

# The International Foundry Forum 2010 “Passenger Car Concepts”



ASOCIACIÓN ESPAÑOLA DE FABRICANTES DE AUTOMÓVILES Y CAMIONES



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1. **Automotive Industry: The “Engine of Europe”**
2. **Low emission vehicles: what comes next?**
3. **Electrification of the mobility/transport system**
4. **Coordinated collaboration of all key players**
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6. **Global race about leadership on Electrically Chargeable vehicles**
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8. **Conclusions**

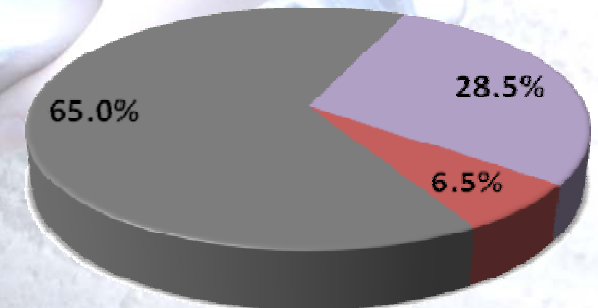


## *An industry crucial for economy...*

- ⇒ over 18.4 million vehicles produced in 2008
- ⇒ €20 billion in R&D spending, largest private investor
- ⇒ €42.8 billion of net trade contribution
- ⇒ €378 billion of tax revenues

## *... and employment*

- ⇒ 35% of EU manufacturing employment
- ⇒ 2.2 million direct jobs (6.5%)
- ⇒ indirect employment for another 9.8 million families (28.5%)



## Internal combustion engine

- Still potential for further improvement
- Primary powertrain in the 2020 timeframe
- Drastic reductions of regulated emissions
- Important contribution to overall CO2 reductions possible



## Alternative fuels

- CO2 reduction potential of bio-fuels, CNG and LPG could be better used with sufficient fuel infrastructure



## The next steps

- Electrification (incl. fuel cells)
- Hydrogen



## Electrically Chargeable Vehicles

- Range of electrical technologies in development
- Applications include hybrids, plug-in hybrid electric vehicles, extended-range electric vehicles and battery electric vehicles
- Low or zero emissions at the tailpipe
- Low-carbon electricity key to realizing CO2 savings potential

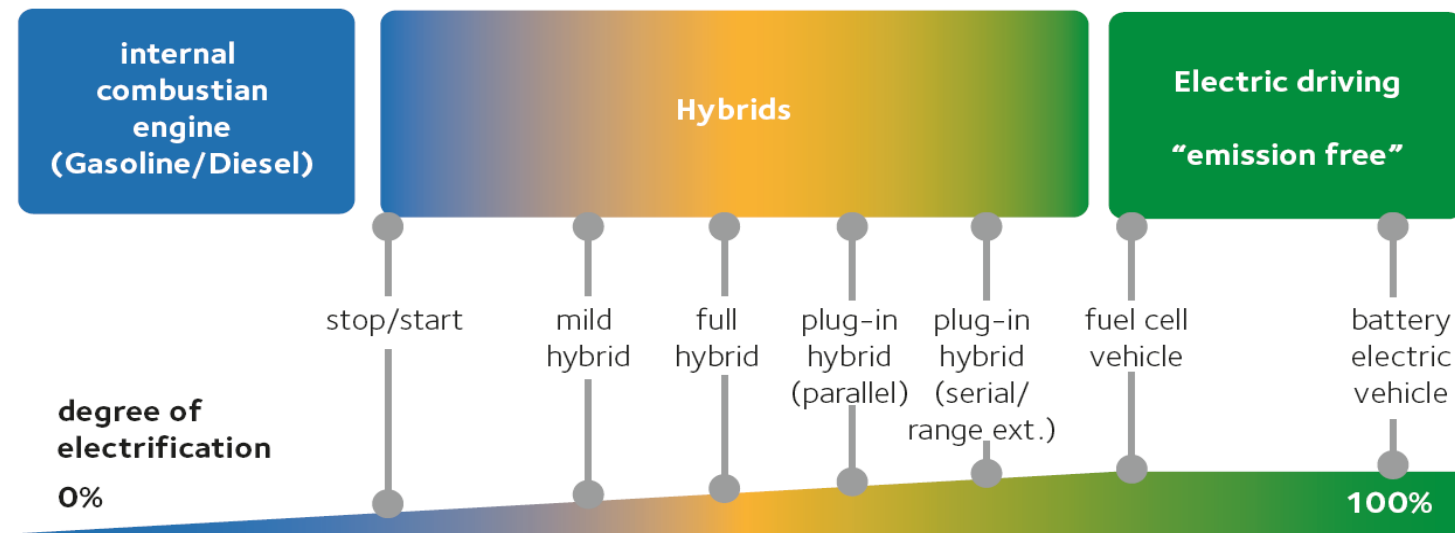
## Part of the solution towards sustainable mobility

