



House of Commons
Committee of Public Accounts

Carbon Capture and Storage

Sixty-fourth Report of Session 2016–17

*Report, together with formal minutes relating
to the report*

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The Committee of Public Accounts

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Summary

Despite spending £168 million, the Department for Business, Energy and Industrial Strategy has failed to support the construction of the UK's first large-scale carbon capture and storage (CCS) projects. After its first competition for support ended in 2011, the Department launched its second competition without being clear with HM Treasury on the support that would be available to successful CCS projects through bill payer-funded contracts for difference once they were up and running, or ensuring that its proposed risk allocation was viable for developers. These design weaknesses contributed to the Treasury's decision, as part of the 2015 Spending Review, to bring the competition to an early end by withdrawing the £1 billion capital grant it had previously made available to contribute to the projects' construction costs. This was the latest in a series of decisions that indicate the Treasury is having undue influence on the government's energy policy. Halting CCS's deployment means that the UK will have to pay billions of pounds more to meet its decarbonisation targets, has missed opportunities to be at the forefront of a growing global industry, and has damaged investors' confidence in working with the government on CCS in the future. There is now a major gap in the government's decarbonisation plans, and we urge the Department to set out as soon as possible how this gap will be filled.

Introduction

CCS is a process whereby carbon dioxide is captured from large emitters, such as power stations, before being stored indefinitely, often under the sea. CCS has the potential to play a central role in decarbonising the UK's economy at the lowest cost. It could reduce carbon dioxide emissions from the power sector, heavy industry, heating systems and transport, which together account for over 80% of the UK's emissions. However, there are challenges to deploying CCS in the UK that mean it may not be currently commercially viable, including the need to build supporting infrastructure for some projects and manage long-term storage risks. The Department for Business, Energy and Industrial Strategy has therefore aimed to support construction of the first CCS facilities in the UK over the past decade. It has run two competitions for government support, but neither has reached a successful conclusion, and there are still no CCS plants working in the UK.

Conclusions and recommendations

1. **After two competitions costing taxpayers £168 million, the UK is no closer to establishing CCS. The UK has now missed opportunities to be at the forefront of a growing global industry.** In 2012 the government launched a second competition for supporting CCS projects. The competition was cancelled in 2015 after Treasury decided, as part of the Spending Review, to withdraw the £1 billion of capital funding it had previously committed to the programme. The Department had spent £100 million of this on the second competition before it ended, having already spent £68 million on the first competition that was cancelled in 2011. As part of the competition process, developers and government gained some technical and commercial knowledge. But much of this knowledge is project-specific and will be lost, unless the same projects are resurrected. Since 2007 when the first competition was launched, other countries have been developing CCS projects successfully, and more projects are due to come online in 2017. There is a risk the UK will now miss out on the chance to lead the way in this technology, much as it did with wind power in the 1980s.

Recommendation: *The Department should set out in its Industrial Strategy the role that CCS can play, recognising the potential economic value of being a world leader in a globally expanding technology.*

2. **It is now highly likely the UK will have to pay billions of pounds more to meet its decarbonisation targets.** In 2015, the Department's own calculations showed that it would cost the UK £30 billion more to meet the 2050 emissions target without CCS in the power sector. The Committee on Climate Change recently reported that the total costs to the UK of inaction on CCS in power, industry, heat and transport would be higher still: £1 billion to £2 billion per year in the 2020s, rising to between £4 billion and £5 billion per year in the 2040s, if the UK is to achieve its carbon emissions targets. However, neither the Department nor the Treasury quantified the impact of the delays to deploying CCS that would inevitably result from cancelling the second competition.

Recommendation: *By the end of 2017, the Department should quantify and publish the impact across the whole economy of delays to getting CCS up and running, and of it not being established at all.*

3. **Without CCS, there is a gap in the government's plans for achieving decarbonisation at least cost while ensuring a secure supply of electricity.** CCS was a key part of the government's Electricity Market Reform programme, along with renewables and nuclear power, for establishing a low-carbon power sector. The Department expected its competition to lead to the deployment of CCS technology at scale. This would allow low-carbon, flexible gas power to complement intermittent renewables and inflexible nuclear power in a diversified generating mix. It also expected the competition to establish the infrastructure and commercial arrangements that would support decarbonisation of heavy industry, heat and transport in future decades. The Department has not yet set out its next set of detailed plans for decarbonising the economy and the role it expects CCS to play, saying it will do this in its delayed Emissions Reduction Plan by the end of this year.

Recommendation: *The Department's Emissions Reduction Plan should set out a clear, joined-up strategy for deploying CCS in the sectors where it is needed to achieve decarbonisation at least cost.*

4. **Once again, the Department did not allocate the risks appropriately between the government and developers, meaning at least one of the two projects was likely to have been unviable.** The Department made good progress compared to its first competition in understanding the risks in deploying the first CCS projects. However, it is unclear whether the Department tested at the outset of the competition which risks the private sector could feasibly bear. Instead, the Department opted for its prevailing approach to energy policy, of shifting risks as far as possible to the private sector, without properly considering the merits of alternative approaches. In particular, it asked developers to bear the 'full-chain' risk, which created problems for sharing risks between investors in different parts of a CCS project, making one of the competition projects unviable. It remains to be seen whether the Department will have sufficient commercial skills to avoid this problem repeating in the future, particularly following the recent machinery of government changes.

Recommendation: *When designing future energy policies, the Department should assess and explain the viability of different options for allocating risks between the government and developers.*

5. **Establishing CCS is now likely to cost taxpayers or billpayers more in the future because of the damage to investors' confidence caused by aborting two competitions.** In the most recent competition, matters were made worse by the timing of the cancellation: the Treasury withdrew the funding just before developers were due to submit their final bids for government support. The Department expected at least one of the bids would have met its criteria for support and been a viable project. Throughout this Parliament, several energy policy decisions have similarly damaged investors' confidence. These include cuts to demand-led green tariffs and sudden changes to low carbon support prompted by the failure to forecast an overspend on the Levy Control Framework. Investors are now likely to require greater incentives to engage with the government again on CCS and other low-carbon projects, which will mean higher costs.

Recommendation: *HM Treasury and the Department should ensure they fully agree on the Emissions Reduction Plan from the outset, and quantify the negative impact on investors' confidence before making any sudden changes.*

6. **The Treasury seems to be determining energy policy, often with detrimental impacts on the government's long-term energy objectives.** The Treasury did not appear committed to CCS from the outset, as demonstrated by the fact it did not make clear the total funding available to the projects, through consumer-funded contracts for difference. The Treasury's decision to withdraw funding was based in part on it expecting the projects to require a 'strike price' of £170 per megawatt hour, which it considered to be too expensive compared to other low-carbon power generation technologies. But this measure neglects the potential long-term benefits of the projects, such as building infrastructure for subsequent facilities to share and the value of CCS to other sectors of the economy, or the additional costs that would result from any delay to CCS deployment. This is reminiscent of other energy

policies which HM Treasury has cut across in recent years, driven by short-term considerations. We are concerned that the Treasury has had undue influence on energy policy in recent years.

Recommendation: Given our concerns about HM Treasury's undue influence on energy policy, the Department and HM Treasury, as part of their work on the replacement for the Levy Control Framework, should agree a way of appraising the costs and benefits of energy policies, which reflects the potential impact across sectors and over the long term, rather than relying on the strike price measure.

1 The competition for supporting carbon capture and storage

1. On the basis of a report by the Comptroller and Auditor General, we took evidence from the Department for Business, Energy and Industrial Strategy (the Department) and from the Treasury on their role in supporting deployment of Carbon Capture and Storage (CCS) in the UK.¹

2. The Department has lead responsibility for addressing the UK's energy 'trilemma': ensuring a secure supply of energy that is affordable for consumers and helps the UK to meet its statutory target to reduce carbon dioxide emissions in 2050 by 80% compared to 1990 levels. CCS formed an important part of the Department's plans to reduce carbon dioxide emissions. It expected CCS to enable existing and new fossil-fuelled power stations to produce low-carbon electricity. In 2015, the Department estimated that it would cost the UK £30 billion more to meet the 2050 target without CCS in the power sector because a more expensive mix of low-carbon technologies would be required. Once established, CCS could also potentially help to decarbonise heavy industry and domestic heating systems.²

3. Like other low-carbon power technologies, CCS is currently too expensive in the UK to be commercially viable for private developers without public support. There are no working examples of the technology in this country. The Department has tried twice to help developers get CCS off the ground with competitions for government support, but it has not reached a successful conclusion on either occasion. The second competition ended after the 2015 Spending Review, when the Treasury withdrew the £1 billion that had previously been available for it. This was just before the two projects involved were due to submit their final bids for support.³

A missed opportunity

4. The Department launched its first competition for government support for CCS projects in 2007, but cancelled it in 2011 before awarding funding as it could not agree a deal with the one remaining bidder that would represent value for money.⁴ In April 2012, the Department launched a second competition as the first major part of a new long-term CCS programme. It wanted the competition to demonstrate the commercial operability of CCS in the UK and to establish the transport and storage infrastructure that subsequent projects, including those in heavy industry, could share.⁵ Before it was cancelled, the Department had spent £100 million on its second competition, of which £81 million was to support the two preferred bidders' engineering design phase. It paid £29 million to Shell and £52 million to Capture Power Limited to cover 75% of their costs during this phase. The remaining amount was used to pay for advisory services. This is in addition to £68 million it spent on its first competition between 2007 and 2011.⁶

1 C&AG's Report, [Carbon capture and storage: the second competition for government support](#), HC 950, session 2016–17

2 [C&AG's Report](#), para 2

3 [C&AG's Report](#), paras 2.2–2.9

4 [C&AG's Report](#), para 2.2

5 [C&AG's Report](#), para 2.3, 2.4

6 [C&AG's Report](#), para 2.7

5. The Department told us that its second competition did achieve some value. For example, the Department and its commercial partners learned lessons about the technical and commercial challenges of deploying CCS in the UK. The Department required the developers of the two shortlisted projects to distil this learning into ‘key knowledge deliverables’, which it intends will provide useful learning for CCS developers in the future.⁷ At the end of the competition, the Department and other stakeholders conducted separate lessons-learned exercises, which could inform a future CCS programme. However, some of this learning will be lost as it was project-specific, such as the appraisal of storage sites, or because project teams have disbanded since the competition was cancelled.⁸

6. We pressed the Department on whether cancelling the competition means losing an opportunity for the UK to be at the forefront of CCS’s development globally. Several other countries have developed successful projects utilising CCS technology whilst the Department has presided over its two unsuccessful competitions. There are now over 20 such projects either operational or due to come online this year around the world.⁹ The UK may now have lost any competitive advantage to export CCS technology to countries that are seeking options to reduce their own carbon dioxide emissions, which could have created engineering and R&D jobs in this country. This is reminiscent of government decisions in the 1980s not to develop renewables, meaning the UK lost its position as the world leader in emerging technologies such as wind power.¹⁰ Neither the Department nor the Treasury evaluated the potential benefits for the UK’s economy of having a globally competitive CCS sector prior to the competition being cancelled.¹¹ The Department told us its main motivation for running the competition was decarbonising the UK economy at the lowest cost. It also told us that experience gained during the competition is currently being exported and applied in projects abroad.¹²

Risk allocation

7. In its first competition, the Department did not articulate the commercial risks involved in deploying CCS or develop a commercial strategy to manage them.¹³ For the second competition, the Department attempted to identify and understand the risks in developing the first CCS projects at the outset.¹⁴ The Department opted to shift risks, as far as possible, to the private sector so that the competition aligned with the wider energy policy for supporting new generating technologies. However, it did not fully consider the merits of alternative approaches to allocating risks.¹⁵

8. The Department told us that at the outset it discussed with developers how to allocate risks, and continued this discussion with its two preferred bidders throughout the programme. The Department was willing to share risks specific to the untried nature of the technology, such as risks associated with long-term storage of carbon dioxide. When the competition was stopped, the Department was negotiating the share of CCS-specific

7 Q1

8 Q88

9 Qq21, 97

10 Q93

11 Qq25, 27, 28

12 Q18

13 C&AG’s Report, *Carbon capture and storage: lessons from the competition for the first UK demonstration*, HC 1829, session 2010–12, para 9

