



EU Policy Framework for e-mobility

- | **Energy demand and CO₂ emissions**
- | **EU policy actions**
- | **Alternative fuel activities**

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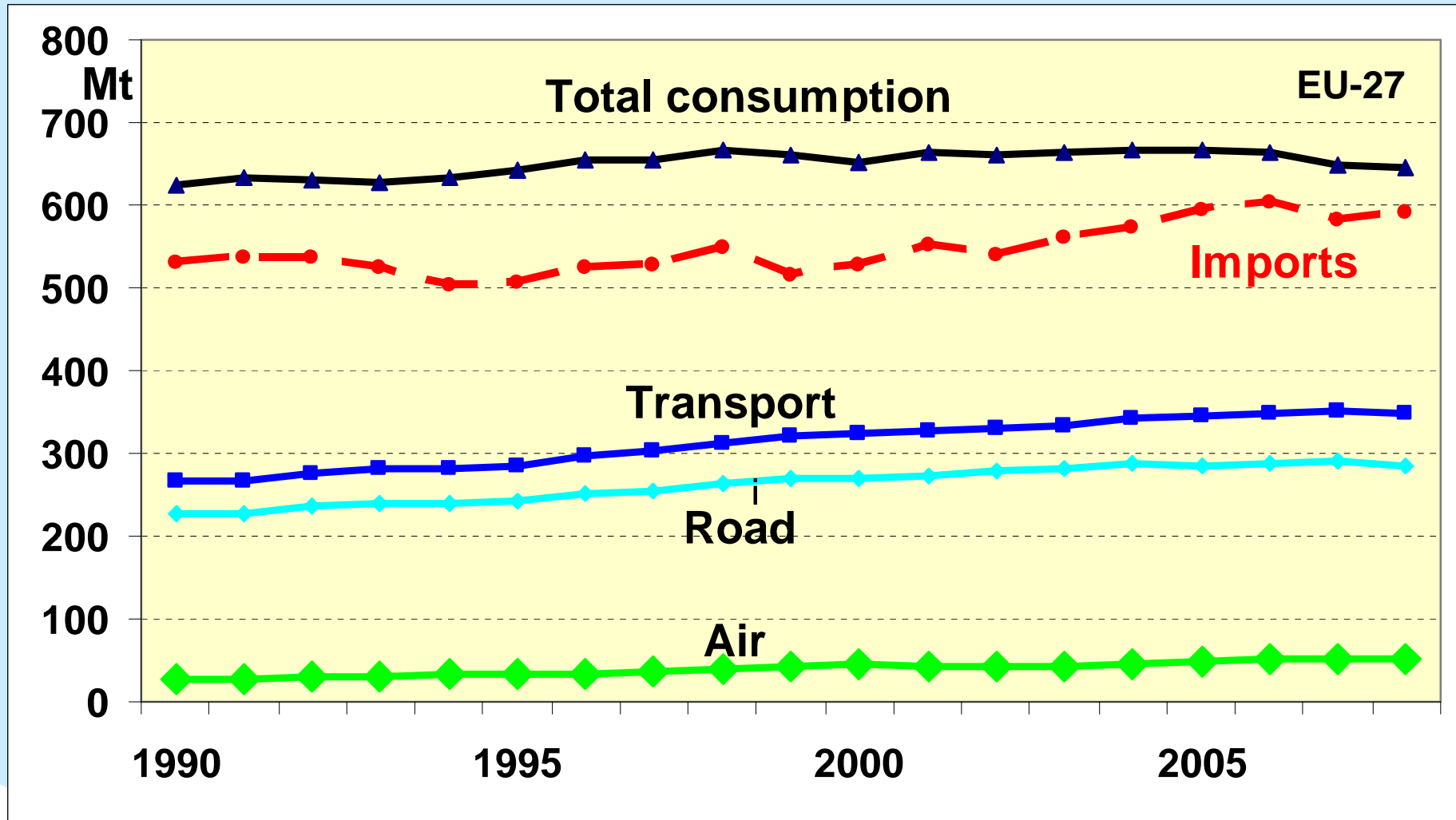


