



EU-Strategy on Hydrogen and Fuel Cells

- **European energy policy**
- **European Technology Platform**
- **Research and development projects**
- **Joint Technology Initiative**

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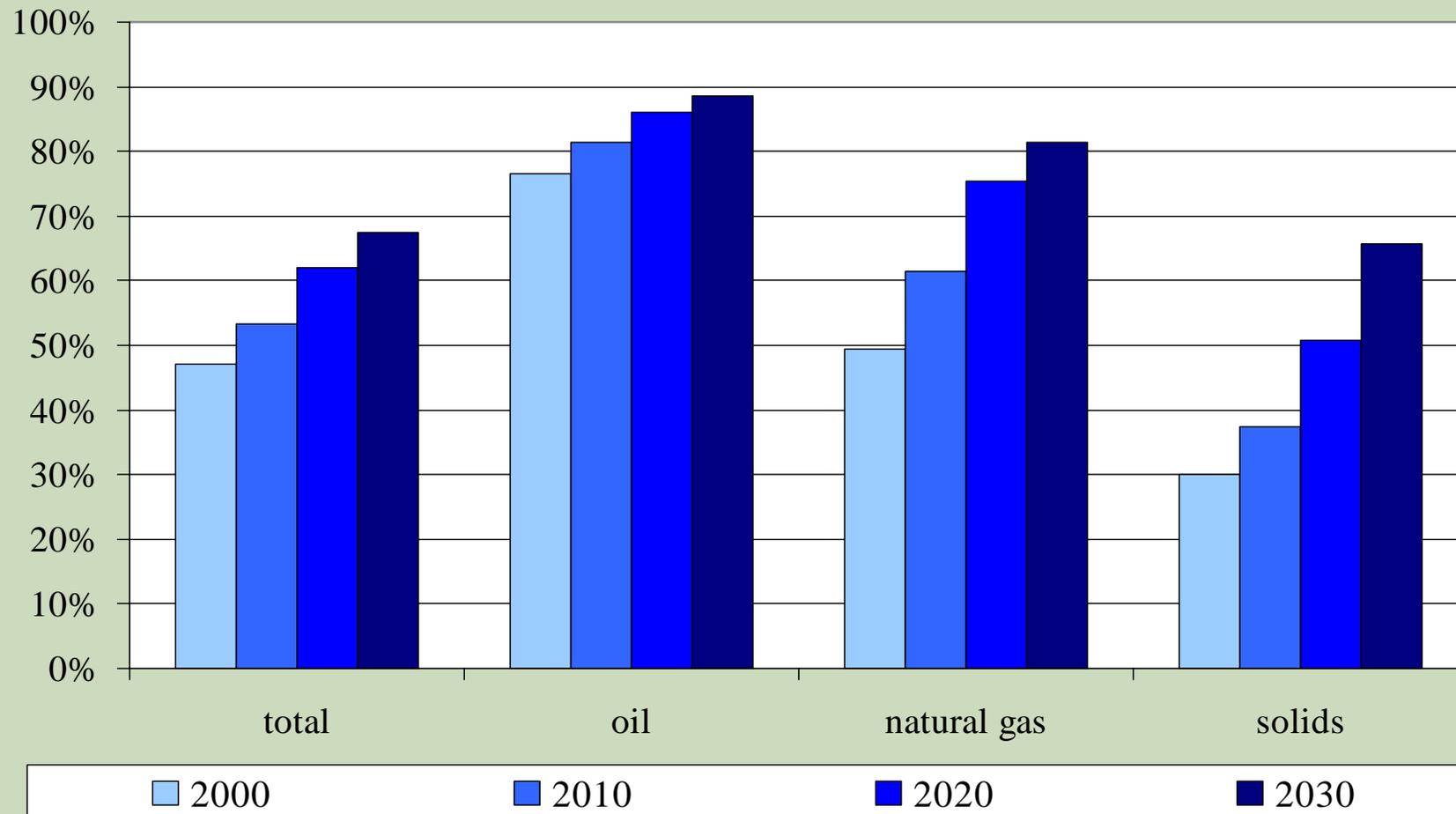
European Commission

