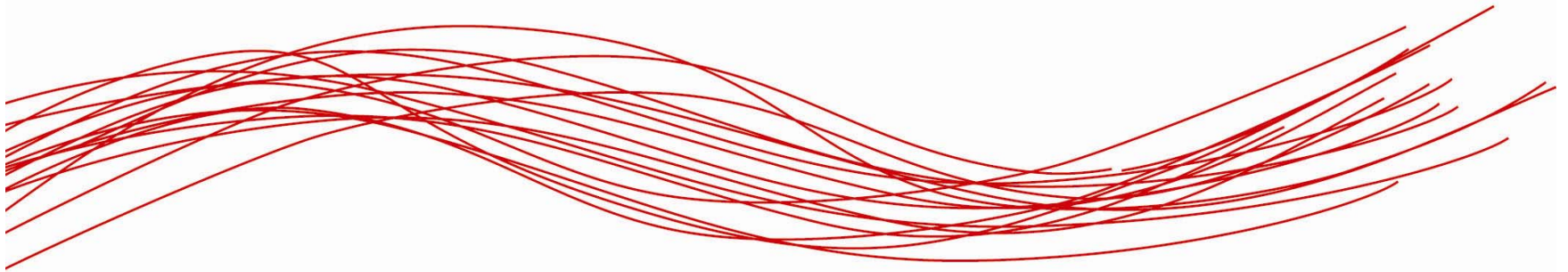


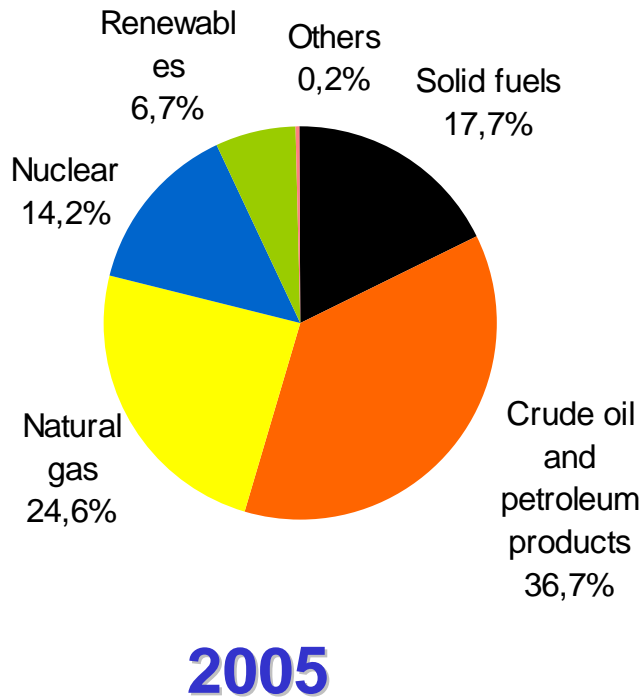
JRC Supporting the European Strategic Energy Technology Plan (SET-Plan)

The Technology Map



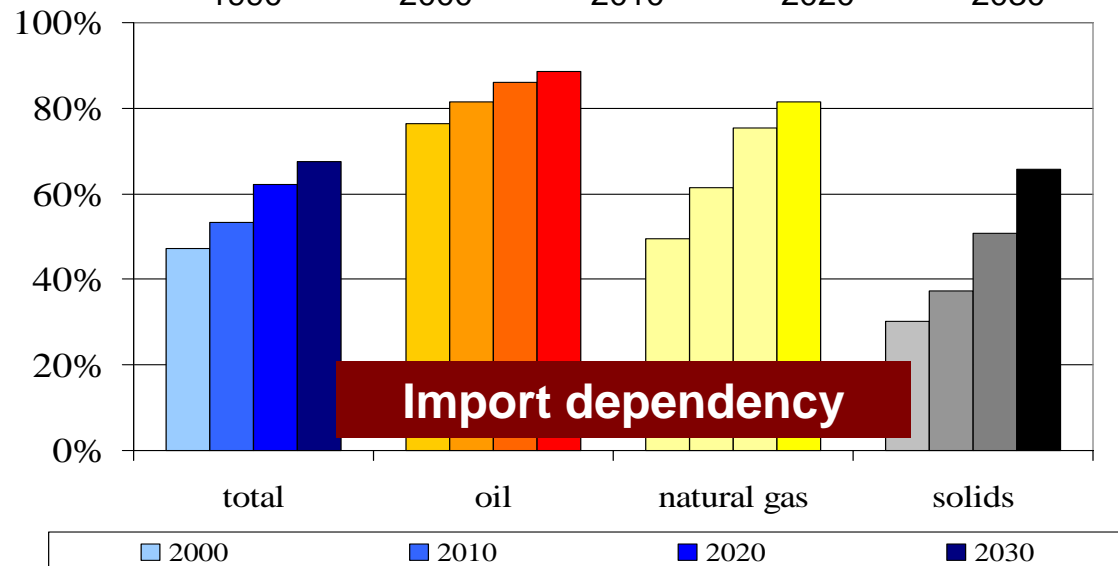
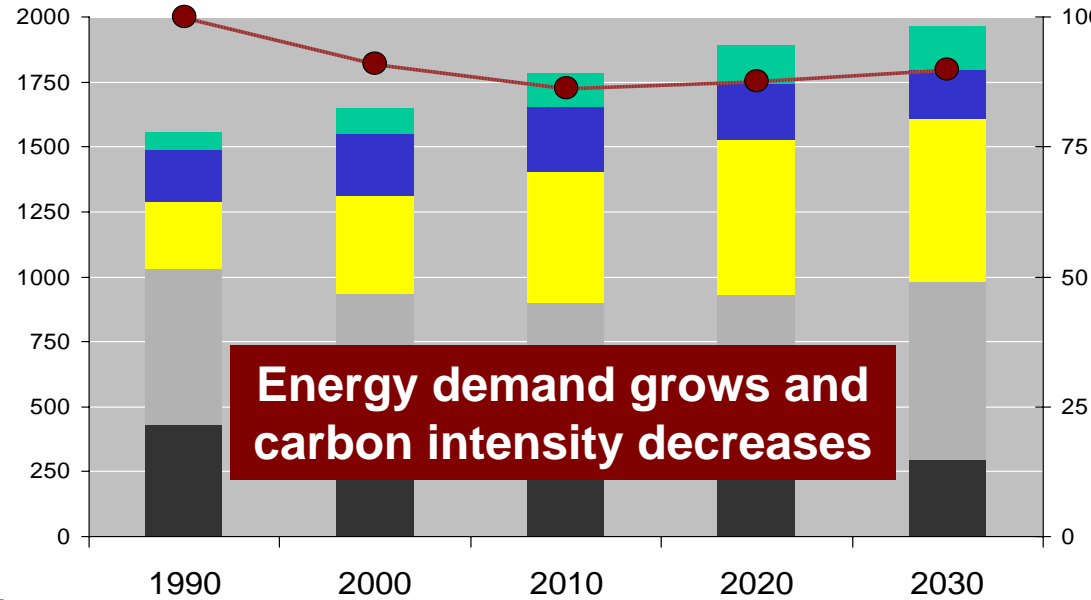
Joint Research Centre
Arnaud MERCIER
Institute for Energy,
Energy Systems Evaluation Unit