Energy/Transport Policy Drivers

- **High demand on finite energy sources**
(Range of conventional oil: ~ 45 years; gas: ~ 65 years)
- **Increasing energy import dependence**
(Import dependence for oil: 80% now; ~ 90% in 2030)
- **Increasing greenhouse gas emissions**
(Increase of transport CO₂ emissions: 25% since 1990)



Oil Consumption

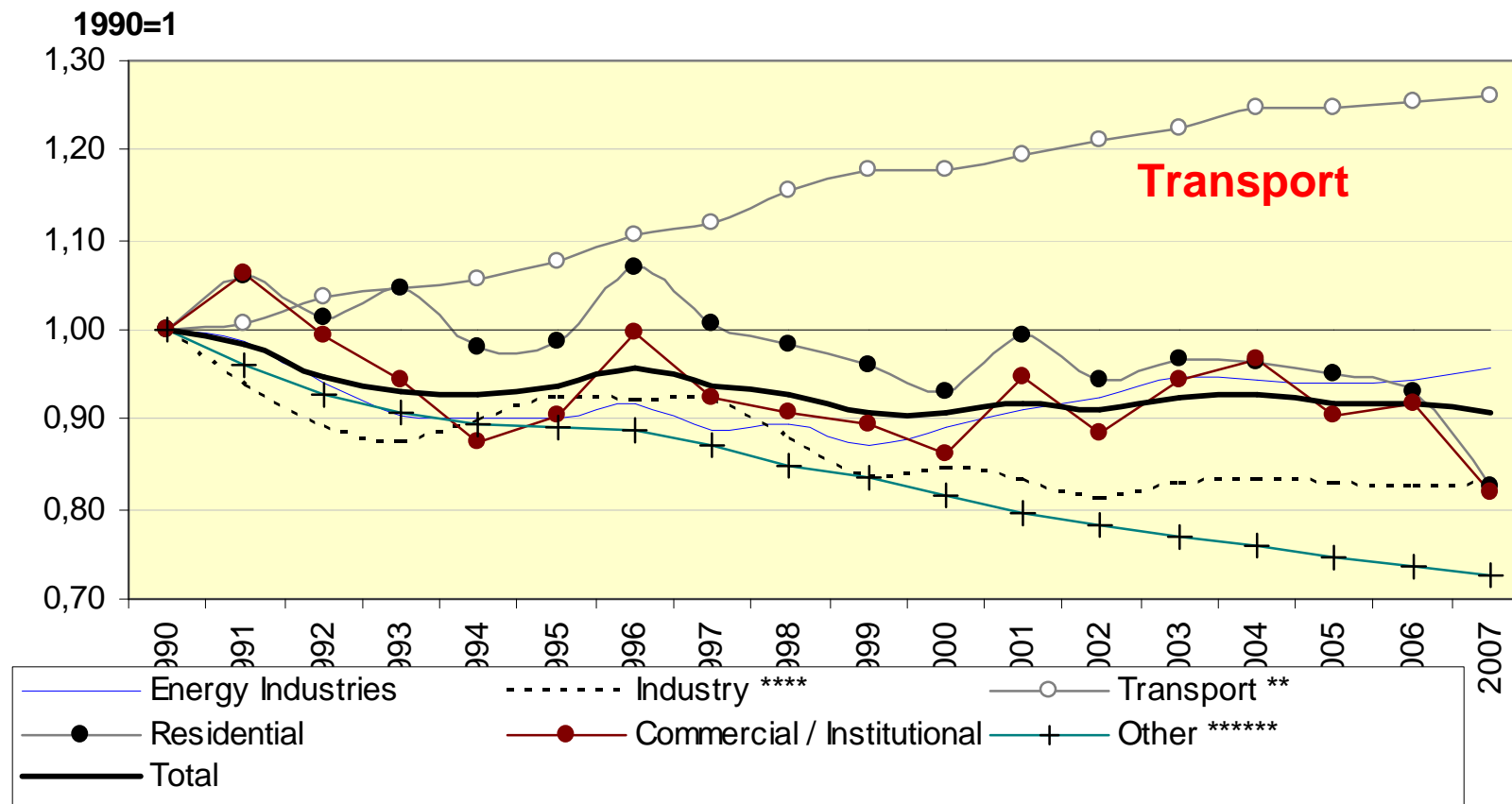


F. Söldner, EU Policy Framework for e-mobility



Greenhouse Gas Emissions

EU-27





Fields of Policy Action

- | **Research and Technological Development**
- | **Market Introduction**
- | **Market Regulation**
- | **Funding**