Directorate General Energy and Transport

Unit G4, Clean Transport and Urban Transport

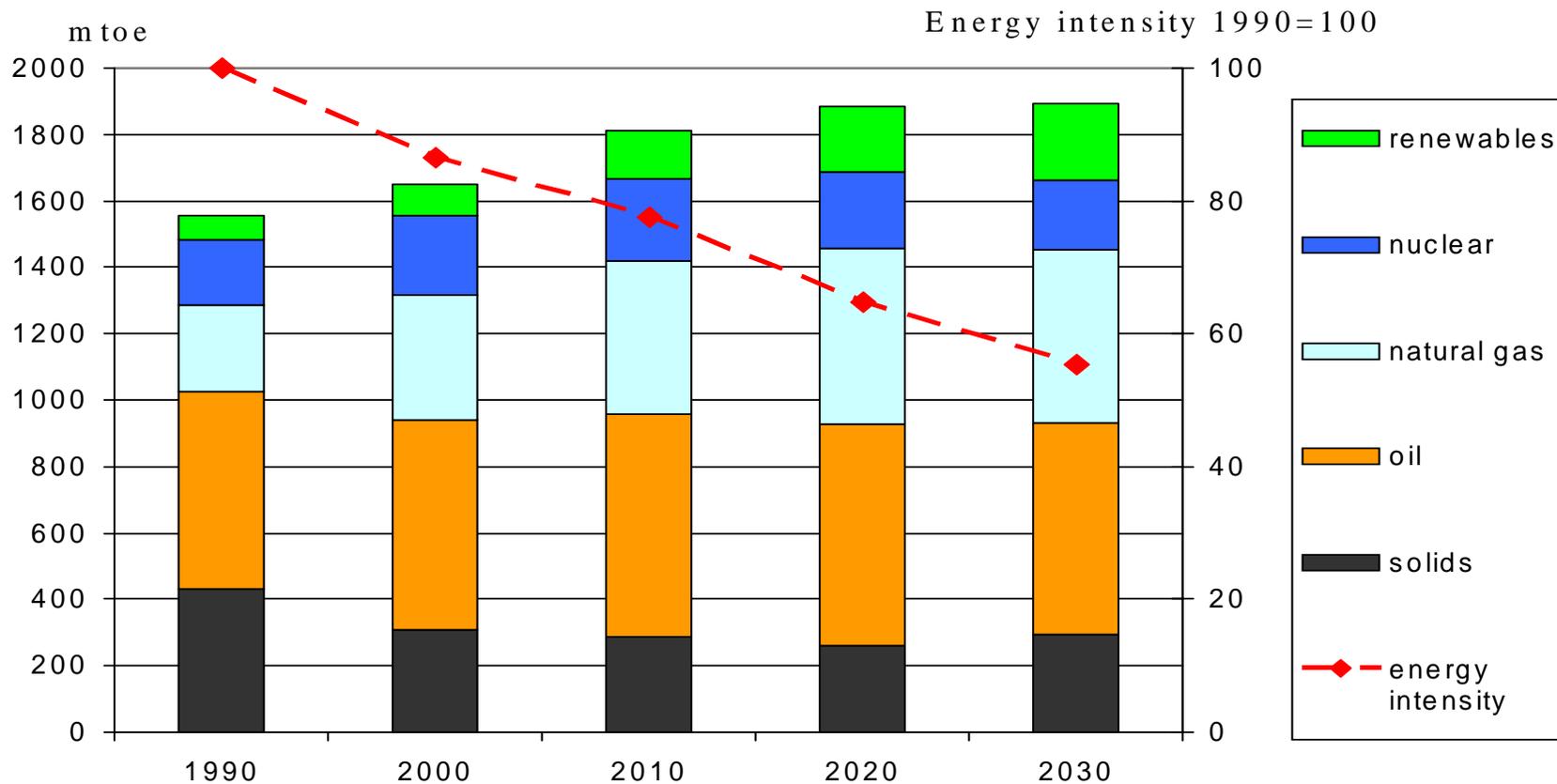


EU Energy Import Dependency





Trends in EU Energy Consumption

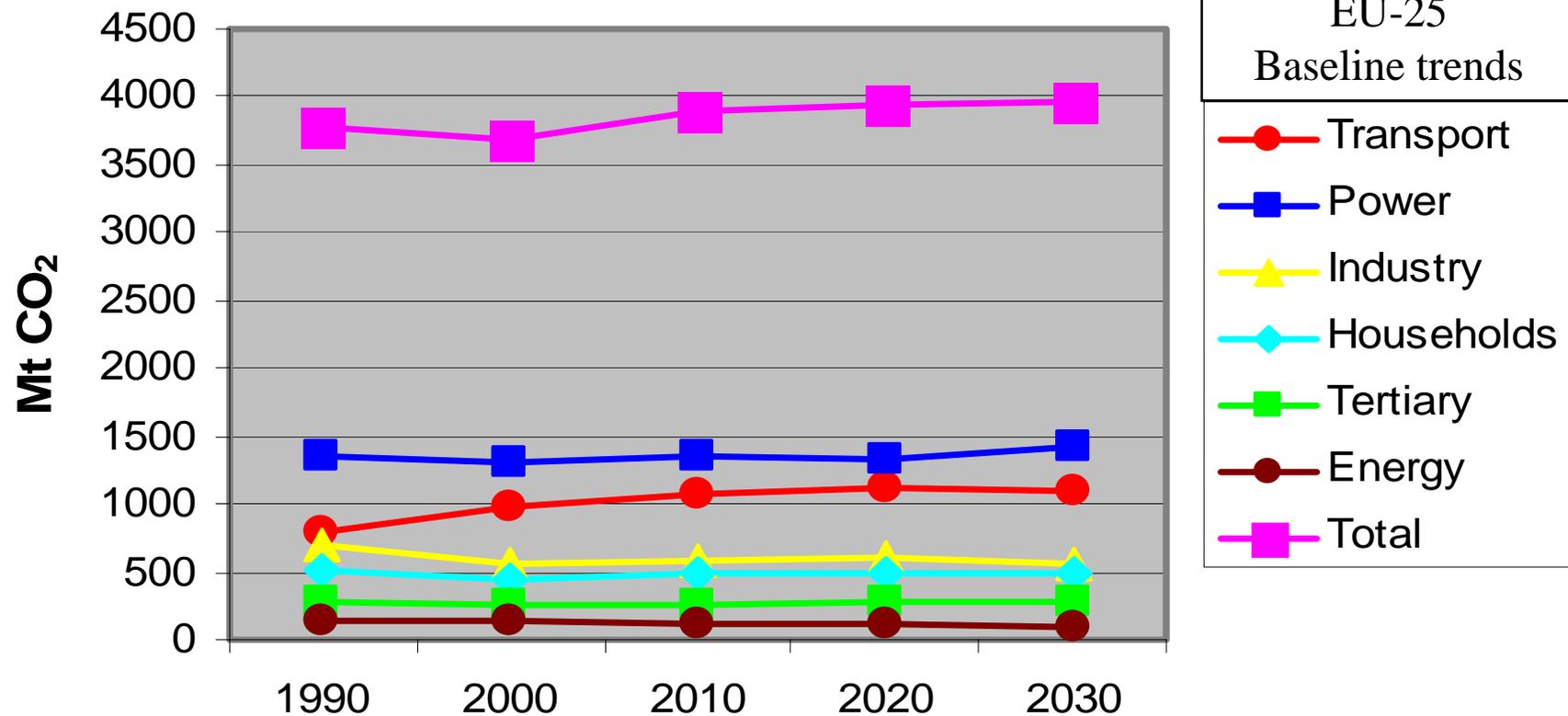


Renewables increase strongly
Natural gas increases its share considerably

Oil remains main energy source
Energy intensity continues falling



Trends in EU CO₂ Emissions

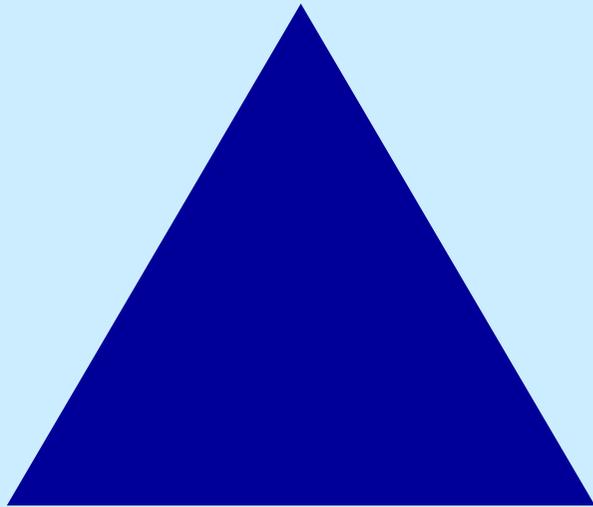


- CO₂ emissions projected to slightly increase
- Power production and transport remain main emitters



Common Energy Policy Goals

Competitiveness: Lisbon



Environment:
Kyoto

Security of
supply

Competitiveness:

internal market, competition, interconnections (TEN-T), European electricity grid, research & innovation (**energy efficiency**, clean coal, carbon sequestration, nuclear, **alternative fuels**)

Environment:

