



House of Commons  
Energy and Climate Change  
Committee

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# **Future of carbon capture and storage in the UK**

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**Second Report of Session 2015–16**





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**Second Report of Session 2015–16**

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to the report*

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## The Energy and Climate Change Committee

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## Summary

Meeting the UK's climate change commitments will be challenging if we do not apply carbon capture and storage (CCS) to new gas-fired power stations and to our energy intensive industries. Building the transport and storage infrastructure needed for CCS requires large upfront investments, but costs of later projects are expected to fall rapidly once this primary infrastructure is in place. Without CCS it may be necessary to find large and potentially more expensive carbon savings to meet the legally binding targets set out in the Climate Change Act as well as the more recent challenging ambitions set out at the Paris climate summit.

The UK Government first promised support for CCS in 2007, and in 2012 launched a commercialisation 'competition', with the aim to see CCS projects developed before 2020. Up to £1 billion pounds was to be made available in capital funding, with additional operational support available through guaranteed price contracts—known as Contracts for Difference (CfDs)—to support the initial stages of commercialisation.

In November 2015, just weeks before the final bids were to be submitted in this process, the Government unexpectedly announced that the money was no longer available. This decision came as a shock to the industry and investors. Pulling the plug on the competition without warning in this way was damaging both to the relationship between Government and the industry, and to investment into the UK.

This delay also seems to be in direct contradiction with the direction of energy and climate change policy set out in the Government's 'energy policy reset'. With gas and without CCS, we will not remain on the least cost path to our statutory decarbonisation target. If Government is committed to its climate change targets, it cannot afford to sit back and simply wait and see if CCS will be deployed at the moment when it is needed.

DECC must now promptly devise a new strategy for CCS in conjunction with a new gas strategy. The challenging infrastructure surrounding the transport and storage of carbon needs to be considered far in advance of it being utilised and investors need the confidence that the UK is committed to a domestic CCS market. The Department should assess the financial and other benefits of using our existing North Sea infrastructure. It should also engage with the National Infrastructure Commission to explore options for the development of CO<sub>2</sub> transport and storage. If Government does not come up with a clear strategy for CCS very soon, knowledge, investment, assets and expertise in the UK will all be lost.

We also note the December 2009 report by the working party, assembled by Lord Oxburgh, on 'the arrangements needed to develop the infrastructure for carbon capture and storage in the UK', which recommended setting up a National Carbon Storage Authority, and we urge the Government to give serious consideration to this recommendation.



# 1 Introduction

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1. Carbon capture and storage (CCS) is a way of ‘decarbonising’ fossil fuel power generation. It involves capturing carbon dioxide (CO<sub>2</sub>) emitted from high-producing sources, transporting it and storing it in secure geological formations deep underground. The transported CO<sub>2</sub> can also be reused in processes such as enhanced oil recovery or in the chemical industry, a process sometimes known as carbon capture and utilisation (CCU).<sup>1</sup> Carbon capture and storage can be applied to fossil fuel power plants (coal and gas-fired power stations) and to industrial CO<sub>2</sub>-emitting sources such as oil refineries or cement, chemical and steel plants. Rather than being a single technology, CCS is a suite of technologies and processes.<sup>2</sup> While some of these have been operated successfully for decades, progress in applying large-scale CCS to power generation in the UK and globally has been slow.

2. Although large-scale CCS is still in its infancy,<sup>3</sup> CCS is widely viewed as a crucial approach to meeting global and national climate change targets. The global deal struck in December 2015 at the 21st United Nations Conference of Parties (COP21) commits the world to reducing greenhouse gas emissions to limit global temperature increase to below 2 °C (with a desire to reduce this to 1.5 °C) above pre-industrial levels.<sup>4</sup> The UK is committed to reducing its emissions by 80% by 2050 through the Climate Change Act,<sup>5</sup> with a commitment to halving UK emissions in the fourth carbon budget period between 2023 and 2027.<sup>6</sup> The UK Government’s advisers, the Committee on Climate Change (CCC), have recently proposed a target of 57% for the period between 2028 and 2032.<sup>7</sup> Meeting these targets will not be easy. It will require clear and perhaps uncomfortable decisions to bring forward new forms of low carbon generation, promote innovation and drive down energy demand, while minimising the costs passed on to consumers.

3. On 18 November 2015, the Secretary of State for Energy and Climate Change, the Rt Hon Amber Rudd MP, laid out her vision for the direction for UK energy policy (referred to throughout this report as the “energy policy reset speech”). This speech emphasised bringing forward new gas generation:

We’re encouraging investment in our shale gas exploration so we can add new sources of home-grown supply to our real diversity of imports. [ ... ] In the next 10 years, it’s imperative that we get new gas-fired power stations built. [ ... ] Gas is central to our energy secure future. [ ... ] New nuclear, new gas and, if costs, come down, new offshore wind will all help us meet the challenge of decarbonisation.<sup>8</sup>

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1 [Letter](#) from Stag Energy Development Co on carbon capture and utilisation

2 Department of Energy and Climate Change, [Next steps in CCS: Policy scoping document](#) (August 2014), p 8

3 Scottish Enterprise, [Scotland and the central North Sea CCS Hub study](#) (March 2014), p 23

4 United Nations Framework Convention on Climate Change, [Adoption of the Paris agreement](#) (December 2015), p 2

5 Climate Change Act 2008, [section 1](#)

6 Department of Energy and Climate Change, [‘2010 to 2015 government policy: greenhouse gas emissions,’](#) accessed 22 January 2016

7 Committee on Climate Change, [The Fifth Carbon Budget](#) (November 2015), p 11

8 Department of Energy and Climate Change, [‘Amber Rudd’s speech on a new direction for UK energy policy,’](#) accessed 22 January 2016

In parallel, the Secretary of State announced that she would “set out proposals to close coal by 2025 - and restrict its use from 2023”.<sup>9</sup>

4. While gas is cleaner than coal, it still produces on average 400 gCO<sub>2</sub>/kWh.<sup>10</sup> The CCC has assessed that an average grid intensity of around 50 gCO<sub>2</sub>/kWh by 2030 was the necessary objective for the power sector if the UK is to meet its targets.<sup>11</sup> The CCC’s modelling scenarios show that an average intensity of up to 100 gCO<sub>2</sub>/kWh by 2030 would still allow the UK to meet its 2050 emissions target,<sup>12</sup> but this remains four times lower than the carbon intensity of unabated gas.

