Report on the:

Second Workshop on Research for the Fully Electric Vehicle

11 June 2010 – Brussels

Organised by:

European Commission
Directorate-General *Information Society and Media*
Unit G.2
"*Micro and Nano Systems*"

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1. Introduction

Following a first event in 2009[1] a second Workshop on Research for the Fully Electric Vehicle has been organized on June 11, 2010 in Brussels. This second workshop had two specific objectives :

- A **clustering and concertation meeting** bringing together **European funded projects on ICT for the Fully Electric Vehicle**. The first call for proposals in the framework of the European Green Cars Initiative[2] (Call Identifier FP7-2010-ICT-GC) with deadline on 3.11.2009 addressing the area of ICT for the Fully Electric Vehicle resulted in the selection of seven new projects that are being launched in 2010. Additionally, several other projects addressing the same theme have been launched through the Joint Technology Initiatives ENIAC[3] and ARTEMIS[4] previously. The main objectives of the meeting were to create complementarities of the different EU funded projects' activities for the Electric Vehicle, to identify potential synergies and relevant topics for further cooperation and thus to improve the performance of the individual EU funded projects.
- A presentation by national funding agencies and ministries of various Member States about the **ICT related research programmes and projects at the national level on the topic of Electric Vehicles**. The intention was to offer an opportunity to synchronise efforts in view of a common goal, i.e. the international competitiveness of the European automotive sector. Key issues such as regulation and standardisation needs for a common European infrastructure of the need for public incentives were part of these discussions.

Both objectives have been covered in two main sessions during the workshop, the first one in the morning and the second in the afternoon. As a bridge between the two main sessions two dedicated presentations were given by **Josef Affenzeller** of AVL/ERTRAC :

- **Standardisation** : A challenge for the Full Electric Vehicle – Plug-in as well as FEV
- Overview of **worldwide automotive electrification plans**

The workshop was opened with a presentation by **Thierry Van der Pyl**, Director Components and Systems with DG Information Society and Media, European Commission. In his opening statement he presented the global challenges for a new electro-mobility approach in Europe, driven by issues such as the global recession, sustainable transport, competitiveness and economic and social benefits, as smart, sustainable and inclusive growth is needed for creating more jobs in Europe. He continued with a SWOT analysis for the Electric Vehicle in Europe, which has a strong automotive industry. Different EU programmes are focussing on the Fully Electric Vehicle such as the European Green Cars Initiative PPP and the ENIAC and ARTEMIS Joint Undertakings. More focus will be required in the future because the available money is thinly spread for the large amount of topics covered by these EU programmes. The question will be to find out how to articulate these different programmes in order to become more efficient. The European Green Cars Initiative is part of the European Economic Recovery Plan, defined in 2008 in order to stimulate demand, boost consumer confidence and above all to maintain jobs. It is an ad-hoc action to reinforce the European competitiveness and to speed up the shift towards a low carbon economy. Mr. Van der Pyl covered in detail the recent European Commission's Communication on Clean and Energy Efficient Vehicles, the European Parliament Resolution on Electric Cars and the Competitiveness Council Conclusions on clean and energy-efficient vehicles for a competitive automotive industry and decarbonised road transport. Hence, a strong political support is present in Europe for a new mobility approach based on Fully Electric Vehicles. Future research programmes such as FP8 will be roadmap driven and will require the involvement of all relevant stakeholders such as the automotive industry and the different Member States. A more open approach towards SMEs would also be pursued.

[1] European Commission Workshop on European Commission and Member States' R&D Programmes for the Electric Vehicle, 26 June 2009.
[2] www.green-cars-initiative.eu
[3] ENIAC : European Nanoelectronics Initiative Advisory Council : www.eniac.eu
[4] ARTEMIS : The ARTEMIS Embedded Computing Systems Initiative : www.artemis-ju.eu

2. Presentations of EU funded Research Projects

2.1 ICT4FEV

- Project title : Information and Communication Technologies for the Full Electric Vehicle
- Coordinator : VDI/VDE-IT
- Project type : Coordination Action
- Funded by the European Commission – ICT Call GC 10.3
- Project website : www.ict4fev.eu
- Presentation by : Gereon Meyer, VDI/VDE-IT

ICT4FEV is a Coordination Action in the framework of the European Green Cars Initiative. The focus of the project is on enabling the full electric vehicle (FEV) by opening new technology paths towards energy efficiency, functionality and usability that are complementary to future advances in performance of battery cell technology. It can be foreseen that early EV technology leadership will be determinant for the global competitiveness of major European industries such as the automotive, energy and ICT sector. The objectives of the ICT4FEV project include:

- To build a R&D community
- To edit a European roadmap
- To recommend standards, regulations, business cases and R&D priorities
- To establish a European Organization / Think Tank for the FEV.

The consortium is lead by VDI/VDE-IT and includes as members CRF (I), Siemens (D), NXP (NL), and EADS (F), as well as AVL List (A). Further organisations have been invited to contribute to the project as associate partners.

ICT4FEV started on 1 May 2010 as the first project of the European Green Cars Initiative. It is funded by the European Commission's Directorate General Information Society and Media and has a duration of 24 months.

2.2 EcoGem

- Project title : Cooperative Advanced Driver Assistance System for Green Cars
- Coordinator : TEMSA
- Project type : STREP
- Funded by the European Commission – ICT Call GC 10.3
- Presentation by : Kerem Kürklü, TEMSA

The objectives of the EcoGem project are:

- To render the FEV capable of reaching the desired destination(s) through the most energy efficient route(s) possible
- To render the FEV fully aware of the surrounding recharging points/stations while travelling

The EcoGem approach is based on:

- Continuous monitoring of the vehicle's battery level and energy consumption
- Autonomous optimized route planning
- Cooperative optimized route planning
- Continuous awareness of recharging points and optimized recharging strategy
- Online management of recharging points
- Holistic approach for energy efficiency and operational cost optimization

The consortium consists of 11 partners coming from 8 different countries and is lead by TEMSA (TR). The project has a duration of 30 months.

2.3 ELVIRE

- Project title : Electric Vehicle Communication to Infrastructure, Road Services and Electricity Supply
- Coordinator : Continental Automotive GmbH
- Project type : STREP
- Funded by the European Commission – ICT Call 4
- Project website : www.elvire-project.org
- Presentation by : Hannes Lüttringhaus, Continental

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 E-driving, customers need to be free from concerns to get 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.

With a customer centric view on electric mobility, the ELVIRE project is aiming to solve acceptance issues stemming from Electric Vehicle's limited range.

In order to optimize the exploitation of the scarce resource and to cope with limited battery capacity, advanced mobility management systems and services will be developed. New processes and algorithms will be searched as a foundation for those services which will be developed and validated in real EVs. Usability tests will conclude that the results are qualified for commercial real world deployment.

The ELVIRE project is laying the groundwork for the shift to sustainable mobility for everyone.

The project's purpose is to develop an effective system which is able to neutralize the driver's "range anxiety", i.e. the fear to break down due to the vehicle's power range limitation. In order to ease and optimize energy management of Electric Vehicles (EV) and to cope with the sparse distribution of electrical supply points during the ramp-up phase, innovative Information and Communications Technologies and service concepts will be developed.

The ELVIRE consortium is lead by Continental Automotive GmbH and consists of 11 partners coming from 6 countries. The project started on 1 January 2010.