energy efficiency, **renewable energy**, nuclear, innovation & research, emission trading

Security of Supply:

European stock management (oil/gas), refining capacity and storage of energy, international dialogue, **diversification of energy mix**



Policy Framework Papers

Energy Efficiency Green Paper (7/2005)

→ ***Energy Efficiency Action Plan (10/2006)***

European Strategy for Sustainable, Competitive and Secure Energy (3/2006)

→ ***Energy Policy for Europe (1/2007)***

Mid-term review of Transport White Paper (6/2006)

→ ***Urban Transport Green Paper (9/2007)***



Hydrogen and Fuel Cells in Support of Policy Priorities

Security of Supply	Diversification of primary energy sources through hydrogen as universal energy carrier Energy saving through fuel cells as efficient energy converters
Climate Protection	Avoidance of greenhouse gas emissions through hydrogen from CO₂-lean production Energy saving with efficient fuel cells
Competitiveness	High market potential for investment into innovative technologies Creation of jobs in expanding markets



Key Points of Strategic Overview

H₂

**European Hydrogen & Fuel Cell
Technology Platform**

Strategic Overview

Need for a highly focused 10 year R&D&D programme

- **reduce FC system costs** (stationary by 10; transport by 100)
- **enhance performance + durability** of FC systems (factor ≥ 2)
- **reduce costs of hydrogen** delivered (factor ≥ 3)
- **novel storage materials** to increase vehicles' operating range

Need to combine private and public investment at EU scale

- **combine funding from EU, Member States and Regions**
- **programme execution through Joint Technology Initiative**

Need to develop integrated projects and policy frameworks

integrated RTD + D programme

large-scale demonstrations ("Lighthouse Projects")

