

# Carbon Abatement Technologies – Review of policies & measures in the UK

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# UK approach is to decarbonise the economy while maintaining security of our electricity supplies



At the heart of our plan to decarbonise is the **EU Emissions Trading System** which sets a declining limit or 'cap' for emissions from electricity generation and heavy industry

Further action:

30% of electricity through **renewables** in 2020

**New nuclear** power stations under way by 2018

**Drive forward CCS and the move to clean coal**

We want to keep the benefits of using coal power stations: they are flexible, can **respond to changing supply and demand** and provide **diversity in the energy mix**, in particular providing an **alternative to gas**

**CCS would enable coal power stations to continue to play this role as we move to a low carbon energy mix**

# 2010 and beyond: delivery of a new framework for coal and CCS in the UK

In developing our policy, we have considered the advice of the CCC in their first annual report and reflected on the wide range of views given in the responses to the consultation

## (1) No new coal without CCS

- **4 commercial-scale** CCS demonstrations funded by a new **CCS incentive**
- Any new coal power station to demonstrate **full CCS chain** at commercial scale

## (2) Long term transition to clean coal

- Ambition to see CCS ready for **wider deployment from 2020**
- Expect demonstration plant will **retrofit CCS to full capacity by 2025**

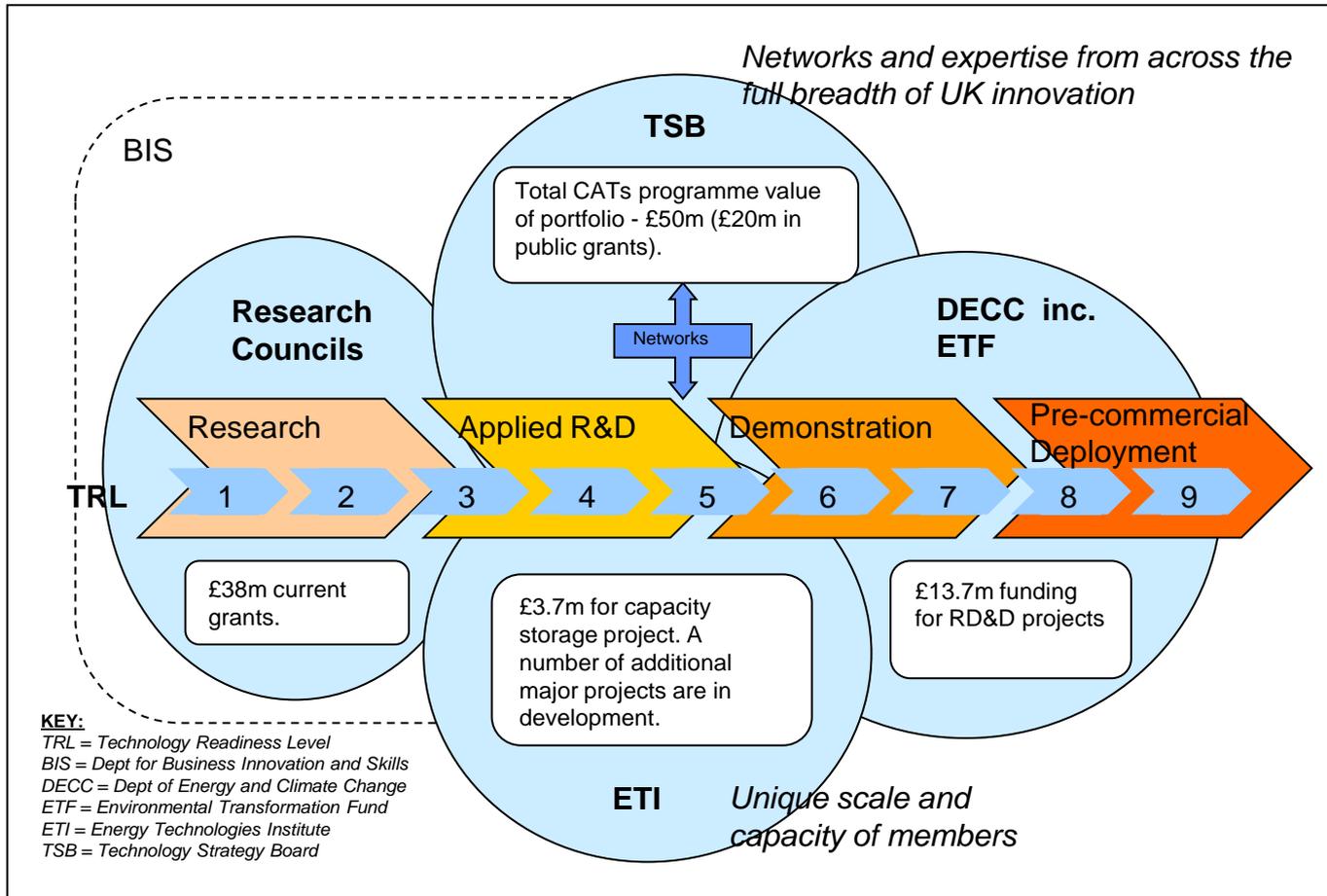
- A **rolling review** process to **report by 2018** on CCS status
- Possible measures to manage emissions **if CCS is not viable**