2.4 CASTOR

- Project title : Car Multi Propulsion Integrated Power Train
- Coordinator : Infineon Technologies
- Project type : STREP
- Funded by the European Commission – ICT Call GC 10.3
- Presentation by : Reiner John, Infineon Technologies

The objectives of the CASTOR project are:

- Advancements in efficiency and safety will be achieved by implementing a multi propulsion power train based on the integration of the energy storage with the propulsion unit based on the related synergies.
- The future requirements of the multi propulsion EV power train are determined by their integration level, the interoperability of the propulsion units, there functionality and robustness.
- The future concept is not based only on the integration of the component functionalities but also considering an holistic approach for the thermal management.
- The research will focus on the EV power train consisting of the drive inverter, accumulator and engine.

Key research topics that are addressed in CASTOR include:

- The integration of accumulators (batteries, super capacitors) and inverters enabling next generation of high dynamic electrical power train
- The integration of thermal management for the inverter and accumulator enabling high efficient decentralized thermal systems
- Accumulator performance based on the combination of cells with physically different properties in terms of power dense cells and energy dense cells (e.g. Li-Ion and Super capacitor) will enable new functionalities and higher efficiency.

The project consortium is lead by Infineon Technologies and consists of 7 partners coming from 5 countries. The project has a duration of 3 years.

2.5 E³Car

- Project title : Energy Efficient Electrical Car
- Coordinator : Infineon Technologies
- Project type : Integrated Project
- Funded by ENIAC Joint Undertaking
- Project website : www.e3car.eu
- Presentation by : Reiner John, Infineon Technologies

The goal of the E³Car project is to extend the travel range of electric vehicles by up to 35 percent, with a battery unit of the same size as a current baseline. Alternatively, this means battery units up to 35 percent lighter and more compact, while providing the same travel range as a current baseline, will be possible. The results of the E3Car project should help make Europe the world leader in the advancement and production of electric vehicles.

As part of the E³Car project and by the end of 2011, Europe is targeting research on innovative electronic components that play a key role in electric vehicle power consumption. Research will focus primarily on semiconductor components and power modules that control the supply and distribution of power in electric vehicles. These are used in the powertrain, which consumes most of the car's energy, as well as in power converters and lithium-ion batteries. Project efforts are concentrated on extending the travel range per battery charge, on integrating components to make the battery, charge unit and power distribution network lighter and more compact, and on increasing the efficiency of the power converter so that as much battery charge as possible is used to drive the vehicle and is not lost through heat dissipation.

The ENIAC E³Car project covers the research and development of nanoelectronics technologies, devices, circuit architectures and modules to build efficient components for Electrical Vehicles (EVs) and demonstrations in the final systems. The project has a vision to:

- Build a solid nanoelectronics technology base for Europe.
- Establish standard designs and platforms for electrical/hybrid vehicles with a significant industrial, economic, innovation and societal impact to enable the path to the all electrical vehicle.
- Develop efficient and smart semiconductor components for the first industrial generation of energy efficient electrical vehicles.

The E³Car project covers 3 functional EV domains:

- Energy : Batteries, super capacitors, range extender, grid connection
- Propulsion : Power converters and motor generators
- Auxiliary systems : Power supply only

Power and signal distribution, chassis and body and board control are not covered by E³Car.

The ENIAC E³Car consortium is lead by Infineon Technologies and consists of 33 partners coming from 11 European countries.

2.6 P-MOB

- Project title : Integrated Enabling Technologies for Efficient Electrical Personal Mobility
- Coordinator : Centro Ricerce Fiat
- Project type : STREP
- Funded by the European Commission – ICT Call GC 10.3
- Presentation by : Pietro Perlo, Centro Ricerce Fiat

The objective of the P-MOB project is to develop a safe and ergonomic small vehicle addressing personal mobility needs having:

- Distributed powertrain solutions (optimisation of the drive train as a whole)
- Ultralight structure
- Advanced aerodynamic solutions
- V2G+I technologies
- On board solar cells
- State-of-the-art ICT technology for energy flow management and connectivity.

The P-MOB project addresses the design and development criteria of EVs basic building blocks such as:

- Overall system optimisation based on two PM motors for enhanced efficiency of the Drive train
- Implementation of Advanced V2G+I
- On board V2G multifunctional charger for V2G
- Low weight and aerodrag body
- Solar panels distributed on both horizontal and vertical surfaces with smart adaptive electronic for a continuous optimization of the output under shadowing
- Solar output to battery load optimised adapting coupling
- Finalisation trough a demo vehicle for urban mobility integrating the proposed concepts.
- Guidelines, IPR and experience upon which to build a world-leading EU position to track and exploit the global uptake of FEV mobility.

The P-MOB consortium is lead by Centro Ricerce Fiat and consists of 7 partners coming from 4 European countries. The project has a duration of 3 years.

2.7 Pollux

- Project title : Process oriented electronic control units for electric vehicles developed on a multi-system real-time embedded platform
- Coordinator : Centro Ricerce Fiat
- Project type : Coordination Action
- Funded by the ARTEMIS Joint Undertaking
- Project website : www.artemis-pollux.eu
- Presentation by : Marco Ottella, Centro Ricerce Fiat

The objective of Pollux is to develop a distributed real time embedded systems platform for next generation electric vehicles, by using a component and programming-based design methodology. Reference designs and embedded systems architectures for high efficiency innovative mechatronics systems will be addressed with regard to requirements on composability, networking, security, robustness, diagnosis, maintenance, integrated resource management, evolvability and self-organization.

- Next generation EVs will begin the convergence between computer and automotive architectures: future automobiles will be mechatronic systems comprising a multitude of plug-and-play and self configurable peripherals. Peripherals will be embedded systems containing hardware, algorithms, software. The architecture will be based on distributed energy while the propulsion systems will

adopt radical new control concepts. Sensing, actuation, signal processing and computing devices will be embedded in the electronic equipment, electrical motors, batteries and the mechanical parts as well.
- The systems used to control the chassis and the power train will form the "computing engine" that automates lower level tasks during vehicle use (driver assistance, terrain evaluation, predictive battery management) and will enable future higher level functionalities (auto pilot), by means of novel human-machine interfaces.
- Development of design tools and associated runtime support to enable composability, predictability, parallelisation, aggregation and management of systems according to a service driven or data-centric approach, performance and energy modelling and analysis, verification, scalability in electrical vehicle design while preserving system level predictability and appropriate levels of safety.
- Pollux addresses the embedded system needs for the next generation electric vehicles by exploiting the synergy with the ENIAC E^3Car project which aims to develop nanoelectronics technologies, devices, circuits, and modules for EVs in preparation for the launch of a massive European EV market by 2015-2020.

The project addresses the industrial priority area of reference designs and architectures in order to offer common architectural approaches (standardised and interoperable) for future electrical vehicles.

The consortium is lead by Centro Ricerche Fiat and consists of 35 partners from 10 European countries which have already developed state-of-art technology in the field of embedded systems in automotive and in other sectors. Eleven partners are part of the ENIAC E^3Car project. The two projects will be strongly linked for demonstration and overall electrical mobility aspects and strategies.

The new electrical vehicle architectures based on distributed embedded computing and electronics system will allow significant energy saving, with enhanced fun-to-drive while increasing safety, and comfort, and decreasing the overall complexity of the vehicle.

- Energy sources: power electronic modules and control algorithms that perform functions such as power management (battery, super capacitors, etc.), and recharging (grid, range extender, on-board photovoltaics, etc.).
- Propulsion: electronics modules and control algorithms performing functions such as electrical motor control and distributed traction (1, 2, 4 motors).
- Chassis (Drive dynamic): electronics modules and control algorithms that perform functions such as steering, traction control, ABS, ESP, active suspensions, etc.
- Power and Signal Distribution (PASD): on board high voltage (power train) and low voltage (auxiliaries) bus, storage recharge bus, with related high voltage management features for safety and reliability.
- Vehicle Body and On-board Control: addressing chassis/body design for optimisation against conflicting requirements such as cost and strength, or performance and energy efficiency.

