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# Commercialising CCS: research perspectives

European Commission

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SEVENTH FRAMEWORK  
PROGRAMME



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# ***CCS research: state of play***

## ***Where are we now, and where are we going?***



### **Achievements to date**

- ✓ **Activities under past Framework Programmes**

### **Ongoing activities**

- ✓ **The 7th Framework Programme**

### **Looking forward**

- ✓ **Toward a European Industrial Initiative on CCS**



# ***Activities under past Framework Programmes***

## **Activities under FP5 and FP6 (1998-2006)**

- Projects on Clean Coal (FP5) and Carbon Capture and Storage (FP5/FP6) worth more than 35 € (CC) and 170 M€ (CCS)
- European Technology Platform on Zero Emission Fossil Fuel Power Plants launched on 1 December 2006
- Coordination of member states research activities, ERA-NET (FENCO)
- International Cooperation: member of the Carbon Sequestration Leadership Forum, IEA, EU-China MoU, bilateral S&T cooperation
- Research Fund for Coal and Steel (RFCS) actions are complementary to FP



# *Energy Theme in FP7*

Implemented jointly by DG Research and DG Energy and Transport

**Hydrogen and fuel cells**

**CO2 capture and storage  
technologies for zero  
emission power generation**

**Renewable  
electricity  
generation**

**Clean coal  
technologies**

**Renewable  
fuel production**

**Smart energy  
networks**

**Renewables  
for heating and cooling**

**Energy savings  
and energy efficiency**

**Knowledge for energy policy making**



## ***CO2 Capture and Storage (CCS) technologies for ZEP generation***

- ✓ ***R&D to drastically reduce the environmental impact of fossil fuel use***

## ***Clean Coal Technologies (with a view on CCS)***

- ✓ ***R&D to substantially improve plant efficiency, reliability and reduce cost for near zero emission power plants***

## ***Cross-cutting actions:***

- ✓ ***R&D addressing general economic, social, environmental and infrastructural development issues essential to CCS deployment***



## ***FP7: support to CCS***

**More than 54 M€ spent or earmarked for CCS/CCT so far on:**

- Advanced capture techniques
- Transport infrastructure
- Qualification of deep saline aquifers
- Storage safety
- Public acceptance
- Gas turbines in IGCC power plants; oxyfuel combustion; fluidised bed combustion
- Feasibility/engineering study for a CCS demonstration plant (CCS part)
- Efficiency increases in pulverized coal power plants
- Support to regulatory activities for CCS
- Development of a value chain for CO<sub>2</sub> and for GHG emissions other than CO<sub>2</sub>



# ***European Strategic Energy Technology Plan (SET-Plan)***

## **The essence of the SET-Plan**

- ✓ **A tool to reach ambitious EU energy policy objectives**

## **The main elements**

- ✓ **Joint strategic planning**
- ✓ **Increase in resources, both financial and human.**
- ✓ **Reinforced international cooperation**
- ✓ **Effective implementation:**
  - ***Strengthening European Energy Research Capacities***
  - ***Trans-European Energy Networks and Systems of the Future***
  - ***European Industrial Initiatives***



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# ***Towards early demonstration***

