Carbon Capture and Storage (CCS)

Investor Relations | National Grid

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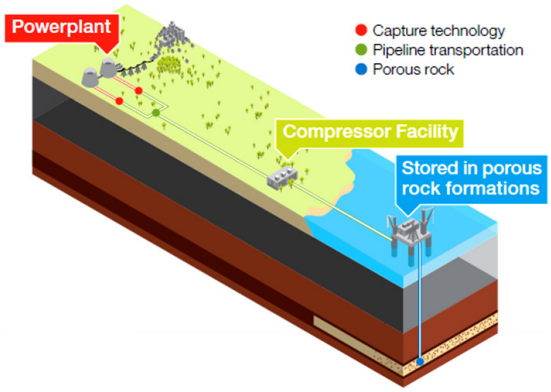
- **National Grid is leading the development of the CCS industry in the UK through the proposed construction of new assets as well as the reuse of existing natural gas transmission pipelines to transport CO_2 to offshore storage sites**
- **Capture, transport and storage of CO_2 are tested and proven processes; however the first commercial scale end-to-end project has yet to be demonstrated in the UK**
- **National Grid's experience and expertise in delivering large scale high pressure pipeline projects safely and cost effectively is key, and we are driving collaboration with industry, universities and government to tackle the issues associated with CO_2 transportation and storage**
- **It is important that the right frameworks for investment are created to enable viable commercial deployment**



Carbon Capture and Storage (CCS)

CCS uses innovative and established technology to capture, transport and permanently store CO_2 emissions from fossil fuel power stations and industrial emitters beneath the seabed in natural porous rock formations or depleted oil and gas fields.

It is widely recognised as one of the most significant potential contributors to reducing carbon emissions. The technology is currently the only means by which fossil fuels can be maintained within the UK generation mix, whilst meeting 2050 carbon targets and keeping long term energy costs low for consumers.

CCS could increase domestic security of supply by acting as a 'bridging technology' and allow us to retain fossil-fuel generation while alternative clean energy sources are further developed, providing flexible electricity generating capacity to balance other sources.

The Government is committed to working with industry to develop CCS technology in the UK.

National Grid Projects

National Grid is involved in four proposed CCS projects in the UK including Don Valley, White Rose, C.Gen and Captain Clean Energy. With the support of the European Energy Programme for Recovery (EEPR) and a variety of developers, National Grid is leading the development of the CCS industry in the UK by building, owning and operating CCS transportation and storage assets; our long term strategy is to develop multiple CCS clusters in the UK.

Political and Funding Support

CCS is not presently a commercially economic activity. Therefore substantial public funding from the UK Government and/or the European Union is essential to kick start the industry. In April 2012, UK Government launched its CCS Commercialisation Programme and published a suite of roadmaps for CCS deployment in the UK. Through a competitive process, successful projects may be awarded capital through the Commercialisation Programme and revenue support through Energy Market Reform.

On 20 March 2013, UK Government announced the two preferred bids to be taken forward to the next stage, one of which is the White Rose Project in Yorkshire, for which National Grid is providing the transportation and storage solution.

The projects will now move to finalise, sign and carry out Front End Engineering Design (FEED) studies.

The two preferred bids were selected following a period of intensive commercial negotiations with four projects shortlisted from an original eight in October last year.

The Captain Clean Energy Project in Grangemouth, Scotland, which National Grid Carbon had also been supporting, is one of the unsuccessful bids. It will now be appointed as a reserve project, should one of the preferred projects fail to enter into a FEED contract by the summer.

The European Union is highly supportive of CCS, aiming to have up to 12 demonstration projects operational by 2015. It has already put in place two funding packages designed to part fund CCS projects: the European Energy Programme for recovery (EEPR) and an element of the New Entrant Reserve (NER). National Grid has secured both UK and EU funding support for its work to date through the former DECC Competition and on-going EEPR programme. If fully used, this could amount to around £75m.

Carbon Capture and Storage

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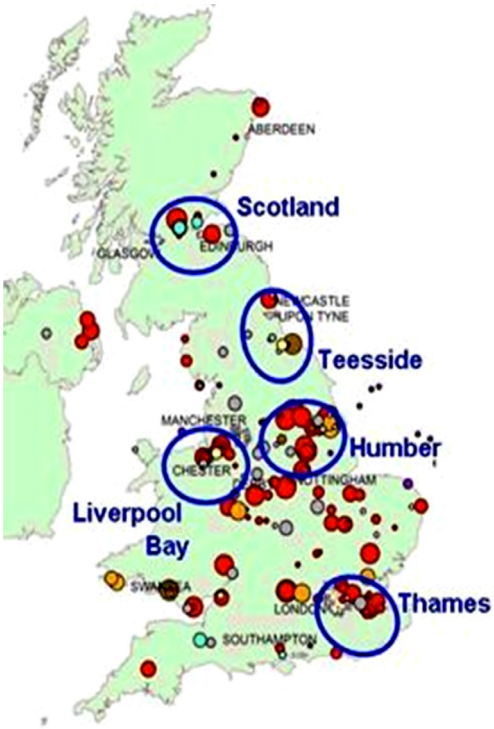
Development of a regulatory framework should enable clustering and anticipatory investment



The UK's historic industrial development has led to emission sources formed in natural clusters, which lends itself to an onshore gathering system of pipelines; this shared infrastructure model is similar to the model on our electricity and gas networks and delivers a number of benefits:

Cost efficiency

Sharing large scale infrastructure brings down unit costs: Based upon our Humber Cluster analysis, there could be a reduction of around 40% in the transport and storage costs per tonne of CO_2 for two commercial scale capture projects sharing that infrastructure, compared to the case if separate infrastructure solutions were developed.

CCS analysts have estimated deployment costs which reinforce National Grid work. This suggests costs need to fall sharply (as they do with any new technology) if CCS is to be deployed on a commercial scale. Shared infrastructure will be essential in reducing the costs of CCS and ultimately reducing bills to consumers.

Extra capacity

A shared transportation line would allow extra capacity to be built economically which will reduce barriers to future capture and storage investment and speed deployment, easing consenting and opening up the possibilities to connect small industrial emitters for whom point to point solutions may be too expensive and who may have no other carbon dioxide emissions mitigation strategy than CCS. This is clearly aligned to the UK Government's Outcome of achieving real commercialisation for CCS in the early 2020s.

Potential Investment

In the UK the potential investment in CCS could be around £6.5bn by 2030. The transportation sector investment is estimated to be £8bn by 2050. National Grid could potentially win a material part of this business.

Timeline

3 April 2012	Q4 2012	2013	2014	2015	2016—18
DECC launch CCS Commercialisation Programme	DECC selected projects for award of FEED and/or Project Contracts	First contract concludes; IPC planning application lodged	Planning consent awarded; detailed design	Main construction season	First end to end CCS projects commence operation

Further information

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