The realisation of energy efficient and cost-effective electrical vehicle with enhanced safety and comfort calls for dedicated development of distributed and embedded hardware and software systems for the automotive industry.

2.8 eFuture

- Project title : Safe and Efficient Electrical Vehicle
- Coordinator : Intedis
- Project type : STREP
- Funded by the European Commission – ICT Call GC 10.3
- Presentation by : Pascal Dégardins, Intedis

The eFuture project focuses on energy optimized and safe vehicle infrastructure/platform which can dynamically adapt its decision for safety, performance and energy efficiency.

Lots of factors influence the energy fluctuation within a vehicle. A vision at vehicle level is mandatory to achieve a new lean vehicle architecture:

- Energy optimised and safe vehicle infrastructure
- Drivetrain performance: new actuators, influence by friction, centre of gravity
- ADAS performance: complexity of independent systems, time to decision
- Choices of dynamics based on: drivetrain current state & energies levels, ADAS & driver commands, time horizon

Three actuator development groups are active in parallel with linear integration:

- Execution layer: Electric motors, traction battery, Dynamics Control
- Electronic platform: ECUs and network nodes
- Command layer: Sensors, Co-Pilot, Decision Units

The project consortium is lead by Intedis and consists of 6 partners coming from 4 countries. The project has a duration of 3 years.

2.9 ID4EV

- Project title : Intelligent Dynamics for Fully Electric Vehicles
- Coordinator : Continental
- Project type : STREP
- Funded by the European Commission – ICT Call GC 10.3
- Presentation by : Horst Kornemann, Continental

The ID4EV project concentrates on the development of energy efficient, lightweight and safe electrified auxiliaries, namely brakes and chassis systems. It focuses also on the interaction between the vehicle, the optimized FEV systems and the driver. A central driveline and in-wheel electric motors, i.e. no driveline, are both considered. Some more specific objectives of the project include:

- Intelligent brakes for Fully Electric Vehicles
  - Development of a regenerative brake system for FEV's
  - Realization of energy savings (low drag, light weight, recuperation)
  - Cooperative vehicle dynamic control system using brake system and electric motor
  - Build up of a demonstrator vehicle with central e-motor
- Intelligent chassis for Fully Electric Vehicles
  - Design of weight and comfort optimized adaptive suspension system
  - Design and implementation of an in-wheel corner module integrating e-motor and suspension
  - Investigation on the effect of in-wheel motors on chassis system
- Intelligent functionality by cooperative interaction for FEV
  - Profile definition
  - Advanced HMI
  - Range calculation algorithm
  - System networking and control for energy optimization
  - Energy management by driver involvement

The project consortium is lead by Continental and consists of 8 partners coming from 6 European countries. The project has a total duration of 27 months.

2.10 MAENAD

- Project title : Model-based Analysis and Engineering of Novel Architectures for Dependable Electric Vehicles
- Coordinator : Volvo Technology

- Project type : STREP
- Funded by the European Commission – Special Interest Group
- Presentation by : Ramin Tavakoli, Volvo

The MAENAD project is driven by the following needs:

- FEV requires new algorithms, new components, new architectures
- FEV introduces more EE safety challenges than any vehicle before
- Several projects are addressing safety in a cross-domain perspective. An automotive adaptation is critical.
- AUTOSAR is gaining momentum. Hence, a compliant systems and safety engineering approach is critical

The project aims at the extension of the emerging description language EAST-ADL compliant with AUTOSAR, as well as on the development of advanced capabilities to facilitate the development of dependable, efficient and affordable FEV.

The project consortium is lead by Volvo Technology and consists of 12 partners coming from 6 countries. The project has a duration of 3 years.

3. Background presentations on Electric Vehicles

3.1 Standards for the Electric Vehicle

- Presentation title : Standardisation : A challenge for the Full Electric Vehicle – Plug-in as well as FEV
- Presentation by : Josef Affenzeller, AVL

Up to now the following **standardisation efforts** have been performed **in Europe** for the Electric Vehicle:

- DG Enterprise gave a mandate to CEN/CENELEC to perform and establish a worldwide EC standard for plug and interfaces to the grid. Two workshops took place, the latest on 18 May 2010.
- The OEMs, supply industry and public bodies in Germany and France agreed on an e-mobility standard (2010). Standardization activities were already performed in Germany in 2001.
- Standards in administration and billing (roaming services) are created in a platform through the IP EURIDICE (EWSP = European Wide Service Platforms).
- Now it is time to speed up in Europe for standards to get leadership
- The Coordination Action ICT4FEV coordinated by VDI/VDE is also addressing this topic.

Standardisation will be a challenge for the European Industry:

- Standardization for interface to the grid – both with relation to power and data communication - is needed in Europe to exploit the electric vehicle to a high amplitude. This is a first step in this direction.
- Interfaces between the sub-systems in the electric vehicle are needed to optimize the efficiency in designing and engineering the variety of architectures and topologies as well as to stimulate new supply chain and market potentials, e.g. connection between the different components, etc.
- Standardized cell packaging (i.e. dimension, mechanical and electrical interfaces) in order to allow sourcing and use of cells from worldwide suppliers in European batteries

Standardisation of test procedures will also be a challenge for the European Industry:

- Battery durability
- Crash test for battery alone and, definitely, also installed in the vehicle. Particular consideration to be addressed to (hybrid) trucks and busses due to their significantly longer time of operation at highest NVH requirements.
- Security test
- Electro-mechanical stress and durability tests of electrical drivetrain components
- New Car Assessment of Safety concepts for EV's (integrated safety systems taking into account minimum vehicle weight, active and passive safety measures

3.2 Overview of worldwide automotive electrification plans

- Presentation title : Overview of worldwide automotive electrification plans
- Presentation by : Josef Affenzeller, AVL

The FP7 project EAGAR is an EARPA[5] project and has benchmarked the current public automotive research activities at international level. Its objectives are to:

- Create a methodology to enable benchmark comparison of automotive research in different countries
- Analyse automotive research in Europe, US, Canada, China, Japan, South Korea, India, Brazil, Russia and Malaysia

[5] EARPA : European Automotive Research Partners Association

- Show a global perspective of automotive research priorities
- Contribute to the definition of European automotive research agendas
- Identify potential international cooperation areas

EAGAR identifies the national road transport visions and roadmaps, research priorities, supported key topics, technology pathway, as well as the level of investment. This enables a direct comparison of national automotive R&D policies relating to the environment (energy, CO_2, pollution, recycling, noise), safety and congestion. The comparison of visions and roadmaps contributes to ERTRAC, the European Technology Platform for Road Transport and its Strategic Research Agenda and Implementation Plans.

The EAGAR study provides a key perspective on global investments designed to improve automotive technologies for a greener, safer and smarter road transport system. It will assist in defining the future direction of the European automotive sector. The benchmarking study benefits the competitiveness of Europe and enables the stakeholders to adjust its visions & plans for the future.

During the workshop an overview of the automotive electrification plans in the USA, Japan and China has been presented.

