



## Deliverable 1.1 | Project test factsheet, public project description



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<b>Dissemination</b>	PU
<b>Project Coordination</b>	RB
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7th Framework Programme  
GC.ICT.2011.6-8 PPP GC: ICT for fully electric vehicles  
Architectures for Energy, Communication and Thermal Management  
Grant Agreement No. 285526  
STREP – Small or medium-scale focused research project

[www.fp7-opener.eu](http://www.fp7-opener.eu)

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## Version control

Version	Date	Description
1.0	05/26/2011	Final version of project factsheet and press release

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# 1 OpEneR Project Factsheet



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Project\_Factsheet.pdf



# OpEneR

## Optimal Energy consumption and Recovery based on system network



**OpEneR will establish new driving strategies and driver assistance systems that significantly increase the efficiency, driving range, and safety of electric vehicles. This is to be achieved by merging data from on-board and off-board sources. A particular focus will lie on an optimal cooperation between the electric drivetrain and the regenerative braking system, supported by data from radar, video, satellite navigation, car-to-infrastructure and car-to-car.**

### At a Glance

#### Project acronym

OpEneR – Optimal Energy consumption and Recovery based on system network

#### Grant agreement no

285526

#### Project type

STREP

#### Programme

7th EU Framework Programme

#### Project coordinator

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#### Partners



PSA PEUGEOT CITROËN



#### Start date, duration

May 1st 2011, 3 years

#### Total cost

Budget: 7.741.705 €  
EU funding: 4.400.000 €

#### Project Website

<http://www.fp7-opener.eu>

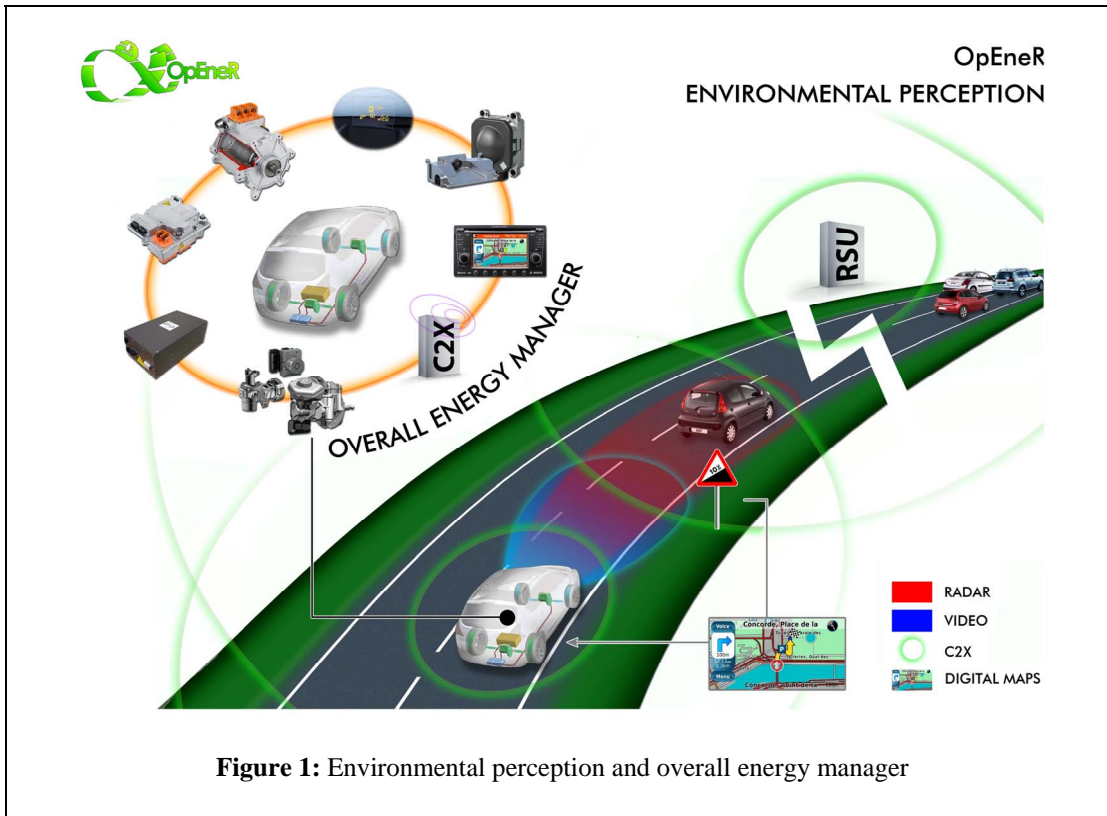
### Partners

The project partners are the Austrian powertrain development company AVL List GmbH, the Spanish research institute Centro Tecnológico de Automoción de Galicia (CTAG), the German Forschungszentrum Informatik Karlsruhe (FZI), the French car manufacturer PSA, and the German companies Robert Bosch GmbH and Robert Bosch Car Multimedia GmbH.

### Objectives

Vehicle electrification will contribute significantly to the further reduction of vehicle fleet CO<sub>2</sub> emissions. However, the limited electric driving range, very high battery price, and long charging times of today's fully electric vehicles are major impediments to their widespread market acceptance. OpEneR aims to unlock the market for electric vehicles by increasing the electric driving range without increasing battery size, and thus also by limiting battery price and charging time.

OpEneR will reduce the “range anxiety” that drivers of fully electric vehicles experience, through the realization of a longer, more consistent, predictable and clearly displayed remaining electric driving range, with the use of highly innovative controller software algorithms. These algorithms will merge data from a diverse range of on-board and off-board sources (existing and new) to provide timely and



effective driver guidance through enhanced vehicle dashboard displays (see Figure 1). This advanced support system will allow the drivers to consistently adapt their route and driving style in order to achieve the best energy efficiency and thus electrical driving range, and to arrive at their chosen destination as quickly and safely as practically possible.

