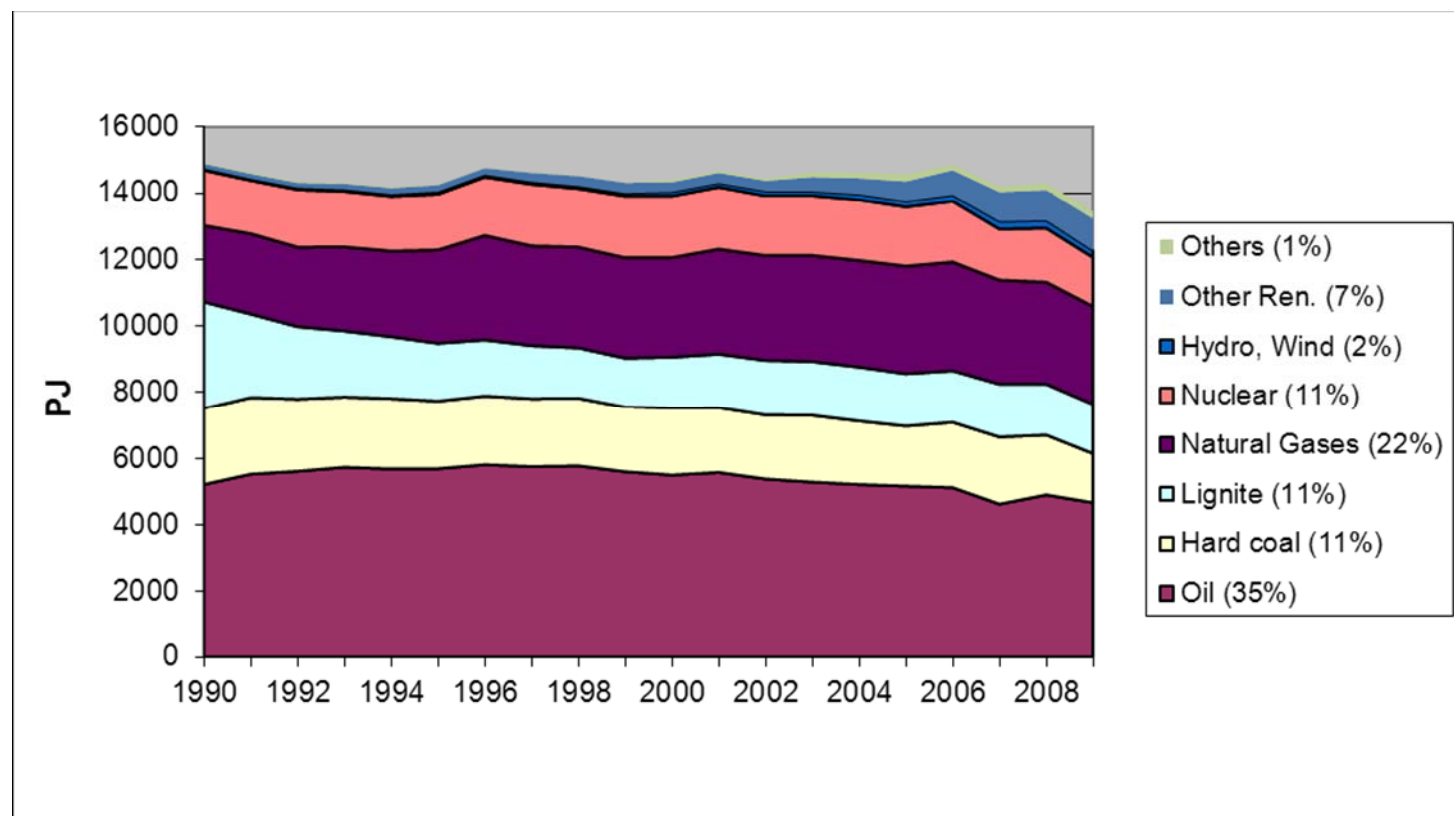


Country Report Germany

Recent developments of CCT and CCS

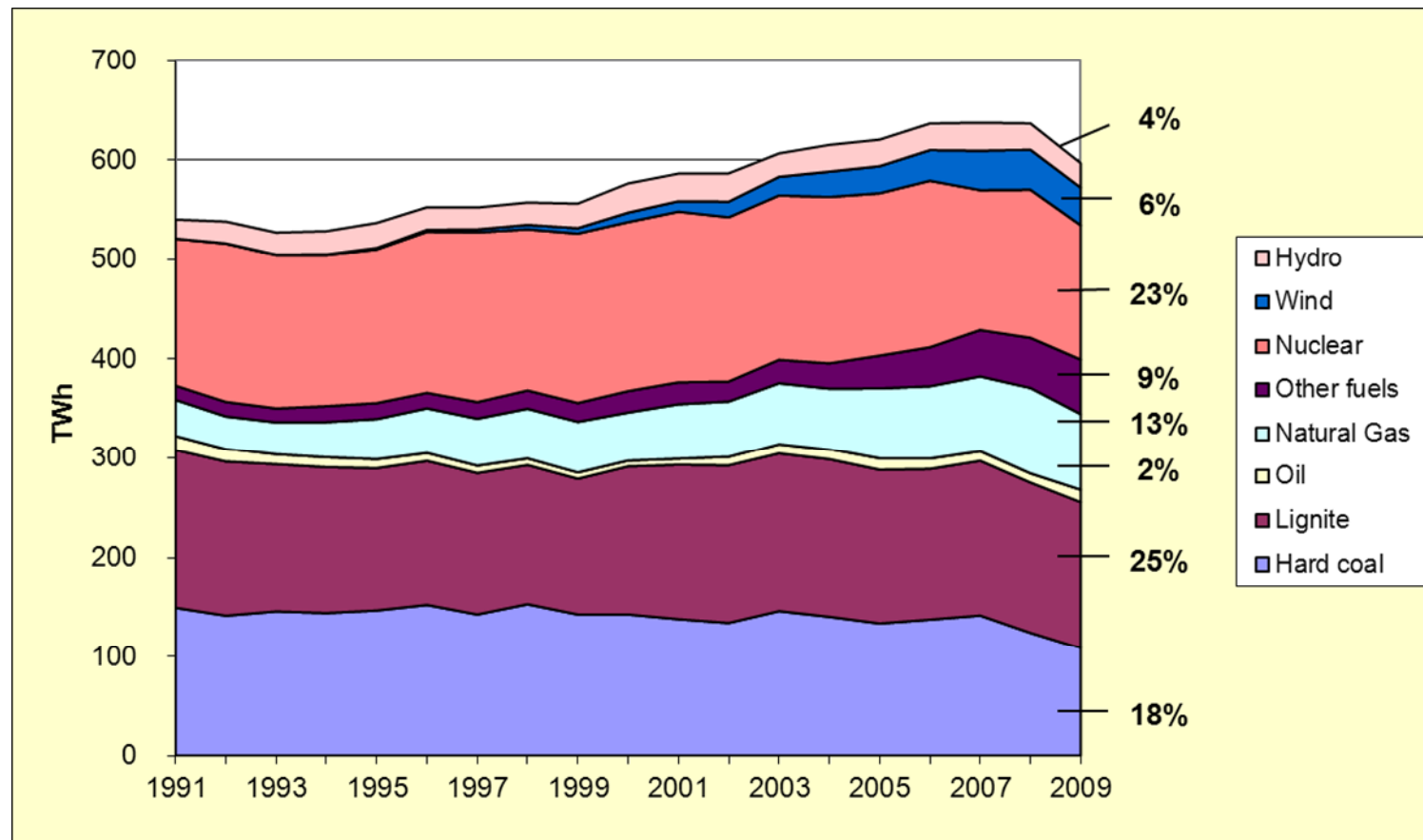
24. Mai 2011 | Jürgen-Friedrich Hake

Primary Energy Supply



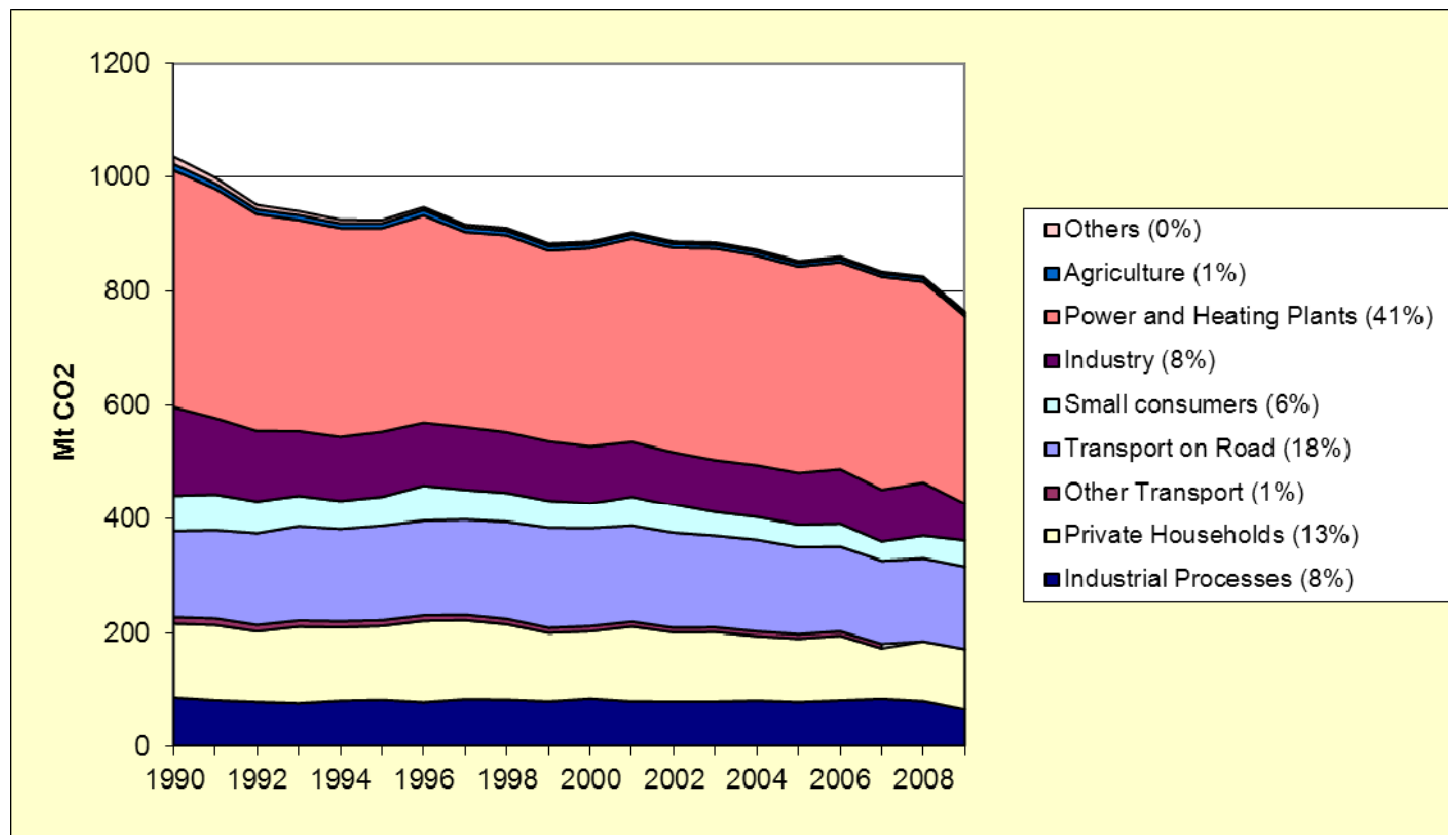
Source: BMWi: Energiedaten 2010

Gross Electricity Production



Source: BMWi: Energiedaten 2010

CO₂-Emissions



The coalition agreement confirms the goal of GHG emissions cut by 40% by 2020 (base year 1990)

Source: BMWi: Energiedaten 2010; Koalitionsvertrag zwischen CDU, CSU und FDP, 17. Legislaturperiode

The German Government's Energy Concept 2010

An overall strategy for the period up to 2050

Renewable energies as a cornerstone of future energy supply:

- targets: by 2020 35% of gross electricity consumption, 80% by 2050
- challenges: i.a. improved integration into the energy system, development and promotion of storage technologies

Nuclear power as a bridging technology:

- operating lives of 17 nuclear power plants are extended by an average of 12 years depending on the date of commissioning

Exploring the option of CCS:

- application in energy-intensive industrial sectors and in fossil fuelled power plants (lignite and hard coal) in a long-term perspective
- support of the construction of highly efficient CCS-ready fossil fuel power plants with precedence given to CHPP in the framework of the European Energy and Climate Package

Energy Research Programme for the period up to 2020:

- focus on renewables and efficiency, planned to be issued in 2011

The New Draft of the CCS Act – April 2011

Limited to the demonstration of CO₂ storage and research projects:

- application must be issued until the end of 2016,
- annual CO₂ storage amount must not exceed 3 million t per storage site and a total of 8 million t in Germany
- 2017 the Act will undergo a comprehensive evaluation which decides, if CCS can be considered as a climate change mitigation measure in Germany.

