Carbon Capture and Storage – A strategy for early deployment in Europe

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CCS Technology Maturity

Most of the elements required for CO_2 Capture & Storage (CCS) are already deployed at commercial scale, but integration for GHG mitigation is not happening due to the high cost and lack of policy framework

CO_2 Capture

- ü **Post-Combustion**
- ü **Pre-Combustion (Hydrogen)**
- • **Oxyfuels**
- • **$40-100+/Tonne CO2**

High Purity Sources

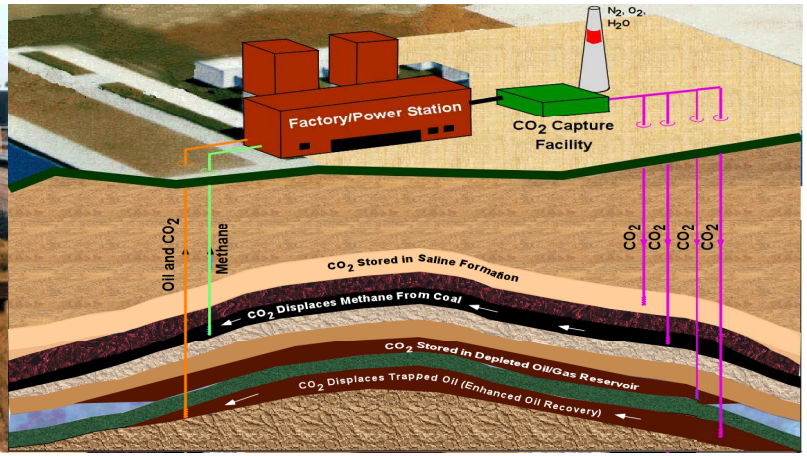
- ü **Amines, Membranes, H2**

Transport

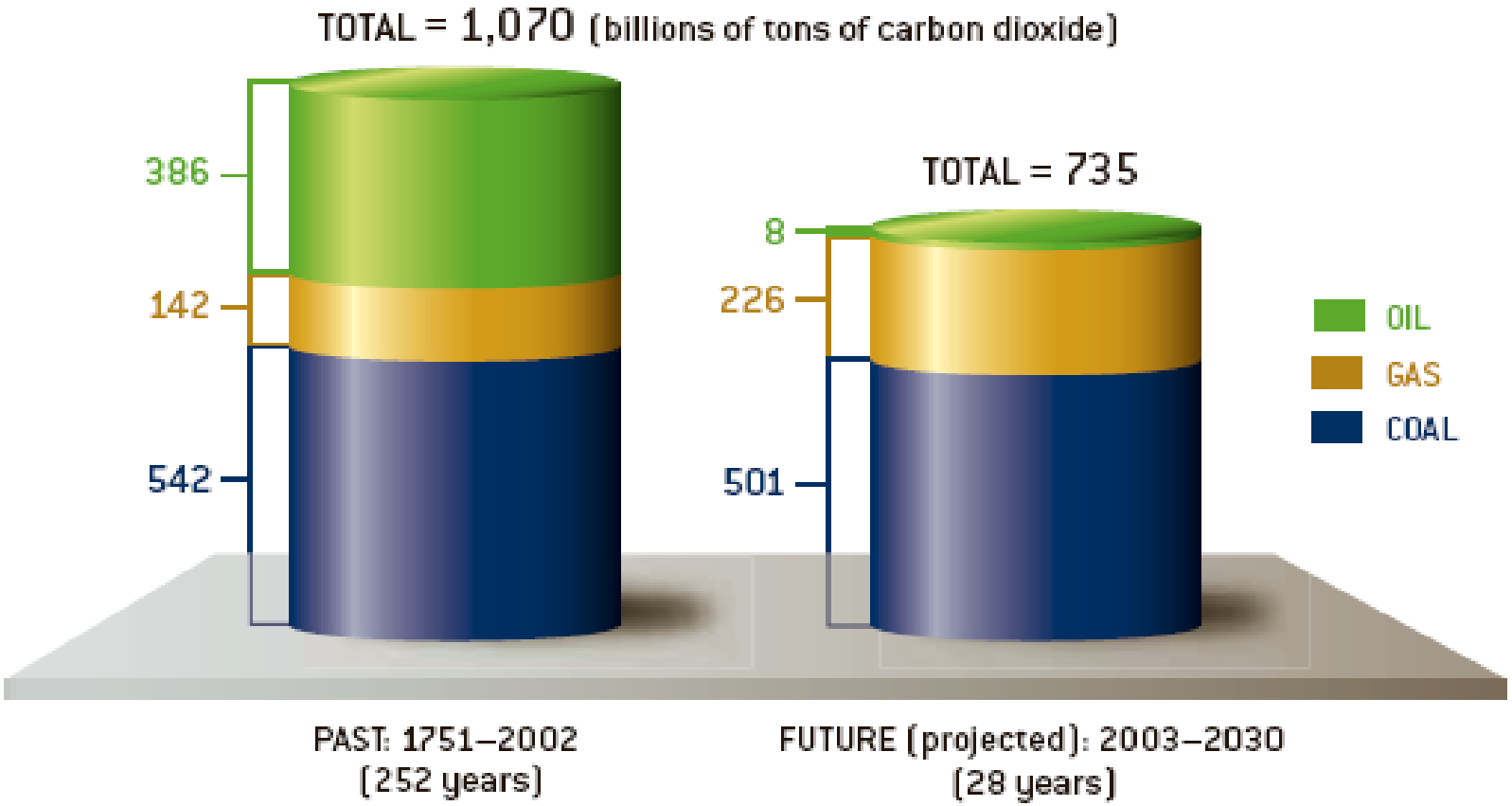
- ü **Pipelines**
- ü **Ships**
- • **Depends on distance**

