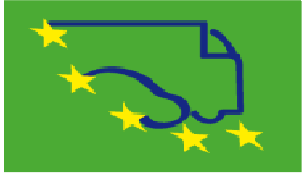




European Green Cars Initiative

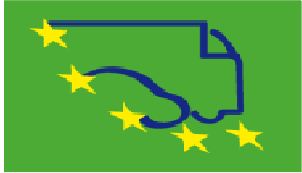
Recommendations of the Ad Hoc Industrial Advisory Group European Green Cars Initiative

Prof. Dr. Wolfgang Steiger
Volkswagen Group / ERTRAC



PPP European Green Cars Initiative

- PPP in the **European Economic Recovery Plan**
(Factories of the Future, Efficient Buildings, Green Cars)
- Total Budget: **5 bn Euro** = 4 bn Euro Loans + 1 bn Euro RTD
- **PPP** of industry, member states and EC (50% funding)
- **Horizontal** activity (DGs Research, Infso, TREN, ENV, Enterprise)
- Implementation through **FP 7** (2010-2013)
- Major focus on **electrification** (appx. 2/3 of budget)
- **Climate protection** (with electricity from renewable sources)
- **Energy security** (Diversification of primary energy sources)
- **Zero local emissions**
- Global **competitiveness** of the automotive industry



Advisory Group

Role:

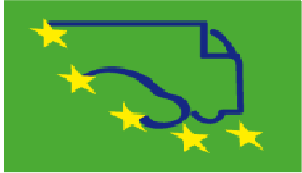
- integration of all involved sectors and EC services
- strategic dialogue between Commission and industry
- implementation of the Green Cars Initiative as a PPP

Members (represent ETPs):

- AVL
- Bosch
- Continental
- ECT
- FEV
- Fiat Research Center
- Iberdrola
- IFP
- KU Leuven
- Procter & Gamble
- PTV
- Renault
- Ricardo
- Schachinger
- Siemens
- Valeo
- VDI/VDE-IT
- Volkswagen
- Volvo
- DG RTD
- DG Infso
- DG TREN
- DG ENV
- DG Enterprise
- EIB

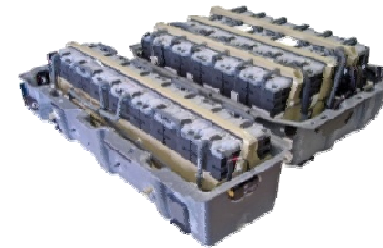


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Technology Challenges

- **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)





Roadmap Electrification

European Industry Roadmap Electrification of Road Transport

Draft Version 2.8
12 July 2009

Abstract

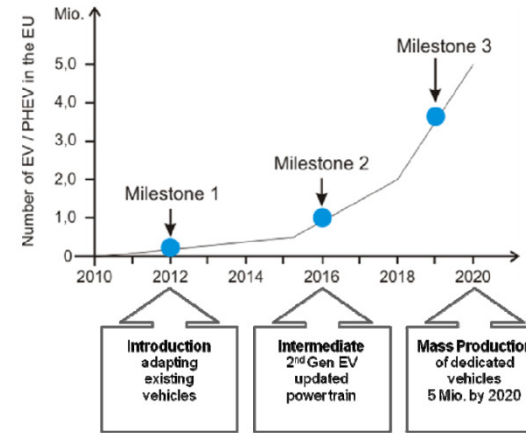
Seizing the great potential of electrified mobility for climate and resource protection and turning it into opportunities for Europe's automotive and energy industries requires joint and coordinated actions of all involved public and private parties. Cheap, safe and well-performing means of energy storage still pose a challenge as do many other key technologies of the electric vehicle like drive trains, vehicle systems, grid interfaces, safety solutions and the integration into the transport system. Fundamental R&D will be needed and to be complemented by measures for scaling-up of manufacturing and preparation of markets as well as by an appropriate regulatory framework. The indications of the document at hand are based on a consensus of major companies and organizations from the European Technology Platforms ERTRAC (European Road Transport Research Advisory Council), EPoSS (European Technology Platform on Smart Systems Integration), and SmartGrids. Starting from a quantitative assessment of the impact electrified mobility may have, a definition of milestones for the next ten years is given, and suggestions are made for actions to be taken in a targeted, well-timed and horizontal manner. This report is meant to stimulate the debate about the multi-annual implementation of the European Green Cars Initiative.

