



European Alternative Fuels Strategy

- **Policy Drivers**
- **EU actions on alternative fuels**
- **Clean Transport Systems initiative**

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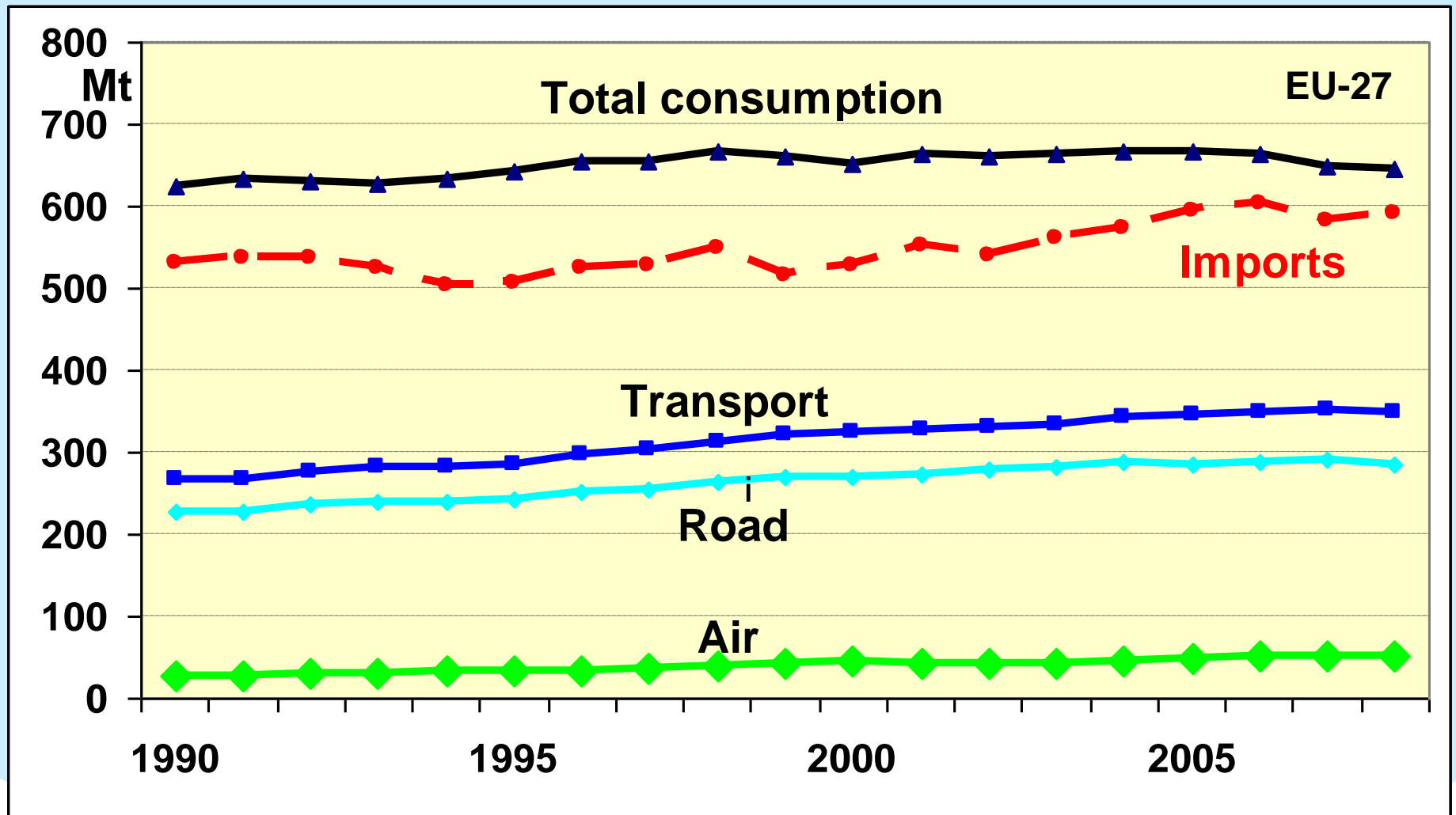