**Our programme of 4 demonstrations projects represents a substantial contribution to the global efforts to develop CCS technology**

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# **Highlights on the delivery of the 2005 Carbon Abatement Technologies strategy actions**

# Support research, development and demonstration of CATs (1)



# Support research, development and demonstration of CATs (2)



## R & D

- Increased funding for CATs
- Improved coordination between public funders e.g. Joint call in 2009 between TSB/DECC ETF/Northern Way
- Establishment of ETF and ETI

## Demonstration

- Launch of current CCS demonstration competition in 2007
- FEED contracts with E.ON and Scottish Power announced on 12 March 2010
- Commitment to total of four commercial-scale demonstration projects funded via CCS incentive
- Legislation under consideration by parliament
- Secondary regulations during Summer 2010
- Competitive process for additional projects launched by end 2010

# Support research, development and demonstration of CATs (3)

| Project                                 | Size & technology                          | Operational dates            |
|---|--|------------------------------|
| <b>Longannet</b><br>(Scottish Power)    | 1 MWe<br>Post-combustion capture only      | Yes, since 2009              |
| <b>Aberthaw</b><br>(RWE)                | 3 MWe<br>Post-combustion capture only      | No, planned delivery by 2011 |
| <b>Didcot testing facility</b><br>(RWE) | 0.5 MWt<br>Oxy-fuel and amine capture only | Yes, since 2008              |
| <b>Renfrew</b><br>(Doosan Babcock)      | 40 MWt<br>Oxy-fuel combustion              | Yes, since 2009.             |

# Support research, development and demonstration of CATs (4)



| Project                              | Size & technology  | Public funding  | Operational dates                                |
|--------------------------------------|--|---|--|
| <b>Longannet</b><br>(Scottish Power) | 300 MWe<br>Post-combustion capture,<br>transport and storage     | Bidder in UK post-combustion<br>competition                                     | Planned delivery<br>by 2014                      |
| <b>Kingsnorth</b><br>(E.On)          | 300-400 MWe<br>Post-combustion capture,<br>transport and storage | Bidder in UK post-combustion<br>competition                                     | Investment<br>decision to be<br>reviewed in 2016 |
| <b>Hatfield</b><br>(Power Fuel)      | 450 MWe<br>IGCC capture, transport and<br>storage                | EUR180m Grant from EC under<br>the EU Economic Plan for<br>Recovery for stage 1 | Planned delivery<br>by 2015                      |

# Facilitate international collaboration in UK-based CATs RD&D projects and vice-versa



| Scheme   | Projects   |
|--|--|
| DECC and US DoE MoU on fossil energy research  | Five-year collaborative projects between UK and US researchers on: <ul style="list-style-type: none"><li>• Advanced Materials</li><li>• Virtual plant simulation</li></ul>   |
| DECC and China MOST MoU on fossil energy research  | Collaborative projects between UK and Chinese researchers: <ul style="list-style-type: none"><li>• Chinese Advanced Power Plant Carbon Capture Options (CAPPCCO) project</li><li>• Biomass Co-firing project</li></ul>   |
| Research Councils UK and China   | £4.7m for collaborative projects on oxycoal combustion, adsorbent materials and processes for capture, syngas burning and hydrogen production network.   |
| Founder member with Norway of the North Sea Basin Task Force (NSBTF)                                 | A joint project involving the Governments and industries of the UK, Norway, the Netherlands and Germany to consider issues related to storing CO <sub>2</sub> under the North Sea.   |
| DECC is supporting the EU-China Near Zero Emission Coal (NZEC) agreement to demonstrate CCS in China | <ul style="list-style-type: none"><li>• to date provided £2.8m for the Phase I (scoping) through the UK-China NZEC initiative.</li><li>• pledged to contribute a further £6m to Phase II of the project (plant selection, design and storage site characterisation), conditional on similar pledges from other EU Member States.</li></ul> |