5. The only practicable way to close this gap is CCS. As long as fossil fuels and carbon-intensive industries play dominant roles in the UK, CCS will remain a critical greenhouse gas reduction solution. The CCC considered that:

Carbon capture and storage (CCS) is likely to be a crucial part of the least-cost path to decarbonisation in the UK, and globally. [ ... ] CCS can provide a back-up role for variable renewables and help to manage swings in demand. CCS also has a crucial role in decarbonising heavy industry where there are limited options, and in the longer term would help to maximise the emissions reduction obtained from scarce supplies of sustainable bioenergy as well as opening up other decarbonisation pathways.<sup>13</sup>

The European Commission has also emphasised that “CCS may be the only option available to reduce direct emission from industrial processes at the large scale needed in the longer term”.<sup>14</sup>

6. However, full-scale CCS fitted to power generation is still a nascent technology.<sup>15</sup> Initial projects require large upfront investments, although the expectation is that costs will rapidly fall for second generation projects once the primary infrastructure is in place.<sup>16</sup> To kick-start CCS in the UK, successive governments had made efforts for the best part of a decade to provide capital support to a large-scale full-chain CCS project on power generation. The first UK CCS competition, announced in 2007, aimed to deliver an operating CCS project at a coal-fired power station by 2014.<sup>17</sup> However, the Government ended negotiations with the last remaining bidder in 2011 due to concerns that the project could not be funded within its agreed £1 billion capital limit. The second competition (the CCS Commercialisation Programme) was announced in 2012, with contracts awarded in 2013–14 to two preferred bidders: Capture Power for its White Rose project in Yorkshire, and Shell and SSE for their Peterhead project in Aberdeenshire.<sup>18</sup> One billion pounds was to be made available in capital funding, with additional operational support available

9 Department of Energy and Climate Change, ‘[Amber Rudd’s speech on a new direction for UK energy policy](#),’ accessed 22 January 2016

10 International Energy Agency, *CO<sub>2</sub> emissions from fuel combustion highlights* (2015), p 35

11 Committee on Climate Change, *Next steps on Electricity Market Reform* (May 2013), p 5

12 Committee on Climate Change, *Fourth Carbon Budget Review – technical report* (December 2013), p 54

13 Committee on Climate Change, *Meeting Carbon Budgets: Progress in reducing the UK’s emissions* (June 2015), p 56

14 European Commission, *A policy framework for climate and energy in the period from 2020 to 2030* (January 2014), p 15

15 Q17 [Richard Simon-Lewis]

16 Qq8, 45 [Luke Warren], Q44 [Prof Gibbins]

17 National Audit Office, *Carbon capture and storage: lessons from the competition for the first UK demonstration* (March 2012), p 6

18 Energy and Climate Change Committee, Ninth Report of Session 2013–14, *Carbon capture and storage*, HC 742, para 15

through Contracts for Difference (CfD) to support the initial stages of commercialisation.<sup>19</sup> The Government expected “the projects to be operational between 2016 and 2020”.<sup>20</sup>

7. On 25 November 2015, nearly four years into the competition and after considerable time, money and effort spent by the relevant parties, the Government unexpectedly announced in a stock market statement that the funding under the long-running CCS Commercialisation Competition was no longer available. The full announcement stated:

Today, following the Chancellor’s Autumn Statement, HM Government confirms that the £1 billion ring-fenced capital budget for the Carbon Capture and Storage (CCS) Competition is no longer available. This decision means that the CCS Competition cannot proceed on its current basis. We will engage closely with the bidders on the implications of this decision for them.<sup>21</sup>

8. This decision came as a surprise to the industry and the companies taking part in the competition, particularly in the light of a number of relatively recent Government statements that suggested a continued commitment to CCS. In December 2014, the Prime Minister acknowledged that investing in gas would require the development of CCS:

On carbon capture and storage, which is absolutely crucial if we are going to decarbonise effectively, we have put a lot of money as a Government into carbon capture and storage experiments, but we have not yet got, as I understand it, a workable system. Before we commit to the next stage, we need to know more about whether gas, particularly, can play a role in a decarbonised electricity system. [ ... ] I hope that carbon capture and storage will come about, so it may be that for many years to come gas will still play a role in our electricity supply.<sup>22</sup>

In July 2015, the Secretary of State told us that DECC “remain[ed] absolutely committed to the carbon capture and storage programme. It would be a fantastic outcome to deliver carbon capture and storage as soon as possible”.<sup>23</sup> As recently as October 2015, less than a month before the announcement, DECC wrote to us that:

This Government is continuing to promote investor confidence across a range of technologies: We are supporting a competition with up to £1bn to bring forward commercial-scale Carbon Capture & Storage.<sup>24</sup>

9. In light of these recent comments and the sudden and unexpected policy change, we decided to hold a one-off evidence session to assess the implications of the cancellation of the CCS competition on the prospects for CCS in the UK. Ahead of the session, we wrote to DECC to seek clarifications as to the evidence behind this decision.<sup>25</sup> The Department responded that:

<sup>19</sup> Department of Energy and Climate Change, [CCS roadmap](#) (April 2012), p 5

<sup>20</sup> Energy and Climate Change Committee, Third Special Report of Session 2013–14, [The Impact of Shale Gas on Energy Markets: Government Response to the Committee’s Seventh Report of Session 2012–13](#), HC 609, p 13

