



## Carbon capture and storage

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Carbon capture and storage (CCS) is a potential way of 'decarbonising' electricity generation, through capturing and storing the carbon dioxide (CO<sub>2</sub>) produced. As a form of 'low-carbon' generation under the current Energy Bill, CCS would allow the continued burning of fossil fuels. However, the 'emissions performance standard' introduced by the Bill also allows unabated gas to 2045; some feel this is not set low enough to incentivise CCS.

CCS generation is not yet proven on a large scale, and nor is storage long-term, despite a series of UK Government and EU initiatives aimed at incentivising its development. In March 2013 Peterhead (Aberdeenshire) and the White Rose Project (Yorkshire) were named as the two preferred bidders in the latest UK CCS Commercialisation Programme Competition.

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## 1 What is CCS?

CCS is a way of 'decarbonising' fossil fuel power generation. The UK has ambitions to be at the forefront of CCS development,<sup>1</sup> given access to depleted oil and gas fields where carbon could be stored, and the potential rewards, such as up to 60,000 jobs by 2030.<sup>2</sup>

Developing CCS was one of the top 40 priority infrastructure investments identified in the [National Infrastructure Plan 2011](#), under the Plan for Growth.

CCS involves three steps;

- capturing carbon dioxide (CO<sub>2</sub>) from power plants or industry, and compressing it to a liquid state
- transporting the CO<sub>2</sub> (usually via pipelines) to deep geological storage points such as depleted oil and gas fields or deep saline aquifers; and
- storing the CO<sub>2</sub> in these sites.

The ideal site for CCS generation is therefore close to a storage reservoir, but DECC considers that a network of new on- and offshore CO<sub>2</sub> pipelines may be required.<sup>3</sup> This could perhaps even be on a scale equivalent to the North Sea oil and gas industry.<sup>4</sup>

A very good description of CCS technology is available on the archived Office of Carbon Capture and Storage (OCCS) [website](#). CO<sub>2</sub> can be captured pre- or post-combustion;

- Post-combustion uses solvents to scrub CO<sub>2</sub> out of flue gases, applicable to pulverised coal generating stations. **This can be retro-fitted.**
- Pre-combustion reacts the fuel with oxygen, air, or steam, and after a further catalytic process removes the CO<sub>2</sub> and uses the hydrogen left over as fuel in a combined cycle gas turbine generating station. **Only new fossil fuel power plants can be equipped with this.**
- Oxyfuel technology burns fossil fuels with nearly pure oxygen producing a flue gas of CO<sub>2</sub> and steam; the water condenses leaving flue gas of almost pure CO<sub>2</sub>. **This can be applied to new and existing fossil fuel stations.**

At the end of 2008 the Committee on Climate Change chaired by Lord Turner concluded that CCS generation was technically feasible but that projects to demonstrate it 'at scale' were of key importance.<sup>5</sup> While carbon capture can reduce emissions enormously (by over 90%<sup>6</sup>) it also requires from 10-40% more energy depending on the type of plant.<sup>7</sup>

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<sup>1</sup> Department for Energy and Climate Change, *Clean coal: an industrial strategy for the development of carbon capture and storage across the UK*, March 2010, p16

<sup>2</sup> HC Deb 28 January 2010 c 343WH

<sup>3</sup> Overarching National Policy Statement for Energy (EN-1) DECC July 2011 p.54

<sup>4</sup> Royal Academy of Engineering, *Generating the Future: UK energy systems fit for 2050*, 18 March 2010, p14

<sup>5</sup> Building a low-carbon economy – the UK's contribution to tackling climate change First Report of the CCC December 2008 <http://www.theccc.org.uk/pdf/TSO-ClimateChange.pdf>

<sup>6</sup> IEA Clean Coal Centre, *Flexible Operation of Coal-Fired Power Plant with CO<sub>2</sub> Capture*, January 2010, p5

<sup>7</sup> IPCC, 2005 Special Report *Carbon Dioxide Capture and Storage* p.4

A *Policy Exchange* [report](#) in 2008 concluded that CCS fitted onto a coal-fired power plant in the UK would cost around £1.5bn to build and operate, at 2008 prices.<sup>8</sup>

There is a June 2009 POST note on “[CO2 capture, transport and storage](#)”.

## 2 Policy

### Planning and consents

[Directive 2009/31/EC on the geological storage of carbon dioxide](#) deals with the regulation of storage sites, including passing long term liability for these to competent authorities. It also amended the Large Combustion Plants Directive (LCPD) to require carbon capture readiness assessments and to set suitable space aside for carbon capture equipment.

