

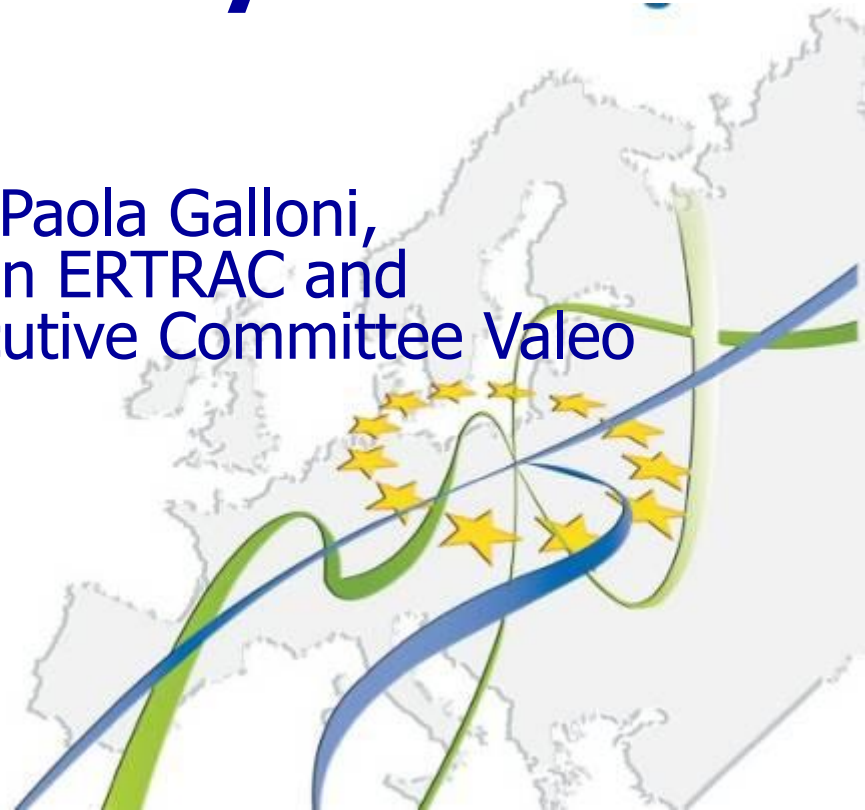


EUROPEAN  
ROAD  
TRANSPORT  
RESEARCH  
ADVISORY  
COUNCIL

# European Road Transport Research Advisory Council

Jean-Luc di Paola Galloni,  
Vice-Chairman ERTRAC and  
CEO's Delegate, Executive Committee Valeo

Madrid, 3.12.2009



# Evolution of the car:

## MEGATRENDS

- Urbanization
- Ageing population
- Connected people
- Economic pressure
- Environmental awareness
- Democratized mobility

## ■ Car could be valued as

- Convenient and cheap
- Environmentally-friendly
- Safe
- One of the mobility key enabler

- Car is valued for
  - Status symbol
  - Speed and power
  - Driving pleasure

# How could driving look and feel in the future:



## Drive eco-friendly

- Neutral CO2 emission balance
- Lighter materials
- Hybrid / pure EV concepts
- Internal engine measures
- Car sharing and car on demand

## Drive safe and smart

- Dialogue with other vehicles/traffic infrastructure
- Intelligent traffic mgmt
- Automatic warning on tail-end traffic jams
- Free parking routing

## Just good enough and cheap

- Downsized engine technology for low cost market
- Use of older product generation for emerging market
- Interior reduction to basic and simple functionalities

## Modularity

- Variable power engines, i.e. power to be chosen/paid via mobile devices
- Flexible set-up changes of basic features
- Integration/use of external intelligence

## Easy comfort

- Situational automation of driving systems
- Integration of mobile devices and onboard electr.
- Flexible exterior/interior configurations
- Modification car window transparency

# Worldwide market trends

## Trends

## Description

**Hypermobility**

Smart buy: from car purchase to mobility purchase



**New technologies**

Enthusiasm for innovation and impact on everyday safe life



**Connectivity**

Information becomes the key of the mobility



**Customization  
Personalization**

Possibility to configure your car yourself



**Green technology**

Incentives for cleaner technologies



**Energy  
consumption**

Energy consumption and weight impact as key criteria



# Automotive Challenges to be Researched and Targeted



# Why ERTRAC?

## Background:

- Road transport is a complex, multi-stakeholder system
- Road transport, one of the largest RTD sectors in Europe