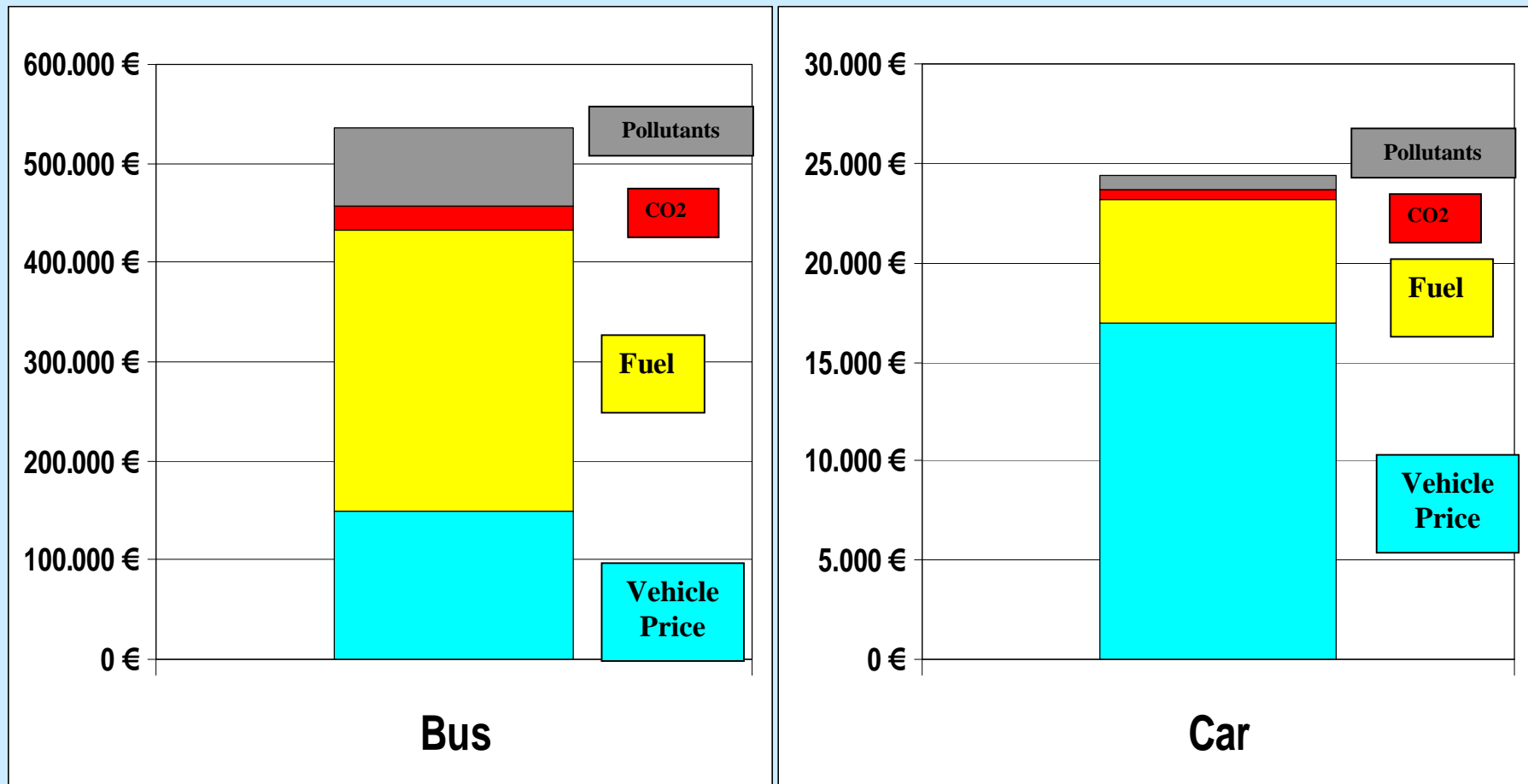
Market Regulation

- | **Regulation of pollutant emissions**
Reduction of pollutant emissions through EURO standards
- | **Regulation of CO₂ emissions**
Cars: 130g/km by 2015; 95g/km by 2020
Light Duty Vehicles: 175 g/km by 2017
- | **Renewable energy Directive**
10% share of renewable energy sources in motor fuels by 2020
- | **Fuel quality Directive**
Reduction of CO₂ intensity of fuels by 6 % by 2020
- **Clean Vehicle Directive**
Public procurement of vehicles needs to take into account (by 12/2010):
Energy consumption, CO₂ emission, pollutant emissions



Clean Vehicle Directive

Monetisation of Lifetime Costs





Clean Vehicle Directive

Support for Innovation with Lifetime Monetisation

Lower pollutant emission costs less:

è Euro V bus ~ 100.000 € cheaper than Euro III bus:

New vehicle cheaper than second hand vehicle

è CNG bus at 0 pm emissions ~8.000 € cheaper than Euro V diesel bus:

compensation for ~ 50% of higher cost of CNG technology

Lower energy consumption costs less:

è Electric car ~ 5.000 € cheaper than petrol car:

compensation for ~ 50% of additional cost of the battery

Competitive advantage for cleaner technology



EU-Activities on Alternative Fuels

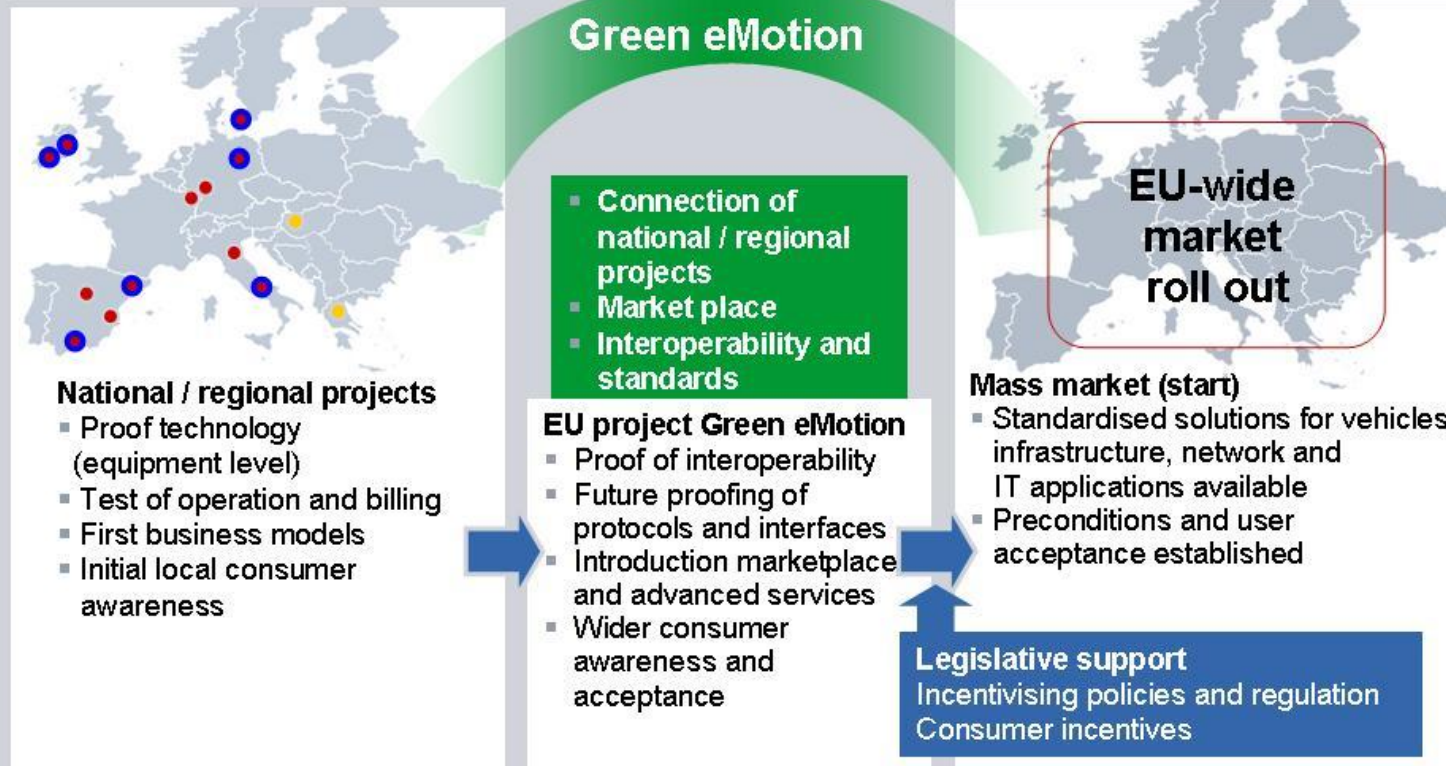
- ◆ **Communication on alternative fuels (11/2001)**
Biofuels, natural gas, hydrogen
- ◆ **Directive on the market share of biofuels (5/2003)**
Market share 2% in 2005, rising to 5.75% in 2010
- ◆ **Directive on the taxation of energy products (10/2003)**
Lower taxation of alternative fuels enabled
- ◆ **Renewable Energy Directive (April 2009)**
Binding target: 10% renewable transport fuels by 2020
- ◆ **Technology Platforms, Joint Technology Initiatives**
Hydrogen/fuel cells(TP:2004; JTI:2008), Transport(2004), Biofuels(2005)
- ◆ **Green Cars Initiative of European Economic Recovery Plan**
Focus on electromobility projects (first calls in July 2009)
- ◆ **Communication on clean and energy efficient vehicle strategy (4/2010)**
Focus on improvement of internal combustion engine and electric vehicles