[Labour Government](#) policy as set out in the 2009 CCS strategy was to leave space at a proposed new combustion plant for retro-fitting CCS, and in some cases also nearby, for more equipment. Any new combustion plant over 300MW would need to be deemed ‘carbon capture ready’ (CCR).<sup>9</sup> Also there would be ‘No new coal without CCS’.<sup>10</sup>

The July 2011 [Overarching National Policy Statement \(NPS\) for Energy](#) (EN-1) agreed that any new combustion plant over 300MW and of a type covered by the LCPD should demonstrate it was CCR. The more specific [NPS for Fossil Fuel Electricity Generating Infrastructure](#) (EN-2) reiterated that new stations over 300MW need to be CCR and that new coal-fired stations would need to be built with “a full CCS chain fitted on at least 300MW net of their proposed generating capacity”.<sup>11</sup>

DECC’s November 2009 [Guidance Note on ‘Carbon Capture Readiness’](#) for electricity generating consents still stands. This says that ‘CCR’ means that it will be technically and economically feasible to retrofit CCS to that power station in the future, including linking it to an offshore site of deep geological storage as well as the retrofitting of carbon capture (and CO<sub>2</sub> compression) equipment to the power station itself. Specifically, applicants for power station consents will be required to demonstrate:

- that sufficient space is available on or near the site to accommodate carbon capture equipment in the future;
- the technical feasibility of retrofitting their chosen carbon capture technology;
- that a suitable area of deep geological storage offshore exists for the storage of captured CO<sub>2</sub> from the proposed power station;
- the technical feasibility of transporting the captured CO<sub>2</sub> to the proposed storage area; and
- the likelihood that it will be economically feasible within the power station’s lifetime, to link it to a full CCS chain, covering retrofitting of capture equipment, transport and storage.

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<sup>8</sup> See pp21 and 23 of *Six Thousand Feet Under Burying the carbon problem* Policy Exchange 2008 [http://www.policyexchange.org.uk/assets/six\\_feet.pdf](http://www.policyexchange.org.uk/assets/six_feet.pdf)

<sup>9</sup> Towards Carbon Capture and Storage: Government response to consultation DECC April 2009

<sup>10</sup> DECC, [A framework for the development of clean coal: Consultation response](#), November 2009, p3

<sup>11</sup> NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) DECC July 2011

## Legislation

The *Energy Act 2008* allowed for a licensing regime for the offshore storage of CO<sub>2</sub>. The *Energy Act 2011* amended the 2008 Act to provide the Secretary of State with a discretionary power to designate offshore installations and pipelines as CCS eligible, and the 2011 Act includes compulsory purchase powers for pipelines for CO<sub>2</sub> transportation.

The most recent [Energy Act 2013](#) includes at least two measures directly affecting any planned new fossil fuel stations:

- An Emissions Performance Standard (EPS), set at 450g CO<sub>2</sub>/kWh so that no new coal-fired power stations are built without CCS, 'but also to ensure necessary short-term investment in gas can take place'<sup>12</sup>
- Feed-in Tariff with long term Contracts for Difference with low carbon generators.

Following its pre-legislative scrutiny by the Energy and Climate Change Select Committee, a planned exemption for CCS from the EPS was removed by the Government.<sup>13</sup> During its committee stage there was some discussion however of whether the EPS was set low enough to incentivise CCS development, given that unabated gas plant can be 'grandfathered' under the EPS to 2045 and really the EPS is only ruling out unabated coal right now.

## 3 The history of UK CCS support

### 3.1 The first UK competition and funding

Budget 2007 announced a [competition](#) for government funding for the first full-scale CCS demonstration plant. In May 2007 BP abandoned plans to develop gas retrofit CCS at Peterhead, saying that the competition, then due to be launched in November 2007, would be too late. This was given its partners' needs to decommission the field involved.<sup>14</sup>

In January 2008 the Government said it had a £35m programme for the demonstration of carbon abatement technologies, including CCS, which might also be eligible for capital grants.<sup>15</sup> By February 2009, it was announced that DECC would support a full scale demonstration project to be operational by 2014, but the costs were unclear.<sup>16</sup>

The then Secretary of State Ed Miliband said in February 2010 that he expected to announce shortly which consortia would be selected to 'undertake the tens of millions of pounds worth of work for the front end engineering and design (FEED) work for the first CCS demonstration project.'<sup>17</sup> The government awarded money to two projects for FEED work on 12 March 2010;<sup>18</sup> Kingsnorth in Kent by an E.ON consortium (a new build), and Longannet in Fife (a retrofit), by a Scottish Power consortium.<sup>19</sup>