## Mission:

- ERTRAC provides the framework to overcome the challenges of the road transport sector
- ERTRAC enhances networking and clustering of the R&D capacity in Europe
- ERTRAC improves the co-operation between EC, national, regional and private R&D actions strategic vision for R&D
- ERTRAC stimulates investment in R&D
- ERTRAC promotes Europe as attractive location for researchers

# History

March 2002: Automotive representatives called for the establishment of an Advisory Council

June 2003: Official launch of ERTRA

June 2004: "Vision 2020 and Challenges"

October 2004: "Strategic Research Agenda"

April 2006: "Research Framework"

June 2006: First TRA Conference in Göteborg

March 2008: "Research Framework Implementation"

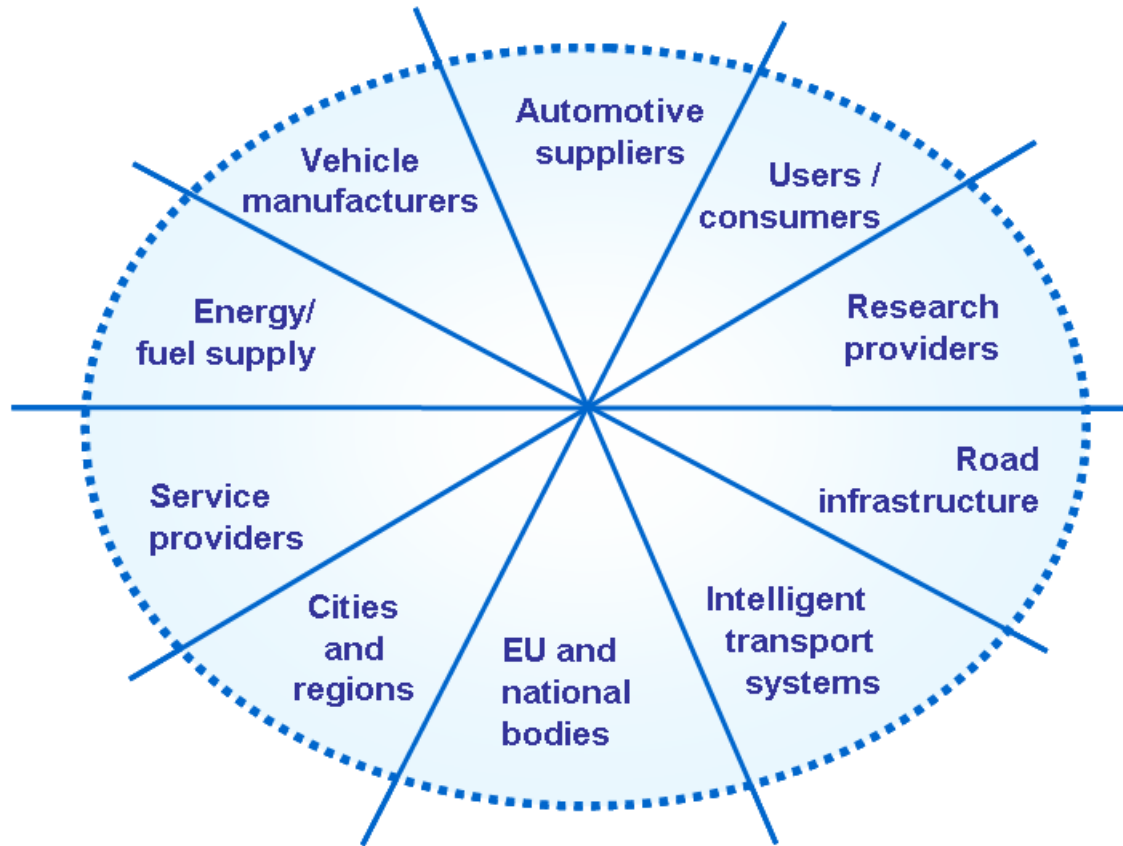
April 2008: Second TRA in Ljubljana

January 2009: Electrification Strategy Position Paper

May 2009: ERTRAC Supporting Institutions Group

Sept 2009: ERTRAC Road Transport Scenarios 2030+,  
ERTRAC-EPoSS-SmartGrids Electrification Roadmap  
ERTRAC SIG office in Brussels

# ERTRAC Stakeholders



All major Road Transport Stakeholders are represented in ERTRAC, through their associations, as representatives of the EU and Member States.