- Promising future technology
- But diverse transportation needs



# Electrification of the vehicle is one option

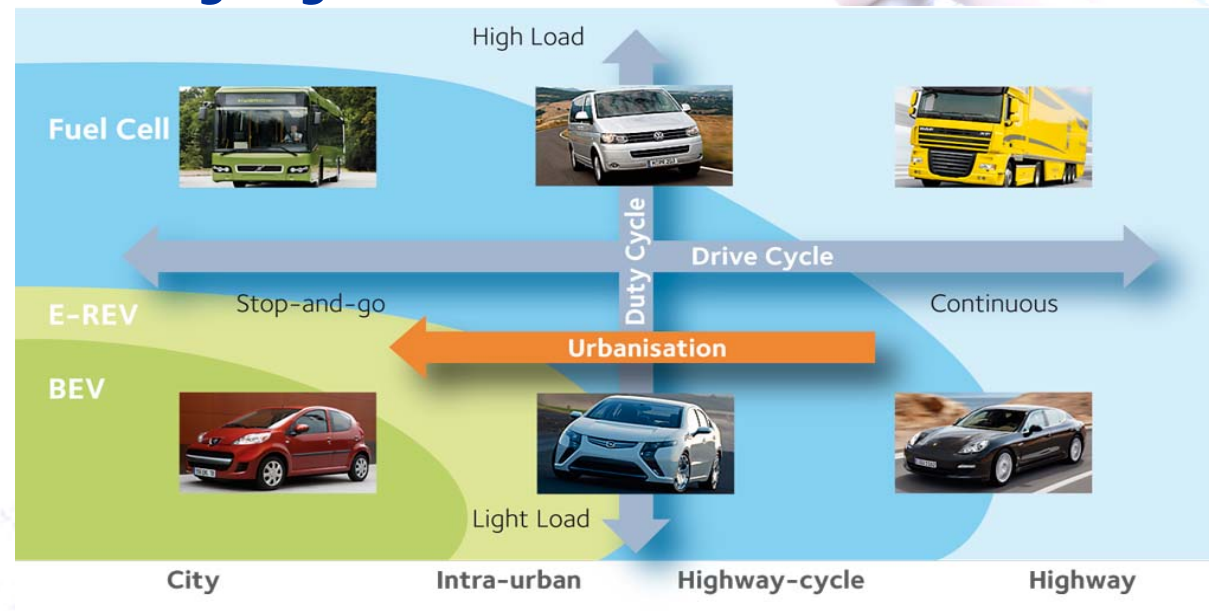
There is a wide spectrum of concepts for electrification of the vehicle:



- These concepts include and incorporate all of the technologies previously mentioned,
- The future share of these different electrification concepts will be determined by maturity of technology and market acceptance.

# Duty and Drive Cycles determine Drive Options

Deployment of different applications will depend on required utility cycle of user:



- Different concepts are appropriate for different applications,
- For certain applications, conventional engines remain the only solution,
- Viability of electric vehicles will depend on cost and infrastructure.

### Key pillars for success

- **Policy environment**
  - Coordinated Market incentives (EU, national governments)
- **Market readiness**
  - Recharging infrastructure
  - Customer acceptance, market demand
- **Technology ability**
  - Vehicles for range of customer needs
  - Costs
  - Need for further R&D (particular battery development)

### Key pillars for success (cont'd)

- **Standardisation**

- Common interfaces (e.g. vehicle-infrastructure)
- Global standards

- **Well-to-Wheel consideration**

- Low-carbon energy key to realise CO2 savings potential



## Market uptake of Electrically Chargeable Vehicles\*

| Customer expectation: | e-vehicles today: |
|-----------------------|-------------------|
| Same driving range    | 150 km            |
| Same refuelling time  | 3 hours           |
| Same cost             | EUR 10,000+       |

**A new vehicle market share in the range of 3-10% in 2020-25 is possible**

**Market penetration depends on the coordinated collaboration of all key players**

\* including battery electric vehicles, extended-range electric vehicles and plug-in hybrid electric vehicles

## Opportunity for EU leadership

- Engineering/new competences in the EU
- Positive impact for employment in the EU

## Policy makers' support is crucial

- Clear political framework conditions for E-mobility to encourage industry to invest and to create demand amongst customers
- Intensive policy support in the US, China and Japan
- EU competitiveness at stake