Energy/Transport Policy Drivers

- **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

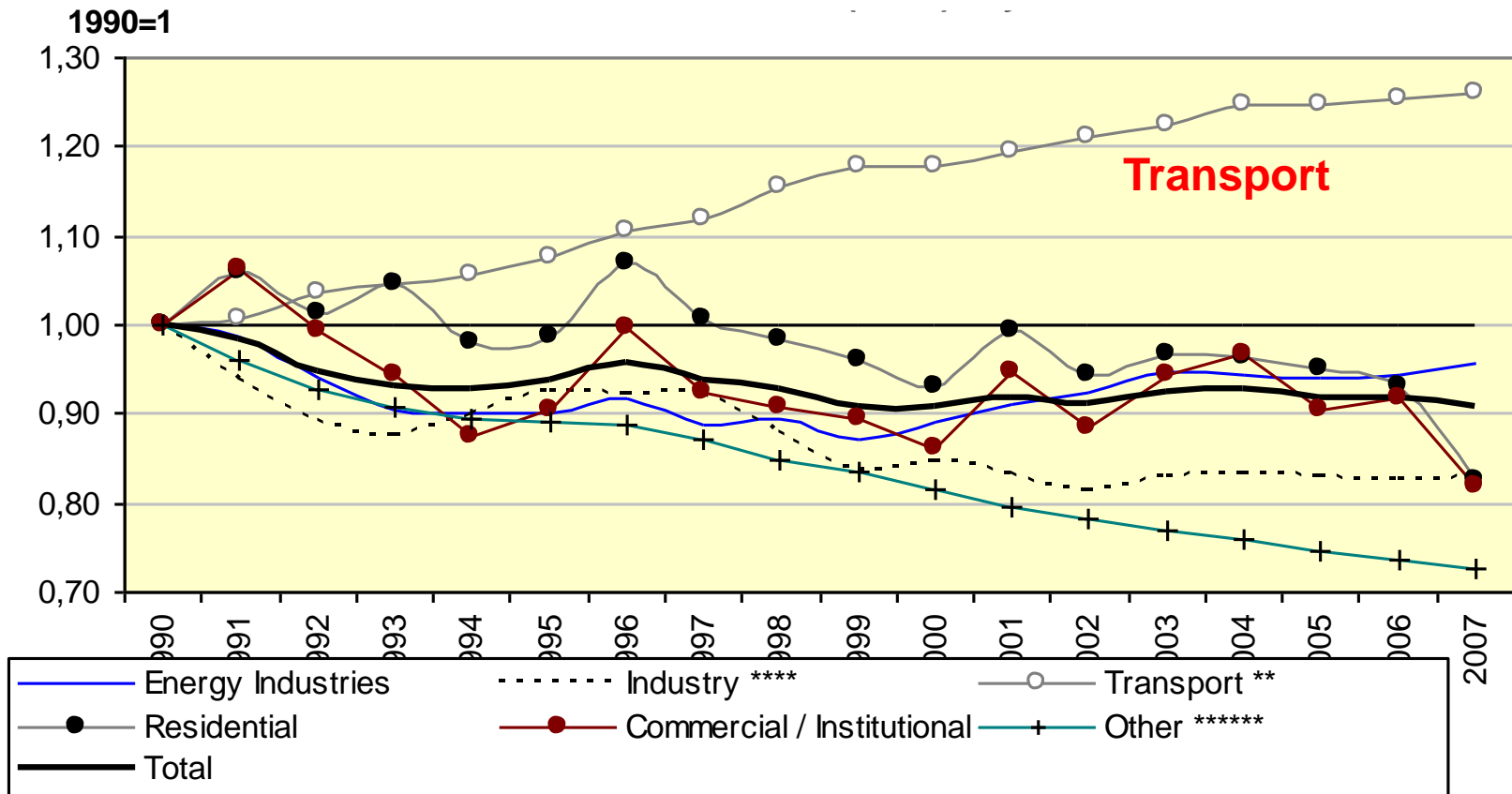


Towards a European alternative fuels strategy, 15th AMAA Forum, Berlin, 29 June 2011



Greenhouse Gas Emissions

EU-27





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 (2008)**
Focus on electromobility (EU demonstration project Green eMotion: 2011)
- ◆ **Communication on clean and energy efficient vehicle strategy (4/2010)**
Focus on improvement of internal combustion engine and electric vehicles



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



Alternative Fuels Strategy

Comprehensive long-term fuel strategy
All transport modes, all segments to be covered

White Paper on Transport - Initiative 24 - Technology roadmap:

Sustainable alternative fuels strategy
including also the appropriate infrastructure

White Paper on Transport - Initiative 26 - Regulatory framework:

- **Appropriate standards for CO₂ emissions of vehicles in all modes, where necessary supplemented by requirements on energy efficiency to address all types of propulsion systems**
- **Rules on interoperability of charging infrastructure for clean vehicles**
- **Guidelines and standards for refuelling infrastructures**