EU Electromobility Demonstration Project



The Concept of Green eMotion

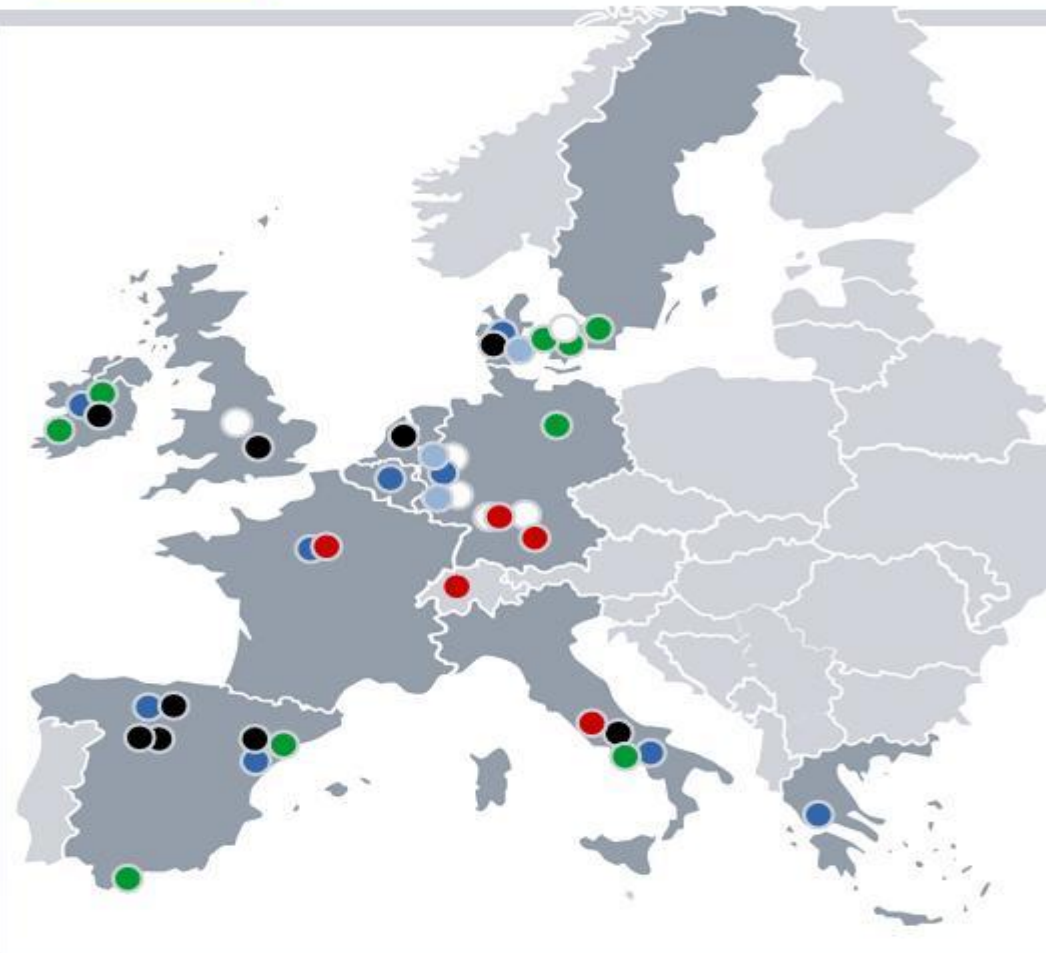




Green eMotion: Project Consortium



Project Consortium



- **Industries:** AREVA T&D, Better Place, Bosch, IBM, SAP, Siemens
- **Utilities:** Dansk Energy, EDF, Endesa, Enel, ESB, Eurelectric, Iberdrola, RWE, PPC
- **Electric Vehicle Manufacturers:** BMW, Daimler, Micro-Vett, Nissan, Renault
- **Municipalities:** Barcelona, Berlin, Bornholm, Copenhagen, Cork, Dublin, Malaga, Malmö, Rome
- **Research Institutions and Universities:** Cartif, Cidaut, DTU, ECN, Imperial, IREC, RSE, TCD, TECNALIA
- **EV Technology Institutions:** DTI, FKA, TÜV Nord

+ **External Stakeholders** to facilitate the access to information not held by the consortium, to disseminate Green eMotion knowledge and encourage its application outside the consortium



Policy Outlook

- n **White Paper on Transport**
Announces sustainable alternative fuels strategy including also appropriate infrastructure
- n **Clean Transport Systems Initiative**
Follow up on the White Paper with comprehensive alternative fuels strategy for all transport
- n **CARS 21**
Follow up on the strategy on clean and energy efficient vehicles



Future Transport Fuels

Future Transport Fuels



Report of the
European Expert Group
on Future Transport Fuels

European Expert Group on Future Transport Fuels

Members:

- Manufacturers, operators, users
- Energy and fuel suppliers
- Civil society

