

# Carbon Capture and Storage Workshop

29<sup>th</sup> October 2008

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## The importance of CCS

- Under business as usual, global emissions from the energy sector will rise by 57% by 2030.
- Global primary energy needs are predicted to grow by 55% between 2005 and 2030. Coal demand is predicted to increase by over 70% in real terms in response.
- CCS technology has the potential to reduce CO<sub>2</sub> emissions from fossil fuel power stations by as much as 90%.
- Could contribute up to 20% of global CO<sub>2</sub> mitigation by 2050.
- Stern Review – without CCS marginal abatement costs rise from \$25 to \$43 per tonne.
- Fossil fuels remain important for secure energy supplies and meeting electricity needs of rapidly growing economies. CCS is only technology that will enable their continued use in a carbon constrained future

## The scale of the challenge

- Current number of operational commercial-scale demonstration projects = 0
- Yearly average required between 2010 and 2050 to meet climate change goals = 35 coal and 20 gas
- Total no. power stations required to have CCS by 2030 = 620

## Global ambitions for demonstrations

- G8 Energy Ministers: “We strongly support the recommendation that 20 large-scale CCS demonstration projects need to be launched globally by 2010, taking into account varying national circumstances with a view to supporting technology development and cost reduction for the beginning of broad deployment of CCS by 2020. “
- European Council 2007: “welcomes the Commission's intention to establish a mechanism to stimulate the construction and operation by 2015 of up to 12 demonstration plants of sustainable fossil fuel technologies in commercial power generation.”
- European Council 2008: “calls on the Commission to bring forward as soon as possible a mechanism to incentivise Member State and private sector investment to ensure the construction and operation by 2015 of up to 12 demonstration plants of commercial power generation with carbon capture and storage, as agreed by the European Council in spring 2007.”

## Proposed demonstration projects

- Countries with serious proposals:
  - UK
  - Norway – Karsto, Mongstad
  - US – 2-3 through re-worked Futuregen
  - Canada – 3-5 in Alberta (not all power stations)
- Proposed collaborative projects:
  - NZEC
  - Japan/China EOR project
- More needed!

## Rationale for UK demonstration project

- Acknowledgement of role CCS could play in achieving twin objectives of tackling climate change and ensuring energy security
- Recognition that the next step in developing CCS is testing full chain on commercial-scale power station
- Importance of CCS to international climate change agenda
- Aid development of effective regulatory framework

## Taking the decision

- Dec 06 - commissioned engineering study to investigate costs
- Study assessed feasibility of projects and potential costs
- March 07 – announcement in Budget that UK Government would hold competition to select project to support
- Nov 07- competition launched under EU procurement rules

## Objectives of UK demonstration

- 2 key objectives –
  - Deliver successful demonstration of full chain of CCS technologies on a power plant at commercial scale
  - Demonstrate technology that is relevant and transferable to key global markets

## What UK Government is supporting

- One project
- Post-combustion capture
- Commercial-scale (at least 300MW) coal power plant
- Carbon dioxide stored offshore
- Operational by 2014

## The choice of post combustion

- Needed to select a capture technology upfront to have a fair and transparent competition
- Pulverised fuel accounts for vast majority of existing & planned coal fired plant globally
- World Energy Outlook 2006 - IGCC will account for less than 20% of new capacity added globally between 2015-2030, and over half of that will be in the USA
- Proposals for new & retrofit coal capacity in UK are supercritical pulverised fuel
- Post-combustion can be retrofitted more easily – tackles carbon lock-in

## Rationale for using a competition

- Significant investment by UK Government
- Competition best way to get value for money
- Aware of several potential projects – competition for funds should deliver better value projects and greater innovation

## Pre-qualification phase

- Pre-qualification questionnaire published in Nov 07 – deadline of 31<sup>st</sup> March 08
- Applicants assessed on technical capability and capacity, and financial robustness – NOT their project
- Received 9 applications
- June 07 – announced 4 consortia successfully pre-qualified – BP, EON, Peel/Dong, Scottish Power

## Next stages

- June 08 – September 08 – informal discussions
- Covered key issues such as design/location of the project, costs, knowledge transfer
- Content of discussions informed development of next stage of competition documentation
- Move to negotiation stage by end November
- Appoint preferred Bidder end 09

## Knowledge transfer

- Key element of UK demonstration project is knowledge transfer
- Need to make most effective use of knowledge and experience gained to feed learning into later demonstrations and the next generation of CCS projects
- Aim is for project to be part of EU Demonstration Programme and to link to other demonstration networks
- Will also explore other means of ensuring knowledge is widely exploited

## Outside the demonstration project

- UK support for CCS is not just about the demonstration
- Need to plot a path from demonstration to deployment
- Several elements
  - Regulatory framework
  - Moving from demonstration to deployment
  - International CCS

## Summary

- CCS is central to UK energy and climate change policies, both nationally and internationally.
- Demonstration project is a key element of approach to CCS
- Not the whole story – working on an approach to move from demonstration to deployment