<sup>21</sup> Department of Energy and Climate Change, [‘HM Government Statement to markets regarding Carbon Capture and Storage Competition,’](#) accessed 22 January 2016

<sup>22</sup> Oral evidence taken before the Liaison Committee on [16 December 2014](#), HC (2014–15) 887, Qq2, 7 [Rt Hon David Cameron MP]

<sup>23</sup> Oral evidence taken on [21 July 2015](#), HC (2015–16) 287, Q92 [Rt Hon Amber Rudd MP]

<sup>24</sup> Department of Energy and Climate Change ([ICE 088](#)) para 31

<sup>25</sup> [Letter](#) from the Chair of the Energy and Climate Change Committee to the Rt Hon Amber Rudd MP on the decision to remove the Carbon Capture and Storage competition (December 2015)

The spending review undertook a full review of capital spending plans to identify the areas of spending that will achieve the best economic returns while delivering on the commitments to invest £100 billion in infrastructure by the end of the Parliament. This necessarily involved difficult decisions, including to no longer make available £1 billion capital funding to support the CCS Competition.<sup>26</sup>

As CCS was not actually mentioned in the Autumn Statement, we sought clarifications as to the evidence that the decision to cancel the competition would provide value-for-money for the taxpayer. We received no specific answer on this, nor on whether an impact assessment had been carried out. The Department did however add that “CCS continues to have a potential role in the long-term decarbonisation of the UK”.<sup>27</sup>

10. We held an oral evidence session on 20 January 2016 with representatives from the competition bidders and other interested parties (including from industry, think-tanks and research institutes). We also received evidence in writing.<sup>28</sup> A full list of witnesses can be found at the back of this report. We are very grateful to all those who took the time to contribute to this short inquiry.

11. This report does not seek to assess in detail the costs of commercialisation, or the barriers that need to be overcome. It summarises the main points that arose from this inquiry and the manner of the Government’s decision. In Chapter 2 we review the immediate implications of the decision to cancel the competition for those involved and set out our views on the nature of the announcement. In Chapter 3, we summarise what stakeholders are now asking of Government, including their calls for a strategy for CCS, and outline our preliminary views on this.

#### **Working towards our goals**

At the start of the 2015 Parliament we set out three goals for our scrutiny work:

- Holding the Government to account on achieving a balanced energy policy;
- Setting the agenda on an innovative future energy system; and
- Influencing the long-term approach to climate targets.\*

Our work on the future of CCS in the UK and this report are primarily focussed on our goal to influence the Government’s long-term approach to climate targets and hold it to account on achieving a balanced energy policy. Throughout the course of this Parliament, we welcome feedback on our work towards our goals.

\* Energy and Climate Change Committee, First report of session 2015–16, [Our priorities for Parliament 2015–20](#), HC 368, para 35-37

26 [Letter](#) from the Rt Hon Amber Rudd MP on the decision to remove the Carbon Capture and Storage competition (January 2016)

27 [Letter](#) from the Rt Hon Amber Rudd MP on the decision to remove the Carbon Capture and Storage competition (January 2016)

28 Energy and Climate Change Committee, [‘Future of Carbon capture and storage in the UK inquiry - publications,’](#) accessed 22 January 2016

## 2 Reactions to the Government announcement

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### An unexpected decision

12. The 25 November announcement, on the same day as the Spending Review and just days before the start of COP21, led to strong reactions in the press. The Financial Times said that the decision “spell[ed] the death knell for a four-year-old contest to build carbon capture and storage systems on power plants”.<sup>29</sup> Richard Simon-Lewis, Financing Director of Capture Power, called the decision “a huge disappointment” for both his company and DECC.<sup>30</sup> He added that:

Clearly, it is disappointing, because we had worked jointly with DECC on this commercialisation programme for a number of years [and] we were on track. [ ... ] In terms of the efforts expended by the sponsor group, our management team, the employees within our company, it was a huge heavy lift over the past couple of years to take this first-of-a-kind technology to the point of market acceptance.<sup>31</sup>

Shell, who were leading on the Peterhead project and had only a month before opened a CCS plant on an oil refinery upgrader in Alberta, Canada, told us they were also disappointed at the withdrawal of funding:

We were committed to the Competition which in our view represented a valuable joint programme between industry and Government to develop CCS in the UK. [ ... ] If approved, the Peterhead project would have been the world’s first CCS facility fitted to an existing gas-fired power plant. It had the potential to bring huge value, placing the UK at the forefront of this vital technology, and developing knowledge for the benefit of a wider industry.<sup>32</sup>

Andrew Koss, CEO of Drax Power (who had until recently been involved in the White Rose project) also told us that Drax was “surprised and disappointed” and had “felt there was still support for CCS to go ahead”.<sup>33</sup>

13. While both Capture Power and Shell recognised that the Government’s decision was made in the context of a particularly difficult spending review,<sup>34</sup> it became clear to us that the industry and investors had had little warning regarding this major decision and were only made aware of it “very late in the process”.<sup>35</sup> Richard Simon-Lewis explained that the first indication Capture Power had been given that a major change could be taking place was as late as the evening before the announcement, when a Financial Times article “seemed to indicate that there was a view within Government that CCS was expensive and, as such, the grant might be exposed to reduction”.<sup>36</sup> He added:

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29 Financial Times, ‘Autumn Statement: £1bn carbon capture storage funds scrapped,’ accessed 22 January 2016

30 Q6 [Richard Simon Lewis]

31 Q6 [Richard Simon Lewis]

32 [Letter](#) from Shell to the Energy and Climate Change Committee (January 2016)

33 Oral evidence taken on [1 December 2015](#), HC (2015–16) 542, Q68 [Andrew Koss]

34 [Letter](#) from Shell to the Energy and Climate Change Committee (January 2016), Q6 [Richard Simon-Lewis]