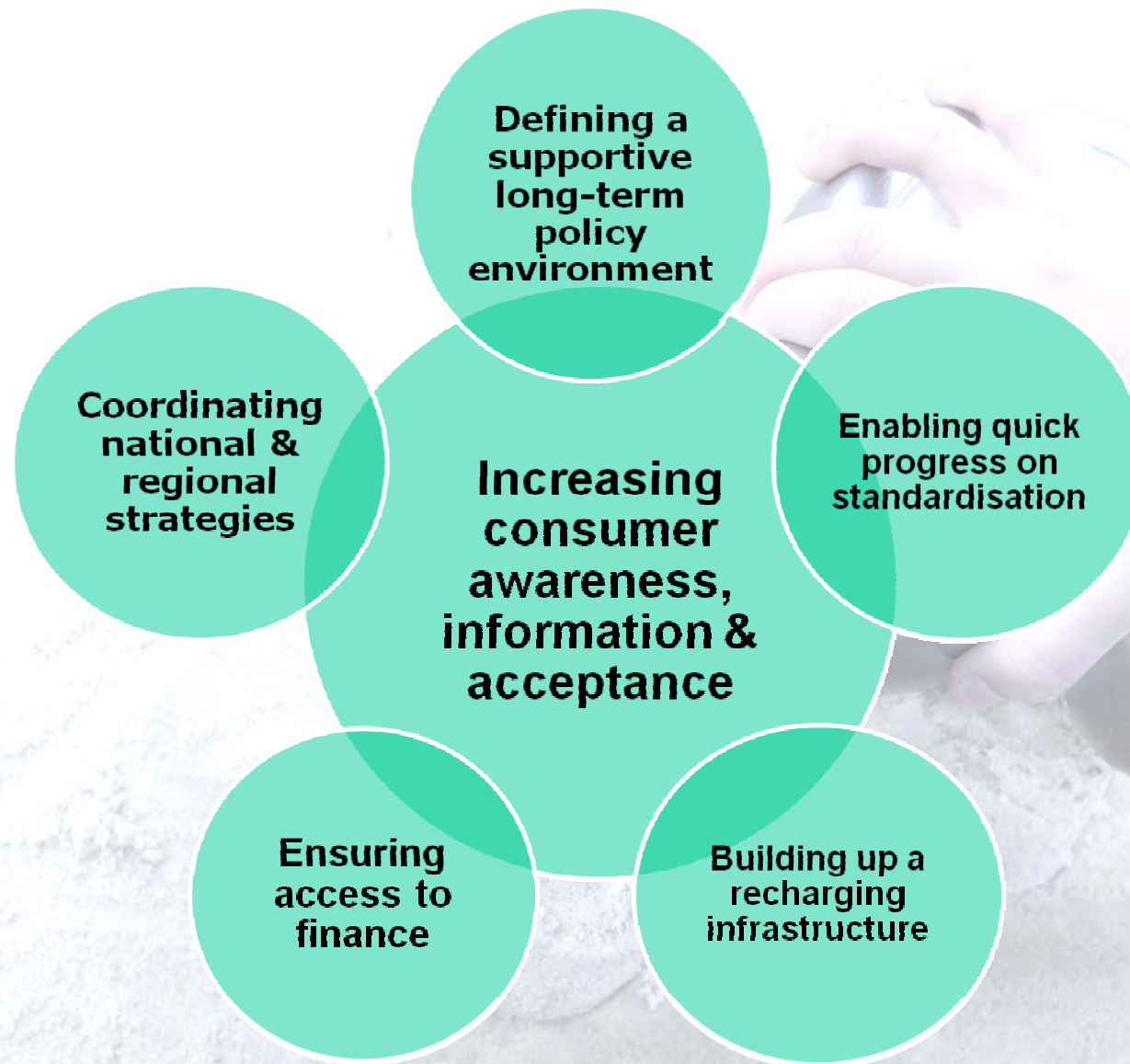
- Industry recognises the implementation of supportive policies for Electrically Chargeable Vehicles in various EU Member States
- Need that all EU Member States established a supportive policy environment
- National strategies need to be aligned/harmonised within the EU to maximise the economies of scale
- Activities outside the EU (e.g. US, China, Japan) are well coordinated which could give them a first mover advantage
- Joint US/China initiative on promotion of E-Mobility

## More support from the EU and Member States is needed

- Underpin industry efforts with coordinated R&D support
- Long-term framework to encourage industry to invest in new technologies (manufacturing vehicles, infrastructure, components)
- Customer incentives to stimulate demand and to offset initial cost premium
  - Battery costs can add 6,000 – 16,000 Euro/car\*
  - Additional costs for power electrics, wiring, etc.
  - Incentives to be based on environmental results (technology-neutral)
- Support on low-carbon power generation and increase competitiveness between electricity producers
- Support of focus areas/competence fields



# Roadmap for EU-leadership on E-mobility



### **Mobility is an enabler of economic growth and social development**

- Vision: truly sustainable mobility

### **The automotive industry is part of the solution**

- Difficult economic circumstances, but robust in the long term
- Continued investment in technology leadership

### **The regulatory framework matters:**

- Defend and strengthen Europe's manufacturing base
- Boost global competitiveness by better regulation and impact assessments

### **Electrically chargeable vehicles require a joint effort**

- Establish roadmap for EU-leadership on E-mobility
- Success depends on coordinated collaboration of all key players