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<sup>12</sup> [http://www.decc.gov.uk/en/content/cms/legislation/white\\_papers/emr\\_wp\\_2011/emr\\_wp\\_2011.aspx](http://www.decc.gov.uk/en/content/cms/legislation/white_papers/emr_wp_2011/emr_wp_2011.aspx)

<sup>13</sup> See for example Library Research Paper 12/79 [Energy Bill, Bill 100 of 2012-13](#) 13 December 2012 pp.33-34, and for links to the Committee's report

<sup>14</sup> *Chemistry World* BP pulls out of carbon capture plans 24 May 2007

<sup>15</sup> HC Deb 7 January 2008 c192W

<sup>16</sup> HC Deb 26 February 2009 c917W

<sup>17</sup> HC Deb 25 February 2010 c671W

<sup>18</sup> [http://www.decc.gov.uk/en/content/cms/emissions/ccs/demo\\_prog/feed/feed.aspx](http://www.decc.gov.uk/en/content/cms/emissions/ccs/demo_prog/feed/feed.aspx)

<sup>19</sup> HC Deb 8 March 2010 c7-8WA

In the 2010 [Spending Review](#)<sup>20</sup> the Chancellor George Osborne announced, as part of the DECC settlement, up to £1 billion of investment to create one of the world's first commercial scale CCS demonstration plants.

On the morning of the spending review, E.ON announced that it would not proceed to the next stage of the competition as the economic conditions were still not right and 'put simply, they had no power station on which to build a CCS demonstration'<sup>21</sup> so Kingsnorth could not meet the competition timescales. The company said its CCS efforts would be concentrated in the Netherlands from where lessons could be learnt for the UK.

The Government continued with negotiations on Longannet and the March 2011 Budget confirmed that CCS money for demonstration plants would come from general taxation rather than a new levy.<sup>22</sup>

### Longannet

Longannet Power Station, owned by ScottishPower, is the third largest coal-fired power station in Europe.<sup>23</sup> The first phase of the scheme was described as a "prototype ... an exact, small-scale replica of a full-scale carbon capture plant". This would lead towards a "full CCS demonstration project by 2014" by retro-fitting an existing power station.<sup>24</sup> The prototype was testing the chemistry of capturing carbon dioxide from flue gases.<sup>25</sup>

In the consortium, ScottishPower was responsible for retrofitting post combustion carbon capture and compression at Longannet, National Grid Carbon was responsible for onshore transport and compression at St Fergus and Shell was responsible for offshore transport and storage.<sup>26</sup> By October 2011 however, it was clear that the project was in difficulties. The consortium provided a report to DECC in summer 2011 on costs, and the *Financial Times* reported protracted negotiations, and that the project would cost "at least £1.5bn and possibly much more, according to people familiar with the matter".<sup>27</sup>

The *New Civil Engineer*<sup>28</sup> alleged that slow decision making by DECC had been a factor, along with increasing project costs. On 19 October 2011 an announcement was made first by the Prime Minister and then by the then Secretary of State for Energy Chris Huhne:<sup>29</sup>

Despite the fact that all the parties have worked extremely hard on the first carbon capture and storage demonstration project at Longannet, we have not been able to reach a satisfactory deal, as the Prime Minister pointed out. We will not, therefore, be proceeding with the project. That decision is purely about the viability of that particular project and is not a reflection on our commitment to the CCS programme...

Chris Huhne stressed that the FEED studies' findings would be made available and that the process had shown that a commercial-scale CCS plant was technically viable and likely to be financially achievable for £1bn, because the difficulties had been 'project-specific', notably to

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<sup>20</sup> HM Treasury October 2010, Spending Review 2010 Cm 7942

<sup>21</sup> E.ON UK press release, [E.ON not to proceed to next stage of Government's carbon capture and storage competition as Kingsnorth cannot meet competition timescales](#), 20 October 2010

<sup>22</sup> HM Treasury, [Budget 2011](#), 23 March 2011

<sup>23</sup> <http://www.nationalgrid.com/uk/EnergyandServices/NonRegs/CCS/Projects/Longannet/>

<sup>24</sup> Press release 29 May 2009 [http://www.scottishpower.com/PressReleases\\_1876.htm](http://www.scottishpower.com/PressReleases_1876.htm)

<sup>25</sup> Financial Times 7 October 2011 Carbon capture project in doubt as costs spiral p.3

<sup>26</sup> <http://www.nationalgrid.com/uk/EnergyandServices/NonRegs/CCS/Projects/Longannet/>

<sup>27</sup> *Financial Times* 7 October 2011 Carbon capture project in doubt as costs spiral p.3

<sup>28</sup> *New Civil Engineer* 13 October 2011 Longannet carbon capture delayed

<sup>29</sup> [HC Deb 19 October 2011 c950](#)

do with the length of the pipeline between Longannet and the reservoirs, and upgrading to comply with the large combustion plant directive..