14 [C&AG’s Report](#) (2017), para 3.8

15 Q6; [C&AG’s Report](#), para 17

risks the government would bear.¹⁶ The Department expected the developers to carry risks associated with routine business operations (business as usual risks). This included requiring the developers to bear the ‘full chain’ risk of their projects. A functioning CCS project is made up of a ‘chain’ of different operations: capture; transport; and storage, each of which could have a different investor. Under the Department’s risk allocation, if any part of the chain stopped working, the investors in other parts of the chain could lose income. One of the Department’s preferred projects, which was backed by a consortium of investors, could not resolve this issue in a way that was commercially viable. It is unlikely that this project would have submitted a bid that complied with the Department’s terms for the competition.¹⁷

9. There are additional risks to deploying CCS in the UK compared to other countries, which amplify the ‘full chain’ risks. CCS projects in other countries often have a commercial use for the carbon dioxide captured, such as for injection into wells to recover more oil, or for some chemical and manufacturing industrial plants.¹⁸ We asked the Department whether it had considered examples of other CCS projects around the world, which have been more successful because there is not a requirement for developers to manage the same full chain risk.¹⁹ The Department told us that the difficulties of allocating risks between the different parts of the chain is one of the main lessons it is taking forwards in its future CCS strategy.²⁰ The Department also told us that it had to balance taxpayers’ interests in designing the competition with the risk appetite of the developers, as any additional sharing of risk by the government could have exposed taxpayers to losses.²¹

10. The failure to understand what private investors can feasibly deliver, for both competitions, suggests a lack of skills from the Department at key stages of its programmes. The Department managed to sustain negotiations so that it gained some technical and commercial knowledge about how to deploy the competition projects.²² But the problems with both competitions indicate the Department did not have sufficient skills to initiate them successfully by understanding the risks that developers were able to bear. We asked the Department whether it thought it had the necessary skills following recent machinery of government changes to manage similar projects in the future.²³ The Department stated that it is investing in developing the right skills internally, but acknowledges that for projects this complex it needs external support, which it secures through inward secondees and by working closely with experts teams in government, such as Treasury and the Infrastructure and Projects Authority.²⁴

The role and influence of the Treasury

11. The Department began the competition without agreeing with HM Treasury on the amount of financial support available for CCS projects, once up and running, through consumer-funded contracts for difference.²⁵ The Department and the Treasury told us

16 Q14

17 [C&AG’s Report](#), para 15

18 [C&AG’s Report](#), para 1.10

19 Qq42–43

20 Q42

21 Qq15, 17, 87,

22 Qq88–90; [C&AG’s Report](#), para 22

23 Q111

24 Q111

25 [C&AG’s Report](#), para 18

that, while funding through contracts for difference was agreed in principle, it was not possible to determine the exact amount to be funded through energy bills due to the uncertainty of how much support the projects would require.²⁶ The Department's estimate of payments through contracts for difference increased from up to £6 billion at the start of the competition to £8.9 billion in 2015, as it learned more about the competitions through its negotiations.²⁷ The Treasury told us they were regularly informed on the progress of the competition and its expected costs.²⁸

12. The lack of agreement between the Department and HM Treasury on a limit to the support through contracts for difference meant the Department could not tailor its approach to the competition in a way that matched an agreed affordability constraint.²⁹ The Department's competition approach increased the projects' unit cost by design. For example, plant size was limited, meaning investors could not fully exploit economies of scale; developers were funding infrastructure for subsequent projects to share, which increased costs; and investors required high returns to bear the majority of project risks. This approach meant the Department expected the projects to need a contract for difference 'strike price' that would be relatively high compared to its contracts to support other low-carbon technologies.³⁰ A recent report by the Parliamentary Advisory Group on CCS showed how upfront costs could have been lower if the Department had taken a different financing and risk sharing approach.³¹

13. The Treasury told us that the decision, as part of the 2015 Spending Review, to withdraw the £1 billion was a matter of affordability, not only of the capital support but also of the contracts for difference to be awarded at the same time.³² Its assessment drew on an expected strike price for the contracts for difference of £170 per MWh, which is higher than for other low-carbon technologies with similar contracts. For the contracts already awarded for offshore wind farms, the strike prices range from £114 to £150 per MWh, while the contract for the Hinkley Point C nuclear power station is £92.50 per MWh (2012 prices).³³ However, the strike price measure does not reflect the full value of the CCS projects, such as their potential long-term benefits for the industry, heat and transport sectors, or the additional costs to meet our statutory carbon targets that would result from any delay to CCS deployment.³⁴

14. We asked the Department and the Treasury whether this demonstrated they had different bases for assessing the value of energy projects.³⁵ The Treasury replied that it was natural for it to care about costs for consumers, while the Department was waiting for the bids before forming its view on whether the projects were affordable.³⁶ The Department

26 Qq35–36

27 [C&AG's Report](#), para 4.3; Q24

28 Q37

29 [C&AG's Report](#), para 4.4

30 Q67

31 Parliamentary Advisory Group on Carbon Capture and Storage, [Lowest Cost Decarbonisation for the UK: The Critical Role of CCS](#) (September 2016)

32 Q36

33 [C&AG's Report](#), para 4.8

34 Q77

35 Q37

36 Qq38–39

also said that it will work closely with the Treasury on future methodologies for looking at the value of long-term projects, considering a range of factors and not just the strike price.³⁷

15. We noted that there had been several other instances in recent years where Treasury decisions seemed to have compromised long-term departmental strategies, for example: cutting feed-in tariffs for solar and onshore wind; scrapping the zero-carbon homes regulation; withdrawing the grandfathering support policy for biomass projects; privatising the Green Investment Bank; and cutting subsidies for low-emission vehicles.³⁸ We asked the Department whether these show that key decisions are taken by HM Treasury, even though the Department is responsible for energy policy. The Department told us much of its activities are big projects, which carry uncertainty, making it more likely for the Treasury to have an influence compared to other departments with ordinary day-to-day expenditure.³⁹

37 Q55

38 Q62

39 Qq56–57

2 The implications of cancelling the competition

The additional cost of decarbonisation without CCS

16. CCS has a central role to play across the UK economy to achieve this country's emissions reductions target at the lowest possible cost to consumers.⁴⁰ The Committee on Climate Change, which advises the government on reducing greenhouse gas emissions, recently reported that a 10-year delay to CCS's deployment across the UK economy would cost an additional £1 billion to £2 billion per year in the 2020s, rising to between £4 billion and £5 billion per year in the 2040s.⁴¹

17. The Department's own analysis during the 2015 Spending Review showed that it would cost £30 billion more in the power sector alone to achieve the UK's climate change target without CCS. This is because a more expensive mix of low-carbon technologies would be required to decarbonise the power sector.⁴² The Department's analysis during the 2015 Spending Review indicated the competition would lead directly to some of this benefit, generating an overall return of £4.50 per £1 invested. However, the Treasury told us it had questions about the Department's modelling in its bid because it did not take account of the costs to consumers through contracts for difference, which would be in addition to the £1 billion capital grant.⁴³

18. Neither the Department nor HM Treasury calculated the financial impact of the delay to CCS's deployment that would inevitably result from the decision to cancel the competition.⁴⁴ The Department told us this was because it did not have time model the impact of a delay in time for the Spending Review and because it did not know what length of delay it should model.⁴⁵ The costs to deploy CCS later could be higher as oil wells that were potential storage sites could be decommissioned requiring new ones to be built, and the burden on the supply chain could be greater to deploy CCS in a shorter timeframe.⁴⁶

A gap in long-term plans for decarbonisation

19. CCS was a key part of the government's plans for decarbonising the economy. In 2012, the Department launched the Electricity Market Reform strategy. This set out how it would secure investment in new generating capacity to achieve the 2050 target while meeting the challenge posed by increasing demand and plant closures in the 2020s and beyond. Along with renewables and nuclear power, CCS formed an important part of the Department's plans. Applying CCS in the power sector could also have had strategic benefits for energy security, as it could have enabled flexible gas power to be part of a low-carbon generating mix, complementing the intermittency of renewables and the inflexibility of nuclear

40 Q29

41 Q63; The Committee on Climate Change, [Letter to Rt Hon Amber Rudd MP: A strategic approach to Carbon Capture and Storage](#), (July 2016). The CCC was quoting analysis by the Energy Technologies Institute.

42 Q32; National Audit Office, [Briefing: Sustainability in the Spending Review](#) (July 2016), para 4.9

43 Q47; National Audit Office, [Briefing: Sustainability in the Spending Review](#) (July 2016), para 4.9

44 National Audit Office, [Briefing: Sustainability in the Spending Review](#) (July 2016), para 4.12

45 Q63

46 National Audit Office, [Briefing: Sustainability in the Spending Review](#) (July 2016), paras 4.16–4.17

power.⁴⁷ The Department also expected CCS to decarbonise the industrial, heating and transport sectors. Added to the power sector, this means CCS has potential to decarbonise sectors making up around 83% of the UK's total carbon dioxide emissions.⁴⁸

20. The Department's long-term aim was to enable investment in CCS projects in the early 2020s without government support and at a price competitive with other low-carbon generating technologies. In 2012 the Department published a 'CCS roadmap' which set out five strands of government support to achieve this objective, of which the second competition was the main strand.⁴⁹ The Department intended that its CCS competition would be the first step towards widespread deployment of the technology. We asked the Department whether HM Treasury's decision to withdraw funding showed the government lacks a long-term view for CCS, with it being difficult to secure commitment from Ministers when the benefits only accrue over the long-term and are difficult to see, in contrast to other areas of government spending such as schools and hospitals. The Department told us the government has had a long-term view for making CCS work, but both competitions have been unsuccessful because their costs were unsustainable.⁵⁰

21. The cancellation of the competition means there is now a significant gap in the Department's plans for achieving decarbonisation while ensuring energy security. Without CCS there is no viable way to achieve emissions reductions in the industrial sector in the near future.⁵¹ The Department and the Treasury both told us that they still consider CCS will have an important role to play in decarbonising the UK.⁵² We asked the Department when it would set out its future plans for CCS, and whether this would include taking action to secure deployment of CCS across the economy.⁵³ The Department told us that it would set out its plans in its Emissions Reduction Plan by the end of this year and that bringing industrial policy and energy within the same government department means it can look at the impact of CCS across both of these sectors.⁵⁴

Damage to investor confidence

22. The decision to cancel the competition has had a negative impact on investors' confidence to engage with the government. The Department designed the competition in a way that meant it could withdraw from negotiations early without incurring significant cancellation costs. But this was at the expense of damaging investors' confidence when HM Treasury withdrew the competition's funding, particularly as this was shortly before the Department was due to decide which projects it would support.⁵⁵ The Department told us it expected at least one of the projects would have met its criteria for receiving support.⁵⁶ HM Treasury told us that it understood its decision to withdraw funding for the competition would affect investor confidence.⁵⁷

47 [C&AG's Report](#), para 1.6 to 1.7

48 Q18; [C&AG's Report](#), 1.4

49 [C&AG's Report](#), para 2.3

50 Q71

51 [NAO report](#), para 4.17

52 Qq45, 86

53 Qq91, 104–108

54 Qq85, 108

55 Q63; [C&AG's Report](#), paras 11, 14; National Audit Office, [Briefing: Sustainability in the Spending Review](#) (July 2016), para 4.16

56 Q90

57 Q79

23. The decision is the latest in a series of decisions on energy policies that have potentially impacted on investors' confidence. In another recent evidence session, we asked the Department and HM Treasury about decisions to cut schemes under the Levy Control Framework after poor forecasting led to delays in the Department identifying an overspend.⁵⁸ We noted the apparent pattern of increases in government support followed by sudden changes to dampen down demand.⁵⁹ Last year, the Energy and Climate Change Committee identified six factors that in combination were damaging investors' confidence, including a lack of transparency or a long-term vision, inconsistency of approach and sudden changes to policies.⁶⁰ HM Treasury told us that the government had learned collectively from its experiences and was moving away from demand-driven schemes.⁶¹

24. The negative impacts on CCS investors' confidence could increase costs or risks for taxpayers or consumers in deployments of the technology in the future. It is the government's policy that the private sector should, as far as possible, finance and build new generating capacity. But investors will require a higher rate of return on projects where they perceive the risks of dealing with the government to be greater.⁶² We asked the Department whether it believed investors would be willing to invest in CCS again in light of the experiences of the competition. The Department told us that it did not know whether the same companies would engage again with the government, but that this is something it would explore. It also told us that it felt the overall investor environment in the energy sector has been strong, as demonstrated by the recent capacity auctions, a new round of contracts for difference, and the deal for the Hinkley Point C nuclear power station.⁶³ HM Treasury told us that successfully deploying CCS is likely to require the government to consider ways of making the technology more affordable to investors. It cited a recent Parliamentary advisory committee report, which suggested a new delivery model whereby the government would carry more of the risks associated with CCS projects.⁶⁴

58 Q99; Committee of Public Accounts, Thirty-ninth Report of Session 2016–17, [Consumer-funded energy policies](#), HC 773

59 Q102

60 Energy and Climate Change Committee, Third Report of Session 2015–16, [Investor confidence in the UK energy sector](#), HC 542

61 Q102

62 National Audit Office, [Briefing: Sustainability in the Spending Review](#) (July 2016), para 4.16

63 Q98

64 Q80; Parliamentary Advisory Group on Carbon Capture and Storage, [Lowest Cost Decarbonisation for the UK: The Critical Role of CCS](#) (September 2016)

Formal Minutes

Monday 24 April 2017

Members present:

Meg Hillier, in the Chair

Mr Richard Bacon	Anne Marie Morris
Charlie Elphicke	Bridget Phillipson
Kwasi Kwarteng	Karin Smyth
Nigel Mills	

Draft Report (*Carbon Capture and Storage*), proposed by the Chair, brought up and read.