## OpEneR Technology

The OpEneR system will provide advanced and fully integrated driver support, based on a networked architecture comprising for example, vehicle, battery, e-machine, regenerative braking, adaptive cruise control, and 3D satellite navigation route data, as well as car-to-infrastructure and car-to-car (c2x) communication and enhanced haptic dashboard and head-up (see Figure 1). Furthermore, a sophisticated and integrated vehicle stability controller with enhanced environmental sensing will improve safety.

To assure the success of OpEneR, the new technologies will be developed in three stages, the so-called OpEneR Technology Levels. The project results will be demonstrated in two fully operational electric vehicles, which will be tested under real world conditions. OpEneR technologies are wholly complementary to other initiatives, such as enhanced battery technologies, and can also be applied to other vehicle types such as hybrids and range ex-

tenders to accelerate the market acceptance of fully or partially electric vehicles.

## Expected Results

A central goal of OpEneR is the investigation of an innovative and highly efficient overall energy manager that uses information from underlying subsystems to generate optimal driving and operation strategies. The strategies will vary from time optimised up to range maximised. An advanced and intuitive HMI display will encourage and support the driver to control an electric vehicle for optimal energy efficiency, in a comfortable and safe way. Significantly improved vehicle range estimations will be computed, with the use of 3D digital map information. Furthermore, optimised vehicle deceleration profiles for best energy recuperation and safety will be investigated. An enhanced simulation tool chain will be built-up to allow both the virtual development and the validation of new OpEneR Technologies, with respect to energy efficiency, enhanced HMI concepts and safety. Radar sensors and video cameras will be used to monitor vehicle surroundings, define smooth driving strategies, plan driving corridors, support lane keeping, and to detect road signs and objects.

### For further information:

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## 2 OpEneR Press Release



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## European Research Project OpEneR started **Improving the mileage of fully electric vehicles**

June 2011

PI 7421 UBK Ks

- ▶ EU funded project to increase efficiency of electric vehicles
- ▶ Merging of on-board and off-board data will enable new assistance functions
- ▶ Project co-funded by the European Commission

A new European Research Project has been launched. OpEneR, which stands for “Optimal Energy consumption and Recovery based on system network,” will develop new driving strategies and driver assistance systems that significantly increase the efficiency, driving range, and safety of electric vehicles. This is to be achieved by merging data from on-board and off-board sources. A particular focus will lie on an optimal cooperation between the electric drivetrain and the regenerative braking system, supported by data from radar, video, satellite navigation, car-to-infrastructure and car-to-car systems.

