Supporting European road-mapping activities for the electrification of road transport: CAPIRE and Smart EV-VC

EMMA BRIEC
RENAULT
CONTENTS

01 Introduction
02 EU Network, CAPIRE & SMART EV VC
03 Electrification Roadmaps
04 EGVI and H2020
05 Conclusions
EU Policy for Clean Transport

- **Europe 2020 Strategy**
  20% cut of GHG emissions
  20% more renewable energy
  20% less energy consumption
  (in 2020, compared to 1990)

- **Transport 2050 Strategy**
  60% cut of carbon emissions by 2050
  50% less conventionally fuelled cars in cities 2030
  no more conventionally fuelled cars in cities 2050

- **EU Fleet Emission Standards for New Cars**
  130g CO$_2$/km (2012 – 2015, phase-in)
  95g CO$_2$/km (2020)
Trends in EU transport CO$_2$
Green Vehicles Network

European Technology Platforms

- ERTRAC: All Stakeholders of the Road Transport System
- EPoSS: All Stakeholders of the Smart Systems Domain
- SMART EV·VC: All Stakeholders of the Smart Grids Field
- AP!RE: All Stakeholders of the European Green Cars Initiative

Public Private Partnership

- Strategic Research Agendas
- Long-Term Roadmaps
- Multi-Annual Implementation
- Annual Prioritization
sustains and puts into practice the European Green Cars Initiative PPP
Propose the implementation paths of the PPP EGCI,
Identify the technology roadblocks and framework needs,
Describe research priorities within the framework of FP7, FP8 and afterwards,
Facilitate the dissemination of results of the projects funded under the EGCI

Three technology pillars

- Passenger Cars & LCV
- Trucks & Buses
- Logistics
- **Fourteen Partners**
- **Duration: 4 Years**
- **Started on December 1st, 2010**
- **Will finish on November 30, 2014**
- **Total Person Month: 132**
- **Total Budget: 2,2 MEuros**
- **EC Funding: 1,7 MEuros**
- **FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2010-RTD-1**
Objectives of the Project

- Sustainability goals require **paradigm shift** in the concept of the automobile regarding architecture, design, materials, and propulsion technology.
- **(F)EVs** provide unique opportunities for reducing energy demand e.g. by smart integration & redesign of architecture.
- Europe has to anticipate the changes of the move towards the EV and adapt its **automotive value chain**.
- **Smart EV-VC** will
  - define goals in terms of ICT and smart systems related **unique selling points** of the EV
  - support related **European roadmapping activities**
  - strengthen the European EV **value chain** by making recommendations for harmonized curricula for education and training, initiating of standards, and concepts for shared facilities as well as the inclusion of SMEs.
Consortium:
Core Partners:

Associated Partners:
EADS, Valeo, TNO, LMS, Fraunhofer ENAS, Umicore, AVERE, MagnaSteyr, NXP Semiconductor, Ideas &Motion, University of Coventry (also representing the INTRASME project), Innovation Bridge Consulting

Duration:
Electrification Roadmap

European Roadmap
Electrification of Road Transport

Accumulated Number of EV / PHEV on the road in the EU

Milestone 1
Introduction adapting existing vehicles

Milestone 2
Intermediate 2nd Gen EV updated powertrain

Milestone 3
Mass Production dedicated EV accumulated 5 Mio. by 2020

Milestone 4
Mass Production 3rd Gen EV fully revised EV concept

October 2009

ERTRAC/EPoSS/SmartGrids
Electrification Roadmap

• Energy Storage Systems  
  (cost, performance, lifetime, safety)

• Drive Train Technologies  
  (energy recovery, range extenders)

• System Integration  
  (energy efficient interplay of components)

• Grid Integration  
  (charging, metering, renewables, V2G)

• Safety  
  (crashworthiness, HV, emergency)

• Transport System Integration  
  (road infrastructures, intermodal use)
Updated in 2012, endorsed by ETPs
## Call Recommendations

### EGCI Work Programme

#### Industry Priorities

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy storage systems</th>
<th>Drive train technologies</th>
<th>Vehicle system integration</th>
<th>Grid integration</th>
<th>Safety systems</th>
<th>Transport system integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EGCI 2010-2013 Collaborative Projects

- 177 projects within EGCI and related initiatives as ARTEMIS, ENIAC, CIP
- 99 dealing with electric mobility
Project Highlights

• Expert Workshops 2013:
  • USP of the FEV made in Europe
  • EV Batteries: From research towards innovation
  • EV systems architecture and standardization needs
• AMAAA conferences 2013/14
• Support of the European Green Cars / Green Vehicles Initiative – Electrification Roadmaps, Multiannual Roadmap, Project Portfolio, Draft Work Programmes..
• Standardization Brochure
What is Horizon 2020?

► Commission proposal is about €80 billion research and innovation funding programme (2014-2020)

► A core part of Europe 2020, Innovation Union & European Research Area:

- Responding to the economic crisis to invest in future jobs and growth

- Addressing people’s concerns about their
EGVI PPP Framework
Horizon 2020 (2014-2020)

- EU Framework Programme for Research and Innovation, financial instrument for funding research in Europe, with dedicated budget of €70.2 billion.

- Industry, Member States and European Commission to engage in joint funding programmes within the EGVI PPP.

- Initial budget proposal of €3 billion over the seven-year period, of which €1.5 billion EU funding.

- Three rounds of biennial calls for proposals expected to be launched within the EGVI PPP in the period 2014-2020.
Today, EGVIA is composed of 64 members:

- 13 automotive OEMs
- 15 automotive suppliers
- 4 from smart systems industry
- 1 from smart grid industry
- 13 research organisations
- 11 universities
- 7 associate members
Suggested topics for first EGVI calls

- **Challenges for 2014**
  - Next generation Li-Ion / post Li-Ion batteries
  - Energy and thermal management of electric vehicles
  - Gas engines for light-duty vehicles
  - Hybrid components and architectures for light/heavy-duty vehicles
  - Electric two-wheelers and new vehicle concepts
  - Innovative natural gas engines for heavy-duty vehicles

- **Challenges for 2015**
  - Battery Management System
  - Power electronics
  - ICT and Grid integration
  - Driveline control for heavy-duty vehicles