

# TCSS-6 Award presentation of CCS 2011

25 years in space in 20 minutes

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# Factors affecting the interest of CO<sub>2</sub> storage

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- 2007 A consensus in the Norwegian parliament (“klimaforliket”)
  - To fully clean CO<sub>2</sub> from two Norwegian gas power plants in respectively 2012 and 2014
  - Reduce emission with 20% within 2020 (relative to 1990 baseline)
  - Do at least 2/3 of these reductions in Norway
  - This consensus agreement is under pressure today....

# When will CCS be commercial?

or

## Time for cheap energy is out!

- Research can certainly reduce the cost of CCS with a few %, but still..
- The cost of clean energy is twice as expensive as today's energy
- We have to be honest: Research will not make CCS “commercial”, but only political decision to curb emissions of climate gases. That is increasing the penalties on emission so much that it is cheaper to find other solutions than emitting
  - Reducing the emission quotas
  - Introducing CO<sub>2</sub> taxes
  - Other economical incentives

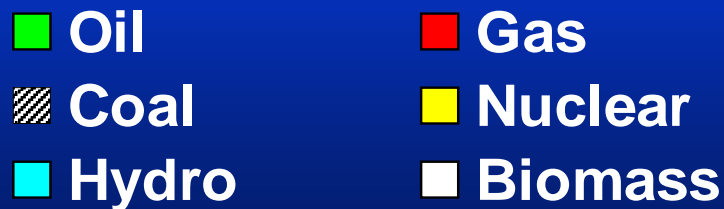
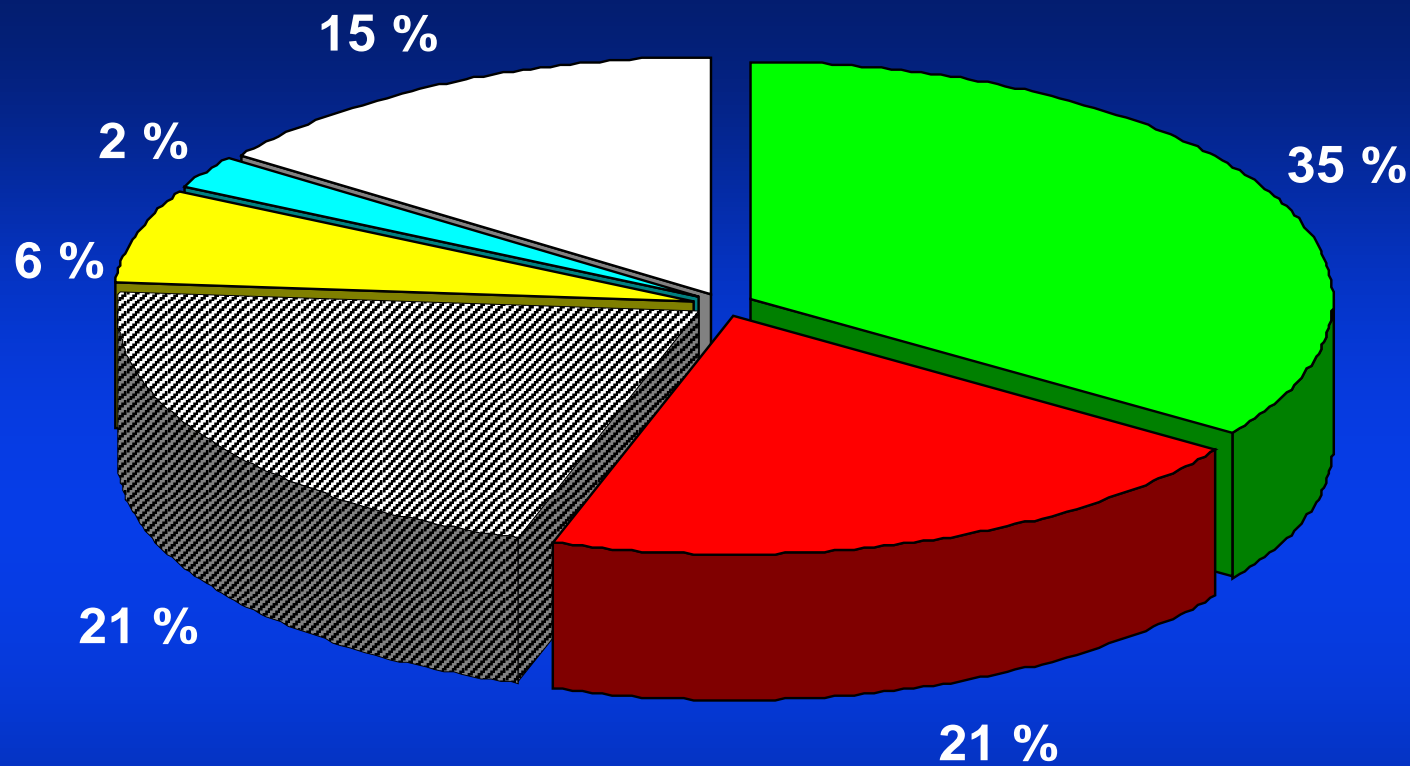
# CCS – one of many options to solve the climate problem?