Geological Storage

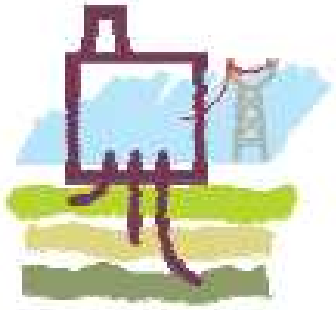
- ü **Enhanced Oil Recovery**
- ü **Saline Aquifer Formations**
- ü **Depleted Oil/Gas Reservoirs**
- • **Enhanced Coal Bed Methane**



Carbon Lock-in from New Coal Plants

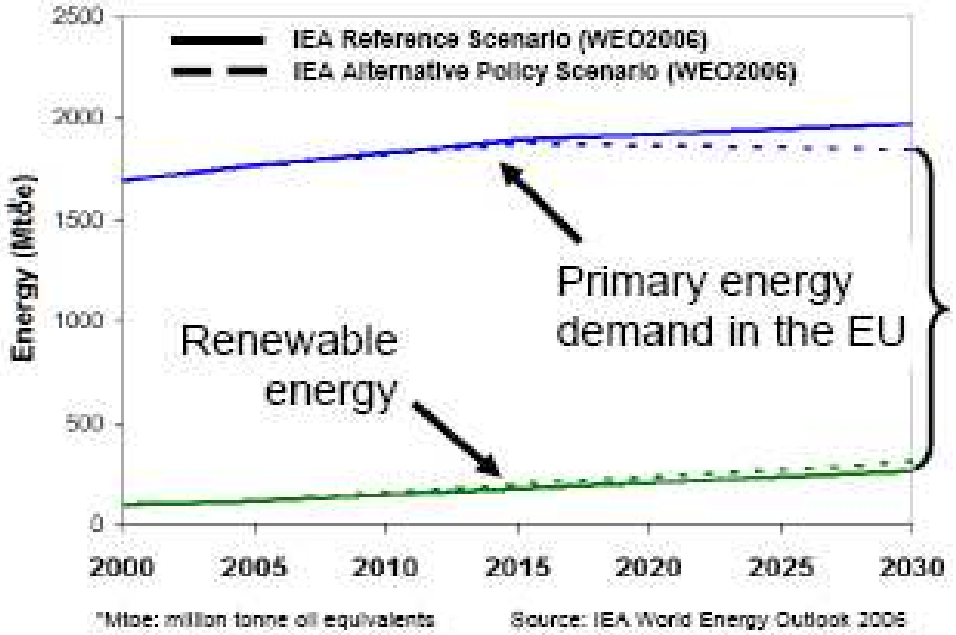


Credit for comparison: David Hawkins, NRDC



EU CO2 emission targets cannot be achieved *without* CCS

- Rising energy demand can't be met by Renewables alone
- CO2 emission targets can't be met by Renewables & energy efficiency alone
- CCS could reduce CO2 emissions by 50% by 2050



CCS is a key solution for combating climate change, within a portfolio of solutions

Climate Action
Energy for a Changing World

Contribution of CCS to climate goals

- Some impact already in 2020 but major contribution comes after that.
- In 2030:
  - **A 32% reduction in 2030 would be €60bn (40%) more expensive without CCS**
  - **Carbon price in 2030 would be 46% higher than would otherwise be the case**

An EU structure to stimulate the demonstration of CCS power plants

- **SET-Plan: proposes European Industry Initiatives (EII) in technologies needed for a decarbonized baseload**
- **Commission action:**
  - proposes launching EII on CCS
  - will launch a support action under FP7 to establish « project network »
    - joint platform for individual *early, large-scale demos in power plants*
    - close inter-action with ZEP TP, focus on projects
    - value to be generated through European approach:
      - Visibility and marketable identity (European logo) of projects
      - Mechanism for sharing information, know-how/experience exchange
      - Common actions: general public, third countries