Clean Transport Systems Initiative

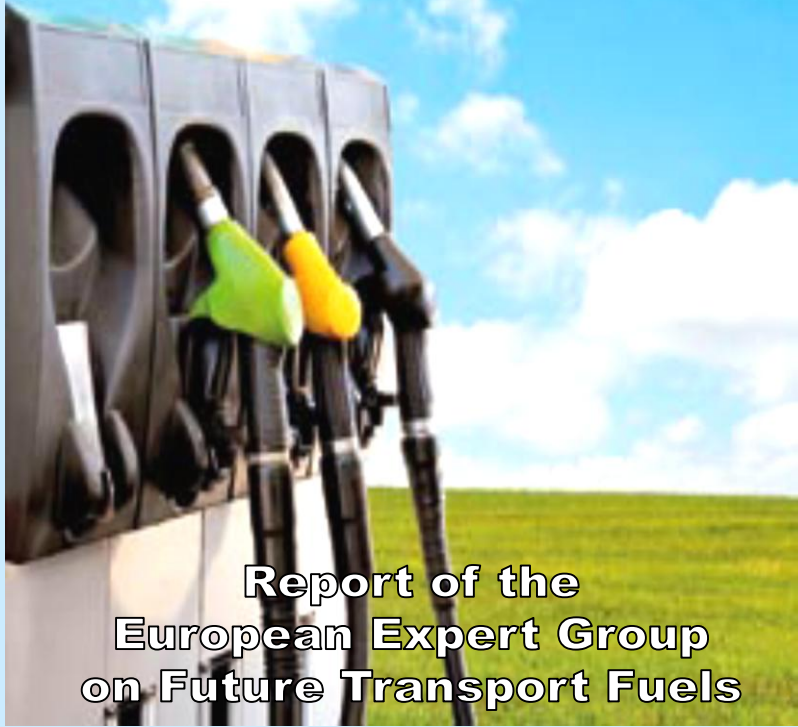
Preparatory actions

- **European Expert Group on Future Transport Fuels**
Stakeholder experts
Created in March 2011; Report: 25 January 2011
2011: Focus on infrastructure and implementation
- **Joint Expert Group Transport & Environment**
National experts
Meeting 17 March 2011; Report in May 2011
- **Scenario Modelling Study**
Launched in September 2011; Report in 2011
- **Conference on Future Transport Fuels**
13 April 2011 (European Sustainable Energy Week)



Future Transport Fuels Expert Group

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

Scope:

Long term energy supply to transport

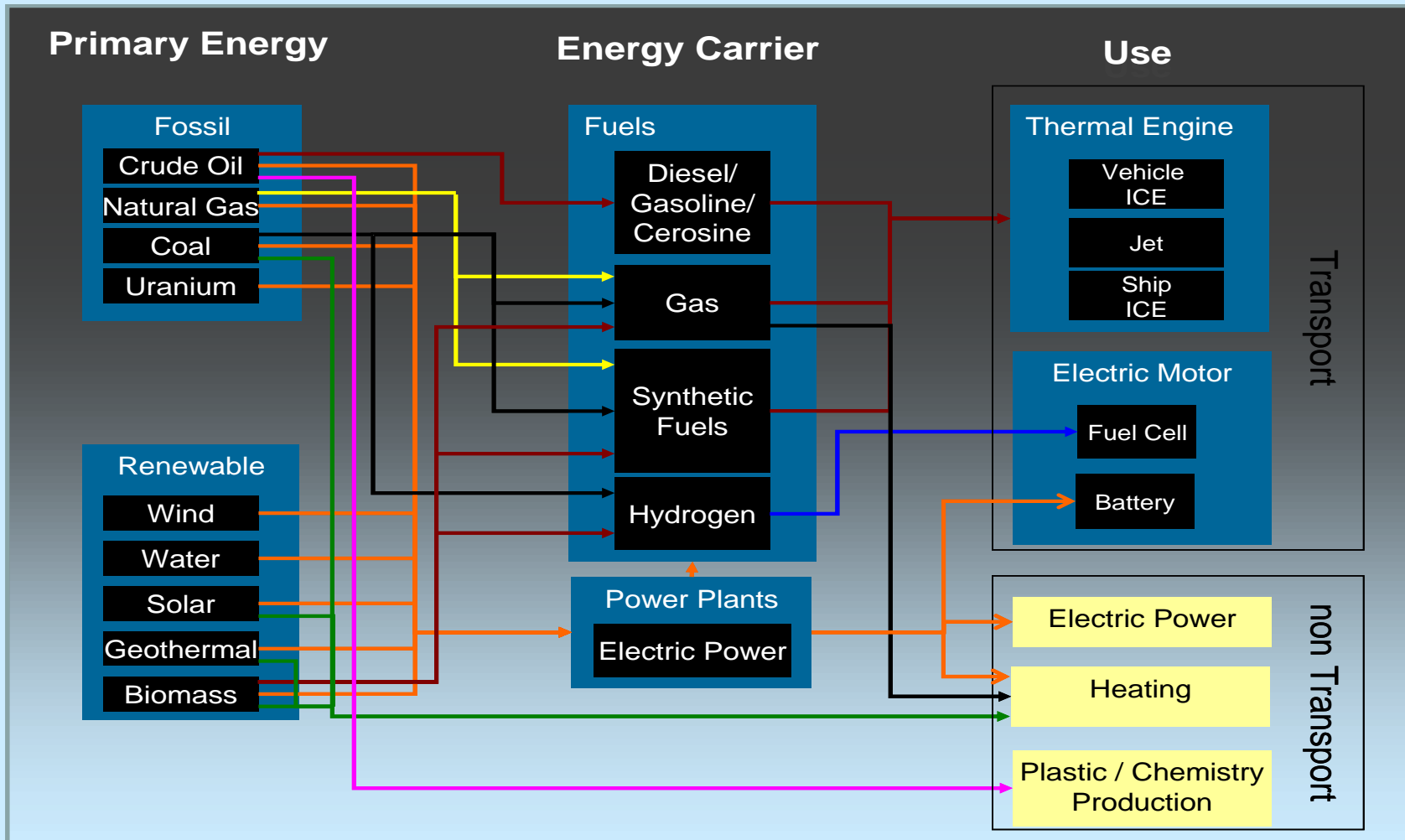
- All transport modes
- All fuels and energy carriers