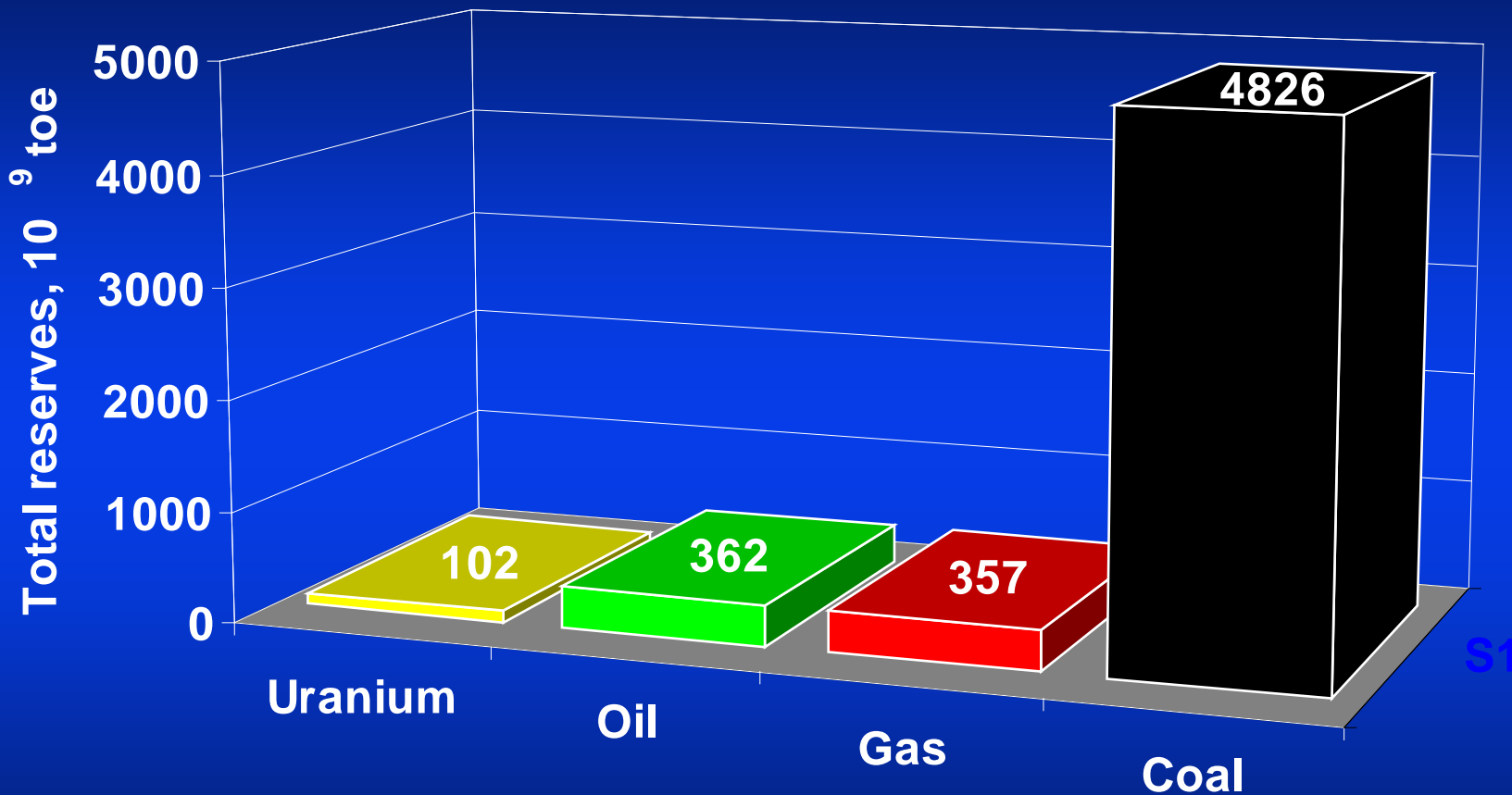
# Global use of primary energy by source: the world will rely on fossil energy for a long period of time