- **Technology is vital** to achieve the EU Energy and Climate Change policy objectives
- **But today we are falling short:**
 - Insufficient energy research budgets in the EU
 - Structural weaknesses in technology innovation
 - International competitors are already accelerating their efforts
- **There is a need to use the ambition and the targets of the EU Energy Package to create a new European policy for energy technology (SET-Plan)**

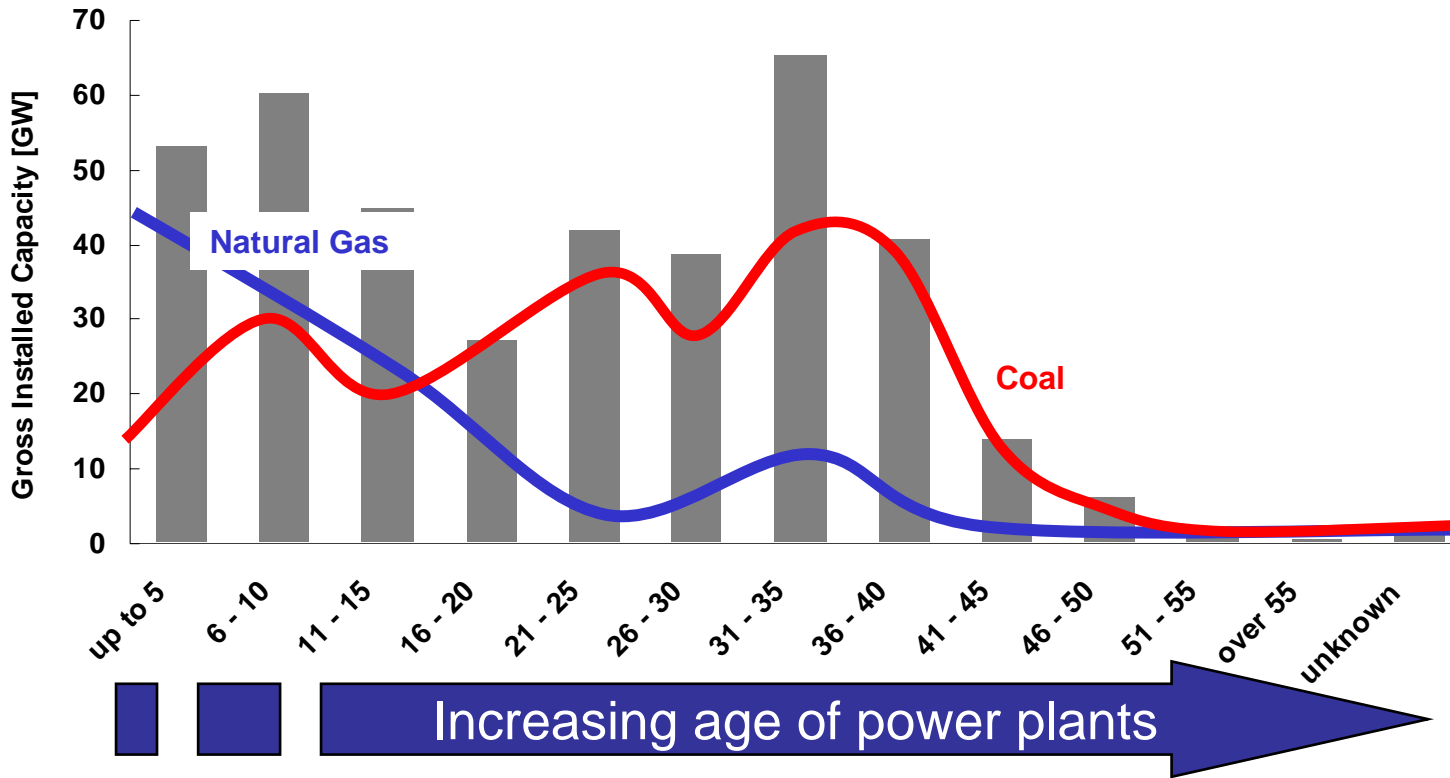


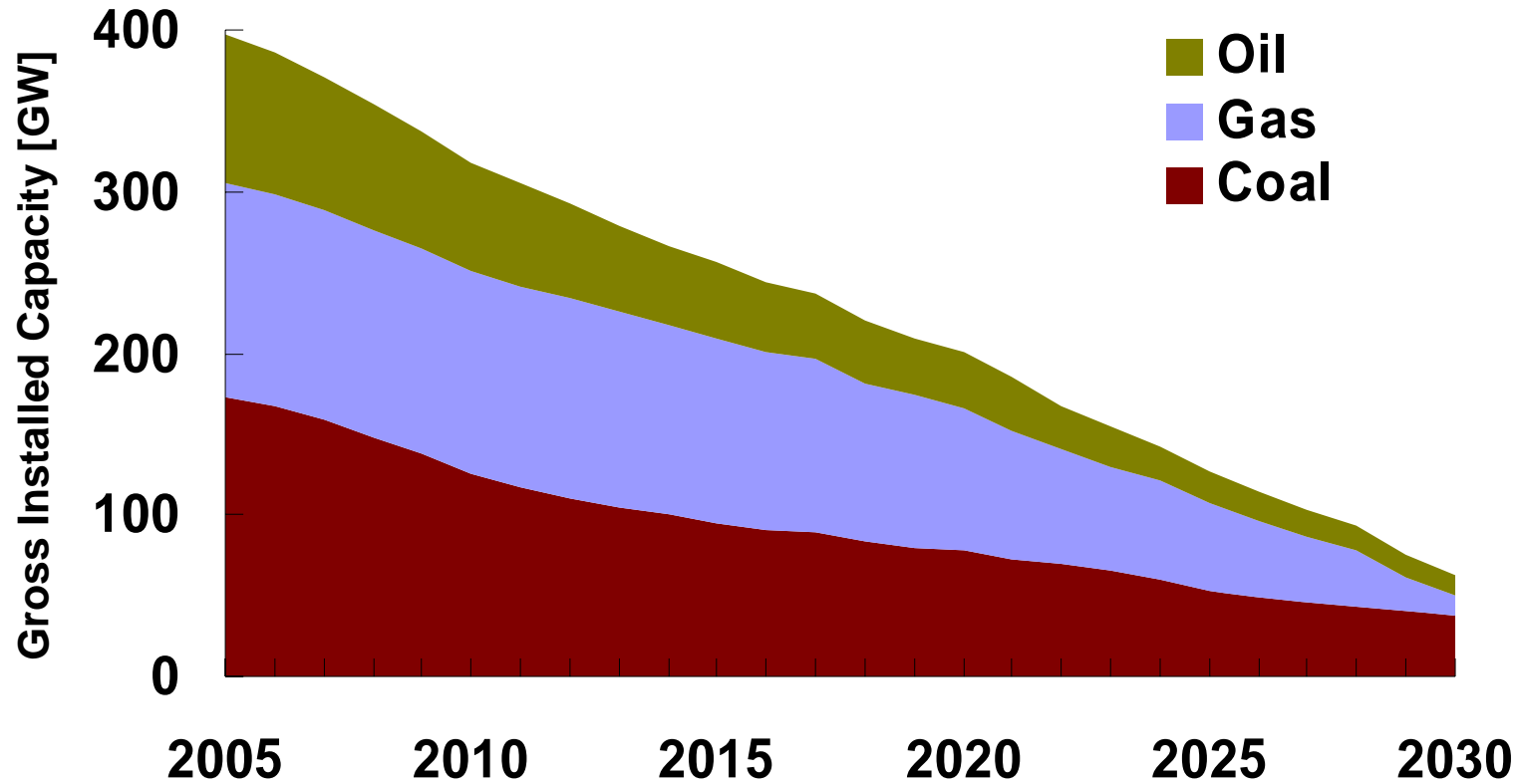
~ 80% fossil fuel

Source: EUROSTAT

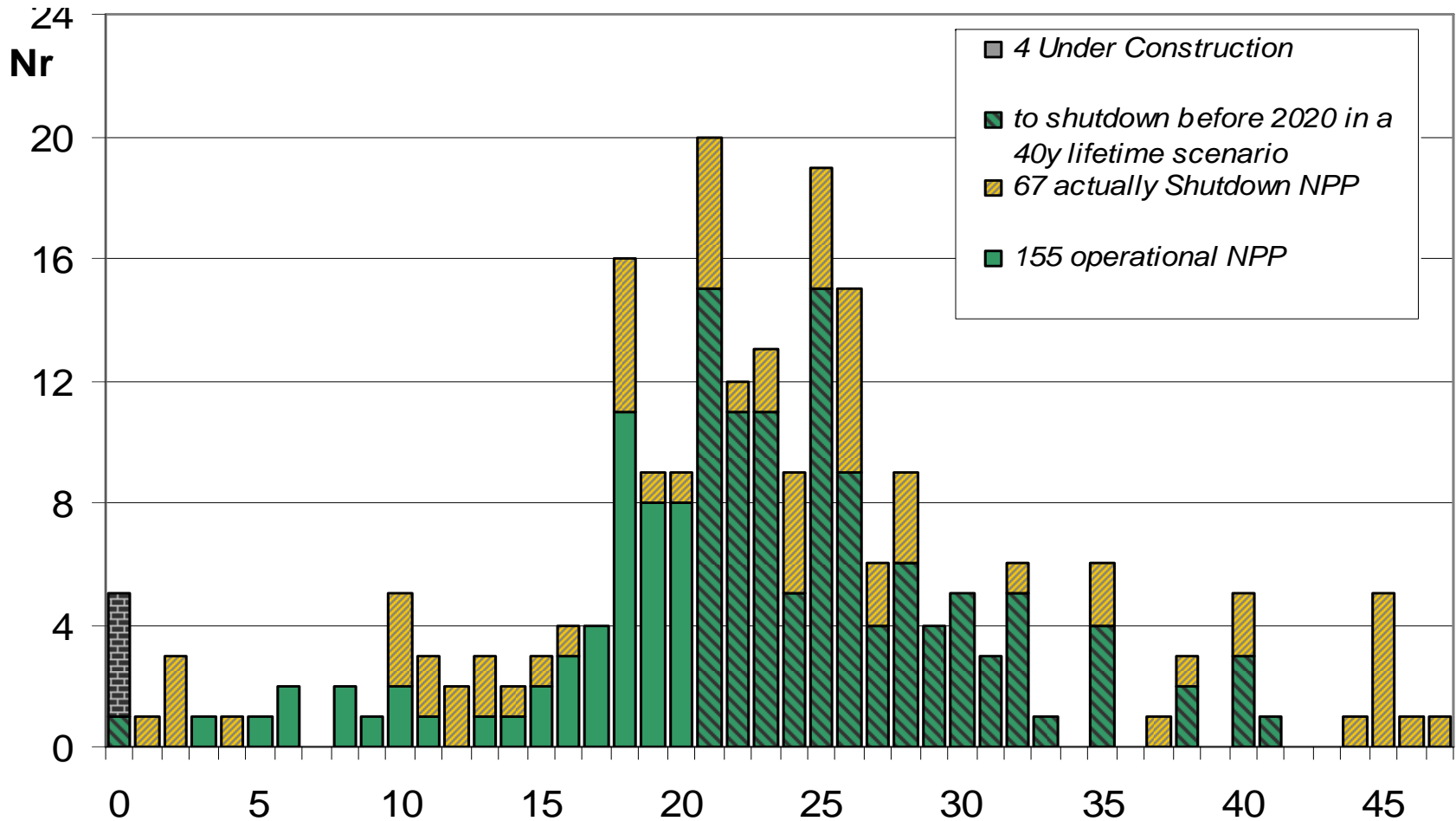


A new playing field for new infrastructures is coming as 60% of coal and oil-fired power plants and 18% of gas-fired plants are older than 25 years.





Only 63 GW of the currently installed capacity will be operational in 2030, mostly coal fired PF plants