**A systemic approach for road transport needs all stakeholders!**

# Current Priorities

## **Road Transport Scenarios for Europe for:**

- Long distance freight transport
- Urban mobility
- Sustainable energy for road transport
- Road transport safety

## **Specific Task Force (together with EPoSS and Smart Grids):**

- Electrification of road transport

## **Update of the SRA** considering the PPP model activities (baseline ERANET+) and the three pillars of the EGCI:











- Electrification
- Long-Distance Transport
- Logistics (ITS)

# European Technology Platforms


Initiatives enabling product development

Level of integration



Application Level	 <b>ACARE</b> Aeronautics	 <b>ERTRAC</b> Transport	 <b>SMART GRIDS</b> Energy Distribution
	 <b>NEM</b> Networked & Electronic Media	 <b>NESSI</b> Software & Services	 <b>E-MOBILITY</b> Mobile Communication
Systems Level	 <b>ARTEMIS</b> Embedded Systems	 <b>EPoSS</b> Smart Systems	<b>EUROP</b> Robotics
Component/ Technology Level	 <b>ENIAC</b> Nanoelectronics	 <b>PHOTONICS21</b> Optical Technologies	<b>MANUFUTURE</b> Manufacturing Technologies

# Electrification Task Force



**European Road Transport Research Advisory Council**      **European Technology Platform on Smart Systems Integration**

## The Electrification Approach to Urban Mobility and Transport

Strategy Paper  
Version 5.0, from January 24<sup>th</sup> 2009


Preamble

This paper emphasizes a major topic of ERTRAC's and EPoSS Frameworks aiming at the development of a smarter, greener, safe, competitive road transport system. Recognising the growing economic and energy security, climate change and air pollution, EPoSS are convinced that the transition of road transport towards electric is inevitable. However, it will be a 'step change' of technologies, but user practice that requires strong efforts in terms of research and development. ERTRAC and EPoSS are calling Europe to take the lead and seize economic opportunities of road transport based on plugin-hybrid and electric vehicles, and more generally the electrification of the powertrain. From their expertise and knowledge of their members, ERTRAC and EPoSS have derived research priorities in all related fields and derived a common strategy for the involved stakeholder from both public and private sides.

**1. Introduction**

The apparent volatility of fossil fuel prices, the oil dependency and the shortage of crude oil are driving concerns about the future security of energy. At the same time, greenhouse gas (GHG) emissions are causing severe health. This situation is increasingly calling for non-fossil generation of energy.<sup>1</sup> Being both the major oil-consuming economic sector and of globally competitive industries in Europe, mobility and transport undergo step changes of technologies, business models and user practices. Furthermore, fossil fuels will more and more be complemented by renewable energy.

<sup>1</sup> Intergovernmental Panel on Climate Change Assessment Report (2007).



**European Industry Roadmap Electrification of Road Transport**

NON-PAPER July 2009

**Abstract**

Seizing the great potential of electrified mobility for climate and resource protection and turning it into chances for Europe's automotive and energy industries will require joint and coordinated actions of all involved public and private parties. Cheap, safe and well-performing means of energy storage pose as much a challenge as do many other technologies 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 document at hand is based on the 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 definition of milestones for the next ten years it indicates what action is to be taken in order to ensure the required efforts are made in a well-timed and horizontal manner.

**Contents**

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

**1. Introduction**

Electrified mobility is currently given first priority in the US, Japan, China, Korea and EU. The announcements of dedicated national programmes are almost countless, similar is the spreading of qualitative position papers and reports while several automotive chairmen have contributed to raise the general expectations announcing imminent mass production of EVs.

The move from conventional combustion based mobility to more electric or full electric mobility poses many questions with answers depending on a multitude of inter-dependent parameters. The matter is quite complex and because of that, when treated only in qualitative terms, gives rise to controversy that may slow down the decisional processes.