The decision did not sit well with Scottish First Minister Alex Salmond, who said “This is a deeply disappointing announcement by the UK Government, and an enormous lost opportunity ... We are led to believe that Peterhead is a contender for a future gas carbon capture project, but that was supposed to be the case four years ago”.<sup>30</sup>

WWF Scotland, which had been broadly supportive of Longannet and CCS in decarbonising energy, said that given slow progress, “Ministers should call a halt to consenting new gas or coal plants that are so-called 'CCS-ready', such as those at Cockenzie and Hunterston.”<sup>31</sup>

The Secretary of State implied that Peterhead might be the next project<sup>32</sup> and the Longannet FEED studies were made available on-line after the announcement was made. While a contractual arrangement, the speed with which this was done was welcomed by industry commentators as a positive sign of data sharing.<sup>33</sup>

In March 2012 the National Audit Office (NAO) was critical of the first competition, providing a history of the competition from 2007-2011. It noted that DECC’s predecessor (BERR) did not have a clear plan to deliver against Government objectives or formally review alternatives, such as holding a design competition or supporting smaller scale projects. This made it hard to assess alternatives such as simply stopping.

Also, narrow project specifications, including post-combustion carbon capture at a coal-fired power station of 300 MW, had limited the number of bidders and their options, and made negotiations inflexible according to the NAO. However, lessons had been learnt by DECC, and the FEED findings had been welcomed. The NAO said in summary:<sup>34</sup>

This competition was launched in 2007 with insufficient planning and recognition of the commercial risks and cancelled four years later. With commercial scale carbon capture and storage technology still to be developed, DECC must learn from the failure of this project.

### Discussions over funding

Longannet or Kingsnorth were to be only project number 1 in the commercial scale demonstration programme for CCS. DECC had published a prospectus in December 2010 *UK Carbon Capture and Storage (CCS) Commercial Scale Demonstration Programme Delivering Projects 2-4* on the approach for selection and support.

According to *ENDS Report*<sup>35</sup> citing DECC, following Longannet the competition process would “now be accelerated, and will cover four plants”. On funding, in July 2011 DECC and HM Treasury were still “discussing arrangements” for how projects 2-4 would be funded.<sup>36</sup>

In his 19 October 2011 statement, and subsequently, the Secretary of State for Energy said that the £1bn earmarked for Longannet remained available for CCS, but on the 28 November

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<sup>30</sup> Scottish Government news release 19/10/2011 Longannet Carbon Capture and Storage Project

<sup>31</sup> WWF Press release 6 October 2011 [http://scotland.wwf.org.uk/what\\_we\\_do/press\\_centre/index.cfm?5317](http://scotland.wwf.org.uk/what_we_do/press_centre/index.cfm?5317)

<sup>32</sup> HC Deb 19 October 2011 c951

<sup>33</sup> *Petroleum Economist* January 2012 “The king is dead; Long live the king” p.38

<sup>34</sup> NAO 16 March 2012 Carbon capture and storage: lessons from the competition for the first UK demonstration HC 1829 2010/2012 [http://www.nao.org.uk/publications/1012/carbon\\_capture\\_and\\_storage.aspx](http://www.nao.org.uk/publications/1012/carbon_capture_and_storage.aspx)

<sup>35</sup> *ENDS Report* October 2011 p.5

<sup>36</sup> see the Minister’s oral evidence to the Energy and Climate Change Committee’s inquiry on Energy Security on 19 July 2011 at <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenergy/1065/106502.htm>

2011 the Chief Secretary to the Treasury Danny Alexander said that “We're launching a new competition to provide £1bn for CCS but that competition, obviously, is going to take longer, so much of the money that we'd allocated to spend in this Parliament we've now reallocated to different sorts of projects”.<sup>37</sup>

HM Treasury sought to clarify this as a spending profiling (i.e. timing) matter, saying that “The Government remain committed to making £1 billion available for carbon capture and storage (CCS)” and that the outcome of DECC’s design for the CCS competition would “determine the allocation of that budget.”<sup>38</sup> There has also been however some concerns around the timing of UK competitions related to European funding competitions and the need to match-fund projects under those.

