

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

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- **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
- **We need to use the ambition and the targets of the EU Energy Package to create a new European policy for energy technology (SET-Plan)**

- **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**
  - Assessment of the policy options for the SET-Plan
- **Capacity Map**
  - Analysis of the European research and innovation capacities in the EU
- **Technology Map**

- ✓ The Technology Map: a brief and comprehensive description of the current status and prospects of key low-carbon energy technologies.
- ✓ The **purpose** of the technology map is to underpin the SET-Plan Communication. Based on it the SET-Plan proposes actions to accelerate low carbon energy technology development and deployment through European technology initiatives.
- ✓ The goal of the technology map **is achieved** by quantifying the contributions of technologies to CO<sub>2</sub> emission reductions, fossil fuel savings and changes in the cost of energy.

For each technology the Map describes:

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

## **Power and Heat**

- Wind power generation
- Solar photovoltaic power generation
- Concentrated solar power generation
- Solar heating and cooling
- Hydropower generation
- Geothermal
- Ocean wave power generation
- Cogeneration of heat and power
- Zero emission fossil fuel power generation
- Nuclear fission power generation
- Nuclear fusion

## **Energy Infrastructures**

- Electricity networks (Smart Grids)

## **Transport**

- Biofuels
- Hydrogen and fuel cells

## *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 (conservative and optimistic) for each technology
- ✓ Time horizon: 2030
- ✓ Key assumption: Technologies replace their fossil fuel based conventional counterpart technologies that produce the same energy carrier

- ✓ Reports from 18 SET-Plan Hearings and Workshops held between March and June – further consultations with technology experts
- ✓ Impact assessments (e.g. RES roadmap, Efficiency Action Plan)
- ✓ Relevant Framework Programme projects
- ✓ JRC in-house data and analysis
- ✓ Comments from the Advisory Group Energy of the Framework Programme