Report published on 25 January 2011

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



Energy Pathways





Alternative Transport Fuel Options

Main fuel options:

- **Electricity / hydrogen → *electromobility***
- **Biofuels (liquid)**

Bridge from fossil to biomass based fuels:

- **Synthetic fuels (from coal, methane, biomass)**

Complementary:

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

Supplement:

- **LPG (now: from oil, natural gas; future: from biomass)**



Fuel Choice

Range		Road - passenger			Road - freight			Rail	Water			Air
		short	medium	long	short	medium	long		inland	short-sea	maritime	
Electric	BEV											
	HFC											
	Grid											
Biofuels (liquid)												
Synfuels												
Methane	CNG											
	CBG											
	LNG											
LPG												



Recommendations on Fuel Strategy

- **Technology-neutral** policy approach
- **Regulations in energy and transport** complementary
- **Multifuel** – multimodal approach
- **Allocation of different fuels** to different sectors
- **Well-to-wheels** and **life cycle** analysis as basis
- **Liquid biofuels**: blending standards / fungible biofuels
- **Single methane grid** for natural gas / biomethane blend



Recommendations on Actions

- **Priority funding** for the main alternative fuels
- **CO₂: Internalise cost; cap on CO₂ intensity for fuel mix**
- **Efficiency standards** for all vehicles beyond 2020
- **Infrastructure: EU-wide build-up for the main fuels**
- **Low emission requirements for urban traffic**
- **Access privileges** for clean and energy efficient vehicles
- **Differentiated charging** favouring alternative fuels



Joint Expert Group Transport & Environment – *Recommendations on Actions* –

- **Revision of energy taxation Directive: introduce CO₂ tax**
- **Business models for multi-energy filling stations**
- **CO₂/energy efficiency Regulation for Heavy Duty Vehicles**
- **Tighter CO₂/energy efficiency Regulations for others**
- **Refuelling/recharging infrastructure: build-up, standards**
- **Labelling of CO₂/energy efficiency in a revised Directive**



Cost of Fuels



Speculative bubble 2007/8: Cost for EU transport: 90 b€
 North-Africa unrest 2010/11: Cost for EU transport: 15 b€

Alternative fuels

*Infrastructure costs
for EU coverage*

Electricity

charging posts for
20 million vehicles
40 b€

Hydrogen

100.000 filling stations
50 b€

Methane

100.000 filling stations
40 b€



Summary

- ◆ **Comprehensive long-term European fuel strategy**
Substitution of oil to all transport modes, all segments
- ◆ **Future transport fuel mix**
Electromobility and biofuels highest priority
Synthetic fuels bridging from fossil to biomass sources
Methane complementary
LPG supplementary
- ◆ **Alternative fuel infrastructure**
EU-wide coverage important



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