Bundesländer have a stronger voice:

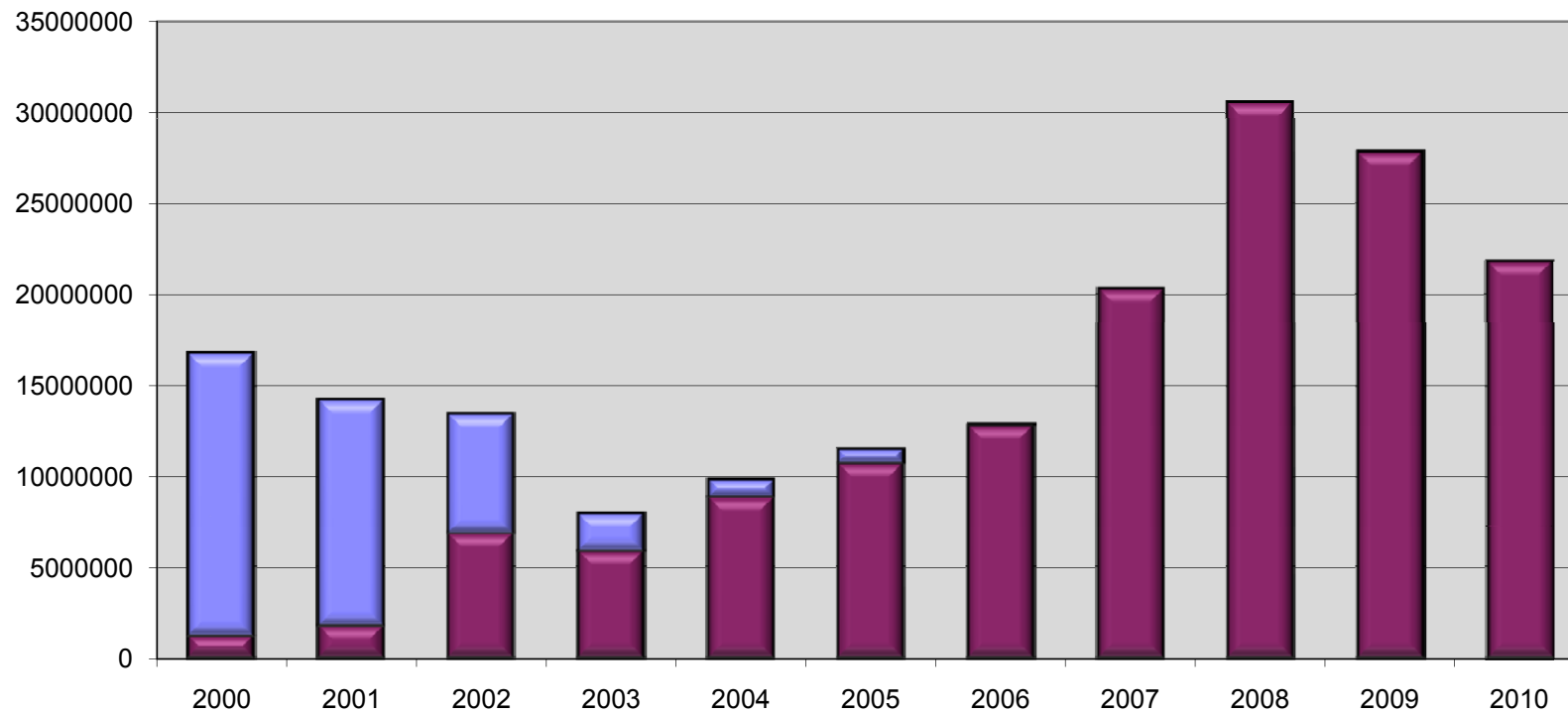
- according to §2 (5) the Bundesländer can designate areas for demonstration projects as well as areas in which such projects are not allowed.

Greater consideration of the conflicts of use:

- the Draft Act commissions a geothermal atlas in order to review the conflicts of use between CCS and geothermal energy

The Draft Act will still have to undergo the parliamentary procedure. It is expected to come into law in autumn of this year.

