

## CCSA article for Energy Procurement magazine

Whilst the importance of and need for CCS remains unquestionable, the rate of progress of CCS in the UK has been slower than expected. Whereas other countries are already moving ahead and building CCS projects, in the UK it will realistically be a few more years before the first commercial-scale CCS plant is operating.

The case for CCS is stronger than ever. The IEA, in its *Energy Technology Perspectives 2012* report, concluded that to meet the aim of limiting global temperature increase to 2°C by 2050 (the 2°C scenario or 2DS), CCS would need to contribute one-sixth of the total emissions reductions required. In addition, the same report concluded that without CCS, the cost of meeting the 2DS would increase by 40%. The UK is similarly committed to a statutory target of an 80% reduction in greenhouse gas emissions by 2050, and the Government's advisor on climate change, the Committee on Climate Change, have estimated that "not having CCS available as an option could increase the costs of meeting the 2050 target by 0.4% of GDP in 2050". To meet the 80% target, the Committee on Climate Change has repeatedly recommended that the power sector in the UK should be decarbonised by 2030, and this will require significant deployment of CCS – on both coal and gas. Although nuclear and renewables will both be important options for decarbonisation, fossil fuel power with CCS will be needed in the foreseeable future to balance the inflexibility of nuclear and the intermittency of renewables – thereby ensuring a diverse and secure electricity mix.

CCS is an extremely cost-effective low-carbon technology, and the costs can be expected to come down considerably once the early projects have been built. The UK established a CCS Cost Reduction Task Force in May 2012, to identify the best options and opportunities for cost reduction across the CCS chain to achieve cost competitive CCS in the 2020s. The final report of the Task Force was published in May this year, and concluded that "UK gas and coal power stations equipped with carbon capture, transport and storage have clear potential to be cost competitive with other forms of low-carbon power generation, delivering electricity at a levelised cost approaching £100/MWh by the early 2020s, and at a cost significantly below £100/MWh soon thereafter." According to the report, the first CCS projects will have costs in the range of £150-200/MWh. The final report also recommended seven key next steps to support the development of the CCS industry in the UK, as well as the establishment of three new leadership groups to take forward these recommendations; a 'UK CO<sub>2</sub> Storage Development Group', a 'UK CCS Commercial Development Group' and a UK CCS Knowledge Transfer Network.

However, these cost reductions can only be realised through a steady roll-out of CCS. So what is the UK doing to deliver this roll-out? Well, after the first UK CCS competition (launched in 2007) failed to reach a successful conclusion, the Government quickly launched a new competition, called the "CCS Commercialisation Programme" in April 2012. This competition is in its final throes now. £1 billion was retained from the previous competition and is available as capital support for the projects that will finally be selected – to be in operation by 2016-2020. After a period of intensive commercial negotiations, the Government announced two preferred bidders in March 2013 - *the Peterhead gas-CCS project* in Scotland and *the White Rose oxyfuel project* on the Drax site. A further two projects were also selected as 'reserve' projects. An announcement is expected shortly on the award of FEED study contracts for the two preferred bidders, after which these projects will carry out detailed design work over a period of about 18 months.

Whilst the two projects coming through the Commercialisation Programme are undoubtedly a long-awaited welcome start to the CCS industry in the UK, questions still remain over what projects will follow. The main issue of concern facing CCS project developers beyond the Commercialisation Programme is the need for a sufficiently strong signal from Government regarding the direction of travel for CCS towards 2030, as well as certainty over the market mechanisms available. In a sense, the UK has the tools at its disposal to deliver both of these through the introduction of Electricity Market Reform (EMR) - the main financial incentive framework for CCS and other low-carbon technologies in the UK. The primary legislation to enact the EMR framework is currently going through Parliament in the form of the Energy Bill 2012/2013 and Royal Assent is expected towards the end of this year. The cornerstone mechanism in the EMR framework is the Contract for Differences (CfD) which represents the world's first mechanism to incentivise CCS beyond early demonstration projects. Although it is hoped that the long-awaited EMR framework (and the CfD in particular) will bring much-needed financial certainty to investors, there are considerable risks of unintended consequences and deterred investment if the detailed implementation is not put together carefully. This is particularly the case for CCS, which has so far received comparatively little attention in recent publications setting out further details on the EMR design - including CfD allocation and price-setting arrangements, Capacity payments and the draft Delivery Plan, which has just been published for formal consultation.

It is the Delivery Plan in particular which has the potential to send the much-needed signal to CCS developers about the Government's objectives for CCS beyond the current Commercialisation Programme. The draft Delivery Plan includes an outlook to 2030 with a number of scenarios - in which higher deployment rates of CCS could deliver around 12 GW of CCS in 2030. It remains to be seen whether these scenarios will be taken as an indication of Government commitment or simply crystal ball gazing. The design of the CfD itself is also a difficult job - balancing three different types of low-carbon electricity generating technologies, all with very different and unique characteristics. As an example, the current design of the CfD proposes a contract length of 10-15 years for CCS Commercialisation Programme projects; yet the minimum lifespan of capital intensive CCS infrastructure is likely to be over 20 years. Therefore the 10-15 year contract length would result in a developer having to recoup their investment over a shorter timeframe, which in turn would likely increase the cost of the project.

Moving beyond power, CCS is also a vital technology for many industrial sectors in the UK. In fact, CCS is currently the only abatement measure for carbon-intensive industries such as steel, cement and refineries, due to the fact that the CO<sub>2</sub> is process as well as fuel-generated. The potential to develop CCS cost-effectively for these vital industries will have a tremendous impact on their continued existence at a time of increasingly stringent climate change legislation - and this will ensure the creation and retention of important UK jobs and skills. However, mechanisms to incentivise industrial CCS opportunities have not been widely explored by the UK government and unfortunately very often do not receive sufficient attention.

Crucial to the cost-effective deployment of CCS for both power and industrial sectors is the creation of regional transport and storage hubs and which can carry CO<sub>2</sub> from a number of different carbon-intensive sources to a network of large reliable offshore storage sites. Such transport and storage hubs are key to achieving significant cost reductions in CCS, and ultimately reducing the cost to consumers. However, the design of such hubs must be considered at an early stage in the CCS

industry, and it is therefore vital that the projects coming through the Commercialisation Programme as well as the design of the EMR framework, takes sufficient account of how to incentivise the development of these hubs.

CCS is not just a climate change mitigation technology; it represents a major investment in UK infrastructure. And similar to other major infrastructure investments, CCS will deliver significant benefits to the UK economy. The global market for CCS is expected to be worth trillions of dollars by 2050 with the UK share estimated at £6.5 billion per year by 2030, supporting more than 100,000 jobs. Combined with an estimated CO<sub>2</sub> storage potential in the North Sea of 70 billion tonnes as well as a world-class oil and gas industry, the UK cannot fail to seize the opportunity to become one of the world leading countries in this important technology.