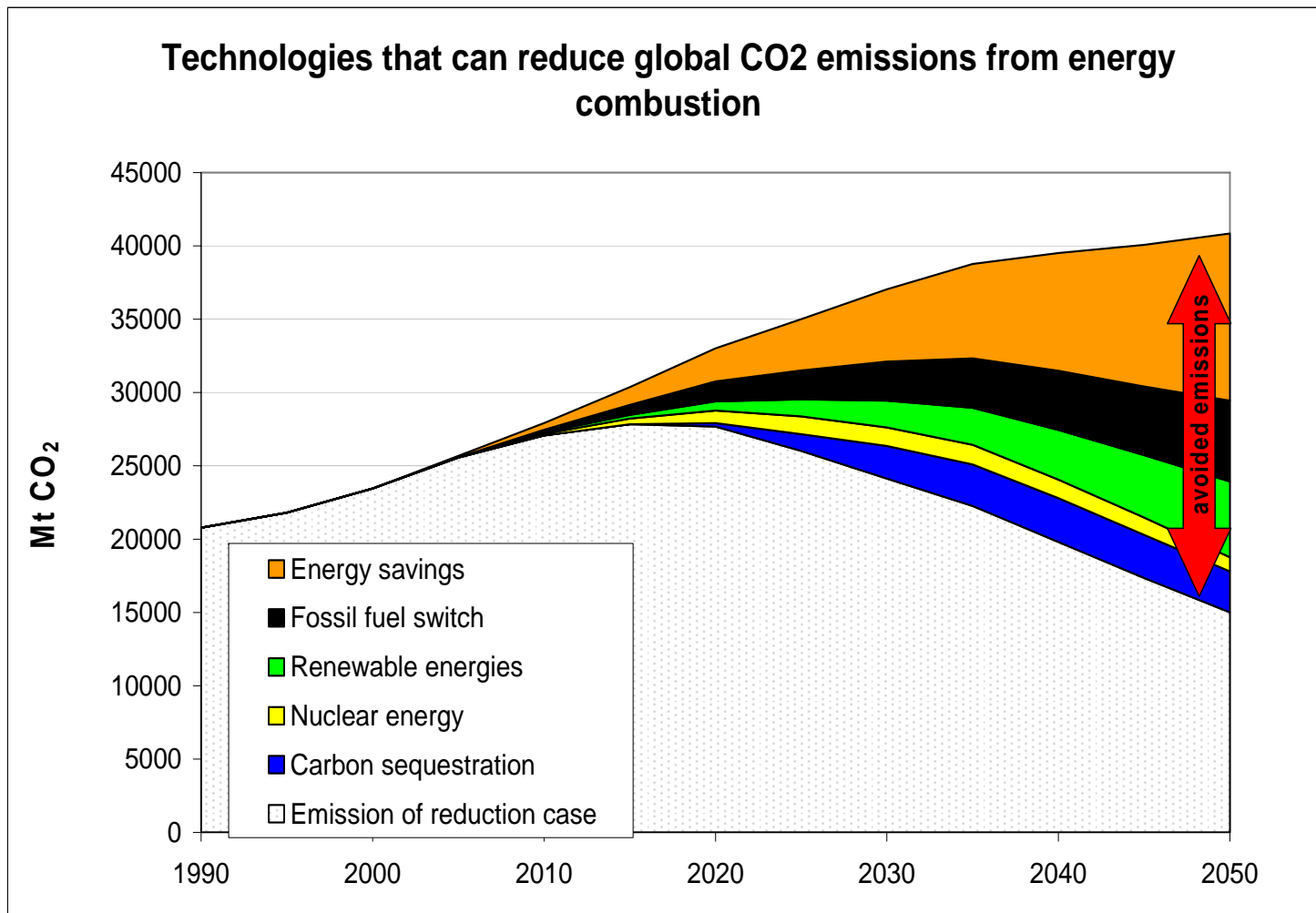


EU-27 Overview on Operational and Shutdown Nuclear Power Plants

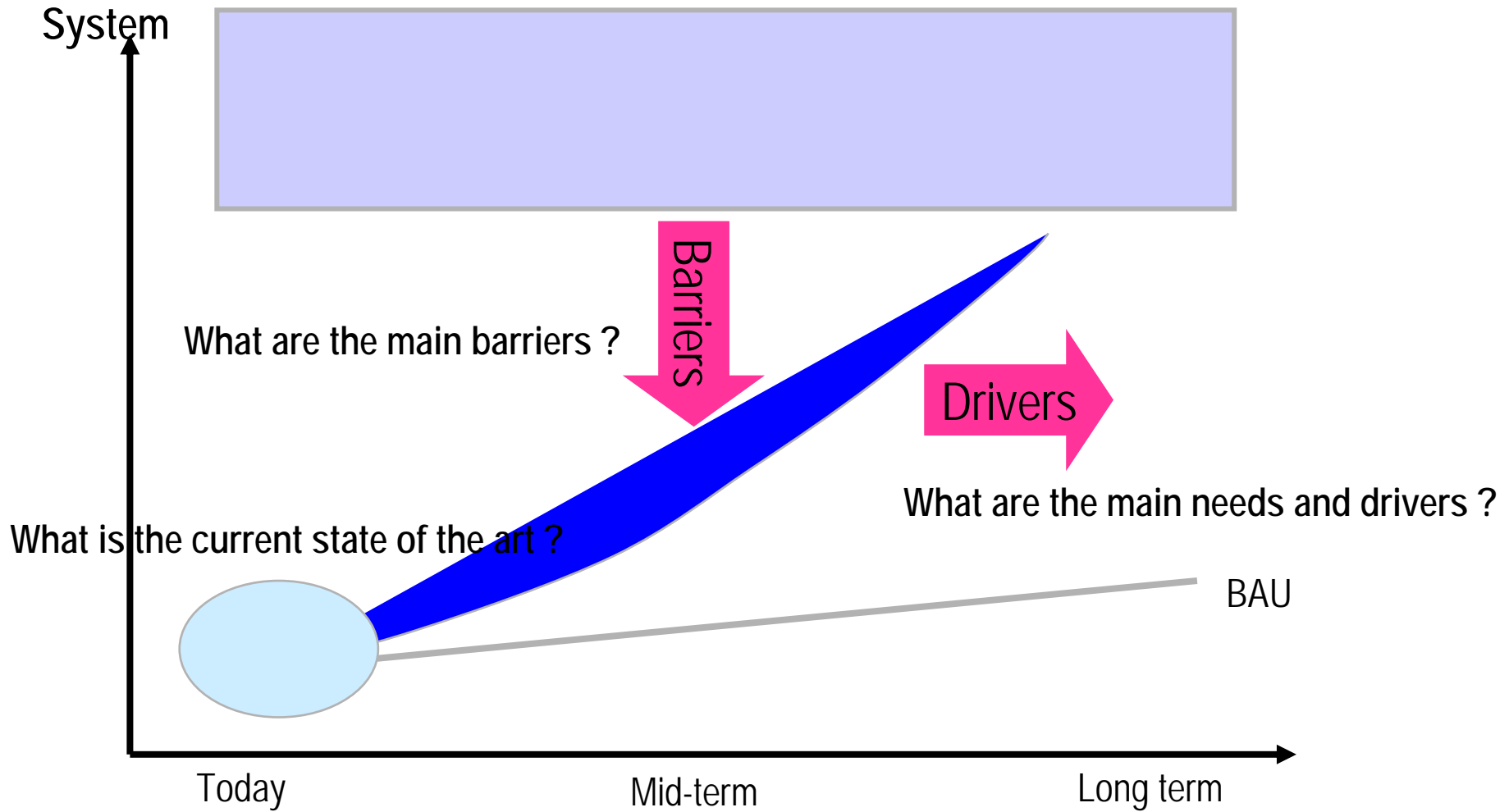
- **The SET-Plan Communication - COM(2007)723 - was adopted by the Commission on November 22, and endorsed by the European Council on 13 March 2008.**
- **Joint strategic planning** – New governance structure - align innovation efforts with energy policy goals
- **Effective implementation**
 - European large projects on technology development
 - Strengthening European energy research capacities
- **Increased resources, both financial and human**
- **Reinforced international cooperation**