## Partners:

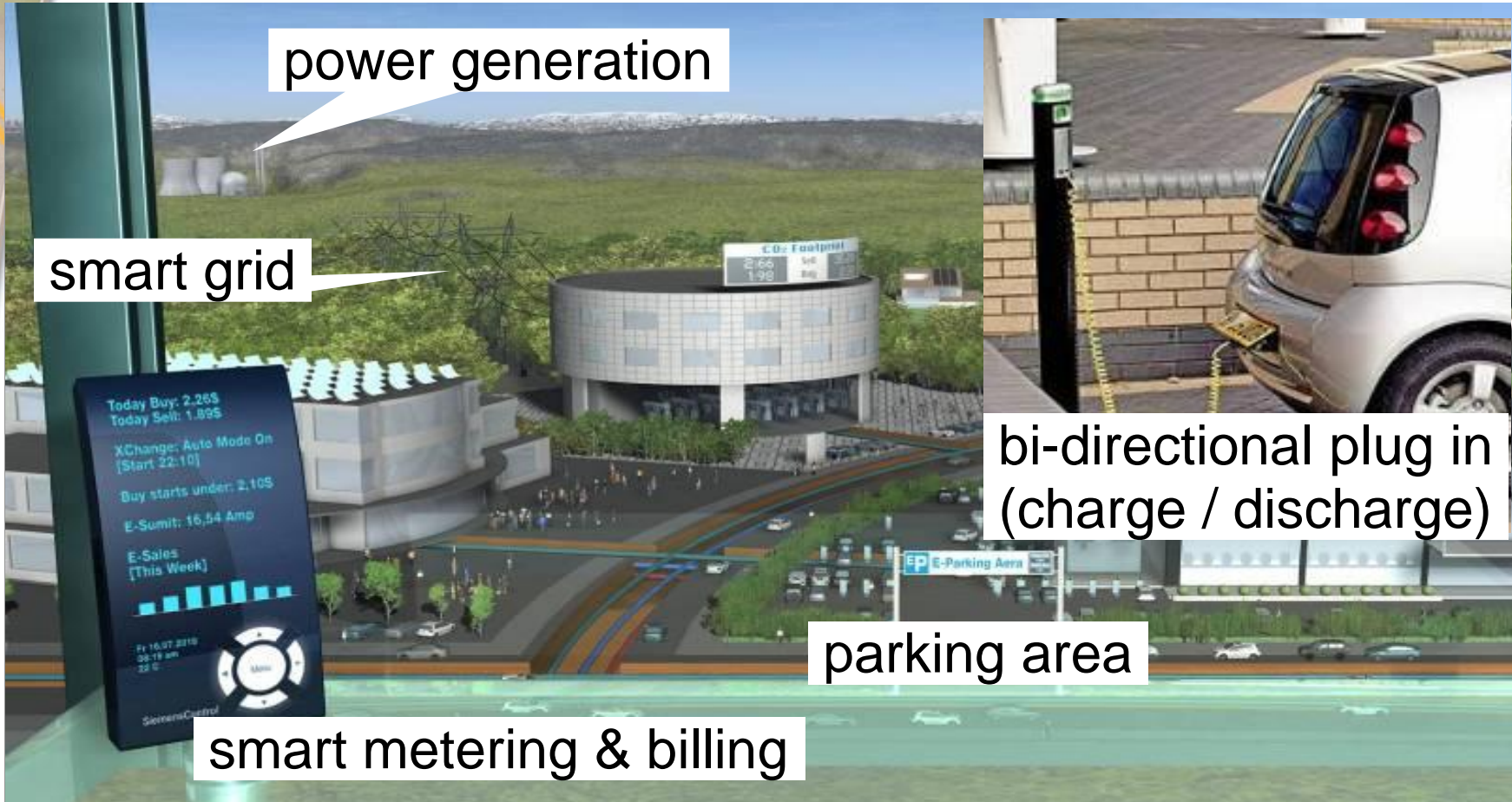
- AVL
- Bosch
- Continental
- Fehrl
- C.R. Fiat
- Polis
- Renault
- Siemens
- SmartGrids
- Valeo
- VDI/VDE-IT
- Volkswagen
- Volvo