- All transport modes
- All fuels and energy carriers

Report published on 25 January 2011

http://ec.europa.eu/transport/urban/vehicles/road/clean_transport_systems_en.htm



Modal Coverage by Alternative Fuels

		Road/passenger			Road/freight			Rail	Water			Air
		short	med	long	short	med	long		inland	sea	marit	
Electric	BEV											
	HFC											
	Grid											
Biofuels (liquid)												
Synfuels												
Methane	CNG											
	CBG											
	LNG											
LPG												



Alternative Transport Fuel Options

Main fuel options:

- n **Electricity / hydrogen**
- n **Biofuels**

Bridge from fossil to biomass based fuels:

- n **Synthetic fuels**

Complementary:

- n **Methane (natural gas and biomethane)**

Supplement:

- n **LPG**



Summary

- ◆ **Domination of fossil fuels will persist for decades**
 - ◆ Energy efficiency and transport efficiency measures required:
 - è Stretch range of fossil sources and reduce CO₂ emissions
- ◆ **Gradual substitution of oil by alternative fuels needed**
 - ◆ Substitution of oil for all transport on the long term
 - ◆ Decarbonisation of transport to match the 80-95% target for 2050
- ◆ **Multiple fuel mix required for sustainable future mobility**
 - ◆ Electricity/hydrogen and biofuels as main options
 - ◆ Synthetic fuels as bridge from fossil to biomass based fuels
 - ◆ Methane (natural gas and biomethane) as backup
 - ◆ LPG as supplement



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