



CREATING A CCS INDUSTRY FOR THE FUTURE

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The UK is well placed to make a success of its carbon capture and storage (CCS) industry. With abundant storage resources, political and regulatory backing, and a solid commercial support framework, the UK can become a confident pioneer in this fast-emerging technology.

With most countries now committed to tackling climate change, the race is on to develop cost-effective technologies that can be transformational in reducing emissions yet still enable the lights to stay on. CCS is fast emerging as a key option in the suite of low-carbon technologies alongside nuclear and renewables.

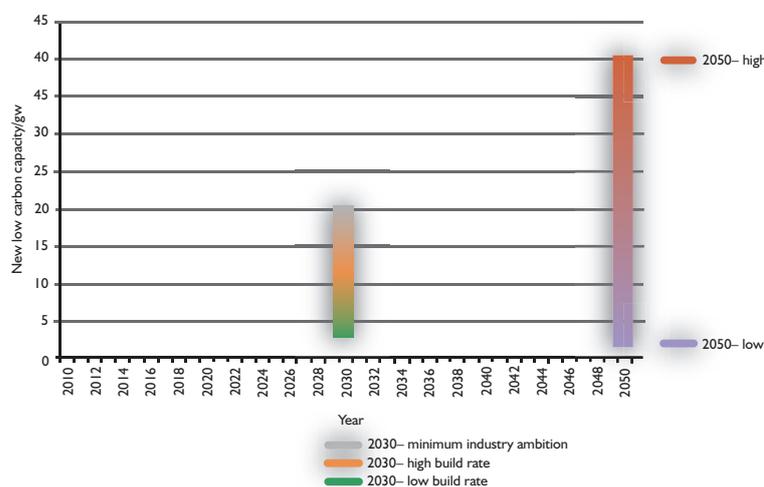
THE NEED FOR CCS

Under the 2008 Climate Change Act, the UK is now committed to a target of reducing greenhouse gas emissions by 80% by 2050 and the Committee on Climate Change (CCC) has recommended, as a necessary milestone, the almost complete decarbonisation of the power sector by 2030. This will in turn enable the subsequent decarbonisation of the transport and heating sectors. Although nuclear and renewables are important options for decarbonisation, fossil fuel power will be needed for the foreseeable

future to balance the inflexibility of nuclear and the intermittency of renewables. A large proportion of fossil fuel plant will need to be equipped with CCS if we are to ensure the emissions associated with fossil fuel power do not reach the atmosphere.

STEPS ALONG THE WAY

In September 2011, the Carbon Capture and Storage Association (CCSA) published 'A Strategy for CCS in the UK and Beyond', setting out the CCS industry's view of the steps needed to deploy CCS to 2030. The report concludes that to ensure the decarbonisation of the power sector by 2030, the UK will need at least 20–30GW of installed capacity of fossil fuel power plant fitted with CCS. This was recognised in the Government's recently published CCS Roadmap, which presents a high CCS build rate of around 15GW by 2030 (see Figure 1).



Top: Roadmap signals governments commitment to a long-term CCS industry

Figure 1: Scenarios for CCS capacity in the UK power sector to 2050.

Source: Modelling by Redpoint Energy for the Carbon Plan; Department of Energy and Climate Change

Although much delayed, the publication of this Roadmap is beginning to send much-needed positive signals to the CCS industry, signalling the Government's commitment to a long-term CCS industry. This is welcome news for developers ready to make investment decisions for the first CCS projects, and for the ensuing roll-out of the industry.

Alongside this Roadmap, the Government has launched the 'CCS Commercialisation Programme' – a revamping of its former CCS Competition. The first competition (launched in 2007) culminated in the cancellation of the sole remaining project at Longannet power station last year.

While the Commercialisation Programme does not commit to a total number of projects to be supported, the Government has committed to supporting four commercial-scale CCS projects in its coalition agreement. This Programme presents the industry with a much more flexible package, including both coal and gas, consideration of all capture technologies and inclusion of industrial emitters where they are part of a cluster project. The change in name indicates that the Government is now focused on the long-term commercialisation of CCS by enabling CCS to compete cost-effectively with

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is that, by a mere doubling of the investment in a pipeline, the pipeline diameter can be increased to carry 10 times the CO₂ capacity, and this could enable future projects to take advantage of existing infrastructure, rather than investing in new project-specific pipelines and stores. The ideal CCS vision for the UK will be the development of several regional pipeline hubs, able to service a number of emissions sources, delivering CO₂ to a network of stores. Perhaps then we would be on the way to a successful CCS industry.

technologies. Current estimates suggest that CCS is already cost-competitive with some low-carbon forms of electricity generation; however, as with any emerging technology, CCS must go through a process of cost-reduction to reach commercial maturity. The cost of CCS is very project specific and although pilot projects and desk studies have been carried out and experience of the plant for capture, transport and storage exist at commercial scale, we have yet to get hands-on design, build and operational experience of full chain CCS projects on power stations. The sooner we get some momentum behind building the first CCS plants, the faster will be the process of technology optimisation and cost reduction.

