

# Work Programme 2011

## Objective ICT-2011.6.8 (letters e to h)

### ICT for fully electric vehicles



Challenge 6 (ICT for low carbon economy) explores how ICT can contribute to delivering a sustainable, low carbon society and help progress towards the Europe 2020 targets on climate and energy.

#### Objectives

ICT-2011.6.1 Smart Energy Grids

ICT-2011.6.2 ICT systems for energy efficiency

ICT-2011.6.3 ICT for efficient water resources management

EEB-ICT-2011.6.4 ICT for energy-efficient buildings and spaces of public use

ICT-2011.6.6 Low carbon multi-modal mobility and freight transport

ICT-2011.6.7 Cooperative Systems for energy efficient and sustainable mobility

**GC-ICT-2011.6.8 ICT for fully electric vehicles**

*p.85-87, Work Programme 2011*  
[ftp://ftp.cordis.europa.eu/pub/fp7/docs/wp/cooperation/ict/c-wp-201101\\_en.pdf](ftp://ftp.cordis.europa.eu/pub/fp7/docs/wp/cooperation/ict/c-wp-201101_en.pdf)

Full electric vehicles (FEV) means electrically propelled vehicles that provide significant driving range on pure battery based power. It includes vehicles having an on-board fuel based electrical generator (Range Extender based on Internal Combustion Engine or fuel cells).

Projects supported under this objective should advance the research, development and integration of major building blocks of the FEV, and integrate the FEV with infrastructures.

#### TARGET OUTCOME

##### **e) Electric Drive and Electronic Components**

Partitioned and highly efficient power electronics devices, converter and inverter and electrical interconnects that simplify packaging and cooling, EMI-EMC designs, the management of high voltages, currents and temperatures and hardware-in-the-loop technology for algorithm and component testing. Projects should target the level of integration between the drive and the motor while maximising the efficiency of the drive over a wide range of operation of the motor as well as in relation to temperature excursions and voltage variability and fail safe tested components.

##### **f) Integration of the FEV in the cooperative transport infrastructure**

ICT-based interaction between the driver, the vehicle and the transport and energy infrastructures, for FEV trip planning and

optimization including energy use and

charging. In order to compensate for the limited autonomy range, gains in energy efficiency, charging strategies and route optimisation by using of traffic information are needed to turn the FEV into a mass market product. Adaptive strategies, algorithms and operation modes are needed for the charge and discharge management of the FEV's that balance, predict the range and adapt to the energy needs of the user in respect of the properties of vehicle's battery and the grid. Research should also address opportunities for improving energy efficiency provided by automated driving and driver training

### **g) Functional Safety and Durability of the FEV**

Electrical and electronic components affect vehicle dynamics, safety and durability. Failsafe concepts are an essential element of the system. Requirements and standards related to electromagnetic compatibility and health impacts of electromagnetic fields should be developed. Continuous improvements are expected against low frequency electromagnetic fields as well as on local sensing of currents and electromagnetic fields, on safe and robust components and subsystems. Research will also address adaptation and improvement of in-vehicle active safety for FEVs, integrated driver-vehicle – infrastructure safety, protection of vulnerable road users, and FEV emergency handling procedures. Moreover, test methods will be required.

### **h) Coordination and Support Action "FEV made in Europe"**

One action for the coordination of a FEV Strategic Research Agenda for ICT, components and systems, for the clustering of R&D projects in the field, and for training, education and dissemination activities. The agenda should also investigate new usages for the FEV (e.g. last mile delivery and mobility for the elderly and disabled); it should cover standardisation measures; it should propose measures for harmonisation of national research policy measures and programmes, and also propose actions for international collaboration. The action should involve relevant electrical vehicle stakeholders.

## **EXPECTED IMPACT**

- Improved energy efficiency and extended driving range of the FEV
- Reduced costs of the electronic components and the overall FEV at increased performance
- Mitigated constraints for the user of the FEV versus the Internal Combustion Engine vehicle
- The FEV seamlessly implemented in the smart grids and existing infrastructure
- Significant improvement of FEV's safety, comfort and new information and comfort services for FEV users.
- Strengthened global competitiveness of the European automobile, ICT and battery sectors. Market penetration of key components of FEVs.

### **Funding Schemes**

e, f, g) STREP in 2012

h) CSA in 2012

Indicative budget distribution

- e, f, g) EUR 29 million

- h) EUR 1 million

Call:

e,f, g, h) FP7-2012-ICT-GC