United States of America

- The overall goal is to have one million PHEV on the road until 2015.
- Targets for electric propulsion systems for 2020:
  - Cost: < 8$/kW
  - Specific power: >1,4 kW/kg
  - Power density: > 4,0 kW/dm³
  - Efficiency (10-100% speed at 20% rated torque): > 94%
- Targets for power electronics (5KW DC/DC converter) for 2020:
  - Cost: < 25$/kW
  - Specific power: >1,2 kW/kg
  - Power density: > 3,0 kW/dm³
  - Efficiency: > 96%
- Funding programmes:
  - Hybrid and vehicle systems: $ 100Mio
  - Recovery Act-Transportation: $ 378 Mio
  - Clean Cities: $ 300 Mio
  - Recovery Act - Electric Drive Vehicle: $2000 Mio

Japan

- Central government incentives:
  - Government will support half of the “basis of incentive”, being the difference between EV/PHEV and baseline vehicle price
  - Zero weight tax for EVs/PHEVs
- Fiscal incentives: Parking fee discount and toll road fee refund
- R&D funding: For FY 2009 NEDO is supporting Next Generation High Performance Battery development with a budget of £15.5m (£1 = 160 Yen)
- Roadmap for battery development:
  - Improved battery for High Performance Hybrid Vehicle by 2010: Performance improvement: x1
  - Advanced battery for Fuel Cell & Plug-in Hybrid Vehicles by 2015: Performance improvement: x1,5
  - Advanced battery for High Performance PHEV by 2020: Performance improvement: x3
  - Innovative battery for Full EV by 2030: Performance improvement: x7

China

- Vision: China aims at being the leader on electric vehicles and hybrid vehicles
- Targets:

  - 20% reduction in energy consumption per unit of GDP and an estimated 45% increase in GDP, each by 2010
  - China wants to raise its annual production capacity to 500.000 hybrid or all-electric cars and buses by the end of 2011, from 2.100 in 2008.
  - 15% EV and PHEV to be expected in 2020
  - Public use of EV and PHEV is heavily subsidized, EUR 6.800 for battery electric vehicles
  - EV infrastructure in 2020 to cover cities having >1.000 USD GDP/capita
  - The cost of the rechargeable battery is low than ¥2-3 RMB/ Wh
- Funding programmes:
  - Automotive Industry Readjustment and revitalization plan: 10 billion yuan
  - National High-tech program (863 program): 6.6 billion yuan
  - National Basic research Program: 1.3 billion yuan overall
  - National Key Laboratories Program: 1.4 billion yuan overall
  - 10 cities x 1000 vehicles: 3 billion $
- Standardization: Similar situation as in Europe. Different regions are starting up own standardization activities for EV.

4. Presentations of National Programmes

4.1 Austria

- Presentation title : Strategies and Programmes for the development and market introduction of electric vehicles in Austria
- Presentation by : Dr. Andreas Dorda – Austrian Federal Ministry for Transport, Innovation and Technology

The total funding for the supporting instruments of the Austrian Federal Ministry for Transport, Innovation and Technology has been increased from 40 M€ in 2008 to 60 M€ in 2009 and 2010.

- **A3 (Austrian Advanced Automotive Technology programme) and A3plus Technology programme**: Funding cooperative R&D projects for developing alternative propulsion systems and fuels:
  - Concentrates on highly innovative research projects and covers the entire innovation cycle from basic research to demonstration projects
  - Focus on alternative drive systems, alternative fuels and innovative energy storage concepts
- **Programme Energy 2020**: ICE-optimisation, light weight structures, electronics
- **Lighthouse Projects**: Demonstration and pilot projects for supporting market introduction
  - Optimisation of alternative propulsion systems and fuels under real life conditions through a close cooperation of developers and users
  - Preparation of the public for technological change
- **Austrian Agency for Alternative Propulsion Systems (A3PS)**
  - Stimulating the cooperation of complimentary partners, building up interdisciplinary research co-operations and trans-sectoral demonstration projects.
  - Providing, compiling and analysing information.
  - Supporting the creation of innovation friendly framework conditions.
  - International networking and marketing for Austrian R&D competence and the product and engineering Know How of A3PS members.

The **National Implementation Plan for Electric Mobility**

- Opportunities for:
  - Clean road traffic
  - Supplied by renewable energies
  - Imbedded into an optimised, intermodal traffic system linked to the public transport
  - Demonstration of Austrian expertise, job preservation and competitiveness of Austrian industry
- Field of consideration and targets:
  - To make a contribution for sustainable mobility in the context of the targets of transport policy and an overall strategy
  - To make a first step out of combustion of fossil fuels
  - To strengthen the Austrian industry by technological upgrading and innovation
  - The focus is on electric mobility as potential for short-distance traffic and as a feeder to public transport

4.2 Finland

- Presentation title : Electric vehicle activities in Finland
- Presentation by : Nils-Olof Nylund – VTT Technical Research Centre of Finland

- **Special characteristics of Finland**
  - Cold climate, sparsely populated country and long driving distances
  - Industry: No major automotive industry, but manufacturing of special vehicles and strong electrotechnical industry (ICT, Europe's first factory for large lithium-ion batteries)

  - Energy: High share of renewable energy (30%), low-carbon electricity generation (170 g CO_2/kWh), vehicle fleet of 2,5 million units, more than 1 million power supplies for electric block heaters that could also be used to recharge electric vehicles.
- **Study by the Ministry of Employment and the Economy**
  - Main emphasis on industrial policy and new business opportunities
  - Numerical target (1 - 2 billion €/a) for EV related turnover by 2020
- **Study by the Ministry of Transports and Communication**
  - Basis for decision making on the promotion and use of electric vehicles
  - Implications of electric vehicles on the transport system and the energy system
  - Environmental impacts of EVs
- **Tekes' funding for EV cluster related projects in 2010**
  - Total funding 5.4 million Euros (as of 4.5.2010)
  - Approximately 4 million Euros for research institutes and universities
  - 1.4 million Euros for projects by the industry
  - Topics on battery chemistry, material research, electric power trains and hybridisation
  - In 2009, Tekes spent approximately 4 million Euros on EV technology related projects
- **TransEco Coordinated Research Effort (2009-2013)**
  - Create a set of measures to cost-effectively adapt Finnish road transport to EU & national level climate gas reduction and energy efficiency targets.
  - Give input for the preparation of EU Directives to reach solutions that are most suitable for Finland.
  - Increase energy efficiency and use of renewable (low-carbon) energies in road transport with focus on advanced biofuels and electric vehicles. 10% energy reduction will be required by 2020. 9% will come from biofuels and 1% from electricity.
  - Assist the Finnish industry to develop business from green transport.
- **European Batteries**
  - Manufacturing plant in Varkaus, Finland begun its operations in spring of 2010
  - First independent large battery manufacturer in Europe
  - 100 MWh annual production capacity, which equals the need of 3.000 full-electric cars
  - Capacity expansion to 300 MWh is scheduled to be ready in 2012.
- **New research initiatives**
  - Pilot production line for battery cells and supercapacitors
  - Testing facility for electric energy storage systems
  - Industrial EV projects
  - Large-scale field demonstrations (thousands of vehicles). EV performance in the Finnish climate is of special interest

4.3 France

- Presentation 1 title : Information on French EV initiatives
- Presentation by : Eric Bessmann – INRETS[6]

- **First French initiatives at the beginning of 2009**
  - Following the ADEME (French agency for Environment and Energy comsumption management) call for interest issued by the end of 2008, 11 projects have been presented, of which 8 were selected :
    - 3 innovative electric cars projects
    - DHRT2 Large scale experimentation on rechargeable hybrid vehicles
    - 2 electric bus projects :
    - 2 projects on small size urban vehicles
  - It was also decided to support 2 innovative private/public platforms :
    - STEEVE : Energy storage
    - DEGE : Electric + hybrid vehicles