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

Paragraphs 1 to 24 read and agreed to.

Introduction agreed to.

Conclusions and recommendations agreed to.

Summary agreed to.

Resolved, That the Report be the Sixty-fourth 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, in accordance with the provisions of Standing Order No. 134.

[The Committee adjourned.]

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

Thursday 30 March 2017

Question number

Alex Chisholm, Permanent Secretary, **Ashley Ibbett**, Director of Clean Electricity, Markets and Infrastructure Group, Department for Business and Industrial Strategy, and **Neil Kenward**, Deputy Director for Energy, Environment and Agriculture, HM Treasury

[Q1-111](#)

Published written evidence

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

CAB numbers are generated by the evidence processing system and so may not be complete.

- 1 Carbon Capture and Storage Association ([CAB0005](#))
- 2 Energy Technologies Institute ([CAB0002](#))
- 3 Prospect ([CAB0004](#))
- 4 Stephen A. Rackley ([CAB0003](#))

List of Reports from the Committee during the current session

All publications from the Committee are available on the [publications page](#) of the Committee's website.

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2016–17

First Report	Efficiency in the criminal justice system	HC 72 (Cm 9351)
Second Report	Personal budgets in social care	HC 74 (Cm 9351)
Third Report	Training new teachers	HC 73 (Cm 9351)
Fourth Report	Entitlement to free early education and childcare	HC 224 (Cm 9351)
Fifth Report	Capital investment in science projects	HC 126 (Cm 9351)
Sixth Report	Cities and local growth	HC 296 (Cm 9351)
Seventh Report	Confiscations orders: progress review	HC 124 (Cm 9351)
Eighth Report	BBC critical projects	HC 75 (Cm 9351)
Ninth Report	Service Family Accommodation	HC 77 (Cm 9351)
Tenth Report	NHS specialised services	HC 387 (Cm 9351)
Eleventh Report	Household energy efficiency measures	HC 125 (Cm 9351)
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Fourteenth Report	Progress with preparations for High Speed 2	HC 486 (Cm 9389)
Fifteenth Report	BBC World Service	HC 298 (Cm 9389)
Sixteenth Report	Improving access to mental health services	HC 80 (Cm 9389)
Seventeenth Report	Transforming rehabilitation	HC 484 (Cm 9389)

Eighteenth Report	Better Regulation	HC 487 (Cm 9389)
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Twenty-first Report	Departments' oversight of arm's-length bodies	HC 488 (Cm 9389)
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Thirty-third Report	Troubled families: progress review	HC 711 (Cm 9429)
Thirty-fourth Report	The Syrian Vulnerable Persons Resettlement programme	HC 768 (Cm 9429)
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Public Accounts Committee

Oral evidence: Carbon Capture and Storage, HC 1036

Thursday 30 March 2017

Ordered by the House of Commons to be published on 30 March 2017.

[Watch the meeting](#)

Members present: Meg Hillier (Chair); Mr Richard Bacon; Philip Boswell; Chris Evans; Caroline Flint; Nigel Mills.

Sir Amyas Morse, Comptroller and Auditor General, Adrian Jenner, Director of Parliamentary Relations, National Audit Office, Michael Kell, Director, NAO, and Richard Brown, Alternate Treasury Officer of Accounts, HM Treasury, were in attendance.

Questions 1-111

Witnesses

I: Alex Chisholm, Permanent Secretary, Department for Business and Industrial Strategy, Ashley Ibbett, Director of Clean Electricity, BEIS, and Neil Kenward, Deputy Director for Energy, Environment and Agriculture, HM Treasury.

Examination of witnesses

Witnesses: Alex Chisholm, Ashley Ibbett and Neil Kenward.

Chair: Welcome to the Public Accounts Committee. We are here to look at carbon capture and storage, which has been a bit of a saga in Government; there have been two competitions to run this programme, with £168 million of taxpayers' money spent so far on two failed competitions. We will ask today what happened with those competitions and what the plans are for the future, and probe the way the Department for Business, Energy and Industrial Strategy deals with the issues, as well as the Treasury's role.

Before I introduce our witnesses, I thank them for rearranging their diaries; we had to do today because of the tragic events of last week. Thank you for fitting us in before the Easter recess, which makes things easier in the long run for all of us. It does mean that Stephen Lovegrove is unable to be with us because he is overseas. Thank you for picking up the baton and coming.

Our witnesses today are Ashley Ibbett, director of clean electricity at BEIS; Alex Chisholm, the permanent secretary at the Department; and Neil Kenward, the deputy director for energy, environment and agriculture at the Treasury. Did you always have such a big job, Mr Kenward, when you have been in front of us? It seems your responsibilities are growing at the Treasury. Our hashtag today is #carbon. I will ask Mr Phil Boswell to kick off.

Q1 Philip Boswell: Thank you, Chair. I should first declare a couple of interests. I was Shell's contract lead on the carbon capture and storage project as it moved from Longannet to Peterhead. Secondly, I was a member of Lord Oxburgh's team in the production for the Parliamentary Advisory Group on CCS of "Lowest Cost Decarbonisation for the UK: the critical role of CCS". I will dive straight in and ask a general question to all in relation to the competition and the full chain. The Government spent £100 million on this competition, after having spent £68 million on the first competition, and we are no nearer having CCS. How do you explain that, Mr Chisholm?

Alex Chisholm: Thank you for your question. I very much appreciate the positive contribution you made, both to the original project at Peterhead and to the report delivered by Lord Oxburgh's group—and to other debates in Westminster Hall, which I obviously followed with great interest.

Looking back, particularly at the second competition, which is the subject of the NAO Report, as the NAO acknowledged, it did achieve some considerable benefits. In particular, it gained valuable technical and commercial knowledge, not only for commercial parties, such as Shell, with which you worked at the time, but for the Government and advisory groups about how to deploy this particular technology in the UK context.



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One thing that the NAO particularly commented on favourably in the Report was that there was a real effort made in the design of the competition to ensure there would be information available to the wider public and other people interested in taking forward these projects in time—so-called key knowledge deliverables, of which there are 86 published, which have been accessed several thousands of times.

Another important legacy from the project has been the three appraised storage sites: Goldeneye, which was important to the project you worked on; Hewett; and Endurance.

- Q2 **Philip Boswell:** That's fair enough. Unless there is something to add—we are short of time—I think we will continue along those lines. After the failure of the previous competition, why did the Department think that starting a new one was the best option, Mr Chisholm?

Alex Chisholm: I think that the UK Government, like many Governments around the world pursuing the decarbonisation agenda, have recognised that carbon capture and storage is very likely to have an important part to play. That has been the advice from experts within the industry and the scientific community in the UK. Obviously, we have had that view from the Climate Change Committee, the Energy Technologies Institute and lots of international bodies such as the International Energy Agency.

- Q3 **Chair:** We know that it is important to do this.

Alex Chisholm: It is important. After the first competition terminated because no satisfactory financial terms could be agreed, the second competition was aimed much more at what it would take to commercialise it.

In the early stages of that, I understand there were a great deal of conversations between the Department and industry about how to design a competition to bring into existence a proof of concept project—or more than one; they looked, as I think you will be aware, at eight possible projects at the outset, and they narrowed it down to two: one using gas-based technology for power generation and the other coal-based. It seems quite reasonable to me, looking back over that, that they tried the two different approaches.

Also, with one of those projects—the one you were involved in, Mr Boswell—Shell was effectively in control of the whole end-to-end process. The other one was much more of a consortium approach. The other one was also one in which a lot of infrastructure was being created for potential future use by a lot of coal-fired power stations, which the MP for Don Valley will be aware of. That was the idea of building something of enduring value.

- Q4 **Chair:** Mr Boswell asked why you thought about doing a second competition. In simple terms, from what you said, I divine that you thought you had learned enough lessons from the first to develop a better competition the second time round.



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Alex Chisholm: Partly that, Chair. There is also this enduring thing that we keep coming back to: that CCS does appear to have an important part to play in the overall decarbonisation.

Q5 **Chair:** So you had to have a second competition because you had to do something about it.

Alex Chisholm: Equally, it was very clear at the time that without some public intervention, it was not going to happen in the UK. The question was: was the market and the technology sufficiently ripe to be able to bring that into existence with an affordable amount of public support?

Right at the beginning, again as acknowledged by the NAO Report, the competition was always subject to the technology demonstrating its cost competitiveness. Obviously, it set out with very good intentions in 2012 to do that. Clearly, at the end of that process it was determined that it was not sustainable in terms of the economic cost to the nation, taxpayers and consumers, but we did not have foreknowledge of that when the competition was launched in 2012.

Q6 **Philip Boswell:** That gives us one of the questions. Why was the option of Government ownership or part-ownership of the chain not considered more thoroughly, given that when you shortlisted to two, only one of the bidders could do full chain? There have been plenty of models in the past. Look at the nature of this work in terms of the three components of this model, which are capture, transportation and storage. It is extremely rare, and probably the only companies that could do that would be the oil corporations: the reservoirs, the transportation systems and the introduction of a capture programme. Why was the option of more Government involvement not taken up, and all risk transferred to contractors? Why was that model adopted?

Alex Chisholm: First of all, in the energy market, as you will appreciate, it is mostly private sector players. Private sector players contribute a lot of capital, a lot of technology and very relevant assets to a project of this kind. I think that, rather than the ownership of the assets, the key thing is probably, as you suggest, Mr Boswell, the ownership of risk and the allocation of risk within that. That issue was gone into very carefully at the outset of the project. A whole thought process went into saying: who is the best holder of this particular risk? That was agreed with the industry bodies and with the potential ambassadors. It was very clear from the outset, and really it was a risk-sharing approach. Obviously, with hindsight, one can look back and say, "Was that risk sharing absolutely optimal?" That is something that I know was well covered in the report, to which you contributed, from Lord Oxburgh.

Q7 **Philip Boswell:** I have one question before we go into risk in more detail, and it is to you all. With hindsight, was it the right choice to have a second competition of this nature?

Alex Chisholm: I think the competition was well designed. Again, one of the important findings of the NAO Report was—they commented favourably on the fact—that it was a test of whether this was economically



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viable at this point in time. Although the conclusion at the end of it was that it wasn't, they pointed out, first, that we got a lot of benefits in terms of the knowledge learned, but also that it was actually open to the Government to exercise that decision without large cost to the taxpayer. Again, the NAO commented quite favourably that, compared with some other projects that don't have that inbuilt flexibility, it was possible for the Government to exit without loading the taxpayer with significant additional costs and financial exposures.

Philip Boswell: You have already touched on understanding of the risks and trade-offs, but—

Q8 **Chair:** Let me just ask you, Mr Kenward, whether you think it was, with hindsight, the right choice, because the Treasury was very involved in designing the whole financing side of this.

