



UK perspective on CCS regulation and incentives

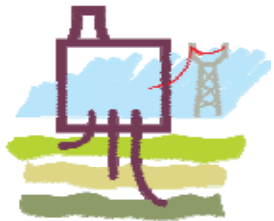
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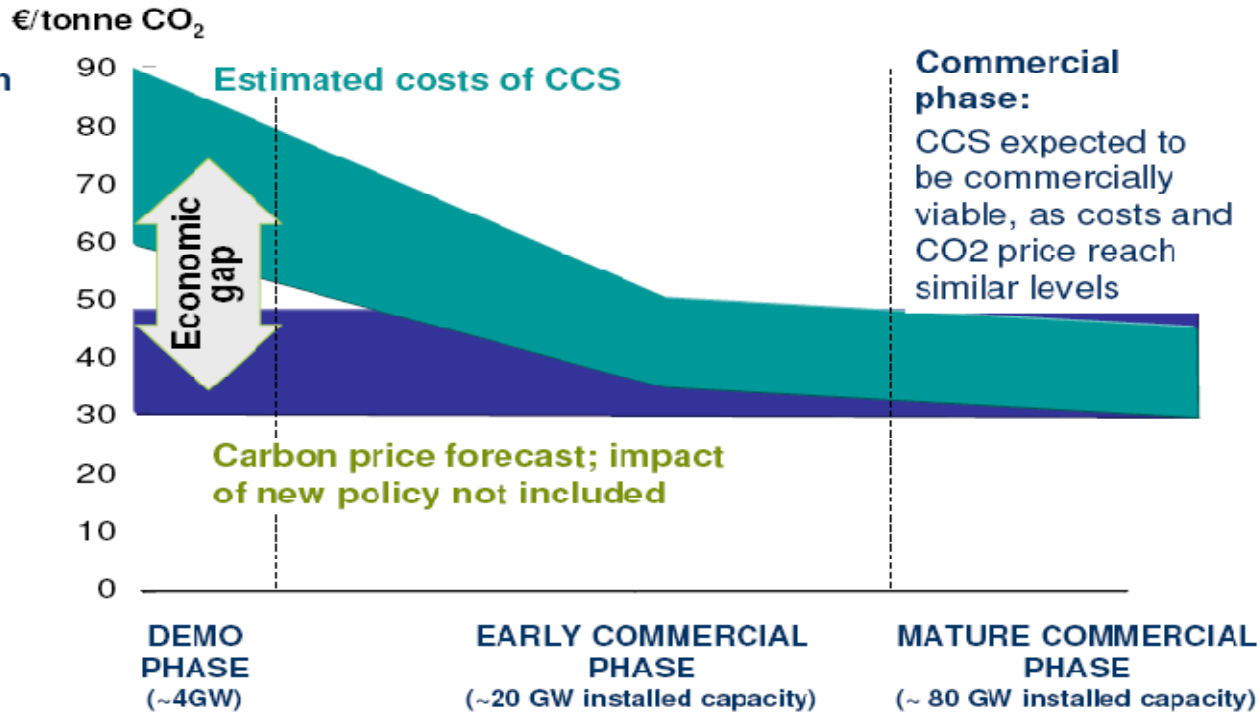
The Goal: commercially viable CCS by 2020

- For CCS to become a commercial option for investors:
 - Technology must be proven at scale and costs reduced through large-scale demonstration
 - There must be a way to incorporate the cost of CO₂ emissions e.g. carbon price
- For widespread deployment need:
 - Technology and infrastructure development
 - Skills and capacity building



CCS costs will come down over time (from ZEP CCS Proposal)

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



Commercial phase:
CCS expected to be commercially viable, as costs and CO₂ price reach similar levels



UK policy context

- To reduce GHG emissions by 80% by 2050
- Energy and climate change together in one Ministry
- Renewables and nuclear deployment, efficiency
- CCS crosses boundaries:
 - Energy and climate change
 - Domestic and international
- UK approach builds on strengths:
 - Fossil fuel power generation
 - Offshore storage of CO₂



Regulation and Incentives

- **UK Energy Act 2008**
- **CCS research in the UK**
- **The UK CCS competition**
- **UK view on EU policy developments**
- **Beyond Europe**
- **Towards deployment**



UK Energy Act 2008

- UK has implemented national regulations for CO₂ storage, which enter in force in April 2009
- Framework for storing CO₂ in UK offshore sites:
 - Requires lease for volume of subsurface
 - Requires licence for exploration and storage
 - Requires decommissioning
 - Provides for transfer of liabilities to state
 - Extendable to EOR
 - Includes penalties for non-compliance
 - Complies with EU Directive



UK Regulation – next steps in 2009

- Response to “Towards Carbon Capture and Storage” consultation:
 - Detail of licensing scheme for offshore CO₂ storage
 - UK approach to implementing carbon capture readiness including guidance document
- Regulations on storage
- Strategy for deployment in the UK



CCS research in the UK

- Research Councils
 - To date £15m on CCS for basic research and capacity building
- Technology Strategy Board
 - £6.4m for university and industry led projects
 - New £15m call in 2009 jointly with the ETF
- Energy Technologies Institute – a 50:50 Government-industry partnership with £1.1 billion over ten years
 - Calls: CO₂ storage; Scoping next generation capture technology
- Environmental Transformation Fund (ETF)
 - 40 MW oxy-fuel CO₂ capture component demonstration in Renfrewshire, Scotland (Doosan Babcock)



UK CCS competition – rationale

- Capture, transport and storage elements of CCS chain have been individually demonstrated
- UK project will:
 - Integrate full chain on a commercial scale power plant
 - Define and reduce the costs of post-combustion technologies that have the potential to be retrofitted
 - Ensure effective use of knowledge and experience to feed into research, later demonstrations, and increase public awareness of CCS