[6] INRETS : Institut national de recherche sur les transports et leur sécurité

- **Latest French initiatives**
  - Electricité de France (EDF) and Toyota intended to install recharging points for PHEV on roads, streets and parking lots
  - The Renault Nissan Alliance and EDF have signed 2 years ago an agreement to promote emission free mobility in France.
  - The Sustainable Development Ministry of France has announced to promote the installation of 400,000 charging points in France up to 2015. 1.5 billion euros were assigned in 2009 to support research and preparation of the 1rst part of the electric network.
  - The Renault Nissan Alliance including EDF has enlarged its scope in March 2010 by partnering with Enel in Italy and Endesa in Spain.
- Renault Nissan intends to provide 60 all electric vehicles to the E-Moving pilot project in Italy (forecasted installation of 270 charge points in the Lombardy region)

- Presentation 2 title : The ERANET+ "Electromobility" project
- Presentation by : Ralf Engel – Scientific Adviser Europe & partnerships – Predit[7], France

- **The Ultra Low Carbon vehicle (ULC-V) in France**
  - ULC-V means -60g CO_2, today EV and Plug-in Hybrid
  - Target: 2 millions cars and 4 millions recharging stations in 2020
  - ULC-V in France: Scope on EV and Plug-in Hybrids through ADEME R&D programme
  - ULC-V in PREDIT: 200 M€ (50% of PREDIT 4) available in period 2008-2012 for R&D on:
    - Internal combustion engines
    - Electrical and hybrid motorization
    - Low consumption vehicles
    - Noise reduction and reduction of exhaust
    - Reduction of auxiliary units energy consumption
- **ERANET+ "Electromobility"**
  - Perspective for the creation of an ERANET+ in the framework of ERANET Transport. ERANET is the appropriate frame to address public policies and to overcome boundaries
  - French position paper on Electromobility : Europe wide Electromobility for 2025: perspectives for multilateral cooperation on research action. The objective is to create a sustainable European infrastructure for Electromobility
  - 5 (+1) key dimensions :
    - Energy and environmental policy approach
    - Usage patterns, economic models, actors involved
    - Techniques dimensions of the recharge and distribution system
    - Testing, trials and normative standards
    - Applied technical research / Innovation
    - + Round-up and roadmap for research

4.4 Germany

- Presentation title : Research and development for electro-mobility in Germany
- Presentation by : Dr. Peter Schroth – Bundesministerium für Bildung und Forschung

- **National platform e-mobility**
  - Started in August 2009 to give advice to the German Government, and more specifically to 4 different ministries which are connected in a way to the topic of e-mobility, and where all stakeholders in the field are present that are needed to make e-mobility a success.
  - According to the National Development Plan for Electric Mobility (2009) the objective is to have 1 million EVs by 2020
  - By August 2010 the first results and recommendations are needed.
- **Project E3CAR (2009-2012) – see Presentation by Reiner John**
  - Nanoelectronics for an Energy Efficient Electrical Car

[7] PREDIT : Programme de recherche et d'innovation dans les transports terrestres

  - Aim: New concepts for propulsion systems, energy transformation, power and battery management
  - 6 German partners in a consortium of 31 partners coming from 10 European countries
  - It is the largest project on e-mobility in Europe
  - Budget 9.5 M€ for German partners, 3.35 M€ funding (42.8 M€ overall)
- **Project ePerformance (2009-2012)**
  - Design and construction of a battery-electric vehicle
  - Aim: Research on the interaction of new components for an electric vehicle in high-end
  - 5 partners and 7 subcontractors
  - Budget: 36 M€, 22.2 M€ funding
- **Project Fraunhofer system research e-mobility (2009-2011)**
  - Aim: Preparation of the German automotive industry for e-mobility
  - 33 FhG institutes in Germany
  - Budget: 30 M€ funding
  - Research on all parts of the value chain: Vehicle concepts, energy creation and –management, energy saving technology and system integration
- **Funding announcement on e-mobility**
  - SchlüsselTechnologien für die elektROMobilität (STROM)
  - R&D on new vehicle concepts in terms of a complete system approach, creation of realistic demonstrators, safety, reliability and robustness of all electric/electronic components and next generation energy storage
  - Focus on battery research and system aspects of EV
  - Available budget: Not settled yet

4.5 Poland

- Presentation title : EV related programmes in Poland and cooperation opportunities at EU level
- Presentation by : Zbigniew Turek – National Contact Point for the Research Programmes of the EU - Instytut Podstawowych Problemów Techniki Polskiej Akademii Nauk

- **Need for an EV Development Strategy in Poland**
  - After consultation by the Polish NCP with different national stakeholders interested in creation of an EV development programme a draft proposal of the *Polish Road Transport Technology Platform* composition was proposed.
  - <u>EV development programme in Poland is in definition phase</u> and:
    - R&D is being conducted at universities, technical universities, R&D units and centres
    - R&D is performed for whole electric transport units (electric bus, vehicles for disabled people)
    - One major project is run - „Development of electric vehicles market, with infrastructure and charging stations – Basis for energetic safety in Poland". Value of 5 mln EUR; Impact Automotive cars, Solaris buses and FSO Chrysler Aveo EV conversions will be tested.
  - <u>Cooperation with the Ministry of Economics</u>: Three Working Groups have been created with the aim of developing the National Plan:
    - Research, development and industry
    - Infrastructure
    - Incentives
- **Examples of EV projects, concepts and technologies in Poland**
  - Development of electric vehicles market, with infrastructure and charging stations – basis for energetic safety in Poland
  - Electrobus – Electric bus with accumulators charged from power grids
  - EV for people with limb disfunction
  - „Kul-Car" – electric city car for drivers on wheel chairs
  - MOBILO utility vehicle to be used on parking lots and as a town car
- **Polish successes at European (FP7 and ENIAC) and national level**
  - FP7 EGCI projects (3rd Transport Call) : 7 projects with overall requested funding of 1.6 M€
  - 2 ENIAC JU projects with overall requested funding of 1 M€
  - IniTech Call, coordinated by The National Centre for Research and Development : 8 projects with overall funding of 5.2 M€

- **Proposals for EU cooperation**
  - A non-exhaustive list of submitted needs for EVs and technologies has been generated by EV manufacturers and R&D units. This list does not include future needs connected to the EV sector development.
  - ERA-NET Transport: 2nd Call on criteria for loading systems in parking areas and Safety issues for electric (& hybrid) vehicle: Available budget of 1.8 M€
  - ENT 19 – Electric Road Transport 1st Call project: Analysis of European EV market in terms of users and market attitude and policies supporting the development process.