Neil Kenward: The Treasury were involved in the CCS competition from the beginning. We will have signed off the business case, and we were on the project board throughout the process, throughout the period. I don't think the Treasury had any fundamental objections to the way the—

Q9 **Chair:** But with hindsight, it didn't deliver, did it? Do you now think, looking back, "Actually, we could have foreseen some of these problems"?

Neil Kenward: As the permanent secretary has said, it was always designed knowing that a decision had to be made, at the end of the process, about whether it was affordable, and that decision was taken. There was a lot of value gained from that competition, and that value—the FEED studies, for example—remained available to other potential CCS projects and investors going forward.

Q10 **Chair:** But one of the challenges, which we will come on to in a bit more detail later, is that some of the options are now effectively running into the sand, because these were time-limited options on the two programmes that were being most worked up. Some of the sites won't be available in the next few years.

Neil Kenward: I think it is important to recognise that there are other potential sites, if indeed—

Q11 **Chair:** So you are saying that you are absolutely clear that what was worked up will still apply to other new sites.

Neil Kenward: I think there are benefits to be had from—

Q12 **Chair:** But were those benefits worth £100 million? That is really where we are coming at it from.

Neil Kenward: I think they are important benefits, and I think it was a sensible strategy to run the competition and to try to advance our understanding of CCS in the UK.

Q13 **Chair:** That was worth £100 million—of money that has not actually delivered anything.

Neil Kenward: It was the right approach to take.

Chair: Even though it didn't deliver. Okay, Mr Boswell, carry on.

Q14 **Philip Boswell:** Mr Ibbett, early on during the competition, stakeholders indicated concerns in respect of the risk allocation, or proposed risk allocation at the time. What did you do to get the allocation of risk correct for this competition?

Ashley Ibbett: Before we launched the competition, we had quite extensive discussions with industry about what we called the risk allocation matrix, and identified certain risks as business as usual, which would be better handled by the developers themselves, and then a large bulk of risks that we would share with the developers. The negotiations we were taking forward with the two bidders were designed to allocate the share of those risks between the parties. Also, we were in discussions about what the boundaries between business as usual and CCS-specific risks should be. So we talked extensively to the bidders, through the process, about those issues.

Q15 **Philip Boswell:** What scope do the Government have to carry more risk? In a scenario similar to the CCS one, be it for CCS or nuclear, what further risk could the Government carry? As we know, when all the risk is with the contractor, the price goes through the roof—that has always been the model. So are the Government taking some responsibility? What scope do the Government have, or do you see the Government having, going forward in a situation similar to the CCS one?

Ashley Ibbett: Obviously, we are reflecting on the lessons we have learned through the competition and Lord Oxburgh's report, which I know you were involved in, as well as other input we have had. Clearly, there is a balance to be struck between loading more risk on to the consumer and taxpayer and asking the private sector to bear risk itself. That balance was the one we were trying to strike through the competition. Indeed, certainly in the case of one of the projects, I think we had a project that could have been taken forward on the basis we had set out in the competition.

Q16 **Philip Boswell:** Going back to first principles, please explain the thinking and application of cost-effective risk allocation in respect of the contract strategy for this second competition. What were the factors that led you to make the decisions you made, and what did you do?

Ashley Ibbett: It is worth stressing that it was a very complex negotiation, because we were combining capital support with a contract for difference, and those two things are complicated in their own right, let alone together. One of the issues we were discussing with the projects was, if a risk occurred, who would pay what share of that risk manifestation. In the case of business as usual risks, the private developer would bear those risks up to a liability cap. There was a liability cap that would set the overall exposure of the developer to costs. In the case of CCS-specific risks, there are different classes of risks. There are risks that occur during the operation of the chain—you will be familiar with the issue of cross-chain risk, which could crystallise either because of a CCS issue or

just in business as usual—and then there are long-term storage liabilities. Again, we were in discussions with the developers about how their exposure to those should be capped, and what risk the Government should bear.

- Q17 **Philip Boswell:** A question to Mr Kenward and Mr Ibbett. We have seen the Government, particularly the Treasury, insist that all the risk be carried by contractors, not Government Departments, yet we know from industry experience—there is a long list of projects that we should have learned this lesson from—that it is not the most cost-effective model to pass all the risk to the contractor. It never is. It is a very basic tenet. So why do so here? Did the Treasury pull the strings in that respect? Was that a decision that the Treasury had much input into?

Neil Kenward: The actual decision to design the competition, with apologies, took place many years ago, before I was in this role, but I am sure the Treasury would have been involved, and I am sure they would have signed off on the design and approved it. As Mr Ibbett was saying, there is a real balance here, as you are clearly aware from Lord Oxburgh's report and other things, between the level of risk that the Government takes and the potential cost for investors and consumers if it goes down the side of placing risk on the private developer. There are different routes that could be taken. This felt like a sensible route, where you put as much risk as is sensible—as much as you can—with the private developer, with the Government just holding a few backstop risks, I believe. But Lord Oxburgh set out that there are different ways to do this, and we are obviously looking at that range going forward.

Alex Chisholm: We certainly didn't say in that competition that all the risk needed to be taken by the private sector. There was up to £1 billion of taxpayers' money available up front, and furthermore, there was the offer of a contract for difference, which was going to be running for 15 years, where consumers would be paying for this. So there was always risk sharing. I also wonder whether that is in fact the best lesson to draw, looking back over it. I understood that, despite the attribution of risk that was built into the project you were engaged in, Shell was quite happy to proceed with it. That was certainly the information that was given to us at the time.

Philip Boswell: There are some things I can discuss and some things I can't discuss, for obvious reasons.

- Q18 **Chair:** Before I move to Ms Flint—unless Mr Boswell has any further questions—one of the potential prizes of this whole programme was an opportunity for British business to develop this technology and for it to become part of UK plc's exports, particularly to Europe, where there is a different model from the American model on CCS. That is a huge opportunity lost. How much was that at the centre of the thinking on this—or was it really just seen as a fringe benefit?

Alex Chisholm: I think probably the core of the case for introducing CCS was about achieving our own decarbonisation goals at the lowest possible

cost, not only in relation to the energy sector but particularly also for industry and even heating and transport. That was really the core of it. I think the prospect for an export industry on the back of that was the additional icing on the cake-type thing—probably not a physical export industry but more selling know-how expertise around the world. That is something that happens now.

Indeed, some of the companies who are engaged in those projects at Peterhead and White Rose have been advising businesses in the United States, China and others that have tried to pursue CCS. So we have not lost all of that opportunity; that is happening now. Obviously, if the UK was seen as a real leader in CCS, that opportunity would be a bit bigger, but there is a cost to doing that and obviously at the time the decision was taken at spending round 2015, that cost was seen as prohibitive.

Q19 **Chair:** I understand that there was an original plan to have more funding going in, but it was reduced quite dramatically. Is that the case?

Alex Chisholm: No, I think the capital set aside for it was always up to £1 billion; there was no change to that.

Q20 **Chair:** Wasn't there a number between £3 billion and £4 billion? I have heard those figures. I don't know if that rings a bell with you.

Alex Chisholm: Not for the capital investment which is paid for by the taxpayers. The second element of it is the operating costs over the lifetime of the project: a 15-year contract for difference. The estimates of what those would be changed over the course of the project—that was part of the purpose of the competition once we had established what those costs would likely be. The Department at the time—the Department for Energy and Climate Change—had set aside some money to be able to cover one or two projects with that contract for difference within the levy control framework that we discussed back in November.

Chair: We remember that hearing.

Q21 **Philip Boswell:** This may be a difficult question to answer, but when you look around the world to the operation of CCS projects that exist—there are eight in the States, two in Norway, three in Canada, and in Brazil, Saudi and UAE, and near commissioning there are two in the States, two in Canada and one in Australia—they are doing this. Are they doing it because, unlike the UK, they are genuinely interested in reducing their emissions and investing in carbon capture and storage and we were never serious about it?

Alex Chisholm: In our view, it is a very mixed picture around the world. As the NAO Report correctly says, there have been around 20 projects which either have been built or are in construction. Actually, according to the International Energy Agency, over the last six years there have been a further 20 or more that have been cancelled, including in countries like the US and Australia. They cancelled projects at the same time that the UK found it necessary. So it is a “one step forward, one step back” type of situation. The jury is out.

Even earlier this week we saw that China, for the first time in Yanchang has just given a final investment decision to go ahead with a CCS plant for the first time. That is a significant development. However, the IEA commenting on that said that there are three concerns at the moment that are holding back CCS across the world—again there is an international picture. No. 1: large up-front capital and investment. No. 2: the time lag to achieving returns. No. 3: lack of sufficient business cases. That is the latest, absolutely bang up to date assessment from the International Energy Agency. It underlines the fact that the decision the UK took was not out of line with what has happened in other countries.

- Q22 **Philip Boswell:** Following on from the Chair's comments, if you look at India under Prime Minister Modi, there are over 2,000 coal-fired power stations planned. Okay, they will not all be built and things will fall by the wayside, but new ones come along and policy is something that you have got no control over. None the less, there is the missed opportunity to build a coal-fired power station with CCS not just for our own emissions but for world emissions and to take the lead in the industry. We have lost it so many times before. We are in desperate need for high-end engineering, development and R and D. It is the kind of thing that screams out "we are good at this." The Brits are good that this type of thing, yet time and time again we miss these opportunities. Do you feel this was a missed opportunity?

Alex Chisholm: I emphasise that we are able to export that know-how now, and we are actually doing so. British advisers are involved in a lot of these international projects.

Chair: Advisers—that's not really the prize, is it?

- Q23 **Mr Bacon:** It is not much of a sales pitch when we are not doing it ourselves, is it?

Alex Chisholm: We do not have a very large coal industry at the moment. Coal-fired power stations are diminishing in number, and there is a proposal out there from the Government that coal-fired power stations should terminate completely in 2025. So it is much more likely that it will be in countries like India and China that the large-scale introduction of CCS to coal-fired power stations will be applied.

- Q24 **Chair:** As Mr Boswell reiterated, the prize is the jobs in R and D and so on. A few highly-paid advisers to go out to other countries is not quite the prize that could have been won with a good industrial policy strategy through what was then DECC. That is the missed opportunity, surely.

Alex Chisholm: As you know, we are very committed to the industrial strategy, but equally it cannot be pursued without regard to cost. At the time the decision was taken in spending round 2015, not only was there £1 billion of cost to taxpayers directly, but a future commitment to costs of between £3.9 billion and £8.4 billion just for those up to two projects from the competition—not for all of CCS, just two specific projects. That is a very high cost to pay.



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- Q25 **Chair:** Did DECC or the Treasury do any analysis of what potential business opportunities were out there, to see what the pound-for-pound or pound-for-dollar ratio would be of that investment you just described and how much it could leverage in from good investment opportunities around the world selling this technology?

Ashley Ibbett: It is worth looking at the two projects involved in the competition. The Peterhead project involved Shell using a technology that they have deployed already in the Canadian project Mr Boswell referred to. There was no unique UK value that would be generated through that particular project—we would learn a lot from it, but it was a technology Shell had developed already and, indeed, are using in projects around the world.

White Rose was a consortium of different companies using technologies that, again, they had deployed in other applications but had not brought together to create a full-chain project. The unique know-how was in that end-to-end process. That is knowledge, and we have made the knowledge we have freely available on our website; we have had 12,500 hits on that website, so the knowledge is being shared about how those projects were going to be developed and taken forward.

- Q26 **Chair:** That knowledge is being shared nice and widely around the world. What about capturing it for UK plc, UK jobs and UK investment?

Ashley Ibbett: There is knowledge that is being used also by the UK CCS base. We have a very strong academic base in CCS in the UK.

- Q27 **Chair:** But, to go back to my precise question, did you ever do an analysis in DECC of how many jobs could be spawned around the world, with British very businesses very involved, against the investment by the taxpayer? It was obviously of benefit to the UK and the climate change targets, which Mr Chisholm outlined, but there was this other potential really big win of jobs and investment in UK business as a result.

Ashley Ibbett: That was certainly one of the qualitative benefits we saw.

- Q28 **Chair:** But no one did a full analysis of what gearing you might get from this development in the UK for jobs.

Ashley Ibbett: Obviously we had taken a full assessment of the benefits from the competition projects. Had the competition run to its conclusion, we would have considered those sorts of issues as part of our analysis at the end of the process.