### 3.2 The new competition; the Commercialisation Programme

On 3 April 2012 the Secretary of State for Energy and Climate Change Ed Davey [announced](#)<sup>39</sup> both a new competition for CCS and a ‘[CCS Roadmap](#)’.<sup>40</sup> Elements include;

- the competition, the ‘CCS Commercialisation Programme’, to drive down costs by supporting practical experience in the design, construction and operation of commercial scale CCS with £1bn capital funding;
- a four year programme of R&D and innovation with £125m funding including a new £13m UK CCS Research Centre;
- planned long term Contracts for Difference through EMR to drive investment in commercial scale CCS in the 2020s and beyond;
- working with industry on skills and the supply chain, storage and CCS infrastructure, along with international engagement, to share knowledge.

The main [CCS Roadmap document](#) said the Government would ask industry to establish a CCS Cost Reduction Task Force to work alongside DECC’s OCCS to set out a path and action plan to reduce the costs of CCS. The BBC reported:<sup>41</sup>

Now, ministers are hoping that by revising the rules for the competition they will have a better chance of attracting more interest.

In the last contest, entries were originally limited to designs that could only be used at power stations burning coal, not gas.

And the rules also only allowed systems that trapped carbon dioxide after the fuel was burned - so-called "post-combustion".

By contrast, the new competition will be open to coal and gas stations, and to schemes that attempt to capture carbon before combustion.

On 20 March 2013 [DECC announced](#) that it would take forward two Preferred Bidders out of four to a detailed planning and design stage, as the next step in the £1bn CCS

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<sup>37</sup> *Business Green* CCS plans mired in confusion as Treasury raids £1bn fund 28 November 2011

<sup>38</sup> HC Deb 10 January 2012 c63W

<sup>39</sup> DECC Press release 2012/040 3 April 2012 CCS competition announced as Government sets out long term plans [http://www.decc.gov.uk/en/content/cms/news/pn12\\_040/pn12\\_040.aspx](http://www.decc.gov.uk/en/content/cms/news/pn12_040/pn12_040.aspx)

<sup>40</sup> DECC April 2012 CCS Roadmap Supporting Deployment of Carbon Capture and Storage in the UK <http://www.decc.gov.uk/assets/decc/11/cutting-emissions/carbon-capture-storage/4899-the-ccs-roadmap.pdf>

<sup>41</sup> Today programme 3 April 2012 and New UK attempt to capture carbon, 3 April 2012 <http://www.bbc.co.uk/news/science-environment-17586596>

Commercialisation Programme. These are the Peterhead Project in Aberdeenshire, and the White Rose Project in Yorkshire, i.e. one coal and one gas CCS project;

- Peterhead involves CCS at the existing gas fired power station at Peterhead to be transported and stored in the depleted Goldeneye gas reservoir beneath the North Sea. The project involves Shell and SSE.<sup>42</sup>
- White Rose is CCS at a new oxyfuel (i.e. efficient burning) coal-fired power station, with potential to co-fire biomass, at the Drax site, to be stored in a saline aquifer beneath the southern North Sea. The project involves Alstom, Drax Power, BOC and National Grid.<sup>43</sup>

The expected timings are for signature of FEED contracts by Summer 2013; Final Investment Decisions from DECC on up to two projects by early 2015, and operational by 2016-2020.

### 3.3 Energy Market Reform

One of the key elements of the Energy Market Reform provided in the Energy Act 2013 is the introduction of Contracts for Difference (CfDs). CfDs ensure that developers of low carbon power stations can be assured a stable price for the energy they generate. It aims to ensure that investment can be made commercial scale CCS when the time is right.

The Government is in the process of developing further details of the CfD process for CSS.

### 3.4 Energy and Climate Change Committee inquiry

On 21 May 2014 the Energy and Climate Change select committee [published its report](#) on an inquiry in CCS. The Committee recommended that the Government fast-track final funding decisions on the two pilot Carbon capture and storage (CCS) projects at Peterhead and Drax by early 2015. It concluded that without this the UK would struggle to meet climate change targets.

## 4 European funding

### Don Valley

In 9 December 2009, the Commission announced details of six CCS projects that had been selected for funding under the European Energy Programme for Recovery (EPR). They included the [Don Valley Power Project](#) at Stainforth in South Yorkshire, formerly known as the Hatfield project, a coal CCS project.