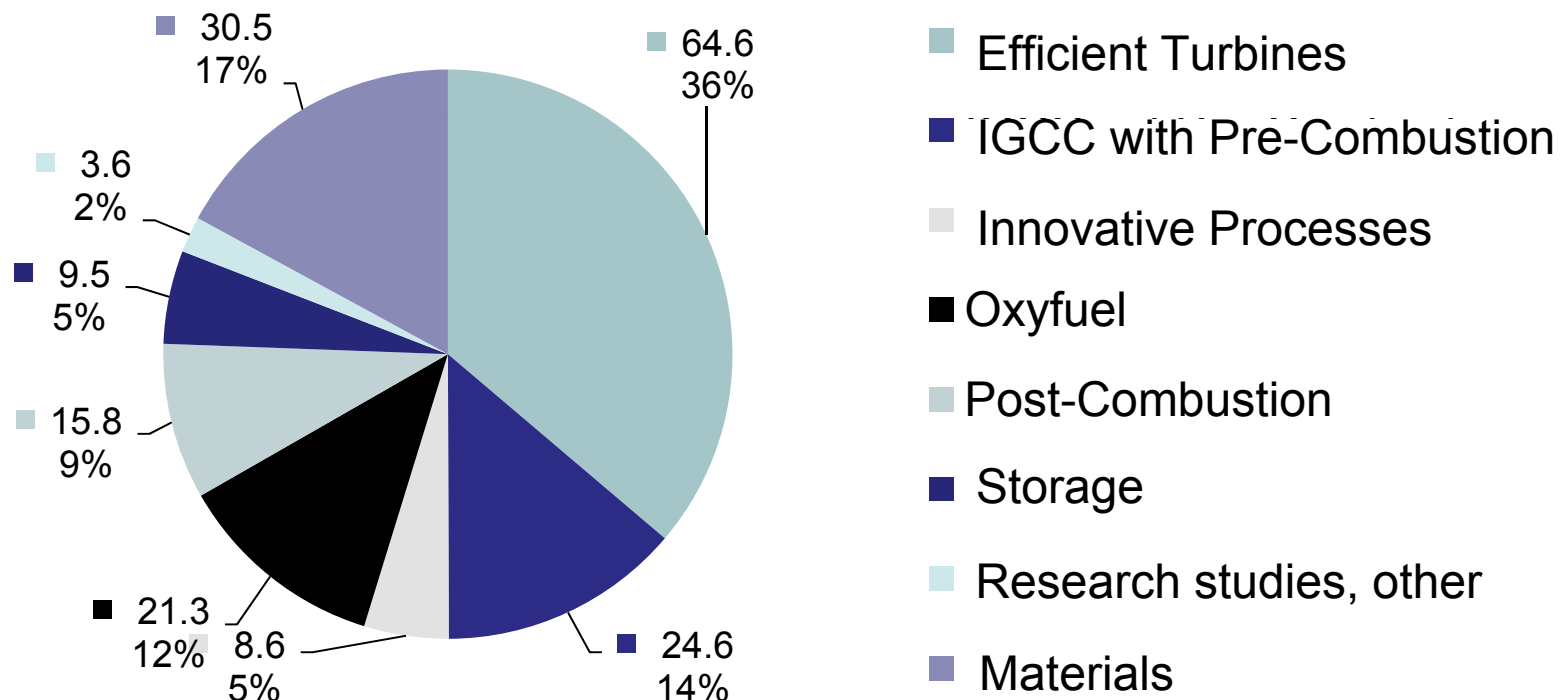
COORETEC Funding (€)



COORETEC: General Information as of May 1, 2011

- › Number of projects since 2004: 338
- › Total funding BMWi: 180 Million Euro

COORETEC: Funding of Topics since 2004



COORETEC: Selected Projects

- › Efficient Turbines
 - › CC Irsching, SIEMENS (E.ON) $\eta > 60\%$

- › Improved Materials
 - › HWT, Großkraftwerk Mannheim, $T > 700^{\circ}\text{C}$
 - › Metpore (Membranes)
 - › E.ON Demo 700°C Wilhelmshaven

- › Post Combustion Capture
 - › Postcap (e.g. RWE Niederaussem)

COORETEC: Selected Projects

- › OxyFuel
 - › ADECOS, OxyCoal AC
 - › Vattenfall OxyFuel Demo Jämschwalde

- › Pre Combustion Capture and Combustion Technologies
 - › HP Pox, COORVED, HotVeGas
 - › RWE Demo IGCC Hürth

- › Storage
 - › CO₂SINK Ketzin, 45,000 t CO₂ (co-funded by EC and BMWi)

Fukushima Aftermath

- From March 14, 2011 on, the German government imposed a three-month moratorium on the extension of nuclear power plant operations
- Seven oldest nuclear power plants which started commercial operation up to and including 1980 were disconnected from the grid for safety check
- Due to the moratorium the generating capacity of ca 5000 MW was shut down
- Replacement of the capacities by the renewable energies and fossil-fired power plants
- Reconfiguration of the electricity grid
- Impacts on energy-related R&D (COORETEC)?

Thank you for your attention!

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