

# **Carbon Capture and Storage:**

*From demonstration to deployment – bilateral solutions*

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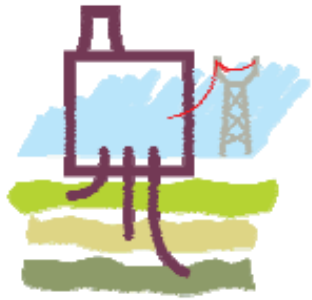
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## **The Goal**

Commercially viable CCS by 2020

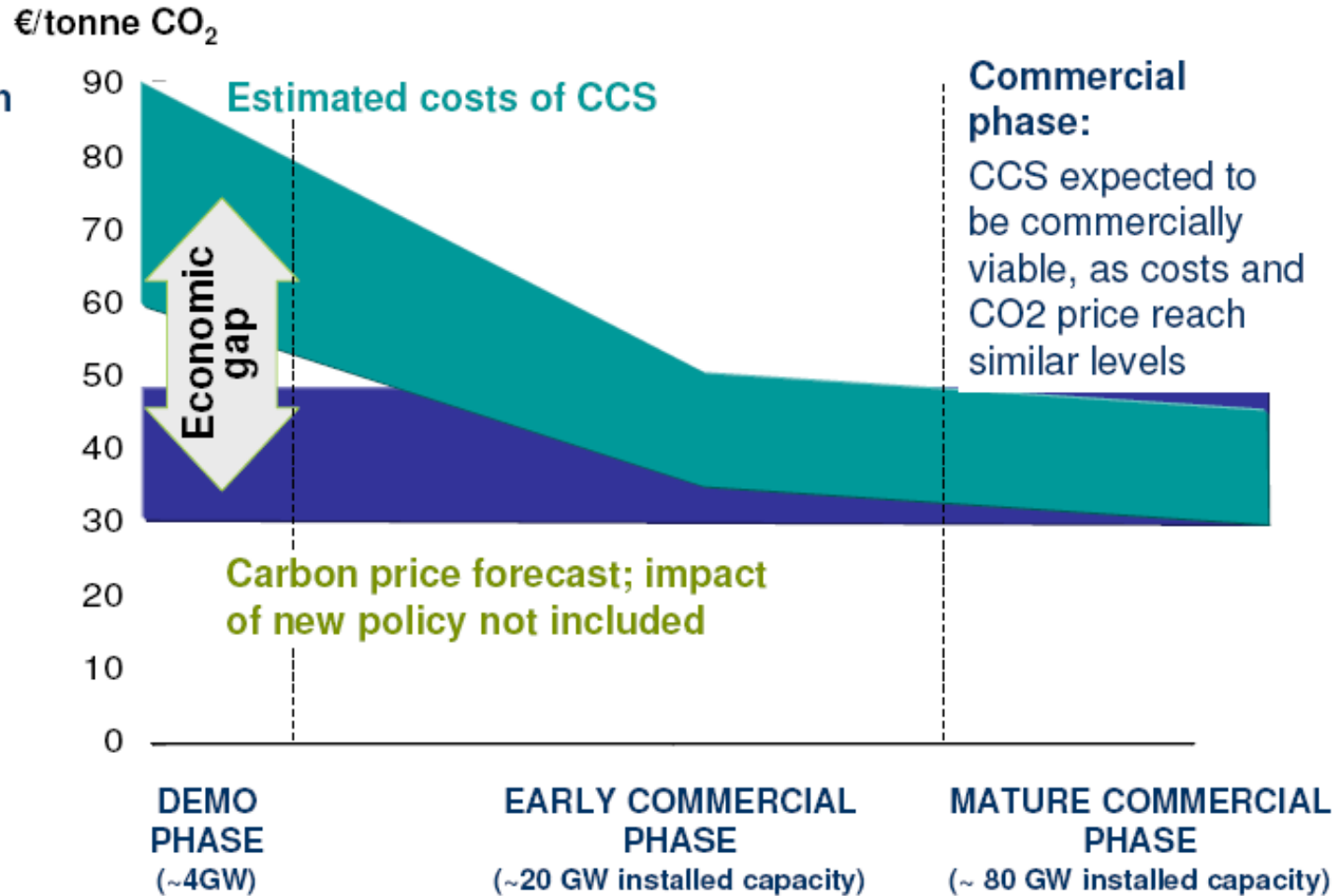
## What is ‘commercially viable’?