    - can develop further into a financial-support tool

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Catalyzing the finance for CCS

- **Economics of early demonstration**
  - substantial capital requirements
  - increased operating costs
- **Sources of financing**
  - **Industrial commitments**
    - ETP-ZEP: a vital initiative with commitments to the issue
    - still needed: clear, early and decisive commitments by individual players to concrete large-scale demonstration
  - **Member States' involvement**
    - MS-level crucial given budgetary reality and size of challenge
    - Commission guidelines facilitate state aid to CCS
    - ETS revenues + structural policies hinted as suitable
  - **EU-level financing**
    - limited availability for the time being
      - FP7 + EU structural funds
      - EU financial institutions for specialized cases
      - Communication on financing low-carbon technologies – end 2008

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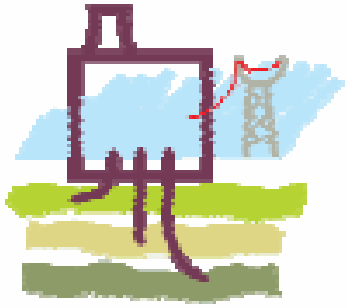
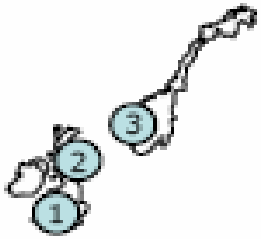
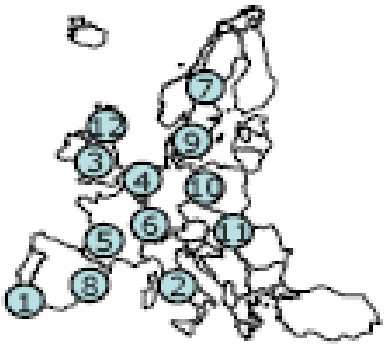


Why an EU Flagship Programme is essential

The EU Flagship Programme



"Disparate projects with no strategy for sharing"



"A highly visible, integrated set of projects, Europe-wide"

- Kick-start the wide-scale deployment of CCS in Europe – and beyond
- Ensure a geographical & technological spread of projects
- Accelerate learning through knowledge sharing & avoid duplication of effort
- Ensure scope for trans-national projects
- *Drive down the costs of CCS so less than the price of carbon*

The goal: to make CCS commercially viable by 2020