- Q29 **Caroline Flint:** I have two questions about where you see CCS, perhaps for Mr Kenward. Do you agree that CCS has a central role to play across the UK economy if we are to deliver emissions reductions to which we are committed at the lowest possible cost to UK consumers and the taxpayer? Yes or no?

Alex Chisholm: I will start, and my colleagues may choose to come in after me. The Government has said that it is going to respond to Lord Oxburgh's report. Mr Hurd, before the BEIS Select Committee earlier this



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year, said that the emission reduction plan, which we will publish this year, will include the Government's views about CCS.

Q30 **Caroline Flint:** So you can't say right now whether you think it has a central role.

Alex Chisholm: I can't say right now, in anticipation of that plan, but that is where you should look for an answer.

Q31 **Caroline Flint:** Okay. Do you agree that the decarbonisation targets we have set ourselves will come at a very much increased cost without CCS? That is the view of the Committee on Climate Change.

Alex Chisholm: The advice I have read from the Committee on Climate Change has said they are not expecting significant CCS before the 2030s.

Q32 **Caroline Flint:** That's not my question. When it happens, they are saying that the legal targets we have set ourselves on decarbonisation will come at a very much increased cost without CCS. Do you agree with that?

Alex Chisholm: Between now and 2050? Certainly the projections published by the Department that I have inherited show that very thing. They expect it would be more expensive to achieve decarbonisation without CCS.

Q33 **Caroline Flint:** Thank you. So the answer is yes.

Alex Chisholm: Well, that was the estimate published in summer 2015, yes.

Q34 **Caroline Flint:** Okay. I want to move on to how the Departments, the Treasury and DECC worked together. My first question is to Mr Ibbett, if you don't mind, Mr Chisholm, because he was actually in charge of the project in DECC. Why did you and the Treasury fail to agree the financial support for operating costs through contracts for difference?

Ashley Ibbett: The process of the competition we would be going through was one of cost discovery. We had £1 billion in capital which had been earmarked for the competition, some of which we used to do the front-end engineering and design studies. Within our forecasts for the levy control framework, we always included sufficient cover for up to two projects. These were ground-breaking projects, the first of their kind, so it was difficult at the outset of the competition to be absolutely clear about how much they would cost. That is why we agreed we would use this process of design studies and risk reduction to get to a better understanding of the costs.

Q35 **Caroline Flint:** Okay. It is good that the £1 billion was identified for capital, which is very helpful; the problem was that the Department did not agree an overall budget. In fact, I understand from the NAO Report that when you launched the competition, the Department was uncertain how much it would cost consumers, expecting their contribution could be between £2 billion and £6 billion, which I suggest is quite a wide range. Don't you think the fact that you did not attempt with the Treasury to outline the overall costs of the projects affected the competition, because



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the affordability factors and constraints were not known by those in the private sector who were bidding to be part of the competition? They were jumping into the unknown.

Ashley Ibbett: We were always clear with both projects that the competition would support up to two projects, and that there would be the £1 billion and a contract for difference. We used our best estimates at the time of what those contracts for difference might cost as part of our estimation of the levy control framework, but in a way, until the projects had made their final bids, we couldn't be certain how much they would cost or how much they would draw from the levy control framework. That was what we were anticipating receiving at the end of 2015. Mr Kenward will no doubt want to comment; the Treasury was involved in those discussions with us, and knew that we were forecasting those numbers in the levy control framework.

Q36 **Caroline Flint:** What did you think about those numbers, Mr Kenward—between £2 billion and £6 billion?

Neil Kenward: We understood, as Mr Ibbett has explained, that there was not complete certainty about what the costs would be. One of the processes and objectives of the competition was to identify the likely costs of CCS in the UK. Obviously, those costs were very significant. Had the projects gone ahead, they would have imposed billions of pounds in additional policy costs and additional subsidy required from consumers. The context was very important. It became clear in 2015 that there was quite a significant overspend forecast on the levy control framework, as you are aware from the previous hearing and the previous NAO Report on this.

We were looking at projects where the context was already an expected overspend, if you like, on the forecast budget for levies to support low-carbon power. In that context, I can understand, certainly, from a Treasury perspective, that we did not want to add further costs to consumers, which would have been sustained for a 15-year period and then potentially followed by more projects. That was quite an important bit of context when we were evaluating the affordability of these projects.

Q37 **Caroline Flint:** How much do you think the Treasury could have played more of a hands-on role in working with DECC to get to a better place on what the operational costs might have been, given that you were already working as a Department on other energy projects, such as Hinkley? You mentioned the levy control framework, and this Committee has already heard about the problems in the working arrangements between Treasury and DECC in that area. Do you think you could have done more to be engaged and work to find some sort of agreement together?

Neil Kenward: My team at the Treasury and Mr Ibbett's team were in pretty constant dialogue. There were no barriers between officials discussing these issues. Indeed, the Treasury sat on the programme board for CCS, so we were involved throughout the process.

Q38 **Caroline Flint:** We heard about a board when we discussed the levy



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control framework. I don't think the Treasury person turned up to that, or it didn't meet.

In paragraph 4.5 of the Report, the NAO reflects a view from the Major Projects Authority, which "repeatedly found in its reviews a lack of agreement between the Department and HM Treasury over the affordability constraints for the CfDs" and reported "different assessments of the affordability of operational support." Why were you so out of kilter with each other?

Neil Kenward: I think it is natural for the Treasury to care enormously about these costs throughout the process.

Q39 **Caroline Flint:** Did DECC not care?

Neil Kenward: I am sure it did, and part of the objective of the competition was to drive those costs down as far as possible, so obviously it would have been premature to set a limit before we knew more about the project.

Caroline Flint: Mr Ibbett?

Ashley Ibbett: I agree with Mr Kenward. One of the unique features of the competition was that we had the concept of what we called the maximum funding amount—the total amount of exposure for the taxpayer and consumer if we were to take one or both of the projects forward. That amount relied on us understanding the final strike prices from the bidders themselves, but that number is one that we would have agreed with the Treasury in the process that we would have followed following receipt of final bids.

Q40 **Caroline Flint:** The Departments have failed twice. How will you ensure that that does not happen a third time, in terms of working out between yourselves that you are actually working in partnership rather than at odds with each other?

Alex Chisholm: We are obviously very carefully studying the successful examples—there are not that many, but there are some around the rest of the world. We are also paying a lot of attention to developments in technology; some interesting new approaches have been developed, most recently in Austin, Texas. We are certainly very keen to draw lessons not only from this project and the invaluable NAO Report, but also from Lord Oxburgh's report and from the further advice from the CCC and the ETI. All of those will be reflected when the Government sets out its plans for CCS going forward.

Q41 **Caroline Flint:** Do you accept in any way one of the points made in Lord Oxburgh's report, as you phrased it: that the high costs revealed by the earlier approaches to developing CCS reflected the design of the competitions more than the underlying costs of CCS itself?

Alex Chisholm: The finding of the NAO Report was that the competitions would have produced successful projects, or at least one—there was a question mark against the other, although even in the case of the consortium approach with White Rose, they never said to us that they had

doubts about being able to complete the project. From that perspective, the viability of the projects seemed to have been high through the second competition. The competition was ended by a funding decision, not by the projects not being viable.

- Q42 **Caroline Flint:** My colleague raised earlier the risks that were put on the private sector, particularly in having to deliver a whole-chain approach to these programmes. Would you be looking to design a future competition, or a future model for developing CCS, differently from what has been done?

Alex Chisholm: That is fair to say. I agree that one of the lessons of the project, in hindsight, was that the Peterhead project seemed to be more straightforward to manage because of the end-to-end management by a single company, whereas for White Rose certainly one of the difficulties that the consortium seemed to experience was how to allocate risk across the chain with the different parts.

- Q43 **Caroline Flint:** When you look at a number of the projects that are happening worldwide, they seem to be able to cope with this approach of delivery by breaking up parts of the chain to make it more suitable for a number of different people to come in and bid for those parts of the contract. Do you acknowledge that?

Alex Chisholm: That can help. It can bring as much competitive pressure as possible.

- Q44 **Caroline Flint:** Unless there is anything else on that, can I go on to the cancellation of the project? Mr Kenward, given that you could have decided whether to confirm the £1 billion based on the merit of the bids, rather than speculation about the bids, could you tell us a little bit more about why you just allowed this competition to finish as it did? Why were you so keen on cancelling?

Neil Kenward: It was really a question of affordability. The spending review at the end of 2015, as you're aware, was going to set out the capital spending across the entirety of the Government for pretty much the whole of this Parliament. In doing that work, the Treasury runs a very rigorous process. It invites bids from all Departments. I think there were over 300 bids—it was a very large number of bids—and obviously a limited pot of funding available.

It was a zero-based review, so everything that required new spending during the Parliament had to bid in to receive that money. That's a very sound and well-used principle for fiscal events. It means that Ministers and officials can compare across the full range of bids, to identify those that are most aligned with Government priorities and deliver the best value for the Government against their objectives.

In that context, the money—almost £1 billion—required for the two CCS projects essentially had to compete against all these various alternative projects. It was a very tight spending review, as I am sure everyone is aware, in the middle of a period of austerity, so £1 billion spent on CCS



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would mean £1 billion less for other Government investments, such as schools, hospitals, roads, etc.

That was the decision Ministers had to take and our role was to provide the best possible advice, looking at the pros and cons, the costs and benefits, of the projects, interrogating and understanding the bid that DECC had provided to us. That's what we did and we provided advice to Ministers that set out those pros and cons.

Q45 **Caroline Flint:** Do you believe that CCS has a future in the UK, Mr Kenward?

Neil Kenward: I think it is very clear that CCS could play an important role in decarbonising the UK. That is, as we've already discussed, the expert opinion on this matter; I can see the value of it.

Q46 **Caroline Flint:** Do you believe that, by cancelling the project, you might have inadvertently cost the taxpayer more—bill payers too, for that matter—in the long run, by reinvigorating the project at a later stage?

Neil Kenward: One of the important points here is that the decision was merely about these two projects and the funding for them. It was not a decision to abandon CCS in the UK for the future. That option remains open and Ministers are considering options for that now. That is quite an important consideration. Those potential benefits remain available, if the Government choose to pursue CCS.

Q47 **Chair:** The Comptroller and Auditor General wants to come in here.

Sir Amyas Morse: Can I check something that is relevant to your question?

Chair: Can you just give us a reference in the Report?

Sir Amyas Morse: Yes, paragraph 4.9.

Michael Kell: Sorry. This is the previous Report on the cancellation.

Sir Amyas Morse: Yes. I just want to be clear that at that point your bid showed a return of £4.50 per £1 invested. Is it your testimony that the other projects were preferred over this by showing better returns than this? Or was it just a more arbitrary decision?

Neil Kenward: I certainly wouldn't describe it as arbitrary. The underlying analysis there assumed a continuing programme of CCS, and the £30 billion figure quoted was based on a whole stream of CCS projects. Actually, all we were doing was discussing the two initial projects, so the £30 billion was not the key number here.

Sir Amyas Morse: No, but the whole point of this—forgive me just for a second, but the logic there is worth challenging, isn't it? If CCS is worth developing it must be because there will be a stream of future projects and the stream has to start somewhere. So I think that argument is quite difficult. You must have thought that through when you were originally



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allowing this initial project to start. I would have thought some foresight on the part of the Treasury would have been expected.

Neil Kenward: There are two things going on. One is that that £30 billion of benefits is still available and we can continue with CCS in the future—

Sir Amyas Morse: But you will have to start a project in order for it to be achieved.

Neil Kenward: But the cost to gain that full £30 billion benefit would also involve extra costs. Also in this cost-benefit analysis, even for these two original projects that cost-benefit ratio was based on the £1 billion of capital spend, but we know, as we've discussed it already, that there were billions of additional pounds of consumer spend that were not part of that equation. So, I think it is fair to say that the Treasury had valid questions around the £30 billion number.

Q48 **Caroline Flint:** It is quite interesting, because it is very revealing. Thanks for pointing out paragraph 4.9, because it seems to suggest that DECC was making assumptions and modelling in a very different way from what the Treasury was doing, even though you were meant to have a board. Is that a fair point to make?

Neil Kenward: DECC, like all Departments, would put forward their best case for a project or a capital bid, and then it is up to the Treasury officials to interrogate that case, and that is the process that happened in the autumn of 2015.