- When CCS is a commercial option for investors
- Needs
  - Technology to be proven and costs reduced – which requires demonstration
  - A way to incorporate the cost of CO<sub>2</sub> emissions (carbon price)
- Commercial viability needs both!



# CCS costs will need to come down over time

**Demonstration phase:**  
CCS not economically viable. Public contribution necessary for some portion



**Commercial phase:**  
CCS expected to be commercially viable, as costs and CO<sub>2</sub> price reach similar levels

## UK policy context

- UK committed to reduce GHG emissions by 80% by 2050
- CCS crosses boundaries:
  - Energy and climate change
  - Domestic and international
- UK approach builds on strengths:
  - Fossil fuel power generation
  - Offshore storage of CO<sub>2</sub>
- Energy and climate change brought together in one Ministry

## EU policy context

- UK subject to EU developments:
  - EU Emissions Trading Scheme (and associated carbon price)
  - Flagship demonstration programme (up to 12)
- EU Climate and Energy Package (agreed Dec 08)
  - Funding mechanism for up to 12 projects
  - Directive on CO<sub>2</sub> storage (also includes capture readiness)
  - Full inclusion of CCS in Phase 3 of EU ETS

## UK Actions

- Approach to CCS has several strands which run in parallel –
  - Demonstration project
  - Supporting R&D
  - Regulatory Framework
  - Moving from demonstration to deployment
  - International CCS

## UK demonstration

- 300MW post combustion capture project on a coal-fired power station, with CO<sub>2</sub> stored offshore
- Project to be operational by 2014
- Handled via competitive process
- 4 consortia successfully pre-qualified – BP (withdrawn), EON, RWE/Peel/Dong, Scottish Power

## **UK demonstration: 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

## Support for R&D

- Support across the spectrum of R&D from basic through applied research – university and industry led
- Energy Technologies Institute - a 50:50 partnership between Government and industry, up to £1.1 billion over ten years for transformational research and development in low-carbon energy technologies
  - Call for CO<sub>2</sub> storage

## Regulatory Framework for Storing CO<sub>2</sub>

- UK one of the first countries to implement national regulations for CO<sub>2</sub> storage
- Overarching framework for storing CO<sub>2</sub> in UK offshore sites,
  - Require lease for area where storage site is located
  - Requires licence for exploration and storage
  - Outlines sanctions
  - Provides for transfer of liabilities to state
  - Requires decommissioning
  - Extendable to EOR

## Capture Ready

- Unreasonable to demand new build power stations to be fitted with CCS before it is demonstrated, but reasonable to suggest that they are built to allow retrofit.
- 4 key elements required –
  - Clearly identified strategy by which a credible capture technology can be retrofitted
  - Space available both within and around the plant to permit capture technology to be fitted
  - Credible route for CO<sub>2</sub> to be removed and transported to storage site
  - Availability of suitable storage

## From demonstration to deployment

- Infrastructure development and regulation
  - For transport and storage
- Supply chain development
  - Skills
  - Industry capacity
- Technology development
  - Continued R&D
- Bridging the funding gap

## Promoting global deployment of CCS

- UK carbon dioxide emissions 2-3% of global total
- In order to achieve global climate stabilisation, need to promote low carbon technologies globally
- No single country can achieve global deployment of CCS
  - requires co-operation between Governments and industry
- International work integral part of UK approach to CCS
  - Financing demonstration projects, working towards commercial deployment
  - Capacity building
  - Multilateral/bilateral collaboration

## Financing commercial-scale CCS

- Long term – carbon price and reduced costs should be enough to incentivise CCS
- But significant gap remains in short-medium term.
- Developed countries starting to find ways to incentivise projects – direct funding, trading schemes, regulation
- Larger problem is financing CCS in developing countries.  
Possible options –
  - CCS in CDM
  - Post-2012 architecture
  - Multilateral financial institutions
  - Co-operative projects, e.g. NZEC

## Aspirations for 2009

- More demonstration projects
  - Agreement at UNFCCC meeting in Copenhagen (COP/MOP15) on –
    - comprehensive, global and long-term framework for addressing climate change
    - robust financing mechanism for CCS
  - New fossil fuel power stations built capture ready
- = Significant progress to
- commercial viability by 2020
  - widespread global deployment as soon as possible thereafter
  - tackling climate change cost effectively