# Lead in preparing the national and international regulatory frameworks and market mechanisms needed to support CATs (1)



- UK Energy Act 2008 established the enabling provisions for regulating CO2 storage in the UK offshore area.
- In 2008 UK supported the recognition of CCS in the EU Emissions Trading Scheme and the introduction of the CCS Directive, incl. capture readiness.
- In November 2009 UK published regulations and guidelines implementing Carbon Capture Readiness policy for new large combustion plants (coal, gas, oil, biomass and CHP)

## Lead in preparing the national and international regulatory frameworks and market mechanisms needed to support CATs (2)



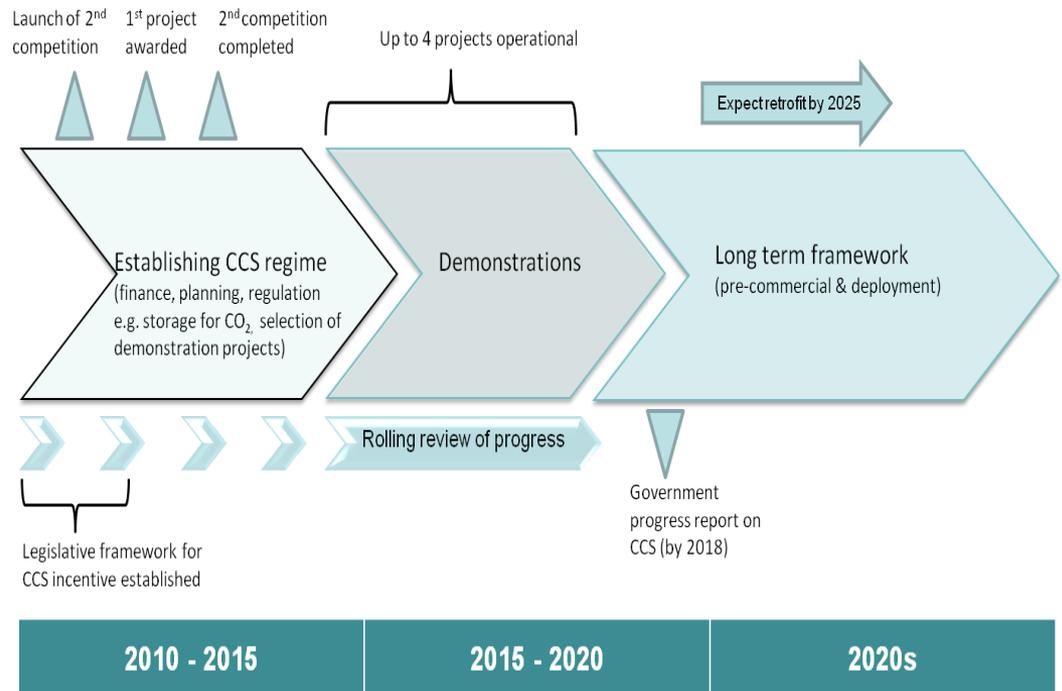
- Recently UK concluded a consultation on the arrangements for licensing CO<sub>2</sub> storage under the CCS Directive.
- UK already has arrangements for licensing pipeline transportation of CCS – currently developing approach to 3<sup>rd</sup> party access.
- UK successfully campaigned for amendments to OSPAR and London (Marine) Conventions to enable sub-seabed CO<sub>2</sub> storage and cross-border transportation. UK will ratify OSPAR amendments by mid-2010.
- UK (through the EU) continues to support the approval of CCS projects within the UN Clean Development Mechanism (CDM).

Over the coming months we will be taking forward a number of measures to help deliver our framework

## Next Steps

- **CCS industrial strategy** to be published (early 2010)
- **Energy Bill** to establish CCS Incentive (2009/10) and secondary legislation (summer 2010)
- Award **FEED** contracts for 1<sup>st</sup> competition (early 2010)
- Run competition for **other CCS projects** (2010-2011)
- Establishment of the **Office of Carbon Capture and Storage (OCCS)**

## These measures will feed into our long term timetable for CCS demonstration and deployment



# Questions?