- **Facilitator of the Consultation process**
 - Hearings and workshops with 18 technology sectors (European Technology Platforms, Associations, etc.)
- **Lead author of the Impact Assessment –SEC(2007)1508/9**
 - Assessment of the policy options for the SET-Plan
- **Technology Map – SEC(2007)1510**
 - Brief and comprehensive description of the current status and prospects of key low-carbon energy technologies
- **Capacity Map – SEC(2007)1511**
 - Analysis of the European research and innovation capacities in the EU

Open field but for which technology mix?



Contribution to Energy System



Energy Technology penetration path

The First Technology Map examined 14 Technologies (power and heat, power grid, transport) and described:

1. The current status and the anticipated developments
2. The current and future share in the European energy demand
3. The quantified impacts of technology penetration on:
 - *Greenhouse gas emissions*
 - *Security of supply*
 - *Competitiveness*
4. Barriers to penetration in the European energy market
5. Needs to realise its potential
6. Synergies with other technologies and sectors

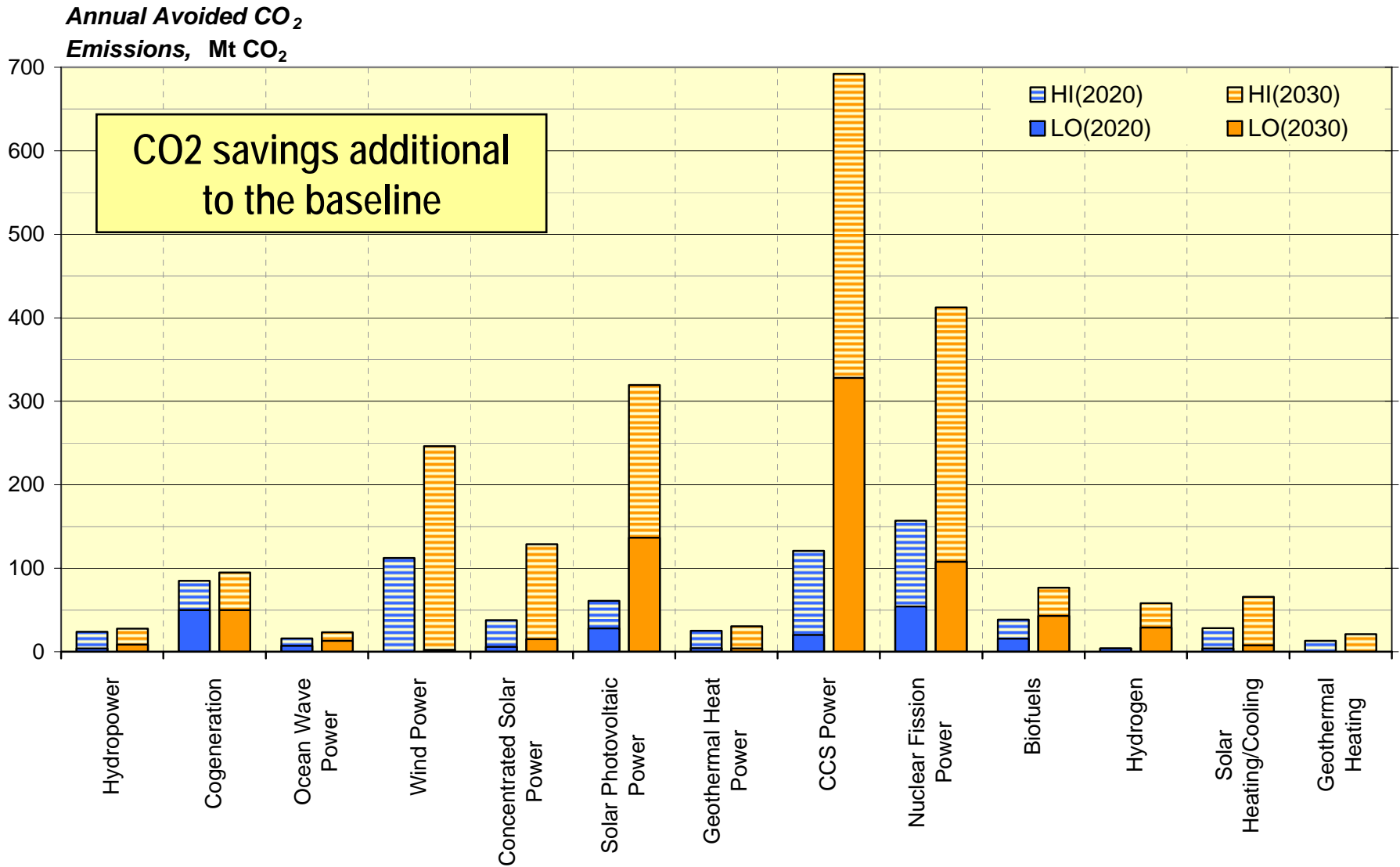
- ✓ This was the **First** Technology Map!
- ✓ Focused on energy supply technologies and alternative transport fuels
- ✓ It paved the way to the setting-up of an European Energy Technology Information System