4.6 Italy

- Presentation title : Italy – Committing on EV programs
- Presentation prepared by : Dr. Antonio Agostini – Ministry of Education, University and Research
- Presentation given by : Dr. Roberto Zafalon – STMicroelectronics, Italy

- **Italian policy on transition from fossils and hydrocarbon based transportation to clean energy and mobility**
  - Italy has installed over 2,000 MW of renewable power in the 2009, expected to double by 2010.
  - In 2009 Italy has been the second nation after Germany per installed capacity of Photovoltaic and in 2010 is going to be the first country where installed photovoltaics will overcome the one of wind energy. In total 130.000 photovoltaic installations with an overall capacity of 2.500 MW are foreseen in 2010.
- **Renewable energy (RE) and e-mobility : Some facts**
  - 2008/EU-27: New RE installations exceeded in power the new installations based on fossils!! (www.EWEA.org[9], www.EPIA.org[10])
  - 2010/EU-27: Amongst the new installations RE will produce more energy than those based on fossils!
  - 2003-2009 World : EV at 50% CAGR !!
  - 2011 World: The production of e-means will exceed that of internal combustion engines (ICEs)
  - 2010-2014 World : RE at 35- 40% CAGR
  - 2010-2014 World : EV to continue at 40% CAGR
  - The production of e-means will soon supersede that of ICE means. By 2020 there will be more than 2 billion motor vehicles (two-wheels, cars, trucks) on the roads, corresponding to a production of e-means of 200 millions/year!
- **Pursuing the convergence of EVs and Renewable Energy**
  - The convergence between EVs and RE is synergistic. E-Mobility and RE are both at a point of no return.
  - The introduction of EVs would lead to radical primary energy savings (30-50%), GHG (Greenhouse gas) reduction (1/3rd to 1/15th) and reduction of noxious emission (harmful for health), which are almost cancelled.
  - Yet, Electrical Mobility cannot be fully defined clean or healthy, safe and energy efficient until it will be based on 10+ years old technologies
- **EV at the Ministry for Economic Development**
  - Industria 2015: Launched in 2008 for a total of 380 M€ funding.
    - All projects are addressing clean mobility and energy efficiency
    - About 50 millions are addressing Electrification
- **EV at the Ministry of Education, University and Research**
  - PON : Launched in 2010 for a total of 500 M€ funding
    - Focus is given to energy efficiency and clean mobility. Typical size of projects submitted for review is 15-25 MEur. A total of 10 projects addresses EV. Start of projects end 2010-beginning of 2011.
    - Topics addressed: Batteries, new EV, embedded solar cells, intelligent infrastructures, etc.
  - EV in JTI 2008-2009 approved by MIUR:

[8] EWEA : European Wind Energy Association
[9] EWEA : European Wind Energy Association
[10] EPIA : European Photovoltaic Industry Association

- ENIAC : E3CAR, END
- ARTEMIS : Pollux
- Over 10 Meur/year granted to EV at component and architectural level

4.7 Portugal

- Presentation title : MOBI.E – Portuguese electric mobililty program
- Presentation by : André Dias – INTELI/GAMEP – Portuguese Office for Electric Mobility

- **Energy strategy and electric mobility program**
  - Portugal is the European country with the 3rd most ambitious renewable share of electricity and a 6-fold increase in wind power capacity in less than 6 years.
  - Portugal is a pioneer for conceiving, developing and testing novel sustainable mobility solutions, and for exploring the use of energy from renewable sources through intelligent networks.
- **Portuguese electric mobility program initiatives and national scale infrastructure**
  - Main initiatives:
    - Public procurement: 20% annual renewal of the public car fleet
    - Use of EV priority lanes and parking spaces
    - Public pilot infrastructure funding
    - Incentives to infrastructure in new/existing buildings
    - Communication and education
  - Incentives:
    - EV acquisition and circulation tax exemption
    - Tax reduction for private customer and company fleets
    - €5000 direct subsidy on purchase
  - National scale infrastructure:
    - 25 municipalities involved in the pilot infrastructure network, as well as the main highways
    - Widespread pilot charging network
- **Technology and innovations – IT systems**
  - Web-based multi-platform access
  - Integrated invoicing with complementary services
  - Roaming between electric mobility and electricity retailers
- **Insights from the Portuguese approach**
  - Business/service models are key
  - ICT systems enable regulation of EV impacts on energy efficiency and on the grid
  - ICT systems establish platforms for service integration

4.8 Spain

- Presentation title : Spanish initiatives in the electromobility sector
- Presentation by : María Luisa Soria – SERNAUTO, Spanish Green Cars Support Action

- **2009: National Automotive Plan**
  - Objectives:
    - Raise market acceptance of new electric propulsion technologies, to reach 1 M EV and HEVs in 2014
    - Boost industrial development in Spain to meet this demand level of EVs
  - Competitiveness Programme for the Automotive Sector:
    - Objective: Promote investments to reorient production towards higher value-added vehicles, more sustainable, more efficient and safer.
    - 12 projects on EVs funded in 2009 and 16 in 2010
  - MOVELE Project:
    - Electromobility project aimed at demonstrating the technical and economical feasibility of EVs and promoting public and private collaboration in this field and the deployment of the associated infrastructure
    - Introduction of 2000 EVs in urban environments and at least 500 recharge spots

  - Integrated R&D projects:
    - VERDE: Electric vehicles: Response to energy dependence. Objective is to create the technological bases for the future development and production of PHEV and EVs in Spain
    - City-elec: Systems for the electrification of mobility in urban areas. Objective is the introduction of new mobility systems of people and goods in an efficient and clean urban environment, including research on key elements of the vehicles and infrastructure
    - TECMUSA: Technologies for sustainable and accessible urban mobility. Objective is the development and demonstration of hybrid and electric vehicles, for an efficient, sustainable and accessible urban transport of people and goods.
- **2010: National Strategy for the Electric Vehicle**
  - The objective is to reach 250.000 EVs and PHEVs and 750.000 HEV in 2014 (a total of one million)
  - Action Plan 2010-2012: It includes 15 measures to reach 70.000 EVs in 2012
    - Demand promotion: Incentives for the acquisition and use of EVs, map or urban public and private fleets, guide of urban advantages for EVs
    - Industrialisation and R&D and innovation: Industrialisation plans focused on EVs, ICT for EVs, and RTD on priorities for EVs
    - Infrastructure and charge management: Utilities involvement, special recharge rates, smart metering systems, legal architecture of recharge services
    - Cross-cutting actions: Development of strategic marketing, standardization of charging components, homologation and standardization of vehicles and components, development of specific education and training programmes
- **Coordination and Support Actions**
  - Spanish Technology Platforms:
    - Technology Platform MOVE TO FUTURE (M2F): Focus on vehicle electrification, energy and resources, safety, materials, design and production systems, efficient mobility in urban (and Interurban) areas, and fostering R&D
    - Technology Platform of the road (PTC): Integration of all actors involved in the sector of road infrastructure in Spain
  - Green Cars Support Action: Objective is to foster the Spanish participation in the European Green Cars Initiative

4.9 The Netherlands

- Presentation title : Dutch electrification strategy
- Presentation by : Serge van Dam – Ministry of Transport

- **Government action plan for electric driving**
  - Formula E-team to accelerate development this year
  - Grants for demonstration and research projects
  - Launching customership by government and stimulation to that end for business
  - Stimulation for building recharging infrastructure
  - Financial support for investments in Dutch automotive industry
  - Exemption of taxes for EV's
  - Low rate income tax charged for private use of company EV's
  - Progress in 2010 :
    - € 10 mln granted to 9 demonstration projects
    - Tender for 3.000 cars starts this autumn
    - Broad agreement on standard for plug (Mennekes)
  - Charging infrastructure parties are joining forces
- **Research programmes**
  - Safety of EVs
  - Practical testing: consumer acceptance
  - Technological development and innovations
  - In total 10 research projects have been granted which are focusing on chassis/body, electric powertrain, control, auxiliary equipment and integration
- **Collaboration opportunities**

- Cross-border demonstration projects
- Joint research on EV safety and battery recycling
- Connecting corporate R&D projects: reducing time to market
- EVA proposal (if granted): large EU demonstration project

4.10 ICT call for proposal

At the end of the workshop some practical information was provided concerning the upcoming call in the frame of the European Green Cars Initiative with deadlines on **December 2, 2010 and December 2, 2011**. The objective **GC-ICT-2011.6.8** on **ICT for fully electric vehicles** foresees a funding level of 60 million €. 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. The following target outputs are foreseen:

- Energy/Power Storage Systems
- Architectures for Energy, Communication and Thermal Management
- Vehicle-to-grid Interface (V2G)
- Vehicle Stability Control
- Electric Drive and Electronic Components
- Integration of the FEV in the cooperative transport infrastructure
- Functional Safety and Durability of the FEV
- Coordination and Support Action “FEV made in Europe”

The expected impacts of the projects under this objective are:

- Improved energy efficiency and extended driving range of the FEV
- Reduced costs of the electronic components and the overall FEV at increased performance
- Mitigated constrains 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.