Contents

1. Introduction
2. Benefits and Challenges of the Electric Vehicle
3. General Expectations
4. Timing for Development and Implementation
5. Milestones
6. Roadmaps
7. Recommendations

1

**Drafted by
ERTRAC/EPoSS/SmartGrids
Task Force Electrification**



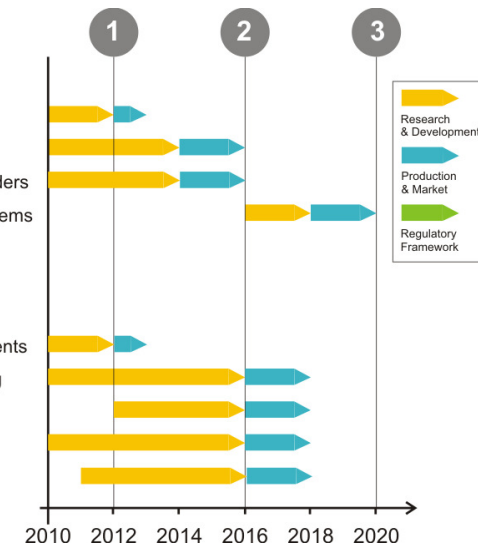
Milestones

Drive Train Technologies

- Develop Low-Cost/Weight Motors & Electronics
- Develop Highly Integrated Motors & Controls
- Optimize Combustion Engines for Range Extenders
- Develop Highly Integrated Range Extender Systems

System Integration

- Optimize System Efficiency w Existing Components
- Find new Solutions for Heating, Venting, Cooling
- Design Electrical Architecture & Interconnects
- Create New Concepts for Space Usage
- Research Light-Weight Materials & Design





Technology Roadmaps

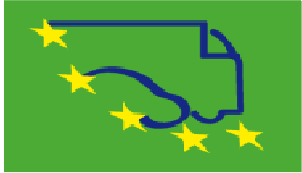


FP7 Advice

Priorities
& Implementation
2010 Work Programme

		EGCI Work Programme				
		NMP	SST	ICT	ENV	Energy
Industry Priorities	Energy Storage Systems	2010 WP	2010 WP	Not yet covered	2010 WP	2010 WP
	Drive Train Technology		2010 WP	Not yet covered		
	System Integration		2010 WP	2010 WP		
	Grid Integration			Not yet covered	Not yet covered	Not yet covered
	Safety		Not yet covered	2010 WP		
	Transport System		Not yet covered	Not yet covered	Not yet covered	Not yet covered

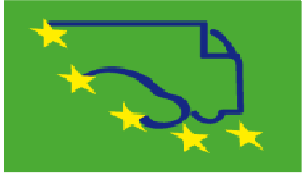
 2010 WP
 Not yet covered



Recommendations 2011/12

Priority Area 1: Electrification 2nd Step

- Smart Management of Energy Storage Systems (ICT)
- Vehicle-to-Grid Interfaces (ICT)
- Advanced Drive Train Controls (ICT)
- Energy Efficient Architectures (ICT)
- Functional Safety and Durability (ICT)
- Integration into the Road Infrastructure (ICT)
- Architectures of Electrified Vehicles for Urban Use (SST)
- Safety of Electric Vehicles (SST)
- Thermal Management (SST)
- Sustainable Manufacturing of Batteries and Electric Components (NMP, SST, ENV)
- Life Cycle Assessment and Strategic Materials (ENV, NMP)