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

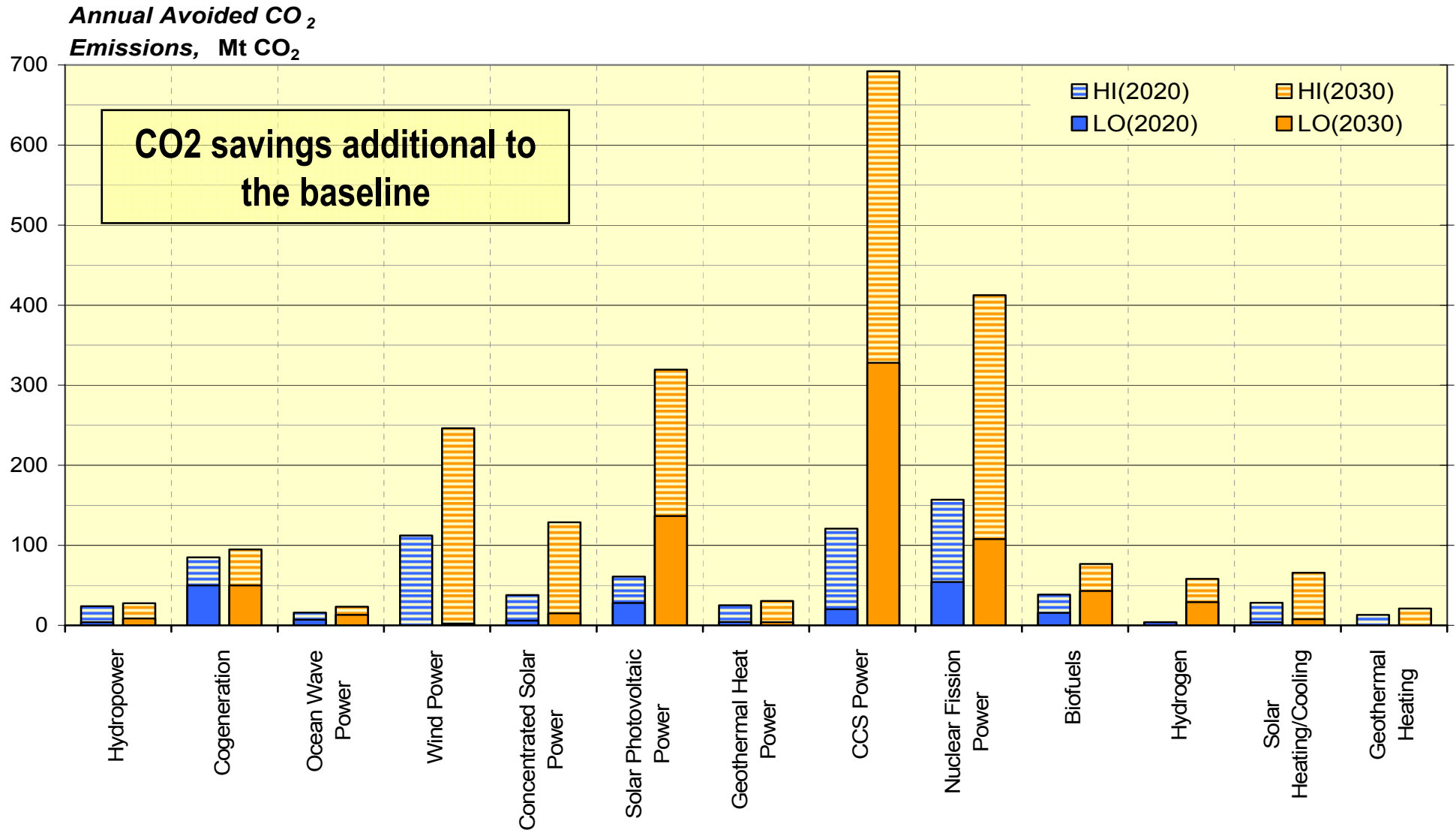
## Medium term

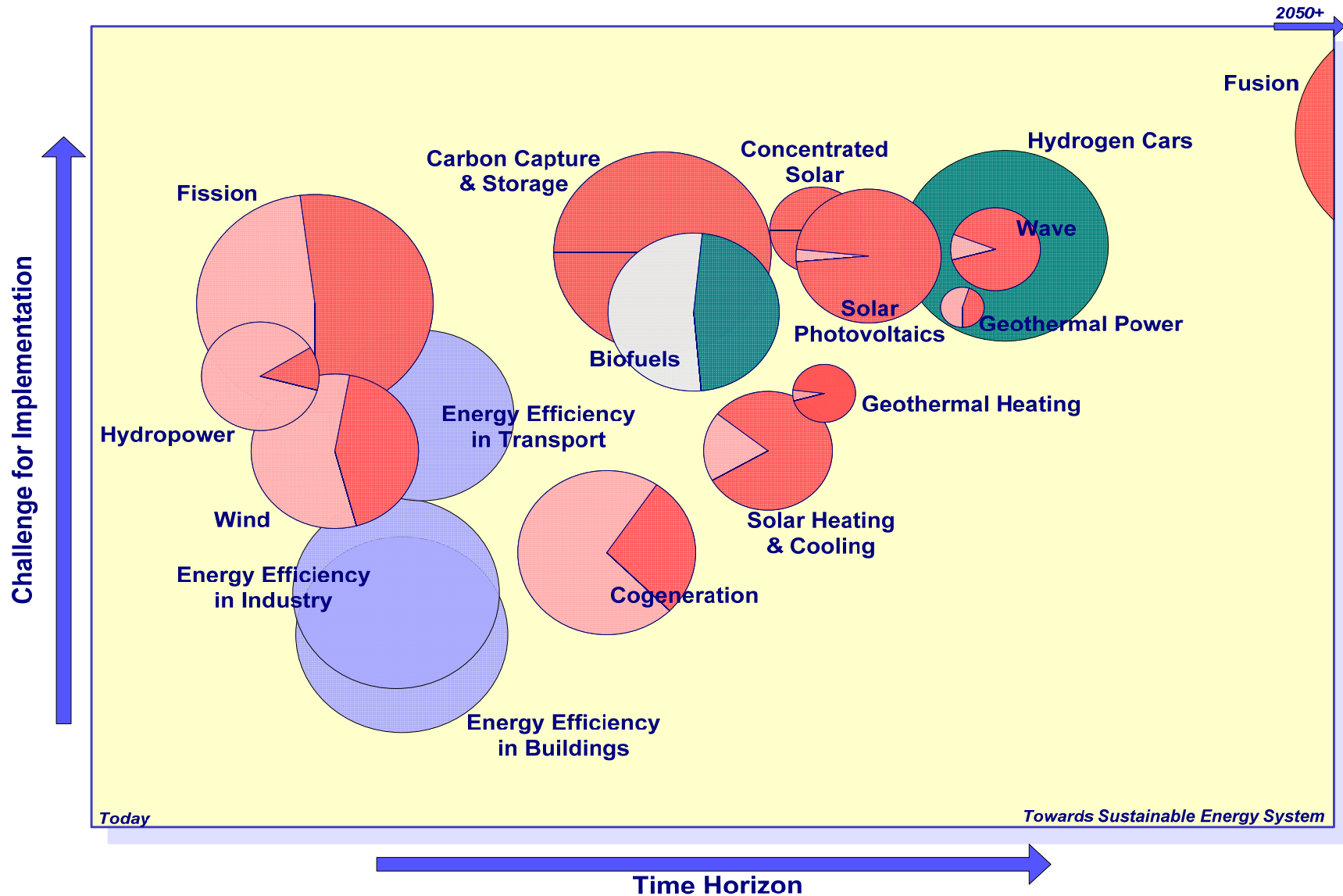
Biofuels  
Carbon Capture and Storage  
Wind energy  
Solar technologies  
A single European electricity grid  
Hydropower  
Cogeneration  
Fission technologies

## Long term

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

# Example – CO<sub>2</sub> emission reductions





The Map is planned to be revisited, extended and updated regularly:

- Extending the horizon from 2030 to 2050
- Expanding the technological portfolio (e.g. end-use energy efficiency, energy intensive industry)
- Considering a systemic analysis
- Evaluating additional impact indicators
- Broadening the expert consultation process

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