Q49 **Caroline Flint:** But in terms of DECC's calculation on the benefits on the basis that without CCS it would cost an additional £30 billion to meet the 2050 carbon targets—that is paragraph 4.9 of the Report—that must have been something that at some point the Treasury either agreed or disagreed, because that was part of the basis for moving forward on the competitions. At what point did you decide that the project was not worth it?

Neil Kenward: Obviously the spending review was the critical decision point.

Q50 **Caroline Flint:** Was that a political decision or an economic decision or a climate change decision?

Neil Kenward: It was a decision based on affordability and the prioritisation of scarce public funds.

Q51 **Caroline Flint:** So it was a political decision that in the grand scheme of things it was better to spend money in other areas, even though in this area by stalling the project it could cost more in the long run?

Neil Kenward: It was prioritisation of other things at that time, but it was also about recognising that it was not solely taxpayer spend that was required here, but consumer spend. I have already referred to the fact that the levy control framework was overspent. There were two affordability constraints at that time.



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Q52 **Caroline Flint:** So you were panicking, really. There was panic because the levy control framework was heading in the wrong direction.

Neil Kenward: I would not have described it in that way.

Chair: I am sure the Treasury does not panic, but Ms Flint's point is well made.

Q53 **Caroline Flint:** Who is driving energy policy: the Treasury, or DECC or BEIS?

Alex Chisholm: I think my Department is responsible for energy policy.

Q54 **Caroline Flint:** You are responsible for it, but who is driving it?

Alex Chisholm: Clearly if large amounts of public expenditure are involved, that is going to involve the Treasury, the same as it would for any other area of public activity.

Q55 **Caroline Flint:** Are you worried that you might do your modelling and work on costs for other projects and, regardless of what you do, at some point the Treasury is just going to pull the plug?

Alex Chisholm: We do work very closely with the Treasury on these large projects, and that is very necessary. One of the recommendations from this NAO Report is that we do continue to work closely on future methodologies to ensure that when we are looking at these long-term projects, you do not look only at the strike price, but the whole range of factors. That is allowed by the Green Book methodology, but we clearly need to ensure that that is applied correctly in particular situations.

Q56 **Chair:** Ms Flint has a clear point here. We looked at the levy control framework. The Treasury had called a lot of the shots on that and determined what was in it and what was not, largely. The green investment bank was very much a Treasury-driven initiative, although it is in your Department, Mr Chisholm. Solar, the feed-in tariffs and the changes on that hit a certain limit so they had to be pulled in. It seems that the Treasury is calling the shots on energy policy.

Alex Chisholm: All areas of public expenditure are subject to Treasury controls.

Q57 **Chair:** A lot more things in your Department seem to be stopped or shaped by the Treasury than happens in other Departments.

Alex Chisholm: Well, quite a lot of what the energy Department has been doing to achieve decarbonisation is not just day in, day out ordinary expenditure of the type that the Department of Health and the Department for Work and Pensions are doing; it is big projects, and within big projects there are uncertainties—that is the nature of it. There is a lot of risk for investors and very substantial amounts of money are being committed.

Q58 **Chair:** But the track record is not great. We keep seeing problems. This area was previously in a different Department, and it is now in your



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Department. How are you going to get a grip on ensuring that we do not see so many failures in crucial projects to reduce carbon emissions?

Alex Chisholm: Overall, the track record is excellent in achieving decarbonisation. Emissions reduced by 38% in the period from 1990 to 2015. On most measures the UK's performance in that regard is the best in Europe, and it compares very well with countries right across the world.

Chair: But that does not take away from the point about project failure. I am going to bring in Ms Flint on that, and then Mr Boswell.

Q59 **Caroline Flint:** Mr Kenward, you have concluded that the costs to consumers through contracts for difference were high and regressive when it came to CCS. How is that different from other long-term and expensive CfDs, such as Hinkley Point C?

Neil Kenward: The Government looked at each of these projects on their own merits. There are many differences between them, but one of the key ones is that carbon capture and storage also requires, critically, that extra £1 billion of taxpayer spending, which is something the Hinkley project does not require.

Q60 **Caroline Flint:** How do you consider the value to other sectors, such as industry, of having CCS in place when you decided to cancel the project?

Neil Kenward: Sorry, will you expand on your question?

Caroline Flint: As you will be aware, CCS has applications to other industrial uses, so I am interested in how much the impact on those sectors was considered when the decision was made to cancel the project.

Neil Kenward: We were fully aware that in the long run there is an opportunity for CCS to play a wider role in decarbonisation. We completely understood that and we were very clear with Ministers on that point.

Q61 **Caroline Flint:** Do you think, Mr Chisholm, that it is a risky proposition for investors to invest in new gas-powered power stations without CCS?

Alex Chisholm: That is a question that the market is constantly asking itself. We organised a capacity market auction in December of last year. That saw 3.4 GW of new projects clear in that auction, including a new CCGT—a combined-cycle gas turbine—plant in King's Lynn, so there is some evidence of a willingness from investors in the current climate to commit to new gas plant. There has not been a huge amount of new investment there and, obviously, one of the considerations is, "What is the viable lifetime of that plant?", given the overall scheme of policy and the framework of delivering against the five goals under the Climate Change Act.

Q62 **Philip Boswell:** We have touched on a lot of stuff there that I would like to drill into in more detail, time permitting. The Treasury is the tail that is wagging every departmental dog. I have jotted down some of the initiatives affected: green investment bank privatisation cancelled; the early withdrawal of the RO; onshore wind cancelled; reduction of solar



subsidies; biomass guarantees withdrawn; the flagship green home scheme cancelled; watering down of incentives for greener cars; giving up the zero-carbon homes; and tidal power looking like it is for the chop. Is the Treasury sponsored by the nuclear and fracking industries?

Neil Kenward: Not at all. I would emphasise that the Department leads policy. To take one part of your list there, which is the forecast overspend on the levy control framework, we worked very closely with the Department in 2015 to identify the most effective way to curb the expected overspend. It was not a case of Treasury imposing that on the Department; the Department understood the need and urgency to reduce the forecast overspend. This was very much my experience—it was very much a collaborative effort to find the right mix of policy response.

Q63 Philip Boswell: Much has been spoken about figures and costs driving decisions, so I will come to the specific figures used by the PM, or that the PM was allowed to use, a little later. It is commendable, it has to be said, that the strategy from the public purse perspective was one that did not make any great commitment for us going forward—you did not commit us to massive cancellation costs in the early phases—but what that does to investor confidence a second time around is quite another matter, which I would like to go into more detail on later.

Specifically, on cancelling the competition—looking at page 6, paragraph 6; page 36, paragraph 4.2; and page 9, paragraph 16, and again apologies for not going into too much detail—why did you not fully evaluate the implications for meeting the statutory decarbonisation targets of delaying CCS before deciding to axe the competition?

I would also like to chuck in something else before you answer that question—or lead you on, rather. The Committee on Climate Change recently reported that the additional cost of inaction on CCS to UK consumers would be £1 billion to £2 billion per year in the 2020s, rising to between £4 billion and £5 billion per year in the 2040s if we are to hit our carbon emissions targets. For me, that is really where I am coming from. Do you agree that cancelling this initiative is a false economy? Did you do your homework before cancelling?

Alex Chisholm: I am going to ask my colleague Mr Ibbett to address the first part of the question about the modelling of the timing of the impact of delay.

Ashley Ibbett: The savings, or the reduced cost of decarbonisation associated with having CCS as an option, was a number we had modelled, and it is reported in the review. We did not model the impact of a delay, for two reasons. First, we did not have time to do that modelling in the context of that spending review bid. Secondly, because there was a question we needed to answer about what delay we should model—because, as we have been very clear, we are not ruling CCS out as an option; CCS could still play a very important role in decarbonising the UK, but we did not do a specific piece of modelling looking at delay.



Alex Chisholm: Just on your question about the false economy, obviously it did reflect political decisions at the time, based on a lot of economic and financial analysis. The Prime Minister at the time did actually say that “Carbon capture and storage is £1 billion of capital expenditure—£1 billion that we could spend on flood defences, schools or the health service. But even after you’ve spent that £1 billion, that doesn’t give you carbon capture and storage that is competitive in the market.” So clearly that was an important consideration for the Government at the time.

Q64 **Philip Boswell:** We will go into why he was wrong shortly. Moving on, we will go into a bit more detail. First of all, Mr Kenward, given that you could have decided whether to confirm the £1 billion based on the merit of the bids, rather than speculation about the bids, why did you not allow the competition to finish before it was cancelled?

Neil Kenward: It is a valid question, but of course the decision on the allocation of capital had to be made in the spending review, so that is when Ministers were evaluating, as I have described, the bids for capital spend—

Philip Boswell: Autumn statement.

Neil Kenward: Exactly—in the Parliament. They had to take that decision in the round and take a complete set of decisions at that point. So once Ministers had made that decision it would have been wrong, I think, to continue with the competition once the Minister had essentially decided in principle that the capital was not available for it. So it was at that point—at the spending review and after—that DECC had discussions with bidders, and they came to the conclusion that it was not worth getting into.

Q65 **Chair:** To be clear, the decision was made on the money before there was any real understanding of the merits of the cases.

Neil Kenward: The pros and cons were fully understood. We had a good idea, from discussing with our colleagues, of the likely range of costs of the CfD. We obviously did not know the exact number that would come forward from the competition, but I think we understood the expected quantum of costs on bills from the CfD.

Q66 **Philip Boswell:** Okay; two questions—we are jumping around a bit, but that’s fine. This is for Mr Ibbett, and it is following on from something my colleague Ms Flint mentioned. What guidance were the competitors given over the importance of electricity costs with CCS? Because, as you will know better than anyone, it appears that the strike price was not agreed with Treasury for this project, as colleagues have stated. Yet it is critical in enabling agreement with the contractors at Hinkley C.

Ashley Ibbett: In 2012, I think, we established a CCS cost reduction taskforce to look at the expected costs of first-of-a-kind CCS projects and how those costs might reduce over time. In discussions with the bidders, the sorts of strike prices we were talking about were within the sort of range that that study found. We were very clear with the bidders that it was a competitive process; nobody was guaranteed a CfD or the capital



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and it was in their very best interests to put forward the most competitive strike price they could. So they were using their design stage and risk-reduction stage to help them put forward their most competitive bid.

- Q67 Philip Boswell:** It strikes me that the Government were not trying very hard to make this happen, because the Prime Minister was allowed to quote £170 per megawatt-hour, and this figure included—on, I believe, DECC's instruction—costs for a large infrastructure that would be used by a number of future projects. So this caveat should have been made clear. Of course, the Goldeneye pipeline and reservoir is pre-existing and simply needs adaptation, which would slash that figure of £170 per megawatt-hour, which was critical in the decision-making process. That decision was allowed to be made based on saving £1 billion here and now for the project, based on a figure that was completely created by a strategy that was not cost-optimal from the outset.

Maybe there were mitigating reasons why that strategy was put in place. There was talk of needs elsewhere, yet the Committee on Climate Change says it will cost us between £1 billion and £2 billion not to do this if we are going to hit our targets—this is what I'm getting to—and £45 billion in the 2030s and 2040s. If this is going to increase to hit our target for our commitments or obligations, we will have to spend an awful lot more than we would have done here. So, do you agree that the statement of £170 per megawatt-hour was misleading, Mr Ibbett?

Ashley Ibbett: That figure was in line with the CCS cost-reduction taskforce for first-of-a-kind projects. In our preparation for the spending review, we were clear that we expected the cost of future projects to reduce, taking advantage of shared infrastructure reductions in cost of capital, improvements in technology and so on.

- Q68 Philip Boswell:** The CCSA has agreed that CCS is achievable at £85 per megawatt-hour. This was work carried out for the independent CCS cost-reduction taskforce and for the Committee on Climate Change that showed full chain CCS costs at £85 per megawatt-hour. Why was this far more credible figure not used? Is it because it did not suit the purpose of the Treasury, which was to use the £1 billion elsewhere?

Ashley Ibbett: We had the findings of the CCS cost-reduction taskforce, which showed a reduction in the cost of CCS over time through various different components, shared infrastructure, reductions in the cost of capital and improvements in technology. An integral part of the approach to the competition was that these first projects would help us to unlock some of those cost reductions.

- Q69 Philip Boswell:** Mr Kenward, did you just want the £1 billion for somewhere else?