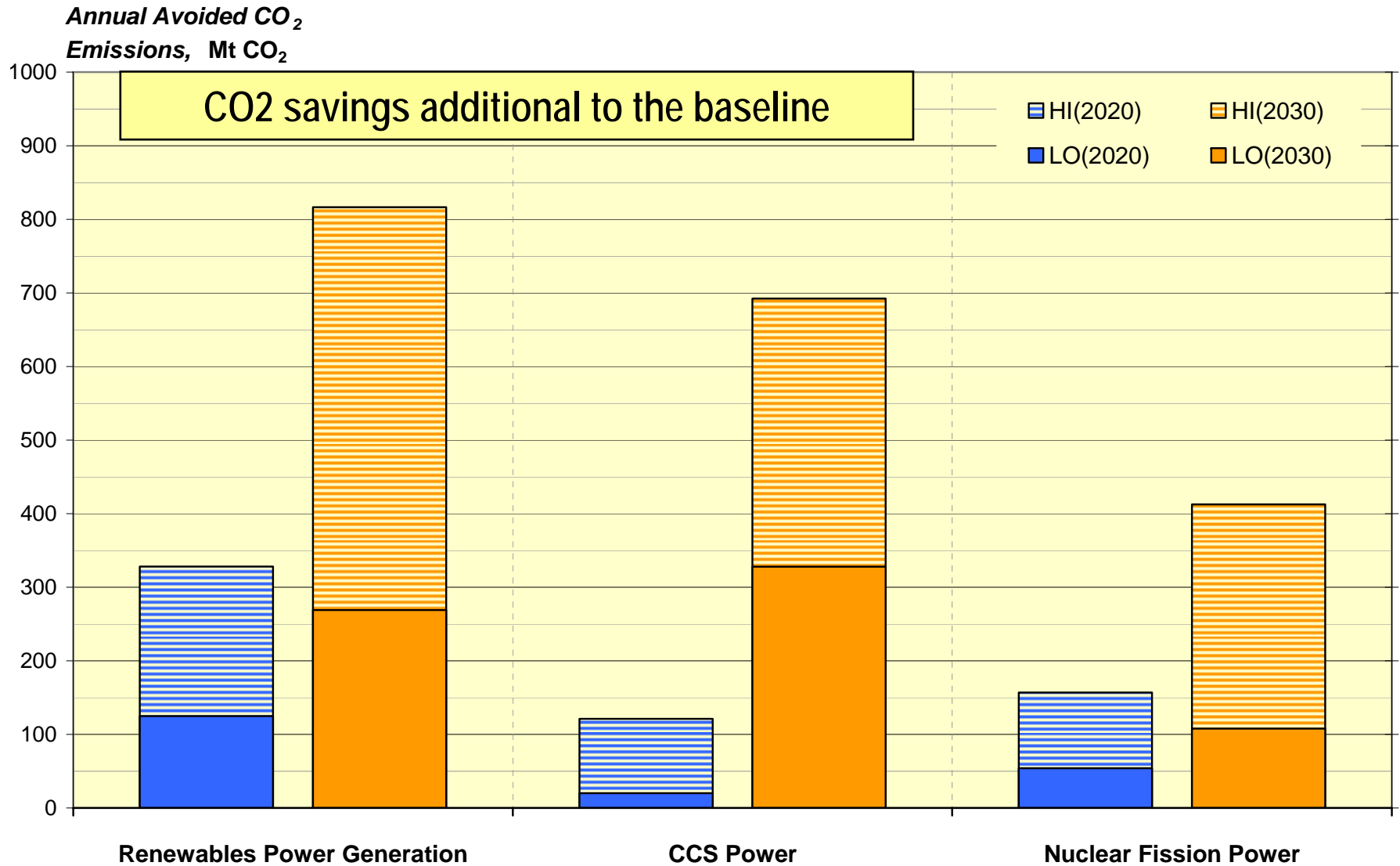
Striving for an open-access, transparent and objective information system

