the electric infrastructure to a minimum.

• The electric intelligent infrastructure communication is advantageously done by using the existing mobile network, thus reducing the communication infrastructure costs.
By using the existing mobile network the transfer of all types of data at high speed is supported.

- The platform architecture allows new services to be quickly developed.
- The billing service has been developed within the project.
- An intelligent charging service has been developed within the project that allows the energy companies to have better control of the charging (if the vehicle user allows it). This is advantageous from a grid perspective.

The result so far should be seen as a proof-of-concept and will be further developed by the project partners. User studies and analysis of user behavior before and after ELVIIS implementation will also be conducted as a part of the project as well as business model analysis.