Neil Kenward: I suppose I have explained already that there was tension, and rightly so, about the evaluation of the priorities for scarce public money. It is right that the Treasury conducts that process in a thorough and challenging fashion. The way the competition was run was providing, as Mr Ibbett has described, shared infrastructure, which meant



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that the initial costs of these projects was higher, and hopefully that would unlock cheaper projects in the future if they were to proceed, and we understood that in the Treasury. We understood that this was a high price for an initial one or two projects.

- Q70 **Philip Boswell:** Mr Ibbett, based on the £85 per megawatt-hour and the knowledge that they had, what more could you have done to convince the Treasury that it was worth completing the competition?

Ashley Ibbett: We put forward the best case we could as part of our spending review bid. As Mr Kenward has said, the Treasury receives many more bids for capital funding than it can meet. I know there is a difficult decision-making process that it has to go through. I think we put forward the best case we could.

- Q71 **Chair:** Was this just knocked into the long grass because it was a long-term possible gain that people could not see, whereas actually building a physical school or hospital is something that people can see? That was the pressure, wasn't it, in reality? We will never get these big projects unless you as civil servants highlight that. All Ministers and politicians are impatient about something tomorrow, but we also need to have that long-term view. Where was that long-term view in this decision?

Alex Chisholm: There has been a long-term view. The Government have had a long-term view in trying to make CCS a reality in the UK market.

- Q72 **Chair:** But there was no strategy. There were two failed competitions.

Alex Chisholm: Both times they have tried so far they have not ended up with a successful project, because they have concluded that the cost at that particular point in time was not sustainable.

- Q73 **Caroline Flint:** It was poor design and poor collaboration between two important Departments.

Alex Chisholm: The second time it was a well-designed competition. As we have heard, there has been a great deal of co-ordination between the Departments. The wider question is whether CCS is a competitive technology at this point in time. That is a question, as I have emphasised, that is being asked right across the world and does not have a definite answer. It is not that CCS is being rolled out—

- Q74 **Chair:** You said right at the beginning that the primary issue was reducing emissions. The question is what happens to heavy industry in this country. We have to get this cracked. It is one of the really big challenges that has got to be dealt with. It is not that there is a blank cheque, but you can't do a normal cost-analysis business case in the same way, because there is a cost premium to tackling this climate change challenge.

Alex Chisholm: Chair, we absolutely understand and appreciate that. It was always seen that CCS would require some public support to bring it into the market. That has been a core characteristic of both competitions—there is no question about that at all. We do recognise that. One of the

reasons why we have continued to fund a lot of innovation and research into CCS—including £11 million since 2015 and in total £130 million since 2011—is because we continue to ask that question: what is the best new technology that offers the way to enable this very promising technology to be cost-sustainable in the UK context?

Q75 Philip Boswell: We have a lot to cover in a very short time, so I want to move on to investor confidence. Before we do, the Treasury was not convinced that Peterhead was a good match for the programme's objectives, in part because of the remoteness compared with other areas of CO₂ production. I want to know what discussions took place on this before the spending review. Oxburgh came afterwards, of course. There are clusters and the whole system comprised of capture, transportation and storage. It is the networks that are the future, thinking outside the box—it doesn't take a lot, given the effort that has been put into this. What discussions had taken place on the programme's objectives being hit by the two projects in respect of the full chain nature? Obviously, you had the location for White Rose and you had full chain in Aberdeen. What discussions did you have with the Treasury to explain to them—because the expertise sits with DECC—the impact of the decisions and the strategy, and what was a good fit and the best fit for your objectives?

Ashley Ibbett: The Treasury was a member of the programme board for the CCS competition.

Q76 Philip Boswell: It didn't meet very often.

Ashley Ibbett: We were in regular discussion with them about it, including in the preparation of the business case that set out the original rationale for the competition. The decision to award the two FEED contracts was one that we again agreed with the Treasury. I don't want to bore you with the intricacies of the competition, but it is worth bearing in mind that the evaluation methodology selected a portfolio of projects that stood the best chance of bringing down the costs of CCS. It is perhaps unsurprising that it combined gas and coal, north and south, new build, retrofit and so on, because it was the portfolio with the evaluation methodology that brought forward Peterhead and White Rose.

Q77 Philip Boswell: Before we move on to the last section, in terms of the metrics by which you measure, the expertise sits here. How will you improve the metrics used to compare low-carbon options that benefit multiple sectors, going forward? What lessons have you learned from this second experience? A third failure would be calamitous.

Ashley Ibbett: Obviously, we are reflecting hard on what lessons we can learn from the competition. This Report is a very useful input to that thinking. We have had the excellent work that Lord Oxburgh did, as well as a report from the Carbon Capture and Storage Association, the Energy Technologies Institute, the Committee on Climate Change and others. We are considering all those issues in detail, as part of our thinking about what we say about carbon capture and storage in the emissions reduction plan.



Q78 **Chair:** Will there be a third competition at some point?

Ashley Ibbett: We haven't taken a decision on what is next.

Chair: I think there might be a lack of appetite to go for it.

Q79 **Philip Boswell:** Moving on to investor confidence and the market experience and what the market has taken from its experiences on the carbon capturing project and similar models, the third report of the Energy and Climate Change Committee of session 2015 was on "Investor confidence in the UK energy sector". It is very critical of the Government's continuous moving of the goalposts in relation to green energy. We discussed the big list. The report's summary specifically references CCS in bullet point 4. It says, "Policy inconsistency and contradictory approaches have sent mixed messages to the investment community about the direction of travel." It gives one example as "emphasising the important role of gas while scrapping support" for the carbon capture and storage project and competition.

Mr Kenward, the sudden decision to cancel the competition, coupled with other shifts in energy policy, had a particularly negative impact on investors. How did you consider the impact that cancelling the competition would have on investor confidence?

Neil Kenward: We understood, of course, that withdrawing the funding for the CCS competition would affect investor confidence in the sector. That was absolutely clear. I would say that the Government has been very clear about its support for nuclear power and off-shore wind and through the capacity market, for example, there is a large amount of private investment flowing into the energy sector, in all those parts of the energy sector. So there is confidence. I can see why CCS investors lost confidence, but across the piece, where the Government has set out very clearly the sectors that it is supporting, investors are coming forward and investing.

Q80 **Philip Boswell:** This is not the forum to go into the other marketplace, but we have just had that list earlier on, which would present a very strong argument that that is not the case. Investors in renewable energy are backing off and are not steady. The goalposts continue to move and there is a lot of lack of investment here. Let's focus on CCS and the lessons learned, particularly in investor confidence. How are you going to ensure that your future decisions do not have a similar impact?

Neil Kenward: On CCS in particular?

Philip Boswell: Yes, or a similar model, which could be nuclear.

Neil Kenward: I guess one of the key learnings from our perspective is the importance of affordability. The Lord Oxburgh report shows that there are different ways that CCS could be pursued that could change the metrics in that way. That is the kind of thing that the Government want to look at, if they decide to proceed with CCS.

Q81 **Philip Boswell:** This is well covered in page 27 of the NAO Report,



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paragraph 2.13. Moving on to Mr Ibbett, what more could you have done to prepare the sector for the risk that the competition would not reach conclusion, given the experiences of the first competition?

Ashley Ibbett: We were very clear with the bidders in the competition, and with the CCS community more widely, that ultimately the Government might choose not to fund any project, having evaluated the bids at the end of the competitive process and decided it was not value for money to do so. We set that out publicly, and when we signed the FEED contracts that formed part of our press notice. I understand clearly that the CCS sector was disappointed by the decision, understandably, but it was always clear that we might not go ahead with either project.

Q82 **Philip Boswell:** How are you ensuring that investor confidence will not be similarly damaged in future in the lessons learned from this? We see the same lessons not learned and the same mistakes made. We are seeing similarities between the first and second competitions. Okay, there is some risk mitigation in that there is investment by the Government, but what more can you do?

Ashley Ibbett: We took time to learn lessons from the first competition and we acted on all the recommendations in the NAO's Report on that competition in building the second competition. We are talking closely to the CCS community as we consider what our future approach might be. Indeed, Ministers have held a roundtable with the CCS sector fairly recently to try to gauge an understanding of where they are at. There is still enthusiasm in the CCS sector and we will be wanting to set out our thinking in due course.

Q83 **Philip Boswell:** Mr Chisholm, this is about working with the Department for Business, Energy and Industrial Strategy and going forward for CCS. Unless CCS appears in the industrial strategy, is it finished?

Alex Chisholm: As I said, we expect CCS to be covered in the emissions reduction plan. That is going to be one of the flagship initiatives of the Department this year. That is where I would look to for further guidance on the Government's plans.

Q84 **Chair:** Just to be clear, it is emissions reductions rather than industrial strategy. Mr Boswell was asking about wider Government industrial strategy.

Alex Chisholm: As I tried to indicate earlier with my remarks on your own question, Chair, the prime reason for pursuing CCS would be around achieving our decarbonisation objectives. It might have some incidental additional industrial strategy benefit.

Chair: Now that energy and climate change are within the one Department [*Interruption.*] You thought you were being saved by the bell there.

Chris Evans: I think it was the Chancellor ringing up.

Q85 **Chair:** Now you have the chance to grapple with this and be the champion

in Whitehall for saying we can have a really proper green industrial strategy, which was seriously lacking over the previous Parliament.

Alex Chisholm: I absolutely agree that we do see great potential in the development of green technologies more generally. By bringing it together in a single Department, we can look at the impact right across the economy, including the industrial sector, as mentioned earlier, as well as in energy generation.

Of course, that also means we need to consider the impact on businesses and consumers and on businesses' competitiveness. Clearly, any costs incurred through pursuit of projects such as this do end up being paid by business or consumers in the end, so we need to weigh that up in the overall consideration.

Chair: The consumer and the taxpayer being the same people.

Philip Boswell: I have a comment, Mr Chisholm, on flagship initiatives. Sticking a flag on it did not do much good for the green homes scheme, to be quite honest. So that does not give me any faith that there is a flag on anything. I know this is an area that Caroline wants to follow up on.

Q86 **Caroline Flint:** Obviously, £168 million was spent on the two CCS competitions. Mr Chisholm and Mr Ibbett, what lessons have you learned from implementing those two competitions? How are you going to salvage anything from the £168 million that the Department spent?

Alex Chisholm: I think Mr Ibbett has said that the second competition did reflect the NAO Report very thoroughly on the first one, so lots of lessons were learned from that. In particular, there was a much clearer allocation of risk, clearer funding up front and I thought that we should not go too narrow too quickly. So, the second competition was superior and based on experience of the first.

If we were to do another competition, clearly we would have to sit down with potential industry partners and investors to see what is best. The situation continues to develop; I do emphasise that. This is a very hot area of technological development. What we have tried over the past few years, unsuccessfully so far, is to try to find a way to introduce CCS into the UK in an economic fashion.

We obviously remain very hopeful that a way will be found to do so. As you have pointed out, most independent projections suggest that CCS will be necessary in the UK, so we are focusing on trying to find ways to do that at lower cost. That is what all this research and innovation effort is about.

Q87 **Caroline Flint:** Would you agree that we do have big projects, such as Crossrail, the Olympics, High Speed Rail, that are nationally important? Some have said that one of the learnings from these two competitions on CCS is that it is important that the Government plays a bigger role in retaining overall full-project risk initially, while letting private sector companies compete to provide the component parts. We have other



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models where Government has done that. Wouldn't that suggest it is worth looking at for CCS?

Ashley Ibbett: It is worth bearing in mind that, although the competition did not conclude, I am confident that we would have received bids at the end of that process. In a way, the model we developed through the competition was working in terms of enabling those projects to get to a point where they would be able to take final investment decisions.

The balance we were trying to strike with a new, untried technology of scale in this country was the balance between loading risk on to the taxpayer and consumer, and allowing the private sector to manage the risk it is best placed to do.

Q88 **Caroline Flint:** To be honest, I don't take much assurance from what you have just said. You are saying, Mr Ibbett, that you were very confident that these two projects could deliver. That is what you seem to be suggesting—we can check the record—but the rug was taken away at a critical point and the indicators are that that work has disbanded.

Although there has been, particularly from the second competition, some public sharing of information to other interests involved in this area of technology, other learning could be lost as these project teams disband. You were on the cusp, and then the money was taken away. I wonder how much more that decision is going to cost the taxpayer and the bill payer. You are saying it could have been successful and it could have been happening.

