Project Synopsis

EC Programme: FP7 ICT-GC (Green Cars)

Grant agreement: N°314151

Start date: October 2012

Duration: 45 months

Coordinator: Softeco Sismat Srl (IT)

Project Website

www.fp7-emerald.eu

Follow us on

www.facebook.com/fp7.emerald

twitter.com/EmeraldFP7

EMERALD Consortium

- Telvent ARCE Sistemas SA-Schneider Electric (ES)
- Fundación Tecnalia Research & Innovation (ES)
- HI iberia Ingeniería Y Proyectos SL (ES)
- Instytut Transportu Samochodowego (PL)
- Institute of Communication And Computer Systems(GR)
- Cosmote Kinites Tilepikoinonies AE (GR)
- Comune di Lucca (IT)
- Lucense SCpA (IT)
- Public Power Corporation SA (GR)
- Comarth Engineering SL (ES)
- Solaris Bus & Coach SA (PL)

Project Coordinator

Softeco Sismat Srl (IT)
Marco BOERO
telephone: +39 010 6026.1
fax: +39 010 6026.350
email: marco.boero@softeco.it

EMERALD

Energy ManagEment and RechArging for efficient eLectric car Driving

European Green Cars Initiative

EMERALD addresses the improvement of the energy efficiency of fully electric vehicles (FEVs) through ICT means. To this end, EMERALD will deliver clear and specific advances over the state-of-the-art (SoA), focusing on energy use optimization and on the seamless integration of the FEV into the transport and energy infrastructure.
The goal is to assist the FEV in becoming a successful commercial product.

"the EMERALD project will innovate a range of advanced functionalities and solutions targeted for efficient vehicle energy management as well as for effective integration with the grid, with cooperative transport infrastructures and with fleet management and planning systems"

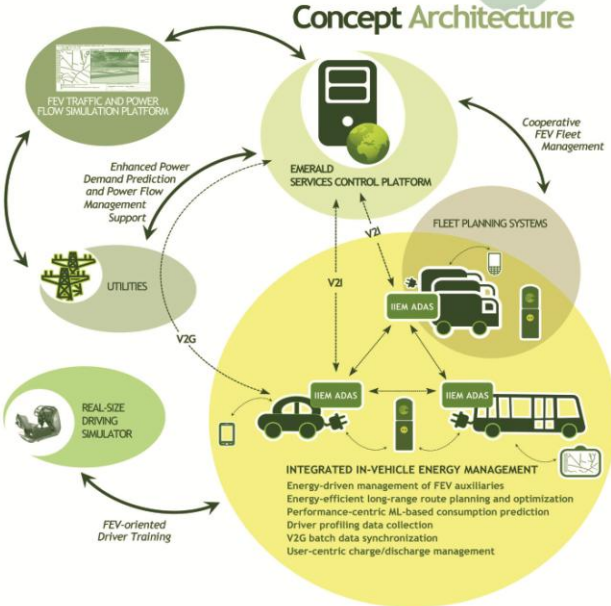
These novel functionalities are briefly listed below:

- Energy-driven management of FEV auxiliaries
- Energy-efficient long-range route planning and optimization
- Performance-centric machine learning for consumption prediction
- Driver profiling data collection
- Vehicle-to-grid data synchronization
- User-centric charge and discharge management
- Enhanced power demand prediction and power flow management support
- Cooperative FEV fleet management
- FEV-oriented driver training

Objectives

In this framework, the EMERALD project intends to take advantage of the thorough R&D work performed so far in the context of earlier Green-Car (GC) projects, so as to achieve significant advancements that will facilitate the smooth integration of FEVs in everyday life.

Concept Architecture



In order to implement, integrate, test and demonstrate the solutions and functionalities that have been described, EMERALD will pursue the following S&T objectives:

- Design and development of an Integrated In-vehicle Energy Management and Advanced Driver Assistance System (IIEM-ADAS)
- Design and development of a Central Platform for Data Integration and Interface with External Systems (Power Utilities, Recharging Infrastructure, Traffic Information Providers)
- Design and development of an Enhanced Power Demand Prediction and Power Flow Support Management System
- Design and development of a FEV-oriented Traffic and Power Flow Simulation Platform
- Energy-aware Real-size Driving Simulator for FEV Driver Training and Impact Assessment
- Validation and evaluation through extensive simulation and field trials

Demonstration

EMERALD will conduct extensive trials for thorough testing and validation of the proposed systems and functionalities. The goal of demonstration activities is to ensure that all of the developed system components and tools deliver the expected functionalities, as well as to properly evaluate the impact of the project's concept and solutions.

EMERALD will conduct three complementary types of trials:

- Simulation trials based on EMERALD's FEV-oriented Traffic and Power Flow Simulation Platform
- Driving simulator trials and driver training based on EMERALD's Energy-aware Real-size Driving Simulator
- Field trials with actual FEVs in real-world trial sites

The field trial sites of EMERALD will include both urban areas as well as the interurban region between urban centers. Particularly, for real-life trials EMERALD has selected two main sites:

- Urban site for electric bus city trials in Poland
- Lucca (Tuscany, Italy). These trials will be conducted using a fleet of fully-electric vans during their everyday city delivery service, and will mainly focus on Cooperative FEV fleet management
- The region between Bilbao, Vitoria-Gasteiz and Donostia-San Sebastian (Basque Country, Spain). These trials will involve both urban centers and the interurban areas between them, and will target more generally FEVs for passenger mobility

The FEVs for real-life trials will be provided by:

Solaris: a urban fully electric 12-meters bus (Urbino 12)
Municipality of Lucca: electric vans suitable for cargo delivery (Fiat Ducato FEV)
Comarth: a light FEV available in a wide range of passenger and cargo setups (CR Sport).