**Goal:**  
Develop an implementation plan for the electrification of European road transport for the EGCI

# Vehicle to the Grid Integration Smart Systems for the EV

## Electric Mobility and the Grid

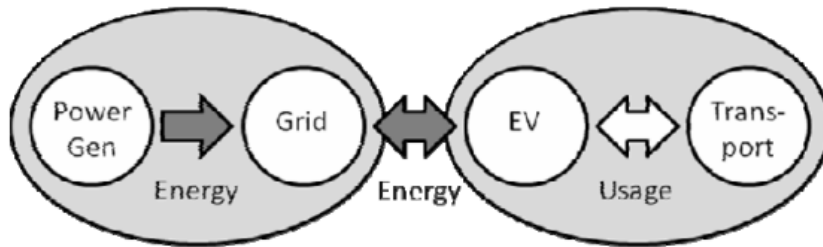
# SIEMENS



# Input to the Green Cars Initiative

## Joint ERTRAC/EPoSS Strategy Paper

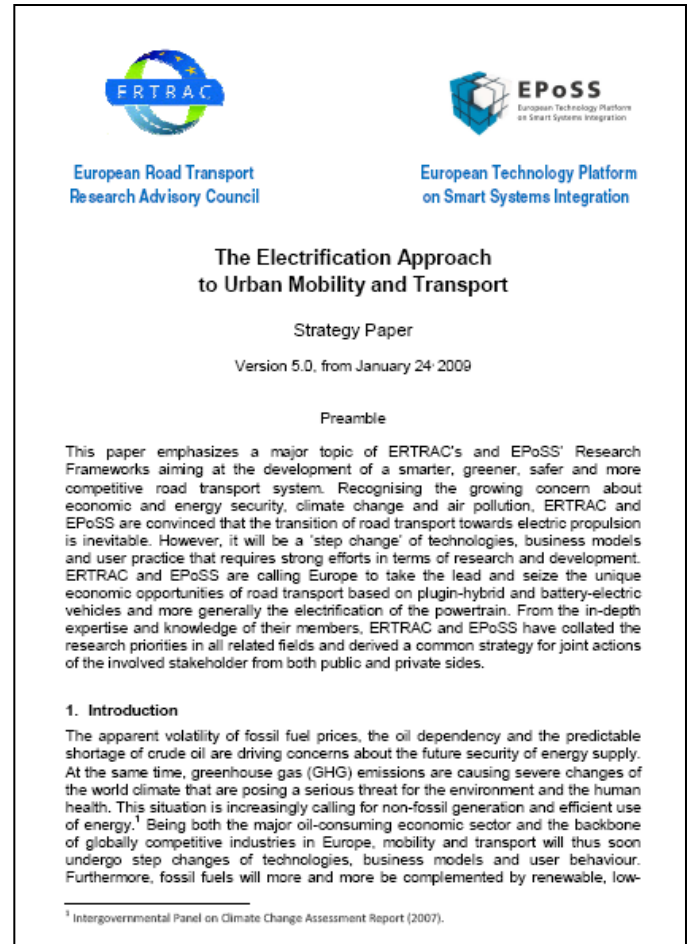
### The Electrification Approach to Urban Mobility and Transport