BP Amoco: "Statistical review of world energy 2000"

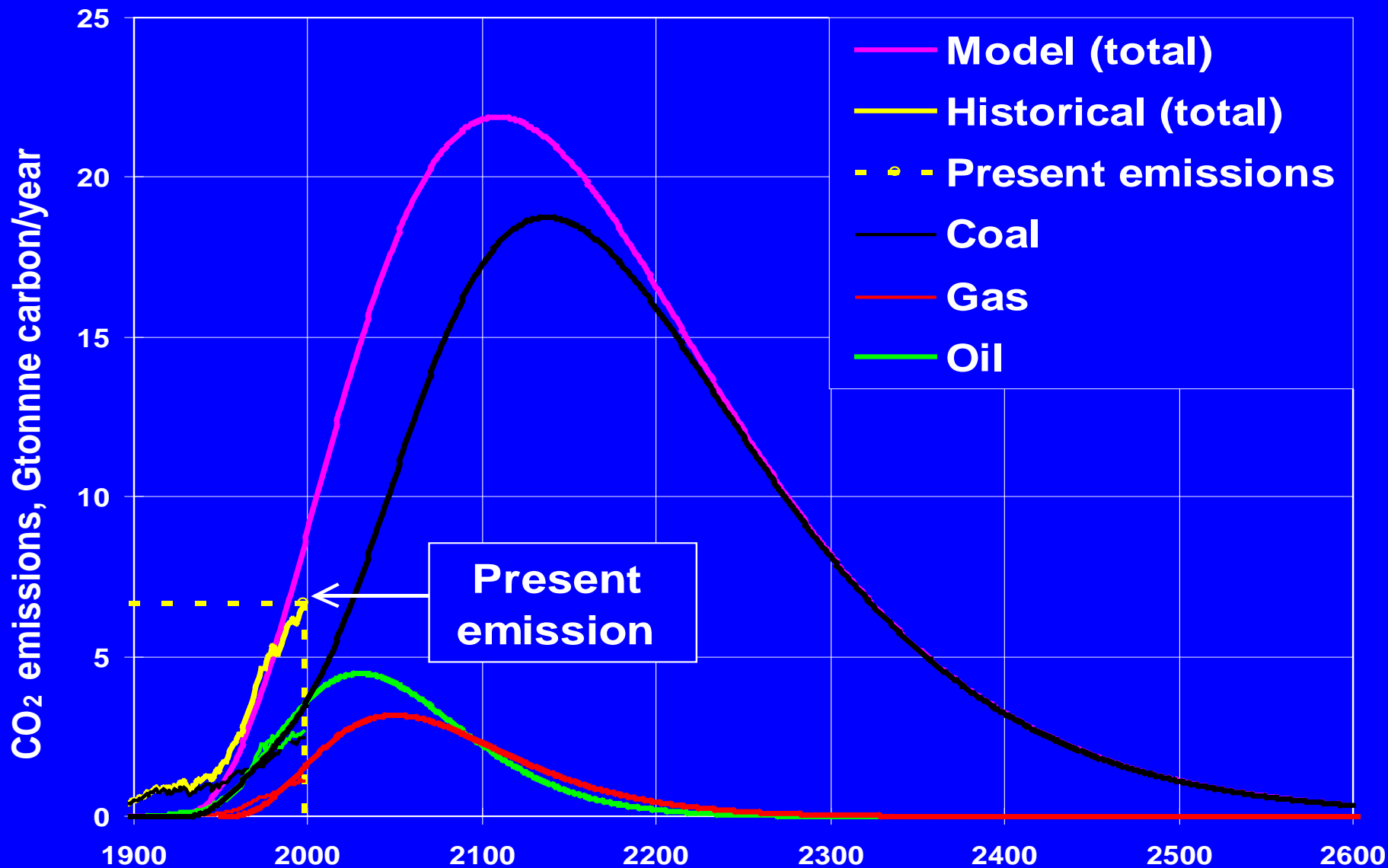


# Non-renewable energy resources

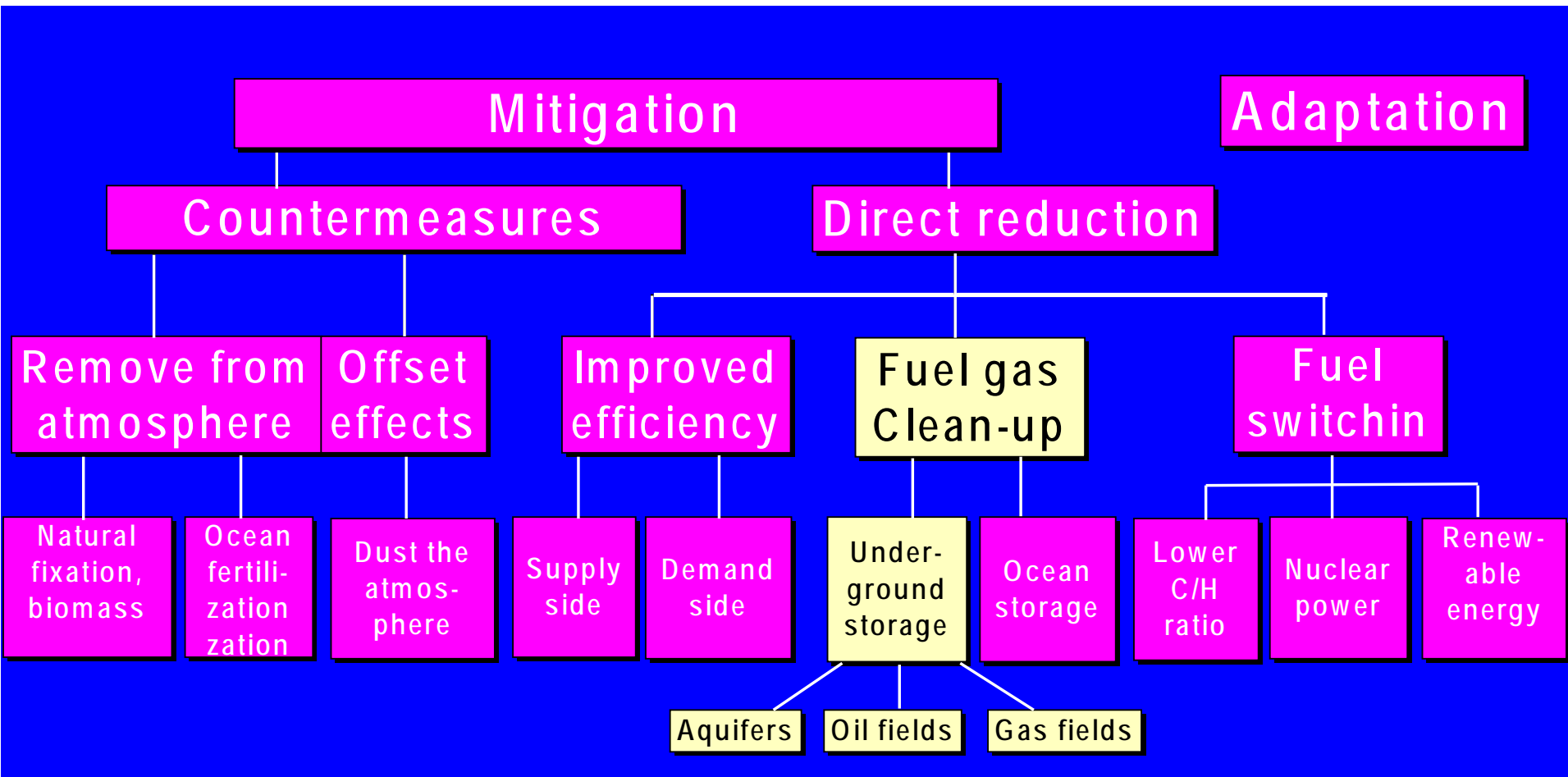
Source: Bundesministerium für Wirtschaft, Germany



# Modelled “business as usual” CO<sub>2</sub> emission from coal, oil and gas



# Options of measures to meet the risk of anthropogenic climate change: only CCS has both sufficient capacity, known and affordable cost and is ready to start now



# Nuclear energy

- Despite catastrophic events as in Chernobyl and Fukushima:
- The biggest risk issue with nuclear power is not the operating risk of producing power
- ...but how to safely dispose the nuclear waste for a period of at least 100 000 years
  - This is both an unsolved technical problem and
  - has a unknown cost

- Astronaut calling ground control...

- . ..permission to land?

- Engage in these effort yourself and enter the political arena