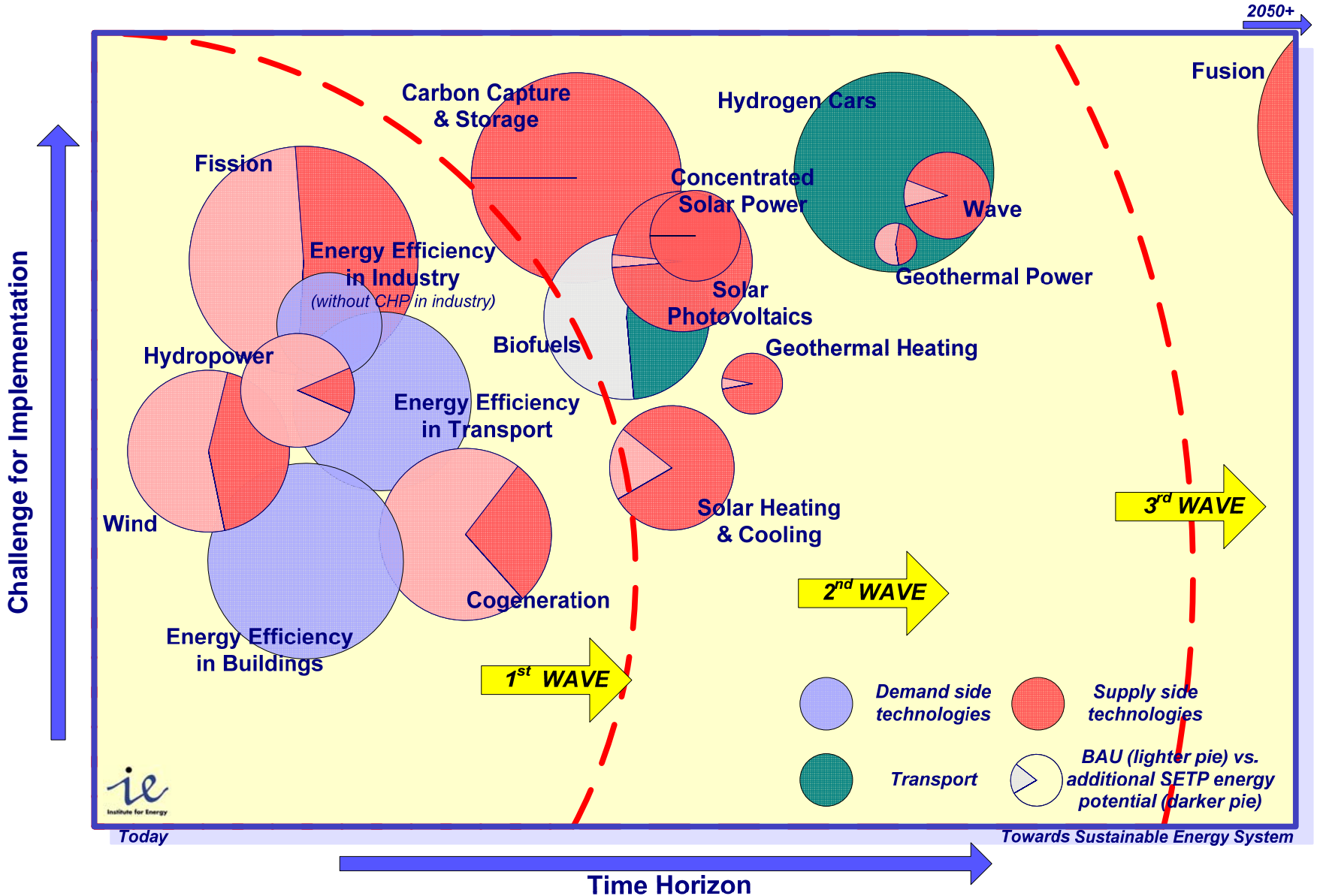
A common assessment framework for all technologies

- ✓ Basic principle: Evaluation of the additional impact of the penetration of each technology individually into an established BAU baseline scenario – **not a comparison at system level**
- ✓ Technology penetration: Two scenarios (minimum and maximum increase) for each technology
- ✓ Time horizon: 2030
- ✓ Key assumption: Technologies replace their fossil fuel based conventional counterpart technologies that produce the same energy carrier

Example – CO₂ emission reductions







There is a significant potential in low carbon energy supply technologies complementing energy efficiency

- ✓ A broad portfolio of technologies needs to be developed and deployed based on a strategic and inclusive master-plan
- ✓ Energy infrastructure needs to be modernised and become more robust to harness this potential

Medium term

Biofuels
Carbon Capture and Storage
Wind energy
Solar technologies
A single European electricity grid
Hydropower
Cogeneration
Fission technologies

Long term

Next generation Renewable Energy Sources
Energy storage technologies
Hydrogen fuel cell vehicles
New generation (Gen-IV) of fission reactors
ITER fusion facility

Contribution to Energy

System



3rd wave

2nd wave

1st wave



Technology Map

from R&D to Demonstration

From R&D,
Deployment to Diffusion

Hydrogen
& Fuel Cells

Carbon Capture
& Storage
2nd Gen. biofuels
Solar Power
Energy Infrastructure

Nuclear Fission
Wind Power
Energy Efficiency Action Plan

European Industrial Initiatives

NEXT STEPS

MISSION: To support the European Energy Technology Policy, in providing regular and sound knowledge on energy technologies

1. **Key-Objective 1:** To establish a robust open-access information system on energy technologies and their innovation aspects geared to supporting an effective strategic planning, monitoring and assessment of the *European Strategic Energy Technology Plan*.
2. **Key-objective 2:** To develop an integrated approach for information and data exchange on energy technologies and capacities for innovation with the Member States, international organisations and energy sectors.

Within the Information System, the Maps are planned to be revisited, extended and updated regularly. As an example for the Technology Map :

- Expanding the technological portfolio (e.g. end-use energy efficiency, energy intensive industry)
- Considering a systemic analysis
- Evaluating additional impact indicators

Information and data exchange with stakeholders from public authorities, research, industry is critical to achieve a reference and dynamic information system on energy technologies. Such a process needs to be continuous based on inputs, feedbacks and consensus. It is planned to set it up throughout 2008.

Thank you for your attention

Contact:

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<http://ec.europa.eu/dgs/jrc/index.cfm>

The interpretations and opinions contained in it are solely those of the authors and do not necessarily represent the point of view of the European Commission.