Novel Links between Energy and Mobility Sectors

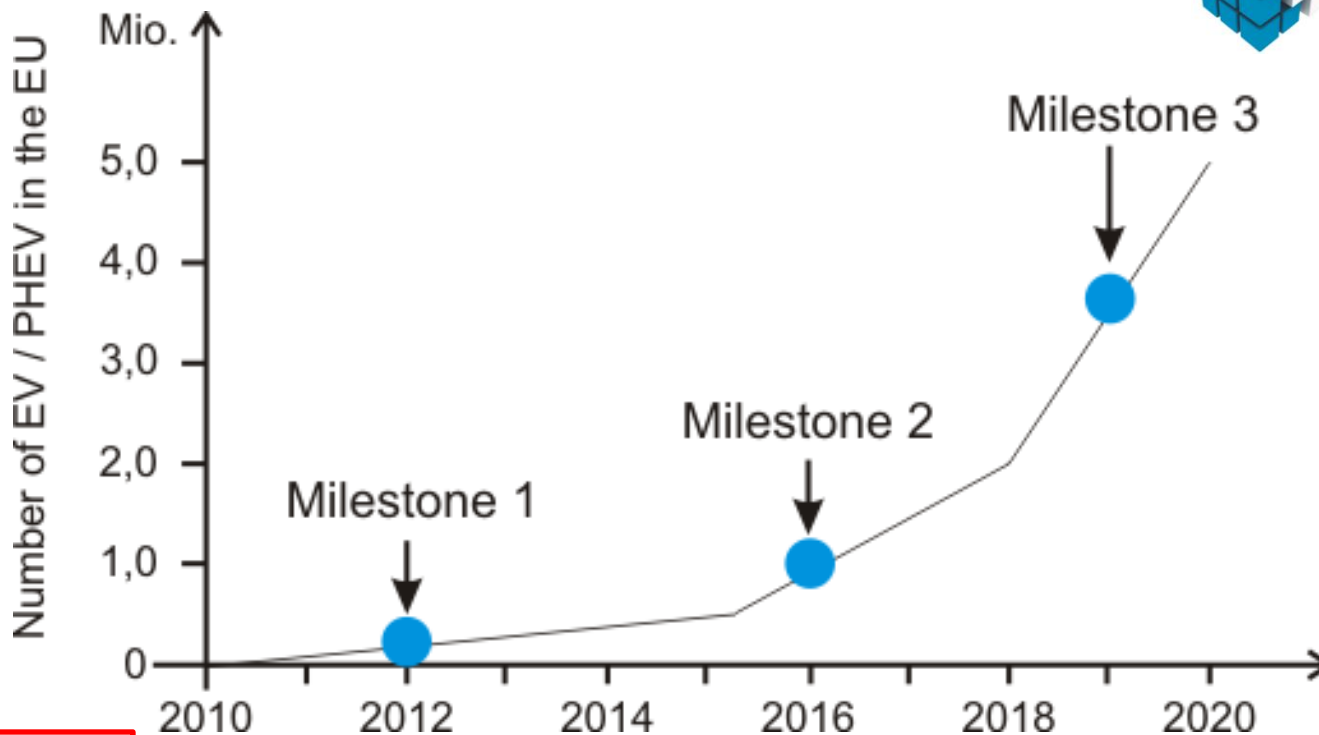
### R&D Priorities

- Energy Storage Systems
- Drive Train Technologies
- Vehicle System Integration
- Safety
- Grid Integration
- Transport System Integration



ERTRAC/EPoSS Strategy Paper

# Electrification Roadmap



Pure EV  
and  
Plugin- Hybrid

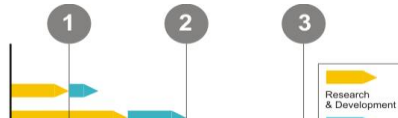
**Introduction**  
adapting  
existing  
vehicles

**Intermediate**  
2<sup>nd</sup> Gen EV  
updated  
power train

**Mass Production**  
of dedicated  
vehicles  
5 Mio. by 2020  
Battery: 3 x 3 x 1/3

## Drive Train Technologies

- Develop Low-Cost/Weight Motors & Electronics
- Develop Highly Integrated Motors & Controls
- Optimize Combustion Engines
- Develop Highly Integrated Ra

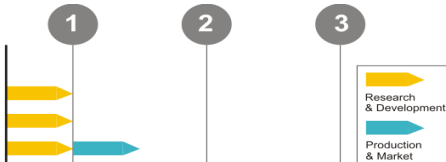


## System Integration

- Optimize System Efficiency w
- Find new Solutions for Heating
- Design Electrical Architecture
- Create New Concepts for Spa
- Research Light-Weight Mater

## Energy Storage Systems

- Study Battery Cell Degradation
- Establish Battery Testing Facility
- Develop Battery Management Systems



## Safety

- Improve Crashworthiness of Lightweight Cars
- Develop Acoustic Perception
- Develop Integrated Safety Concept (HV, Fire, ...)
- Setup Standards for Emergency Handling
- Create & Review Standards for Safety, EMI, Hea