Ashley Ibbett: I am saying that I think the competition would have put forward bids—

Q89 **Caroline Flint:** So you are basically saying we would potentially have had a shovel-ready project.

Ashley Ibbett: We would obviously had to evaluate bids—

Q90 **Caroline Flint:** But you just said that you felt that those two were at that point and could have gone forward.

Ashley Ibbett: Certainly, at least one of the projects—

Q91 **Caroline Flint:** So we would have had a shovel-ready project. We have mentioned the emissions reduction plan. How are you going to ensure that the benefits and the opportunity for the industry and domestic heating are much more part of a co-ordinated strategy?

Alex Chisholm: That is indeed a good question.

Caroline Flint: Because those are wider value benefits.

Alex Chisholm: One of the consequences of the passage of time since this series of CCS projects have been under way is that the mix of which technologies you would want to apply has changed over that time. As I said before, we are using less coal at the moment. There is the prospect of using no coal after 2025. We are continuing to invest in gas, which clearly



seems to play a part in it. We are building our first new nuclear plant for a generation. The mix within the energy sector alone of which technologies might be used and how big the opportunity is has changed and will continue to change.

Across the rest of the economy, we see sectors such as steel, ceramics and chemicals all potentially being good, strong markets for CCS. In the oil and gas sector itself, in north America one of the major uses of CCS is to get more oil and gas out. That is also a function of the new project that has just finally received the investment decision in China, in Yangzhong.

- Q92 **Caroline Flint:** You have outlined the potential advantage of all these other areas benefiting from a project that provides this answer on CCS technology. Would you agree that in all those sectors you talked about—steel, ceramics and others—they are hardly going to invest or get ready for this unless we have a flagship project that is going to give them confidence to invest and make adaptations to their own industries?

Alex Chisholm: Certainly, big projects that work in the UK would be very encouraging. You also need to look at the overall regulatory regime—things like a carbon tax would make a difference to the extent to which the industry felt it paid them to invest in this technology.

I emphasise again the international perspective. When we look at other renewable technologies, such as solar and offshore wind, it has not been about the technology and the first-of-a-kind projects. It was when they hit real, large-scale roll-out that the costs came down dramatically in both those cases. We are getting the benefits from that.

For the CCS technology cost to come down dramatically, it probably won't be only because of what happens in the UK. It will be because of what happens in the very large markets—particularly north America, where two thirds of the projects are at the moment, and China, which will in the future probably be the largest energy market. The fact that they have just committed to CCS is a significant development.

- Q93 **Caroline Flint:** You make a very good point about solar and wind. We lost the opportunity to develop onshore wind in the '80s. As a result, although we have more onshore wind than ever before, we lost the supply chain into it. Both for solar panels and turbines, it is still the case that most of that is imported from elsewhere. That is the danger of missing an opportunity.

Alex Chisholm: Every country finds its own way to achieve its optimal mix of energy. We have focused on offshore wind, and in offshore wind we are now the largest market.

- Q94 **Caroline Flint:** But it was a missed opportunity when, in the '80s, we didn't get behind the onshore wind technology, when we could have. We are apparently the windiest country in Europe, and we didn't do that. This is another missed opportunity on CCS.

Alex Chisholm: I suppose I am focusing on what we can do now. We are making the most of the opportunities in offshore wind.



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Q95 **Caroline Flint:** I am talking about learning the lessons.

Alex Chisholm: There is now a strong supply chain developing in the UK, and a lot of investment is happening in different parts of the country.

Q96 **Caroline Flint:** From a very low base, compared with other countries.

Alex Chisholm: The local content is going up dramatically. It is now heading towards 40% or 45%.

Q97 **Caroline Flint:** Okay, but you acknowledge that there are other countries in the world—we have a list of them here—that are already setting up their own CCS businesses and technologies. It is happening around the world. A number are very similar to what we might have been wanting to pursue with projects here in the UK, so we are already behind, aren't we?

Alex Chisholm: They are mostly trial projects, and as many have been cancelled as have received positive final investment decisions.

Chair: Notwithstanding that, there are a number going ahead, as Ms Flint has highlighted. The danger is that DECC keeps missing the boat—or DECC did. Now that it is in BEIS, we hope it will not happen anymore.

Q98 **Philip Boswell:** I have two final questions—one for Mr Ibbett and one for Mr Chisholm. On investor confidence, the industry has put its own money into these projects, as well as the Government. Do you believe that the industry would be willing to invest in CCS again in the light of this experience?

Alex Chisholm: First of all, as you say, the industry has put its own money into it, but a lot of taxpayer money also went into it. As has been pointed out, £100 million was spent on this project. I think £29 million of that went into the front-end engineering design. My point is that companies recovered a lot of cost during that first phase of the project.

Whether the same companies would come together at this point in time is something we would have to explore. As my colleague Mr Ibbett mentioned, we had a roundtable, which was quite positive. There is a lot of interest. Clearly, quite a number of companies participated, alongside yourself, in the excellent report from Lord Oxburgh, so that is promising as well. There is a prospect that companies will come again.

The overall environment for investment in this sector has been strong. We have a number of proven tools that are working very well, such as the capacity auctions. We have a big new contract for difference auction coming up in offshore wind next month, where there has been a lot of interest. I am very positive about that. There has also been strong private sector interest in the Green Investment Bank, which we mentioned before, and, in the shape of Hinkley, we had the biggest investment decision that there has been in any single year for decades.

So if you look at the overall picture, there is a lot of investment happening in UK energy. We need a lot of investment, for increased capacity and reliability, but also to achieve our decarbonisation goals. As a Department,



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we are committed to making sure we continue to receive that positive investment.

Chair: Maybe Mr Kenward could comment on that, too.

Neil Kenward: On the importance of—

Q99 **Chair:** Investor confidence. The stop-start approach does not inspire confidence, does it?

Neil Kenward: Looking back to 2015, as I have explained, the Government had to take fast steps to prevent excessive overspend on the levy control framework. It was very important that that happened. We all know how these costs can add to bills, so it was very important that we took fast steps then, but the fact that that overspend was forecast was a reflection of the strength of the sector and the speed with which it was growing. It was getting to its end-of-decade targets far earlier than we had forecast, and it was therefore sensible to curb that growth.

Q100 **Chair:** If you remember, Mr Kenward, we were rather critical of the forecasting. You can say you took a great decision, but wasn't it because there was a problem earlier down the line, where those decisions were not well worked through?

Neil Kenward: Of course, as we discussed in the previous session, we are learning lessons on how to strengthen the forecasting methodologies. This is inherently—

Q101 **Caroline Flint:** You're meant to be Treasury, aren't you? I'd have thought that forecasting should be your top skill.

Neil Kenward: It is a core skill, but it is inherently uncertain. I think colleagues here would agree that this is a very difficult area to forecast. The rapid reduction in the cost of solar panels, for example, has come faster than anyone expected, but that presents a great opportunity, because now we can make a transition to the point at which they can come forward without public subsidy.

Q102 **Chair:** We have seen a bit of a pattern, haven't we? You are talking to two people who shadowed the portfolio for five years, and we saw the pattern of supply increase and then changes to policy to try to dampen it down constantly. I am amazed that anyone bothers to invest in the sector, given the uncertainty and swift changes in Government policy—mostly driven from the Treasury, Mr Kenward. You rightly have to watch public money, but it is that forecasting early and a lack of prediction of the market—

Caroline Flint: And harmony between the two Departments in your methodology and how you pursue these projects.

Neil Kenward: The Government have learned collectively from that experience, and we have moved away from the demand-driven schemes that were initially used to bring forward the industries. We have now



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moved to contracts for difference, where the Government have much clearer control over the scale of deployment that comes forward.

Q103 Philip Boswell: Finally, I will pull a few strands together. Mr Chisholm spoke about the industry and its general belief that CCS is a very important feature of emissions reduction, but I am not alone in being concerned about the sincerity regarding meeting our obligations for carbon emissions reduction and those targets. As previously stated, the Committee on Climate Change reported on the additional cost of inaction on CCS to UK consumers, for whose benefit this decision allegedly was made. It put the additional cost of not using CCS at £1 billion to £2 billion a year in the 2020s, rising to £4 billion to £5 billion per year in the 2040s, if we are to hit our carbon emission targets. The billion-pound-and-growing question, Mr Chisholm, is whether the Department has a cost-effective, workable plan for national carbon reduction that does not involve CCS.

Alex Chisholm: I emphasise that the Department and the Government as a whole remain very committed to meeting our obligations under the Climate Change Act. As you know, last summer we adopted the fifth budget from the Climate Change Act. We have also signed up to the Paris agreement for international obligations.

Q104 Chair: We have signed up to the obligations, but how are we going to deliver that?

Philip Boswell: And then we leave Europe.

Chair: Yes, there is that, too.

Alex Chisholm: The range of measures that we can take as a Government, right across the economy, to achieve our decarbonisation obligations will be set out in the emissions reduction plan, so you will get very clear evidence there of our sincerity.

Q105 Chair: When are we going to get that?

Alex Chisholm: I can't give you a definite date.

Q106 Chair: We never expect a definite date from the civil service, but roughly—spring, summer, after recess, before summer recess?

Alex Chisholm: I wouldn't like to hazard a forecast.

Q107 Chair: We were just talking about poor forecasting. Give us a clue, Mr Chisholm, please. By the end of the year?

Alex Chisholm: What Mr Hurd has said is that we are very keen to get the plan out as early as we can, clearly not only for transparency reasons but also—

Q108 Caroline Flint: What about this year?

Alex Chisholm—for public confidence, and also so that people can begin to act in relation to that plan. Did you say this year? I would expect it to be this year, yes.



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Q109 Chair: Behind that, there will be work done laying out all the programmes you expect to deliver. Let's face it: we have seen Green Deal fail, lots of challenges with solar, and the issues around wind that Ms Flint has highlighted, and around the levy control framework. It is not great. We need to know that there is stuff behind that. Will there be a plan behind that reduction plan?

Alex Chisholm: Absolutely. Although you have highlighted some of the areas that have not worked very well, overall, as I have emphasised, we are absolutely on plan for carbon reduction. In fact, we are slightly ahead of the plan, if you look at the budgets that we are given by the Climate Change Committee.

What the Government said in its industrial strategy, published in January, is that we are going to continue to observe fully our statutory and other obligations, but we want to try to find the lowest cost way to achieve that, looking right across the economy and at all the available technologies.

Q110 Chair: It is tempting to go on, but we are going back to our previous roles. Thank you again for coming at short notice. I finish by saying again that we are concerned about the amount of money being thrown at failed schemes.

We are watching your Department, Mr Chisholm. When it was DECC, there was a series of things that, frankly, Ms Flint and I saw then—and were calling out from the Opposition—that we are seeing now. We are now seeing, as proof of the NAO's work, failures. The Green Deal did not work and we have seen problems with this. We are watching your energy projects. Although it is now in one big Department, we will be watching and calling you back on these issues. Be warned about that.

Alex Chisholm: We welcome your scrutiny.

Q111 Chair: We will work with our sister Committees on this as well, of course. I have two final questions for you, Mr Chisholm. Do you think you have got the skills in the Department necessary for these big projects? These machinery of Government changes mean you get an interesting group of people moving into a new Department. Were the skills there when DECC was set up? We have seen some problems suggesting that perhaps they were not. How are you making sure that you have the right skills set to develop these major projects and convince Treasury that they should be funded?

Alex Chisholm: First of all, we invest a lot in developing our own skills. We have a number of very able people managing large projects, and a lot of training goes into that. We also recognise that with these very big projects, especially those in quite specialised technical areas, we do need to draw on experts from outside. We bring them in on secondment. During this particular project, we seconded somebody as the expert programme director, who came in alongside Mr Ibbett, to ensure that we managed it as well as we could.

We obviously also rely heavily on external advice. We had engineers working for us and financial and legal advisers on that project. It is not



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even just this Department: we work very closely with the Infrastructure and Projects Authority and the Treasury. Cross-Government scrutiny is now very much given to these very large, high-value and important national projects.

Chair: We constantly look at skills across Government, so it is your opportunity to tell us if you think there is anything we need to work on there. I thank you again for coming. The uncorrected transcript will be on the website in a couple of days, and you will be sent a copy. We will produce our report at some point after the Easter recess.