## ***A European Industrial Initiative within the SET Plan***



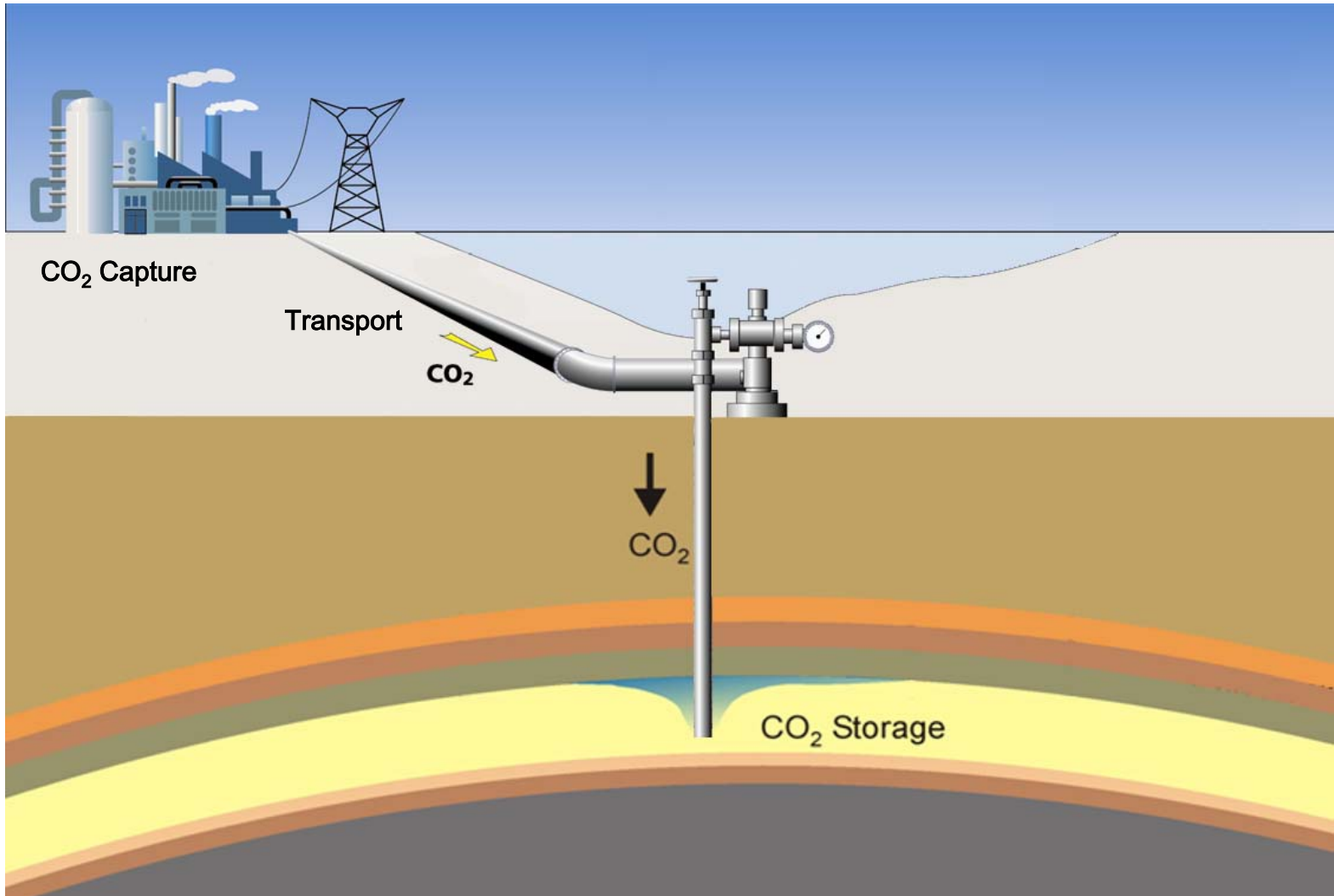
### **Objectives**

- ✓ A set of full-scale demonstration projects covering a wide range of CCS technologies, EU-wide
- ✓ Prepare the way for fully commercial implementation



# ***Demonstrate the full chain of CCS***

***Capture, transport, safe storage and the “after-life”***





## ***Key research needs***

**Large-scale demonstration of power generation with CCS is vital, and should be supported by research to:**

- ✓ **Identify and test geological storage sites to match the capture;**
- ✓ **Address the issue of safe site abandonment;**
- ✓ **Provide knowledge and advise to Member States planning to deploy CCS;**
- ✓ **Address public acceptance, in particular of geological storage;**
- ✓ **Advance CCS technologies, in particular innovative, highly cost-efficient capture techniques**



- ✓ **Activities under the Framework Programmes have considerably advanced the state of CCS**
- ✓ **Industrial stakeholders have played an important role ( e.g. ETP ZEP)**
- ✓ **We need to demonstrate the full chain of CCS**
- ✓ **This requires a balanced portfolio of demonstrators, using different technologies, with a geographical spread...**
- ✓ **... complemented by research to advance the state of CCS technology and support the demonstrators**
- ✓ **Starting with power plants, but extend to other carbon-intensive industry**
- ✓ **Solving the financing in the short term; making CCS plants bankable**



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***Thank you for your attention***