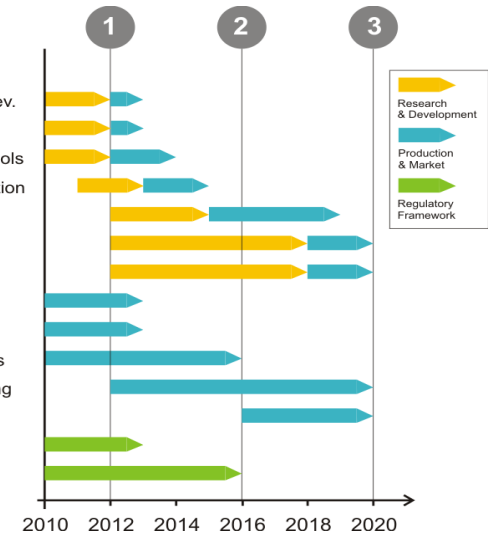


## Transport System Integration

- Explore Potential of ITS for Energy Efficiency
- Provide Convenient Transition Between Modes
- Apply Sensors & C2X for Autonomous Driving
- Promote Green Image of Electric Vehicles
- EU Wide Signage of Roads and Vehicles

## Grid Integration

- Develop Adaptive On-Board/In-Plug Charging Dev.
- Create System for Information on Charge Status
- Develop Simulation, Monitoring, Management Tools
- Develop Protocols/Devices for V2G Communication
- Investigate Quick Charging
- Develop Contactless Charging
- Develop Bidirectional Charging
- Establish 1st Generation Charging Infrastructure
- Create Business Models for Charging
- Connect Regions by Highways w Charging Spots
- Establish Business Model for Bidirectional Trading
- Create Network of Quick Charging Stations
- Regulate Coverage with Charging Spots
- Standardize Billing Concept



# Industry Roadmap



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**EPoSS**  
European Technology Platform  
on Smart Systems Integration



Coverage of  
R&D Priorities  
in EGCI Work Programmes

		EGCI Work Programme				
		NMP	SST	ICT	ENV	Energy
Industry Priorities	Energy Storage Systems	2010 WP	2010 WP	2011 WP	2010 WP	2010 WP
	Drive Train Technology		2010 WP	Not yet covered		
	System Integration		2010 WP	2010 WP		
	Grid Integration			2011 WP	2011 WP	2011 WP
	Safety		Not yet covered	2010 WP		
	Transport System		2011 WP	2011 WP	2011 WP	2011 WP

 2010 WP  
 2011 WP  
 Not yet covered

# Synergic ERTRAC-EPoSS Cooperation European GCI PPP

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## ERTRAC Research Framework

- Urban Mobility
- Road Transport Safety
- Long Distance Freight
- Energy, Resources and Climate Change

European Road Transport Research Advisory Council

ERTRAC Research Framework

## EPoSS Strategic Research Agenda

- Smart Systems for
- Health
- Ambient intelligence
- Safety and Security
- Mobility

EPoSS European Technology Platform on Smart Systems Integration

STRATEGIC RESEARCH AGENDA OF THE EUROPEAN TECHNOLOGY PLATFORM ON SMART SYSTEMS INTEGRATION

Version 2  
March 10, 2009

PPP  
on EGCI



European Industry Roadmap  
Electrification of Road Transport

Version 2.8  
January 2009

# EGCI

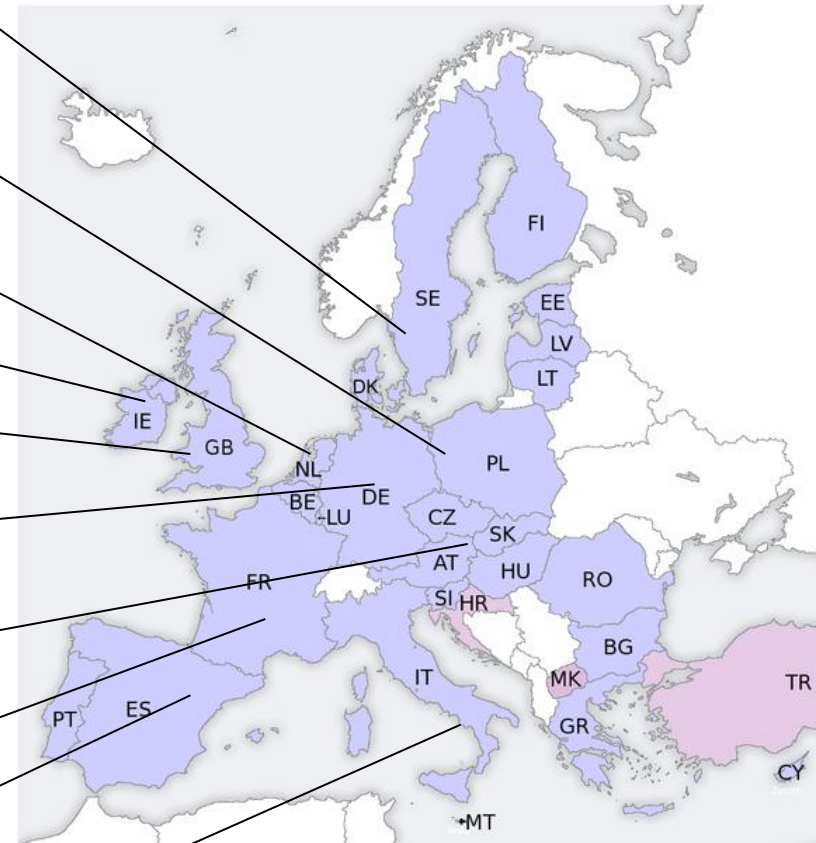
Abstract  
Seizing the great potential of electrified mobility for climate and resource