bridge the gap between R&D and commercialisation

Aim

Early markets by 2010

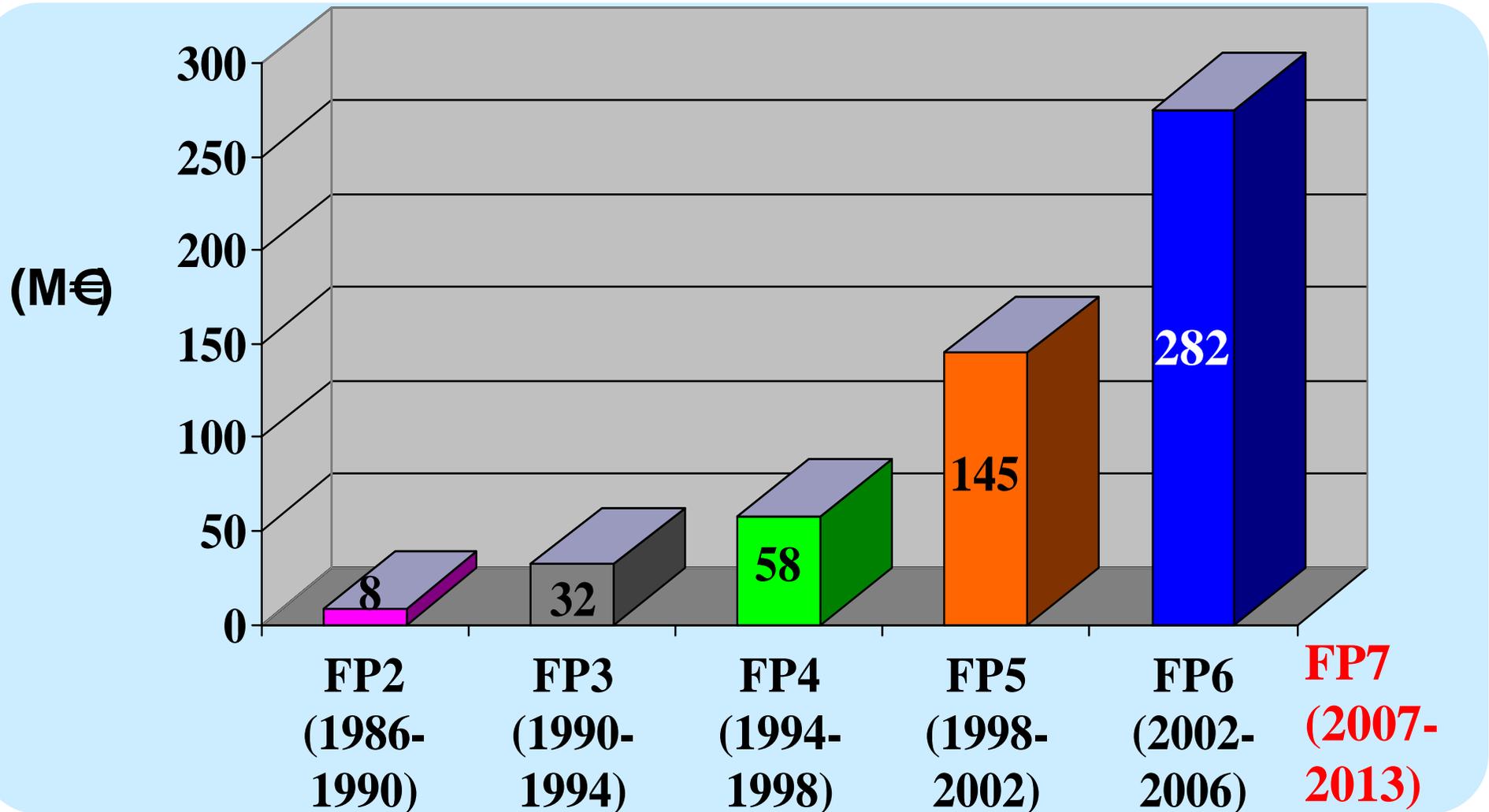
Commercialisation of stationary applications by 2015

Commercialisation of transport applications by 2020

<https://www.hfpeurope.org/hfp/keydocs>



EU Funding for Hydrogen and Fuel Cells



4th biannual meeting HyFLEET:CUTE, London, 6-7 March 2007



Project Family

Hydrogen for Transport

Buses

HyFLEET:CUTE



Cars

ZERO REGIO



Zero Regio
H2-MotorFuel



Mini-Transport

HyCHAIN



200 Vehicles - Investment: 105 M€ (EC: 48 M€)

Coordinated Action



Project evaluation, preparation for »Lighthouse Projects«



Joint Technology Initiative (JTI) for Hydrogen and Fuel Cells

- Introduction of hydrogen and fuel cells requires **long-term stability by public/private partnerships**
- Strategy for research and market introduction requires **coordinated long-term action plan**
- Long-term security of financial support through **ring-fenced EU funds** and leverage of private funds
- **European hydrogen and fuel cell technology platform** has successfully prepared future actions
- **Industry ready to invest more in R&D**



Joint Technology Initiative (JTI) for Hydrogen and Fuel Cells

Four main themes:

- **Fuel cell development programme**
- **Hydrogen supply programme**
- **Lighthouse demonstration projects**
- **Market framework preparatory activities**



Summary

- **Motivation for hydrogen and fuel cell activities**
security of supply, climate protection, competitiveness
- **European Technology Platform**
Development of a common European strategy on hydrogen and fuel cells
- **Demonstration projects**
Development of hydrogen and fuel cells with focus on transport applications
- **Joint Technology Initiative**
Market preparation through public-private partnership to implement the European strategy