Additional calls on "Sustainable Surface Transport" with 30,25 M€ budget, on "Sustainable automotive electrochemical storage" with 25,5 M€ budget and ERA-NET Plus call on "Electromobility” involving several MS" with 10 M€ budget will complement the ICT for the fully Electric Vehicle call. .

5. Conclusions

The first European Commission Workshop on "European Commisson's and Member States' R&D Programmes for the Electric Vehicle" held in Brussels on 26 June 2009 had concluded that a platform for the information exchange would be necessary in order to remove the road blocks for electromobility in Europe. It should be aimed at creating the interrelations between the national and the EU R&D programmes, and at the same time it should address the interplay of the regulatory frameworks, standardization and the support measures for scaling up production. Therefore it needed to integrate all involved sectors as well as public authorities of the member states and the involved industrial sectors. It had also been stated that it would be challenging to considering the topic of electromobility as a whole and to bring together all involved parties in such platform at once. Therefore it had been recommended to start by focusing on subtopics and facilitating the creation of the necessary links between national authorities and private stakeholders.

The Second Workshop on Research for the Fully Electric Vehicle can be seen as a major step forward into the direction of creating such a platform since it was focused on partial but essential topic of ICT, components and systems as the enabling technologies for the fully electric vehicle. Moreover, being a **clustering and concertation meeting** of **European funded projects on ICT for the Fully Electric Vehicle** the workshop brought together major stakeholders from the involved industry, and carrying out at the same time a dialogue on **ICT related research conducted at the national level on the topic of Electric Vehicles** it served the exchange of information between the involved national authorities.

Regarding the **clustering and concertation** part of the meeting, it is important to consider that the first call for proposals (Call Identifier FP7-2010-ICT-GC) with deadline on 3.11.2009, addressing the area of ICT for the Fully Electric Vehicle resulted in the selection of seven new projects that are being launched in 2010. Additionally, several other projects have been launched through the Joint Technology Initiatives ENIAC and ARTEMIS. Thus, this clustering and concertation meeting helped to build a critical mass of activities for the Electric Vehicle, to identify complementarities and potential synergies and relevant topics for further cooperation and to improve the performance of the individual EU funded projects.

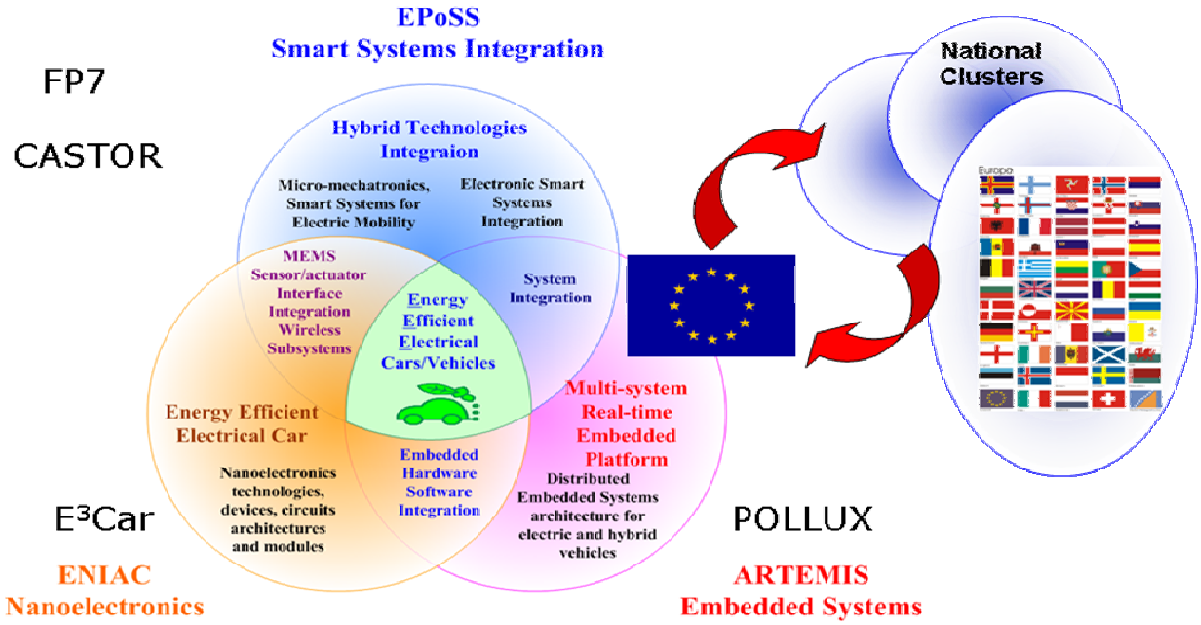
The resulting benefits from the potential cooperation within the cluster of the presented European funded projects on ICT for the Fully Electric Vehicle are obvious:

- Getting a comprehensive overview on ongoing and launched projects within the ICT for fully Electric Vehicles
- Sharing knowledge about technology for Electric Vehicles within an expert community
- Learning to know the EV related initiatives and programmes from different European countries
- Using the opportunities for common EV activities within the cluster, e.g. joint workshops, events

From the presentations it became clear that some cooperation between some of the presented projects is already in place. This is, for instance, the case for the cluster of following projects:

- E^3Car: Energy Efficient Electrical Car
- Pollux: Process oriented electronic control units for electric vehicles developed on a multi-system real-time embedded platform
- CASTOR: Car Multi Propulsion Integrated Power Train

This cooperation is presented in the following overview.



The new Coordination Action "Information and Communication Technologies for the Full Electric Vehicle" (ICT4FEV) will further strengthen the links between the projects as well as between all stakeholders of the FEV community and help to sustain these on the long term by establishing a European Association / Think Tank for Electric Mobility.

The second Workshop on Research for the Fully Electric Vehicle provided also the possibility for the different European national funding agencies and ministries to give presentations about the **ICT related research conducted at the national level on the topic of Electric Vehicles**. Compared to the first workshop in 2009 it can be stated that the willingness of the present member states to participate in a dialogue about their programmes and strategies was far more open and constructive than before. The ppresentations and discussions offered the unique opportunity to initiate the synchronisation of efforts in view of a common goal, i.e. the international competitiveness of the European automotive sector. Key issues such as regulation and standardisation needs for a common European infrastructure and the required public incentives were part of these discussions.

In summary it can be stated that the dialogue between private and public European stakeholders about R&D programmes in the domain of ICT, components and systems enabling the full electric vehicle may become the jump start for removing the hurdles of the implementation of electro-mobility in Europe. Given the urgency to respond to a growing competition with Asia in the field this dialogue should be further strengthened and put onto a continuous basis. On the short and mid term, this may be considered one of the tasks to be pursued the coordination action ICT4FEV an the European Organization / Think Tank for electric Mobility that shall arise from it.

Looking ahead, a strong and well coordinated cooperation of the European Commission' services, the member states' authorities and the involved industrial sectors as a Public Private Partnership will be needed in order to tackle the enormous challenges not just of R&D but also in terms of a mass implementation of electric mobility, e.g. standardization, regulations, incentives and public procurement. This requires a common understanding about the milestones, roles and cross disciplinary roadmaps to be developed e.g. within a dedicated European Innovation Partnership on Electric Mobility in FP8. The dialogue that was initiated at the two workshops of the European Commission's DG Infso on research for the full electric vehicle and that shall continue within the ICT4FEV project will be the seed of such new partnership arising from the PPP European Green Cars Initiative.

