

Providing incentives for CCS demonstration and deployment

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Some barriers to CCS

- Regulatory framework
- Completion of technology development (especially for capture)
- *Size of each investment*
- *Increased operating costs*
- *Missing CO₂ infrastructure*

Three incentives

Three specific initiatives to stimulate early large-scale CCS demos:

- Creating a network of flagship demonstration projects as a support action under the EU's seventh Research Framework Programme (FP7)
- Facilitation of state aid clearance for demonstration projects
- Commitment to address the higher operating costs => Community measures to improve “bankability” of projects

Major challenges for CCS

- The major challenge of the CCS demonstration projects seems to be the financing.
- The projects face the challenge of substantial up-front investment costs, large not only in its absolute size but also in comparison with non-CCS equipped plants;
- Operating costs will inevitably be higher, up to 25-30% more by some estimates

Need for public funding

- Industry must play an important part as they will eventually be the major beneficiary
- However industry should not be left completely only to its devices.
- Support from public funds will be needed, certainly in the first demonstration period
- Eventually the EU's emission trading scheme (ETS) will be a market-driven mechanism adequately rewarding low-CO₂ practices over carbon-intensive ones.

Four questions

- how much money is needed?
- how much will the industry pay?
- in what form should the public money come?
- where will the public money come from?

Additional costs

- The industry estimates that up to €1bn will be needed for CCS-related **R&D** between now and 2020.
- **Demonstration** will be costly- newly built power plant with a CCS facility would represent incremental costs requiring either an additional upfront capital in the range of €1000-1700 per each kW of installed capacity
- This equates to €300-500m for a demonstration power plant of around 300 MW compared to similar power plants without CCS.
- In the EU this means the set of 10-12 demonstration power plants of at least 300 MW will need incremental capital of €4-6bn
- First analyses show that projects in the programme would face incremental costs associated with the deployment and use of CCS corresponding to **€25-67 per each ton of CO₂** produced but not emitted/stored

In percentage terms.....

- The larger up-front investment is estimated to be 40 to 60 % more, compared to non CCS-equipped power plants
- Higher operating costs are 25 to 30 % more, compared to non-CCS equipped power plants.

Facilitating investment

- Public funds will clearly be needed to support the necessary investment for the construction of the demonstration projects
- This could mean state aid being provided by the Member States
- The Commission will need to assess this situation and possibly look favourably on such support
- CCS demonstration projects may be identified as projects of common European interest

Supporting operating costs

- The ETS will be the first-line incentive for CCS.
- Additional schemes could be needed to reinforce/back-up ETS:
 - feed-in tariff
 - preferential grid access/Renewables Obligations (RO)
 - fixed reward per captured and stored t_{CO_2}
 - direct operating subsidy/ETS price guarantee

Infrastructure needs

- CCS will need infrastructure for transport and storage of CO₂ and provisions for linking of emission sources into such infrastructure.
- The cost and time needed to develop CO₂ infrastructure will be significant
- Access to CO₂ infrastructure should not be limited to the owners of the infrastructure but should remain open to other users
- In the EU, the introduction of CO₂ infrastructure in the Trans-European Networks (TEN) policy is a possible option for giving to such CO₂ networks a European dimension and for bringing some additional financial support.

Summary

- CCS demonstration and deployment are necessary
- But CCS demonstration and deployment will be expensive
- There will be increased costs for:
 - Investment
 - Operation
 - Infrastructure
- Very significant public funds (and strong political support) will be needed – and must be made available.