The project partners are the Austrian powertrain development company AVL List GmbH, the Spanish research institute Centro Tecnológico de Automoción de Galicia (CTAG), the German Forschungszentrum Informatik Karlsruhe (FZI), the French car manufacturer PSA, and the German companies Robert Bosch GmbH and Robert Bosch Car Multimedia GmbH. The project is a European research project under the Seventh Framework Program, co-funded by the European Commission – Directorate General Information Society and Media. The total budget is 7.74 million euros, 4.4 million euros of this sum in the form of subsidies. The project is planned for three years and will be led by Bosch.

Vehicle electrification will contribute significantly to the further reduction of vehicle fleet CO2 emissions. However, the limited electric driving range, very high battery price, and long charging times of today's fully electric

vehicles are major impediments to their widespread market acceptance. OpEneR aims to unlock the market for electric vehicles by significantly increasing the electric driving range without increasing battery size, and thus also by limiting battery price and charging time.

OpEneR will reduce the “range anxiety” that drivers of fully electric vehicles experience, through the realization of a longer, more consistent, predictable and clearly displayed remaining electric driving range, with the use of highly innovative controller software algorithms. These algorithms will merge data from a diverse range of on-board and off-board sources (existing and new) to provide timely and effective driver guidance through enhanced vehicle dashboard displays. This advanced support system will allow the drivers to consistently adapt their route and driving style in order to achieve the best energy efficiency and thus electrical driving range, and to arrive at their chosen destination as quickly and safely as practically possible.

The OpEneR system will provide advanced and fully integrated driver support, based on a networked architecture comprising for example, vehicle, battery, e-machine, regenerative braking, adaptive cruise control, and 3D satellite navigation route data, as well as car-to-infrastructure and car-to-car communication and enhanced haptic dashboard and head-up displays. Furthermore, a sophisticated and integrated vehicle stability controller with enhanced environmental sensing will improve safety.

To assure the success of OpEneR, the new technologies will be developed in three stages, the so-called OpEneR Technology Levels. The project results will be demonstrated in two fully operational electric vehicles, which will be tested under real world conditions. OpEneR technologies are wholly complementary to other initiatives, such as enhanced battery technologies, and can also be applied to other vehicle types such as hybrids and range extenders to accelerate their market acceptance.

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*Automotive Technology is the largest Bosch Group business sector. In 2010, its sales came to 28.1 billion euros, or 59 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The roughly 167,000 Automotive Technology associates worldwide work in seven areas of business: injection technology for internal combustion engines, powertrain peripherals, alternative drive concepts, active and passive safety systems, assistance and comfort functions, in-car information and communication, as well as services and technology for the automotive aftermarket. Bosch has been responsible for important automotive innovations, such as electronic engine management, the ESP® anti-skid system, and common-rail diesel technology.*

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**Press photo:** 1-UBK-17697



### **European Research Project OpEneR**

The European Research Project OpEneR has been launched. Its project partners will develop new driver assistance systems that significantly increase the efficiency, driving range, and safety of electric vehicles.

# Factsheet OpEneR:

**Partners:**

AVL List GmbH

Centro Tecnológico de Automoción de Galicia

Forschungszentrum Informatik Karlsruhe

Peugeot Citroën Automobiles SA

Robert Bosch GmbH (Coordinator)

Robert Bosch Car Multimedia GmbH

**Project reference:** 285526

**Duration:** 36 months, from May 2011 to April 2014

**Total Budget:** 7.74 million euros

**Project funding:** 4.40 million euros

**Contract type:** Small or medium scale focused research project (STREP)

**Funding scheme:** Collaborative project

**Sub programme area:** ICT for fully electric vehicles

**Funding body:** European Commission, Directorate-General Information Society and Media

**Call (part) identifier:** FP7-2011-ICT-GC

**Links:** OpEneR Website: [www.fp7-opener.eu](http://www.fp7-opener.eu)

**Project leader:** See project contact