UK CCS competition – progress

- 300MW post-combustion capture project on a coal-fired power station, with CO₂ 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



EU policy context

- EU policy:
 - EU Emissions Trading Scheme (EU ETS) and associated carbon price will drive CCS deployment
 - EU will have a demonstration programme of up to 12 commercial scale projects
- EU Climate and Energy Package (agreed Dec 08)
 - Full recognition of CCS in Phase 3 of EU ETS
 - Funding mechanism for up to 12 projects
 - Directive on CO₂ storage (also includes capture readiness)



Coordinated Domestic and EU actions

- EU funding (including proposed Economic Recovery Package) insufficient to bring forward projects alone
- National government support is vital:
 - To provide certainty in implementing national regulations
 - To ensure EU processes are simple and well-defined
 - To provide additional funding for demonstration to combine with private sector and EU contributions where necessary
- Aim for UK demonstration to be part of EU Programme
 - International element of EU programme and knowledge dissemination are key to its success



Funding large-scale CCS outside Europe

- In the long-term, a higher carbon price and reduced cost of CCS should be enough of an incentive
- But significant gap remains in short-medium term.
- Developed countries are finding ways to incentivise projects – direct funding, trading schemes, regulation
- Options for CCS in developing countries include:
 - CCS in CDM
 - Post-2012 architecture
 - Multilateral financial institutions
 - Co-operative projects, e.g. NZEC



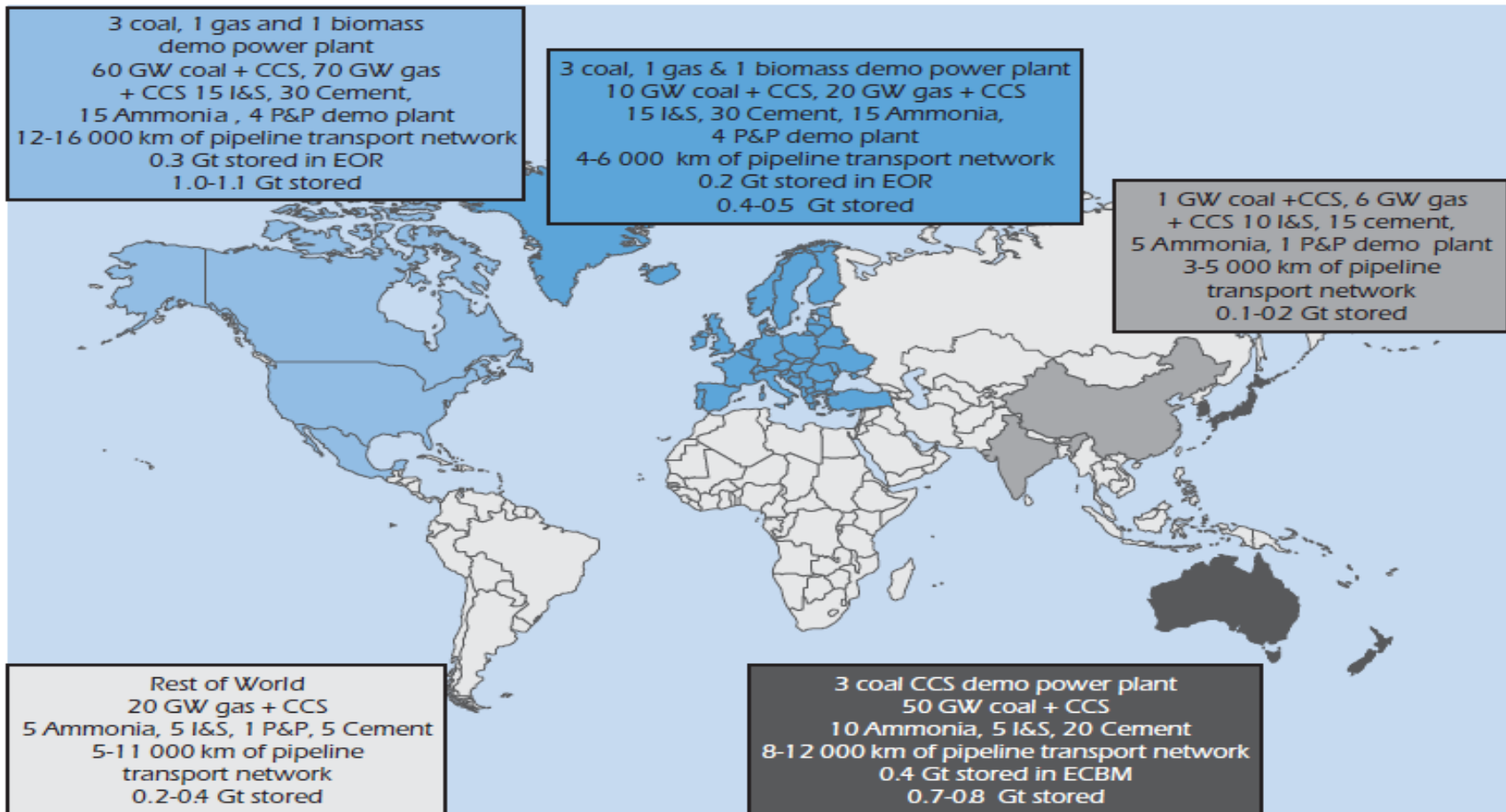
From demonstration to deployment

- Infrastructure development and regulation
 - For transport and storage
- Supply chain development
 - Skills
 - Industry capacity
- Technology development
 - Continued R&D
 - Knowledge transfer for early demonstrations
- Bridging the funding gap
 - For demonstration and early deployment



The scale of the challenge – by 2030

(from IEA WEO 2008)



The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.