35 Q2 [Luke Warren]

36 Q2 [Richard Simon-Lewis]

On the following day, the 25th [of November], after I had spent three days engaging with our funding group [ ... ] we were called across by DECC at 3 o'clock and our chief executive was informed by a DECC representative of the decision. [ ... ] In terms of formal communication, that was the 3 o'clock meeting with DECC that our chief executive attended, followed by the stock exchange announcement, which from memory I think came through just before 4 o'clock.<sup>37</sup>

Neil Kenley, Director of Business and Investment at Tees Valley Unlimited (who was awarded £1m funding by DECC to develop a business case for deploying industrial CCS), told us about the immediate questions that this unexpected announcement had raised:

The first we knew was the day of the announcement; and it was within hours that the phone started ringing from the private sector companies that we have on board, trying to understand what the implications were, going forward.<sup>38</sup>

14. The process by which industry was made aware of the decision was also criticised. Luke Warren, CEO of the Carbon Capture and Storage Association, explained that his first indication that a big change was coming was a sudden lack of engagement from DECC:

It was really around the Monday, Tuesday of the spending review—the 23rd, the 24th [of November]—that we suddenly started getting a bit nervous. That was partly due to our interpretation of how officials in DECC were reacting. It was very hard to get in contact with people, so we sensed that something might have been going on at that point.<sup>39</sup>

While the Secretary of State told us that DECC had been “very careful to communicate it as clearly and as early as possible, given the fact that it was part of the Spending Review”,<sup>40</sup> Richard Simon-Lewis explained that the decision had been even more of a surprise given the absence of a mention of CCS in the Chancellor’s Spending Review speech:

When we got through the speech and nothing had been mentioned about CCS, we unfortunately—or rather naively—thought that CCS was in reasonable shape.<sup>41</sup>

15. This lack of communication seems to have continued in the wake of the announcement, with Mr Warren explaining that there had been “radio silence from DECC and from the Government in general about the next steps”,<sup>42</sup> and that the CCSA was “trying very hard to engage with the Department”.<sup>43</sup> He acknowledged however that the Energy Minister had attended an emergency meeting of the development forum requested by industry.<sup>44</sup> Chris Littlecott, programme leader for fossil fuel transition and CCS at E3G (a climate change think-tank “working to accelerate the transition to a low carbon economy”), added

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37 Qq2-3 [Richard Simon-Lewis]

38 Q7 [Neil Kenley]

39 Q2 [Luke Warren]

40 Oral evidence taken on [16 December 2015](#), HC (2015–16) 614, Q20 [Rt Hon Amber Rudd MP]

41 Q4 [Richard Simon-Lewis]

42 Q31 [Luke Warren]

43 Q32 [Luke Warren]

44 Q32 [Luke Warren]

that no rationale had been provided by the Government, and that “the closest we have had to [rationale] is the Secretary of State’s letter to the Committee” (see paragraph 9).<sup>45</sup>

**16. Reports from stakeholders regarding the cancellation of the competition raise serious questions about the manner in which this decision was handled by Government. It is disappointing that companies that had committed years to a Government-led competition were only informed of its cancellation on the day of the announcement, when there had been consistent statements by Government that it was committed to the commercialisation programme as late as a few weeks prior to the decision.**

*17. The lack of engagement by DECC prior to, and since, the announcement has damaged Government’s relationship with the very stakeholders it will depend upon to develop CCS technologies. DECC must now work to mend bridges and proactively engage with industry in a consultative way to discuss the next steps for businesses involved with the development of CCS in the UK, whether through workshops, meetings or consultations.*

### Immediate implications of the decision

18. As a result of the competition being cancelled, neither CCS project will go forward. Shell told us that “in the absence of the Competition and potential funding, we reluctantly concluded that there is no longer a future for the Peterhead project in the near term”.<sup>46</sup> Shell’s partner on the project, SSE, also confirmed that they were “unlikely to proceed further with the proposed project at Peterhead power station”.<sup>47</sup> Regarding the White Rose project, Richard Simon-Lewis also confirmed that “regrettably, [their] sponsors have had to make the decision to wind down the business.”<sup>48</sup>

19. We also heard that DECC could face financial penalties as a result of the cancellation of the competition,<sup>49</sup> through cost-recovery claims by the two bidders. While Shell told us that they had had “no conversations with Government about cost-recovery related to the cancellation of the CCS Commercial Competition”,<sup>50</sup> Capture Power explained that:

We are currently preparing the final invoice under the FEED [Front End Engineering and Design] contract with DECC following the notice of termination that we received in December last year. The mechanics of the contract in cases of termination are quite clear including in some cases the potential for cost recovery where DECC instigates termination. Our discussions with DECC on the close out of the FEED contract are still ongoing and we do not anticipate any legal issues at this stage.<sup>51</sup>

20. Richard Simon-Lewis told us that Capture Power had had to put an end to conversations with a number of funding bodies:

When we were running our process, we had engaged with the funding community, so we had 22 institutions within our funding group: 15 commercial

45 Q12 [Chris Littlecott]

46 [Letter](#) from Shell to the Energy and Climate Change Committee (January 2016)

47 SSE, ‘[SSE plc trading statement](#),’ accessed 28 January 2016

48 Q9 [Richard Simon-Lewis]

49 Q17 [Chris Littlecott]

50 [Letter](#) from Shell to the Energy and Climate Change Committee (January 2016)

51 [Letter](#) from Capture Power to the Energy and Climate Change Committee (January 2016)

banks, four export credit agencies, the multilaterals, the European Investment Bank, the Green Investment Bank, and Infrastructure UK. We brought the great and the good of the funding market with us. We have had to stand them down off the back of the cancellation of the process.<sup>52</sup>

He explained that additional funding that would have been secured for the projects, in particular from the European Union, runs the risk of being lost from the UK:

The NER 300 funding that had been awarded by the European Commission through work done by the EIB [European Investment Bank] is now probably going to go back. [ ... ] It was €300 million. That will not be deployed. [ ... ] If we had been given more notice of what was coming down the track in relation to the cancellation of the process, one could envision us having, alongside DECC, a discussion with the European Commission and the EIB about availability in the Juncker plan<sup>53</sup> to get this off the ground. [ ... ] On the basis that we are dismantling the structure that constitutes the special purpose company, giving notice to our staff, and writing lessons, reports and key knowledge deliverables for DECC, it is fair to say that the horse has bolted. [ ... ] To go back to the Juncker plan with the confidence that's been lost by the signal that the Government's provided is incredibly difficult.<sup>54</sup>

He added that CCS was “a huge opportunity for Europe” and that “the most literate CCS institution in Europe is the European Investment Bank”:<sup>55</sup>

If I were in DECC's shoes, I would be engaging with the European Commission and the EIB to see what could be done around liquidity and the Juncker plan. If the UK is saying that it cannot afford to bring CCS forward, frankly it is a collective burden that needs to be carried by Europe, if Europe wants CCS.<sup>56</sup>

The Secretary of State confirmed in December 2015 that she was having discussions with the European Commission and that “our EU Commissioner was saying [ ... ] how committed he is [to CCS] and how interested he would be to look at projects”.<sup>57</sup>

21. We also heard that the decisions to cancel the competition had had a detrimental impact on the investment community as a whole, who were now “looking slightly quizzically at what is being done”.<sup>58</sup> While Professor Jon Gibbins (UK CCS Research Centre) acknowledged that new investors could come forward in the future if the market was attractive, Luke Warren warned that inconsistencies in government CCS policy meant that this investment may be difficult to bring back in the future.<sup>59</sup> Chris Littlecott judged that the decision “reflect[ed] very badly on the UK Government's [ ... ] ability to drive long-term investment”.<sup>60</sup>

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52 Q14 [Richard Simon Lewis]

53 The European Commission's Investment Plan for Europe, or “Juncker Plan” aims to address market gaps and mobilise private investment by supporting strategic investments in areas such as infrastructure, education and research and innovation. It was announced by European Commission President Jean-Claude Juncker in November 2014.

54 Qq9-10, 13, 26, 28-29 [Richard Simon-Lewis]

55 Qq13, 29 [Richard Simon-Lewis]

56 Q29 [Richard Simon-Lewis]

57 Oral evidence taken on [16 December 2015](#), HC (2015–16) 614, Q22 [Rt Hon Amber Rudd MP]

58 Q15 [Richard Simon Lewis]

59 Q18 [Jon Gibbins, Luke Warren]

60 Q6 [Chris Littlecott]

22. The decision has also had an impact on other projects outside the competition. We heard that second-phase CCS projects might be affected:

There were a set of projects that were at an earlier stage of development and wanted to come through as part of what was known as phase 2. [ ... ] These were the products that would have seen the big reductions in costs and would have been cost-competitive.<sup>61</sup>

23. Beyond projects seeking to apply CCS to power generation, there have been wider impacts on industrial CCS projects. Neil Kenley explained that the Teeside industrial CCS cluster had also been “put [ ... ] back a bit”.<sup>62</sup> He added that “without the infrastructure in place, it puts our whole project back two, three, maybe even five years, and increases costs”.<sup>63</sup> However, he was positive going forward:

Since the announcement, we have had other organisations approach us to join the collective, which is a positive step. We still strongly believe that it is the only way we can maintain and keep the businesses we have in the long term, because the two issues around the whole CCS question are maintaining what you have while being able to attract new companies. It is still a live project, and we continue to push it with DECC and our partners. The private sector at this moment in time is still 100% behind us and wants to see this happen.<sup>64</sup>

24. Richard Simon-Lewis emphasised the huge pool of knowledge that had developed over the course of the past four years:

The value of what we have done is not lost in its entirety. [ ... ] What we have been doing over the last couple of weeks post the cancellation of the process is working on key knowledge deliverables and the lessons learnt suite of documents. There is an enormous amount of information that both ourselves and Peterhead will be providing to DECC in the form of, in our case 45 key knowledge deliverables, together with a suite of lessons learnt across consenting, permitting, financing, and derisking in terms of technology. That documentation has enormous value for Government in terms of the way we look again at the CCS roadmap and how we reflect on the new narrative for CCS in the UK.<sup>65</sup>

**25. It is disappointing that the White Rose and Peterhead projects will end as a result of the cancellation of the competition. This decision is but one of a number of recent policy announcements that are damaging investor confidence in the UK energy sector. Pulling the plug at the last minute is likely to have led to the loss of significant amounts of foreign investment, which could have been retained if developers had had more warning of the decision. There are also worrying wider impacts on phase 2 projects and potential delays in industrial CCS projects. The lessons learned documents from the White Rose and Peterhead projects will provide valuable information for future CCS development projects.**

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61 Q33 [Luke Warren]

62 Q40 [Neil Kenley]

63 Q30 [Neil Kenley]

64 Q40 [Neil Kenley]

65 Q11 [Richard Simon-Lewis]

*26. We recommend that DECC collects and compiles the lessons learned information as soon as possible, preferably in the first quarter of 2016, and makes it publically available so that a wide group of stakeholders can benefit. DECC should urgently facilitate discussions between UK developers, the European Commission and the European Investment Bank to keep the NER 300 or other European funding in the UK. It should continue to work with the Commission to identify potential future funding opportunities for CCS projects in the UK.*

### 3 The future of CCS in the UK

27. The Secretary of State has said that the new generation assets that will be brought forward in the next decade will be gas-fired power stations.<sup>66</sup> Combined with nuclear, renewables and demand-reduction, the replacement of coal with gas will reduce UK emissions. However, a push for gas cannot get the UK to its 2030 and 2050 targets without CCS. The Prime Minister acknowledged this when he stated that he would “not commit to the decarbonisation targets that people sometimes want [him] to until we know about carbon capture and storage”.<sup>67</sup> In the aftermath of the cancelled competition, the Secretary of State told us that:

[CCS] will be necessary to deliver on ambition for a really low carbon future. That could be in the 50s, the 60s, the 70s, but to get to zero emissions by the end of the century we will need to have some form of carbon capture and storage. Now for the UK was not the right time to commit to £1 billion on carbon capture and storage but that does not mean that my Department is not going to continue its interest in the area.<sup>68</sup>

She has since added that “to facilitate the retrofit of CCS technology to CCGTs in the future, the UK has implemented a robust ‘carbon capture ready’ policy in Europe”.<sup>69</sup> In a recent letter to the Secretary of State, the Committee on Climate Change stressed that “the recent funding decision must not and does not exclude CCS permanently from playing a significant role in reducing UK emissions, provided an alternative approach is implemented quickly”.<sup>70</sup>

28. Most of the costs of full-scale CCS demonstration, whether in the near or far future, will be at the transport and storage stages. Putting this initial infrastructure in place is a major part of reducing the costs of CCS:

To get the value out of CCS, you need to build significant infrastructure at an economic scale and you need to use that infrastructure in a timely manner, and then you can realise the costs.<sup>71</sup>

While the 2030s and beyond may seem a relatively distant future, this reliance on a working transport and storage infrastructure means that “we cannot just wait 10 or 15 years and then suddenly expect to build an industry in a five-year period. The supply chain just will not be able to cope with that”.<sup>72</sup> While the two bidding projects were often thought of as generation projects, “actually they [were] infrastructure projects”.<sup>73</sup> They “were supposed to be providing the initial infrastructure and business models and funding expertise for

66 Department of Energy and Climate Change, ‘[Amber Rudd’s speech on a new direction for UK energy policy](#),’ accessed 22 January 2016

67 Oral evidence taken before the Liaison Committee on [16 December 2014](#), HC (2014–15) 887, Q7 [Rt Hon David Cameron MP]

68 Oral evidence taken on [16 December 2015](#), HC (2015–16) 614, Q22 [Rt Hon Amber Rudd MP]

69 [Letter](#) from the Rt Hon Amber Rudd MP on the decision to remove the Carbon Capture and Storage competition (January 2016)

70 [Letter](#) from the Committee on Climate Change to the Rt Hon Amber Rudd MP on implications of the Paris Agreement for the fifth carbon budget (January 2016)

71 Q17 [Jon Gibbins]

72 Q50 [Luke Warren]

73 Q8 [Luke Warren]

future projects to be cost-competitive”.<sup>74</sup> Professor Gibbins told us that the UK could not simply wait for technologies to be developed elsewhere and imported:

You cannot buy in technology to develop infrastructure. That has to be applied in the UK. You may have the ideas, but actually putting them into practice at scale, and with as much UK supply chain as possible, can only be done in the UK.<sup>75</sup>

29. Investing in a UK CCS infrastructure could also become a financial opportunity for the UK, which could take advantage of the capacity and expertise it has developed in the conventional oil and gas sector. Richard Simon-Lewis explained that:

We are blessed in the UK with storage in the North sea that is sufficient to take the industrial emissions of the UK and the European industrial heartlands for the next 100 years. Also, when you combine that with the fact that we have incredible knowledge and intellectual property within our oil and gas industry, to me the logic of combining the two and taking advantage of the storage capacity in the North sea and the oil and gas capability that we have with CCS as the enabling technology makes an enormous amount of sense. [ ... ] If an enhanced oil recovery industry develops in the UK through the North sea, that is notionally \$32, in euros or sterling equivalent, of value for every tonne of CO<sub>2</sub> that we produce, if that market matures and becomes real.<sup>76</sup>

Chris Littlecott warned that “when we look at the short-term pressures the North sea is under because of the oil price, the [Oil and Gas Authority] is inevitably going to have to look more at decommissioning and the availability of assets. That is a key piece of the puzzle in terms of CCS”.<sup>77</sup> The witnesses argued that the National Infrastructure Commission could have an important role to play and must “take a much more strategic role”.<sup>78</sup> Luke Warren added that the CCSA was “yet to meet the commission”, but was “keen to understand the potential role it might play for CCS”.<sup>79</sup>

30. It is important that the Government is clear now on its immediate and long-term plans for gas deployment and CCS. The CCC warned that if a strategy for delivering CCS was not rapidly developed, “much larger and more costly actions will have to be taken” to meet the UK’s statutory 2050 target.<sup>80</sup> Professor Gibbins explained that:

The timely verification of whether or not you can have CCS is required. There may be some debate about what is timely. You have to allow a few years each way, but equally you cannot take the present situation as being one that will apply even in five years’ time. [ ... ] It is really important to get a fast response and develop a strategy, because we really will lose direction if there isn’t rapid action. The importance of that can’t be overemphasised. Even if it is not the final story, if it is just kicked into the long grass and left we will lose a lot of

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74 Q6 [Chris Littlecott]

75 Q22 [Prof Gibbins]

76 Qq51-52 [Richard Simon-Lewis]

77 Q20 [Chris Littlecott]

78 Q20 [Chris Littlecott]

79 Q27 [Luke Warren]

80 [Letter](#) from the Committee on Climate Change to the Rt Hon Amber Rudd MP on implications of the Paris Agreement for the fifth carbon budget (January 2016)

the information that is available now and a lot of the enthusiasm, so a quick response is needed.<sup>81</sup>

31. The Secretary of State told us in December 2015 that she was “going to be taking a further look at industrial CCS strategy”.<sup>82</sup> Contributors to this inquiry stressed the urgency of this new CCS strategy,<sup>83</sup> which “will be critical if we are to keep remaining projects and investors interested in the UK as a potential market for CCS”.<sup>84</sup> Chris Littlecott explained that:

There is a deep fundamental question around the policy framework in which Government had intended CCS to be delivered. They are, in effect, forcing themselves to come up with a new architecture for delivering CCS.<sup>85</sup>

Clarity over the mechanism for granting long-term contracts to CCS developers was also seen as an urgent priority. Had the competition gone through and money been awarded to one or both projects, these would have been presented with feed-in-tariff contracts-for-difference (CfDs), i.e. a guaranteed price for every unit of electricity generated at the power stations. Richard Simon-Lewis explained that “the customised CfD was incredibly important to make the economics of CCS work”.<sup>86</sup> The competition has now been cancelled and although we heard that DECC had suggested that CfDs may still be available for CCS in principle, this possibility is for the moment, “purely theoretical”.<sup>87</sup> Luke Warren (CCS Association) explained that CfDs will be “absolutely critical” for the development of CCS infrastructure, and that “if we keep CfDs on the table, [phase 2 projects] can potentially see a way to market”.<sup>88</sup> Chris Littlecott explained that “we cannot just assume that they will be able to pick up where they left off, using CfDs”.<sup>89</sup>

**32. Transport and storage infrastructure will be key to any future development of CCS on power generation and industry in the UK. Having this infrastructure in place and maximising the use of the UK’s existing North Sea assets would have allowed second phase project costs to fall rapidly. With both the White Rose and Peterhead projects cancelled, the opportunity to develop this infrastructure in the first half of the 2020s is likely to have been missed. By pulling the plug on the competition, the UK Government may have lost an opportunity to exploit its North Sea capital, which could have generated additional revenues.**

***33. DECC must now devise a new strategy for carbon capture and storage in conjunction with a new gas strategy, taking into account the infrastructure challenge in the future. It has already interrupted the momentum that had built up over recent years. It must not allow what is left to be lost. The Department must be clear over its plans, particularly with respect to CCS contracts-for-difference. Given initial costs and lead time for projects, if we do not commit to CCS now, we may have to accept that it will not be part of the future UK energy policy.***

81 Qq18, 64 [Prof Gibbins]

82 Oral evidence taken on [16 December 2015](#), HC (2015–16) 614, Q22 [Rt Hon Amber Rudd MP]

83 Q17 [Chris Littlecott], Qq33, 59 [Luke Warren], Q 64 [Prof Gibbins], [Letter](#) from the Energy Technologies Institute to the Energy and Climate Change Committee (January 2016)

84 Q20 [Luke Warren]

85 Q19 [Chris Littlecott]

86 Q26 [Richard Simon-Lewis]

87 Q19 [Chris Littlecott]

88 Qq27, 59 [Luke Warren]

89 Q19 [Chris Littlecott]

34. *We recommend that DECC engages with the National Infrastructure Commission to explore options for the development of CO<sub>2</sub> transport and storage. The Commission should consult on whether developing CCS infrastructure should be one of its priority areas. DECC should also immediately begin consulting on its CCS strategy as outlined in paragraph 17 and publish this strategy by the summer of 2016, taking stock of the lessons learned documents from the two competition projects, but also after discussions with the wider industry. The strategy must clearly address the following points:*

- *A detailed reflection and analysis of the lessons learned from the White Rose and Peterhead projects;*
- *If CCS has a potential role in the long-term, DECC must clarify whether this means in 2020s, 2030s or whether it envisages no need for CCS at all;*
- *What DECC's plans are for bringing forward new gas-fired power stations, how much of this new generating capacity is expected to be retrofitted with CCS and by when. DECC must then work backwards and explain when the mechanisms for achieving this will be set out;*
- *A clarification of whether CfDs for CCS will be available for this and/or the next Levy Control Framework period;*
- *A detailed study of the potential of existing and new storage sites in the North Sea, including an analysis around the risk of losing access to North Sea storage as platforms get decommissioned;*
- *Details of what is required for the development of industrial CCS in the UK.*

## 4 Conclusions

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35. We understand that Government has a difficult job to do when deciding where its limited public expenditure should be allocated. However, the manner in which the carbon capture and storage competition was cancelled, weeks before the final bids were to be submitted and without any prior indication given to the relevant parties, was both disappointing and damaging to the relationship between Government and industry.

36. In addition, the delay in bringing forward any subsequent plans for carbon capture and storage seems to be in direct contradiction with the direction of energy policy set out in the reset speech. With gas and without CCS, we will not remain on the least cost path to our statutory decarbonisation target. If Government is still committed to its decarbonisation targets, it cannot afford to sit back and simply wait and see if CCS will be deployed at the moment when it is needed. The challenging infrastructure surrounding the transport and storage of carbon needs to be considered far in advance of it being utilised and investors need the confidence that the UK is committed to a domestic CCS market. If Government does not come up with a clear strategy very soon, knowledge, investment, assets and expertise in the UK will all be lost.

37. *We also note the December 2009 report by the working party, assembled by Lord Oxburgh, on 'the arrangements needed to develop the infrastructure for carbon capture and storage in the UK', which recommended setting up a National Carbon Storage Authority, and we urge the Government to give serious consideration to this recommendation.*

# Conclusions and recommendations

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## Reactions to the Government announcement