6. Workshop agenda

European Green Cars Initiative

Second Workshop on Research for the Fully Electric Vehicle

Avenue de Beaulieu 25, Room 0/S1, 1160 Brussels

11 June 2010

09.00 **Registration & Coffee**

09.15 **Opening**
Thierry Van der Pyl, EC – DG INFSO, Components and Systems, Director

Part I - Presentation of EU Funded Research Projects

09.30 **ICT4FEV -** Information and Communication Technologies for the Full Electric Vehicle
Gereon Meyer, VDI/VDE-IT

09.45 **EcoGem -** Cooperative Advanced Driver Assistance System for Green Cars
Kerem Kürklü, TEMSA R&D COMPANY
Konstantios Demestichas, Institute of Communication and Computed Systems

10.00 **ELVIRE -** ELectric Vehicle Communication to Infrastructure, Road Services and Electricity Supply
Hannes Lüttringhaus, Continental

10.15 **CASTOR -** Car Multi Propulsion Integrated Power Train
Reiner John, Infineon

10.30 **Coffee break**

10.45 **E3CAR -** Energy Efficient Electrical Car
Reiner John, Infineon

11.10 **P-MOB -** Integrated Enabling Technologies for Efficient Electrical Personal Mobility
Pietro Perlo, Centro Ricerche Fiat

11.25 **POLLUX -** Process Oriented eLectronic controL Units for Electric Vehicles Developed on a Multi-System Real-Time Embedded Platform
Marco Ottella, Centro Ricerche Fiat

11.50 **eFuture -** Safe and Efficient Electrical Vehicle
Pascal Dégardins, Intedis

12.05 **ID4EV -** Intelligent Dynamics for Fully Electric Vehicles
Horst Kornemann, Continental

12.20 **MAENAD -** Model-based Analysis & Engineering of Novel Architectures for Dependable Electric Vehicles
Ramin Tavakoli, Volvo

12.35 **LUNCH BREAK**

13.30 **Standards for the Electric Vehicle**
Josef Affenzeller - AVL / ERTRAC

Part II - Presentation of National Programmes

13.40 **Overview of Worldwide Automotive Electrification Plans**
Josef Affenzeller - AVL / ERTRAC

13.55 **Austria**
Andreas Dorda - Bundesministerium für Verkehr, Innovation und Technologie

14.10 **Finland**
Nils-Olof Nylund - VTT

14.25 **France**
Erik Bessmann, Ralf Engel - INRETS

14.40 **Germany**
Peter Schroth - Bundesministerium für Bildung und Forschung

14.55 **Ireland**
Martin Finucane - Department of Communications, Energy and Natura Resources

15.10 **Italy**
Antonio Agostin - Ministry for Education, University and Research, MIUR

15.25 **Coffee break**

15.40 **Poland**
Zbigniew Turek - Transport National Contact Point

15.55 **Portugal**
André Dias - Office for Electric Mobility in Portugal

16.10 **Spain**
Maria Luisa Soria - Sernauto

16.25 **The Netherlands**
Serge van Dam - Ministry of Transport

16.40 **Open Discussion -**
Informal means of cooperation between the Member States

17.30 **End of the workshop**

7. Workshop participants

	Name	First Name	Affiliation
1	Adamopoulou	Evgenia	Institute of Communication & Computer Systems
2	Aertsens	Xavier	ERTRAC SIG
3	Affenzeller	Josef	AVL
4	Agostini	Antonio	Ministry or Education, University & Research
5	Barbara	Peter Paul	Ministry of Transport
6	Bessmann	Erik	INRETS
7	Blervaque	Vincent	ERTICA - ITS Europe
8	Boero	Marco	Softeco
9	Boethius	Eva	EC - INFSO
10	Boukerche	Marc	EC - INFSO
11	Burzio	Gianfranco	Centro Ricerche Fiat
12	Buter	Carolien	BOSCH
13	Codrea	Cosmin	EC - INFSO
14	Coosemans	Thierry	VUB
15	Dam	Henrik	EC - RTD
16	De Albuquerque	Augusto	EC - INFSO
17	De Meyer	Pieter	Permanent Representation of Belgium to the European Union - Transport
18	Degardins	Pascal	INTEDIS
19	Demestichas	Konstantinos	Institute of Communication & Computer Systems
20	Dias	André	INTELI
21	Dogancioglu	Tolga	Hexagon Studio
22	Dorda	Andreas	Deputy Head of Unit - Ministry
23	Dreher	Stephane	NAVTEQ
24	Driever	Hans	EARPA
25	Engel	Ralf	Ministère de l'écologie et de l'énergie, du développement durable
26	Feyder	Camille	DELPHI

27	Filz	Anika	BOSCH
28	Finucane	Martin	Ministry of Communications, Energy& Natural Resources
29	Garcia Martin	Jesus	IBERDROLA
30	Gimenez	Roberto	HI-Iberia
31	Glaser	Sébastien	INRETS
32	Godwin	Simon	EUCAR
33	Ilhan	Esin	on behalf of Prof. Elena Lomonova fromTechnical University of Eindhoven
34	Ilves	Indrek	Procter & Gamble
35	Jiang	Jianmin	University of Bradford
36	John	Reiner	Infineon
37	Köhler	Ulrich	Hella
38	Kornemann	Horst	CONTINENTAL
39	Kürklü	Kerem	Temsa Araştırma Geliştirme ve Teknoloji A.Ş
40	Lüttringhaus	Hannes	CONTINENTAL
41	Maggiore	Maurizio	EC - RTD
42	Malaize	Jérémy	IFP
43	Mayr	Kerstin	BOSCH
44	Meyer	Gereon	VDI/VDE
45	Millet	Patrick	EC - RTD
46	Monclus Gonzalez	Jesus	Centro para el Desarollo Technologico Industrial (CDTI)
47	Muñoz	Oscar	IDIADA Automotive Technology S.A.
48	Nylund	Nils-Olof	Technical Research Centre of Finland
49	Ottella	Marco	CRF
50	Ozkan	Murat	Hexagon Studio
51	Peeters	Bart	LMS International
52	Pellischek	Gloria	ERPC
53	Perlo	Pietro	CRF
54	Reibe	Thomas	EC - INFSO

55	Roesems-Kerremans	Gisele	EC - INFSO
56	Schaffitz	Stephan	DELPHI
57	Schroth	Peter	Bundesministerium für Bildung & Forschung
58	Soria	Maria Luisa	Ministerio de Ciencia e Innovacion
59	Steiger	Wolfgang	Volkswagen
60	Stussi	Robert	Transport policy and planning and sustainable mobility
61	Tavakoli	Ramin	Volvo
62	Thewissen	Harry	NXP
63	Thiel	Christian	JRC-PETTEN
64	Turek	Zbigniew	Transport National Contact Point
65	van Dam	Serge	TNO NL
66	Van der Pyl	Thierry	EC - INFSO
67	Van Honacker	Hughes	EC - MOVE
68	Van Hove	Dennis	Procter & Gamble
69	Vandeweert	Erno	EC - RTD
70	Verhoeve	Wim	CLEPA
71	Voss	Thomas	ZF
72	Walters	Peter	NCP UK
73	Webb	Johnathan	IDIADA
74	Woehrmann	Mark	FKA
75	Zafalon	Roberto	European R&D and Public Affairs