In the UK, the commercial case for early and long-term CCS projects will be determined to a large extent by the UK's Electricity Market Reform (EMR) – introduced in 2011 to create an overarching framework by which all low-carbon electricity generating technologies can compete for a level of support. Key to EMR is the Feed-in Tariff Contract for Differences (FiT CfD) mechanism, which will provide a level of top-up to the wholesale electricity price to support nuclear, CCS and renewables on a similar and comparable basis. While discussions are ongoing regarding the appropriate design of the FiT CfD for CCS, EMR must provide a sufficiently clear and strong signal to the projects selected under the current Commercialisation Programme as well as those not selected and those yet to come on stream. Policy-makers need to ensure that developers are being given the confidence to make long-term investments. This way we will create a CCS industry that takes us into the future.

2012 is the year for CCS in the UK. We have all the tools here to make CCS a success – an abundant storage resource in the North Sea, a highly advanced policy and regulatory environment, a precedent setting support framework under the EMR, and tremendous industry, political and NGO support. In the CCSA we believe the UK is poised to become a leader in CCS and we look forward to carrying the agenda rapidly forward.

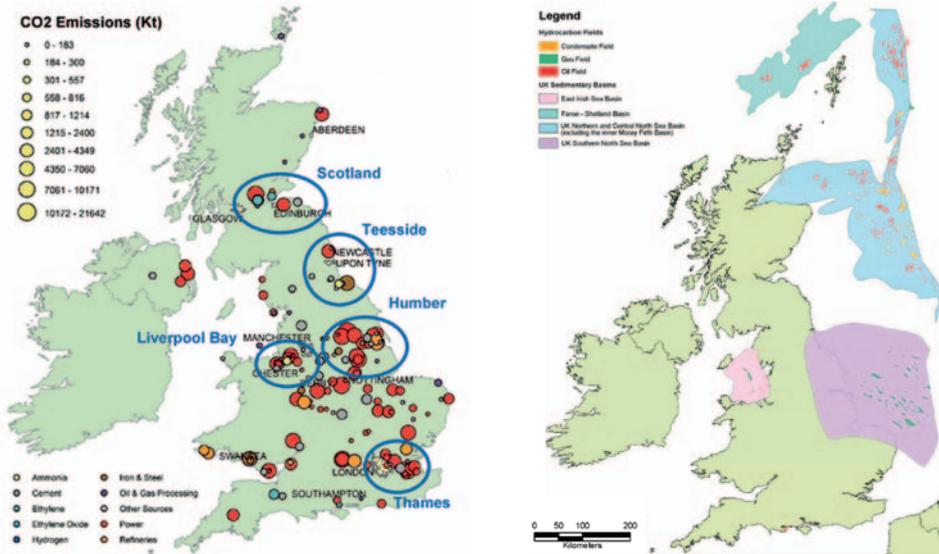


Figure 2: (left) Updating the IEAGHG Global CO₂ Emissions Database: Developments Since 2002, 2006-07, February 2006. Image adapted from IEA Greenhouse Gas RGD Programme. Source: National Grid; (right) Industrial Carbon Dioxide Emissions and Carbon Dioxide Storage Potential in the UK, BGS (for BERR). October, 2006

other low-carbon technologies in the 2020s. Crucially, the Programme now states clearly the need for projects to demonstrate their contribution to the development of early transport and storage infrastructure which will support CCS projects into the future, an issue which has long been at the forefront of industry discussions.

PIPELINE PROSPECTS

The development and funding of the required infrastructure – large CO₂ pipelines as well as a network of large reliable stores – is paramount to the cost-effective adoption of CCS in the UK and elsewhere. The simple fact

MEASURING SUCCESS

The success of CCS will be measured not only by the decarbonisation of power stations but also the decarbonisation of our industrial base. Sectors such as steel, cement, chemicals and oil refining face increasingly tough decisions regarding their continued operation in a carbon constrained world. For many there is no realistic means of decarbonisation other than CCS, because the CO₂ is process as well as fuel generated.

A further factor for success will be the ability of CCS technology to reduce costs to a level that is competitive with other low-carbon

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