1. Reports from stakeholders regarding the cancellation of the competition raise serious questions about the manner in which this decision was handled by Government. It is disappointing that companies that had committed years to a Government-led competition were only informed of its cancellation on the day of the announcement, when there had been consistent statements by Government that it was committed to the commercialisation programme as late as a few weeks prior to the decision. (Paragraph 16)
2. The lack of engagement by DECC prior to, and since, the announcement has damaged Government's relationship with the very stakeholders it will depend upon to develop CCS technologies. DECC must now work to mend bridges and proactively engage with industry in a consultative way to discuss the next steps for businesses involved with the development of CCS in the UK, whether through workshops, meetings or consultations. (Paragraph 17)
3. It is disappointing that the White Rose and Peterhead projects will end as a result of the cancellation of the competition. This decision is but one of a number of recent policy announcements that are damaging investor confidence in the UK energy sector. Pulling the plug at the last minute is likely to have led to the loss of significant amounts of foreign investment, which could have been retained if developers had had more warning of the decision. There are also worrying wider impacts on phase 2 projects and potential delays in industrial CCS projects. The lessons learned documents from the White Rose and Peterhead projects will provide valuable information for future CCS development projects. (Paragraph 25)
4. We recommend that DECC collects and compiles the lessons learned information as soon as possible, preferably in the first quarter of 2016, and makes it publically available so that a wide group of stakeholders can benefit. DECC should urgently facilitate discussions between UK developers, the European Commission and the European Investment Bank to keep the NER 300 or other European funding in the UK. It should continue to work with the Commission to identify potential future funding opportunities for CCS projects in the UK. (Paragraph 26)

## The future of CCS in the UK

5. Transport and storage infrastructure will be key to any future development of CCS on power generation and industry in the UK. Having this infrastructure in place and maximising the use of the UK's existing North Sea assets would have allowed second phase project costs to fall rapidly. With both the White Rose and Peterhead projects cancelled, the opportunity to develop this infrastructure in the first half of the 2020s is likely to have been missed. By pulling the plug on the competition, the UK Government may have lost an opportunity to exploit its North Sea capital, which could have generated additional revenues. (Paragraph 32)

6. DECC must now devise a new strategy for carbon capture and storage in conjunction with a new gas strategy, taking into account the infrastructure challenge in the future. It has already interrupted the momentum that had built up over recent years. It must not allow what is left to be lost. The Department must be clear over its plans, particularly with respect to CCS contracts-for-difference. Given initial costs and lead time for projects, if we do not commit to CCS now, we may have to accept that it will not be part of the future UK energy policy. (Paragraph 33)
7. We recommend that DECC engages with the National Infrastructure Commission to explore options for the development of CO<sub>2</sub> transport and storage. The Commission should consult on whether developing CCS infrastructure should be one of its priority areas. DECC should also immediately begin consulting on its CCS strategy as outlined in paragraph 17 and publish this strategy by the summer of 2016, taking stock of the lessons learned documents from the two competition projects, but also after discussions with the wider industry. The strategy must clearly address the following points:
  - A detailed reflection and analysis of the lessons learned from the White Rose and Peterhead projects;
  - If CCS has a potential role in the long-term, DECC must clarify whether this means in 2020s, 2030s or whether it envisages no need for CCS at all;
  - What DECC's plans are for bringing forward new gas-fired power stations, how much of this new generating capacity is expected to be retrofitted with CCS and by when. DECC must then work backwards and explain when the mechanisms for achieving this will be set out;
  - A clarification of whether CfDs for CCS will be available for this and/or the next Levy Control Framework period;
  - A detailed study of the potential of existing and new storage sites in the North Sea, including an analysis around the risk of losing access to North Sea storage as platforms get decommissioned;
  - Details of what is required for the development of industrial CCS in the UK. (Paragraph 34)

## Conclusions

8. We understand that Government has a difficult job to do when deciding where its limited public expenditure should be allocated. However, the manner in which the carbon capture and storage competition was cancelled, weeks before the final bids were to be submitted and without any prior indication given to the relevant parties, was both disappointing and damaging to the relationship between Government and industry. (Paragraph 35)
9. In addition, the delay in bringing forward any subsequent plans for carbon capture and storage seems to be in direct contradiction with the direction of energy policy set out in the reset speech. With gas and without CCS, we will not remain on the least cost path to our statutory decarbonisation target. If Government is still

committed to its decarbonisation targets, it cannot afford to sit back and simply wait and see if CCS will be deployed at the moment when it is needed. The challenging infrastructure surrounding the transport and storage of carbon needs to be considered far in advance of it being utilised and investors need the confidence that the UK is committed to a domestic CCS market. If Government does not come up with a clear strategy very soon, knowledge, investment, assets and expertise in the UK will all be lost. (Paragraph 36)

10. We also note the December 2009 report by the working party, assembled by Lord Oxburgh, on 'the arrangements needed to develop the infrastructure for carbon capture and storage in the UK', which recommended setting up a National Carbon Storage Authority, and we urge the Government to give serious consideration to this recommendation. (Paragraph 37)

# Formal Minutes

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**Tuesday 2 February 2016**

Members present:

Glyn Davies, in the Chair

Rushanara Ali

Antoinette Sandbach

Tom Blenkinsop

Julian Sturdy

Draft Report (*Future of carbon capture and storage in the UK*), proposed by the Chair, brought up and read.

*Ordered*, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 37 read and agreed to.

Summary agreed to.

*Resolved*, That the Report be the Second Report of the Committee to the House.

*Ordered*, That the Chair make the Report to the House.

*Ordered*, That embargoed copies of the Report be made available (Standing Order No. 134).

[Adjourned till Tuesday 9 February at 9.15am

## Witnesses

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The following witnesses gave evidence. Transcripts can be viewed on the Committee's inquiry page at [www.parliament.uk/ecc](http://www.parliament.uk/ecc).

### Wednesday 20 January 2016

*Question number*

**Richard Simon-Lewis**, Financing Director, Capture Power Ltd, **Professor Jon Gibbins**, Director, UK CCS Research Centre. **Luke Warren**, Chief Executive, Carbon Capture and Storage Association, **Chris Littlecott**, Programme Leader, E3G, and **Neil Kenley**, Director of Business Investment, Tees Valley Unlimited

[Q1-67](#)

# List of Reports from the Committee during the current Parliament

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All publications from the Committee are available on the Committee's website at [www.parliament.uk/ecc](http://www.parliament.uk/ecc).

## Session 2015–2016

First Special Report	Linking emissions trading systems: Government response to the Committee's Fifth Report of Session 2014–15	HC 376
First Report	Our priorities for Parliament 2015–20	HC 368