SMARTGRIDS

## PPP on Smart Systems Technologies

# Green Mobility Programs EU Member States

- Sweden  
Joint Vehicle Research Progr.(90 mE pa , 2009-13)
- Poland  
Initiative promoting electric cars and renewables
- The Netherlands  
Strategy Plan to be published in July
- Ireland  
EV Deployment Progr. (225,000 vehicles by 2020)
- U.K.  
Low Carbon Vehicle Innovation Platform, TSB (150mE)
- Germany  
Strategy Plan (1m PHEV/EV by 2020, 500mE 09-11)
- Austria  
Climate & Energy Fund (150mE p.a.)
- France  
Program Predit et al. (290mE, 100,000 EV in 5yrs)
- Spain**  
**Pilot Project Movele (10mE, 100,000 EV in 5yrs)**
- Italy  
Industria 2015 (150mE in 2009)



## Ad-hoc Advisory Group

- The EGCI consists of 3 pillars.
- The EC established an ad-hoc advisory group with industry members of ERTRAC, EPoSS and Smart Grid as well as logistics (maritime). The EC is represented by DGs RTD, TREN, INFSO.
- This group advises the EC in view of content of Calls for the next year, next to the Programme advisory group as well as national programme committees.
- The advice is based on consultation process in the involved ETPs.
- Chairman: Wolfgang Steiger, Volkswagen, ERTRAC chairman.

## ERTRAC Supporting Institutions Group

- Non profit making international association, Belgian Law
- Aim: Support the activities of ERTRAC in
  - the initiation and development of road transport research activities across Europe, including special programs.
  - strengthen the network of all stakeholders in road transport research related issues.
  - promote the awareness and understanding in the European Research Area on the specific role and importance of the road transport sector.
- Founding Members: Volkswagen, Valeo, AVL
- As per July 2009: 10 additional Members of the industry.
- New office in Avenue de Cortenberg 66, Brussels.

## Summary

- Supporting the European Green Cars Initiative (including the PPP approach) together with DG Research, DG TREN, DG INFSO, DG Environment, DG Enterprise
- Strengthening of the system approach for entire road transport.
- Cooperation with complementary ETPs such as EPoSS, Smart Grids, MANUFUTURE, ERRAC, ARTEMIS
- ERTRAC is a leading partner of the bi-annual Transport Research Arena (TRA) Conference.
- **Involvement of national road transport authorities (Member States) in Plenary and on “working” level for the creation of future PPP activities.**

## Spanish focus

- **The importance of the establishment of ERTRAC España**
- **3rd European contributor in volume of automotive production (with particular highlight in medium and heavy duty vehicles)**
- **Devoted industry essentially to EU internal market:**
  - benchmark for the Commission
  - Spain accessing to Competition Commissioner post (nov 09)

# Crisis yes, but also search for opportunity

- Prepare the after-crisis through investment in R&D.
- Optimize public private partnership
- Get connected to the non-automotive world: think out of the box, for the
  - vehicle to vehicle
  - vehicle to grids
  - vehicle to infrastructures.
- Optimize the advantages: strong player in renewable energies.

**Buena suerte a Ertrac España ! (Desde Ertrac, Bruselas)**