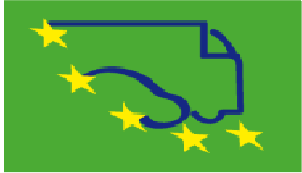
Recommendations 2011/12

Priority Area 2: Long Distance Transport

- Efficient drivelines for long distance transport – future power train concepts (advanced combustion and aftertreatment)
- Efficient drivelines for long distance transport – waste heat recovery
- Efficient vehicles for long distance transport

Priority Area 3: Logistics

- Urban – interurban shipments
- Capability of improving and exploiting capacity
- Demonstrating Green Corridors
- Efficient interfaces for transport modes
- Direct consumer delivery

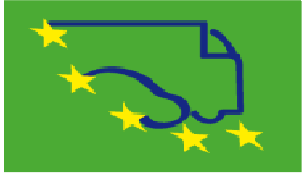


PPP EGCI Towards FP8

Actions needed

to maintain global competitiveness of the European industry in the field of drive components for hybridization, ICT integration and manufacturing processes

- launch lighthouse projects demonstrating and implementing electrified and low carbon vehicles, the required infrastructures and smart interfaces
- invest in R&D, early innovation
- create demand side measures, incentives and public procurement for electric mobility



PPP EGCI Towards FP8

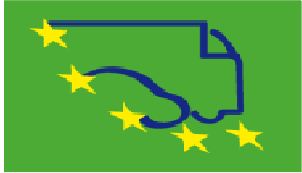
Linking EU and Member States Programmes

Adjustments are needed since

- existing instruments of the European Research Area are lacking critical mass and overall coherence
- too many initiatives aiming at the same objectives dilute funds and are not inefficient

Pan-European challenges of electrification are calling for

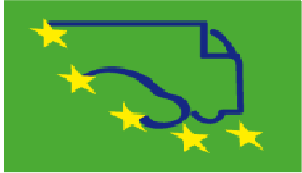
- massive and coherent joint actions
- synergy and complementarity of EU and MS programmes
- showcases of (strategic) research and innovation in straightforward European lighthouse projects



PPP EGCI Towards FP8

Improvements to be aimed for in FP8:

- Better coherence and complementarity of R&D projects by consistent planning along the agreed milestones of multi-disciplinary industrial roadmaps,
- Integrated approaches for lighthouse projects allowing substantial strategic research and innovation to be taken, e.g. networks of well defined smaller projects (STREPS) facilitated by dedicated coordination actions (CSA).
- Clearer split of duties between the industry and the EC:
All tasks regarding the programme content to be assigned to industry (milestones, roadmaps, call drafts, evaluation..) The EC should be in charge of any legal and administrative procedures.

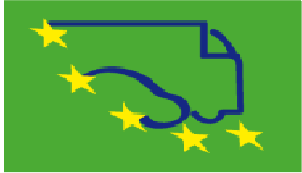


PPP EGCI Towards FP8

PPP implementation model for FP8

to be simple, efficient and quick

- Same laws, procedures, governance principles for all PPPs
- No new administrative burdens or structures
- Substantial budgets to be allocated (EC share about 1bn Euro).
- Regular accounting principles to be used, e.g. average PM rates
- Time from programme definition to project start to be reduced
- Multi-national anchorage of the industries to be reflected.
- Milestones of the joint roadmaps should be taken as a guideline for creating synergy and coherence of national and European R&D programmes.



PPP EGCI Towards FP8

Lighthouse Projects Topics suggested by the PPP EGCI:

- **Reference centres**, e.g. KIC or virtual clusters, focusing on performance testing and impact assessment of clean and energy-efficient vehicles, particularly in terms of health, safety, economics and the environment.
- **Combinations of forces** to strengthen the global competitiveness of the European automotive industry ranging from regional clusters to global alliances of electric vehicle manufacturing.
- **Green corridors and mode interfaces** for electric and low-CO₂ vehicles in areas being particularly sensitive to or suffering from noise and emissions.
- **Public procurement programs** in support of electric and low-CO₂ vehicles



EPOSS

European Technology Platform
on Smart Systems Integration



SMARTGRIDS



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