The total EC contribution to these projects amounted to €1 billion<sup>44</sup> with €180 m going to the UK project.<sup>45</sup> According to [National Grid](#), a major advantage of Hatfield as a location is its potential for 'clustering benefits', since the location provides a basis to develop a pipeline supporting a cluster of CCS plants in the Humber.

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<sup>42</sup> Shell, [Peterhead CCS project](#) website accessed 3 May 2013

<sup>43</sup> [White Rose project](#) website accessed 3 May 2013

<sup>44</sup> [http://ec.europa.eu/energy/eepr/ccs/index\\_en.htm](http://ec.europa.eu/energy/eepr/ccs/index_en.htm)

<sup>45</sup> <http://www.ccstlm.com/news.aspx?id=132>

## European New Entrant Reserves 300 (NER300) funding

NER300 is related to the European Emissions Trading Scheme (EU ETS). The scheme allows for 300 million allowances (rights to emit one tonne of carbon dioxide<sup>46</sup>) to be set aside in the 'New Entrants' Reserve' of the ETS for subsidising installations of innovative renewable energy technology and CCS.<sup>47</sup> NER-300 support will not be as substantial as at first hoped, because of low carbon prices.<sup>48</sup>

NER300 funding also requires match funding by Member States or projects. In May 2011 the Government put forward 12 candidate projects, including 7 CCS plants including the Hatfield/Don Valley Power Project.<sup>49</sup> However, in the [December 2012 Commission decision](#) on projects to receive funding, no UK projects were successful.<sup>50</sup>

The Don Valley project owners had put out a press release in October 2012 placing some blame firmly on the UK Government:

Lewis Gillies, CEO, 2Co Energy Limited said: "This is truly disappointing news for the Doncaster area where we would have built this plant and for our world-class project team working to deliver it. We will complete the current phase of the project and meet the knowledge-share obligations of our existing EPR funding from the EU but we cannot take this project further without funding from the UK government. In the meantime, we are trying to come to terms with how the UK's most advanced project that has twice been selected by the EU for funding and is currently sitting as Europe's top ranked project has not even made it to the UK's shortlist.'

In July, the 650MW (net) Don Valley project in South Yorkshire topped the list of European CCS projects competing for an estimated €337 million share of the €1.3 billion funding pot available in the EU's NER300 programme. The UK had four projects on the list but each required co-funding commitments from the UK. Falling carbon prices since the competition launched reduced the overall funds available and reducing the number of CCS projects the EU can support.<sup>51</sup>

A second round of NER300 funding has now been announced. In April 2013 DECC produced [high level guidance to potential applicants](#) in this second call for proposals.<sup>52</sup> On 8 July it was [announced that the White Rose Project](#) would be awarded up to €300 million under the European NER300 programme. It was [reported in the press](#) that White Rose was the sole CCS project in the competition.

During the Energy Act 2013's passage through the House there was some discussion about how the bill's emissions performance standard would incentivise CCS, especially for coal CCS, versus unabated gas fired power plants. There is also concern about whether a

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<sup>46</sup> The allowances will be sold on the carbon market and the money raised - eg 3 bn EUR if each allowance is sold for 10 EUR - will be made available to projects as they operate; <http://www.ner300.com/>

<sup>47</sup> <http://www.ner300.com/>

<sup>48</sup> DECC April 2012 CCS Roadmap Learning by Doing- launching the CCS Commercialisation Programme p.8

<sup>49</sup> *Business Green* 10 May 2011 [UK puts forward low-carbon projects for EU's €4.5bn NER300 fund](#)

<sup>50</sup> Brussels, 18.12.2012 C(2012) 9432 final [Award Decision under the first call for proposals of the NER300 funding programme](#) and *Business Green* 3 December 2012 [UK's failure to win CCS funding 'a slap in the face' for developers](#)

<sup>51</sup> 2Co Energy News Release 30 October 2012 [EU's leading carbon capture project fails to win UK government backing](#)

<sup>52</sup> DECC 12 April 2013 [DECC guidance on EU Funding Mechanism "NER300" for Carbon Capture and Storage \(CCS\) demonstration projects: Second call for proposals](#)

decarbonisation target is needed quickly, to signal ‘future direction of travel’. The Commons Library Research Paper on the Bill’s committee stage provides further background.<sup>53</sup>

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<sup>53</sup> [Energy Bill: Committee Stage Report](#) House of Commons Library Research Paper 13/19 12 March 2013 pp33-35