National Audit Office

Briefing
for the House of Commons
Environmental Audit Committee

HM Treasury

Sustainability in the spending review

JULY 2016

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Contents

The National Audit Office study team consisted of:
Simon Bittlestone, Andrea Demurtas, Tom Glithero, Katy Losse and Angie Macarthur, under the direction of Michael Kell.

This report can be found on the National Audit Office website at www.nao.org.uk

For further information about the National Audit Office please contact:

National Audit Office
Press Office
157–197 Buckingham Palace Road
Victoria
London
SW1W 9SP

Tel: 020 7798 7400

Enquiries: www.nao.org.uk/contact-us

Website: www.nao.org.uk

Twitter: @NAOorguk

Summary

1 This briefing responds to a request from the Environmental Audit Committee that we review how the 2015 spending review took account of environmental issues. The Committee asked us to assess whether the spending review acted as an effective medium- and long-term planning tool in relation to government's environmental protection and sustainable development objectives. In particular, whether it fully took into account the best available evidence on long-term environmental risks, and the UK's legal commitments on biodiversity, air quality and carbon emissions. The Committee's interest in the spending review forms part of their inquiry into sustainability at HM Treasury.

2 Sustainability is a long-running agenda in political and civil society, which developed from concerns about achieving social and economic development alongside environmental protection. This government does not have a separate strategy for sustainable development, but it does have a wide range of environmental and sustainable development objectives, including to reduce greenhouse gas emissions by at least 80% from 1990 levels by 2050; to keep levels of airborne pollutants within specified limits; to help halt the loss of biodiversity within the European Union by 2020; and to develop a 25 year plan for the natural environment in the UK.

3 Spending reviews are key political and fiscal events. HM Treasury carries out spending reviews to allocate funding across the government's priorities, set firm spending limits and define the key outcomes the public can expect the government to achieve with its resources. It is the government's main tool in planning medium-term expenditure. The last spending review took place in November 2015. It allocated almost £2 trillion in departmental spending, and another £2 trillion in welfare and benefits payments, over five years. It also set out £12 billion of net budget savings through cuts in department's resource spend.

4 We assessed how the spending review took account of environmental issues using a framework based on insights from our previous work, containing principles for a 'good' medium term budgeting framework. Our fieldwork focused on the two government departments with lead responsibility for the environment: the Department for Environment, Food & Rural Affairs (Defra) and the Department of Energy & Climate Change (DECC), and on the Department for Transport (DfT), given transport policies can have significant environmental impacts. We also reviewed the decision to cancel a competition for Carbon Capture and Storage technology, one of the largest capital spending decisions taken as part of the spending review. Finally, we assessed the consideration of environmental issues in Single Departmental Plans and their role as a part of accountability arrangements following the spending review.

5 The briefing is divided into four parts:

- Part One explains the **significance** of the spending review for meeting government's environmental objectives.
- Part Two assesses how effectively HM Treasury **designed** and **implemented** the spending review to ensure environmental issues were considered.
- Part Three reviews the potential **impact** of spending review decisions on government's progress against environmental targets, to the extent that it can be known at this stage.
- Part Four examines the Carbon Capture and Storage competition bid and cancellation decision as a **case study**.

6 This briefing links to and draws on wider value-for-money studies we are undertaking on the 2015 spending review and on Single Departmental Plans, which are to be published shortly.

Key findings

Significance

7 The spending review is one part of a wider set of decision-making processes which together will determine whether government meets its environmental objectives. The spending review is not the only factor that will determine government progress against environmental objectives. Many environmental objectives are met largely or partly by legislation, regulation or taxation rather than spend. There are separate decision-making processes for reviewing government's approach to specific environmental targets, some of which ran concurrently with the spending review (paragraphs 1.2 to 1.6).

8 That said, spending reviews are significant for meeting environmental objectives because they allocate high-level budgets to departments and provide an opportunity to engage senior decision-makers in reviewing priorities across government. Spending review decisions significantly influence the budgets available to departments to fund environmental projects and to staff the public bodies responsible for enforcing environmental legislation or advising on environmental protection. A spending review is a significant occasion for government departments to review priorities and operational planning for the Parliament and therefore can impact on the scale or type of tax and regulatory levers needed. As such, the 2015 spending review was an important opportunity for HM Treasury to encourage a coordinated approach to meeting environmental targets (paragraphs 1.4 and 1.7 to 1.10).

Design and implementation

9 **The design of the spending review gave departments the scope to put forward information on environmental risks, impacts and obligations as part of their bids and HM Treasury took steps to encourage departments to do so.** HM Treasury asked Defra, DECC and DfT to provide a summary of the impact of their bids on carbon targets and advised their teams facing spending departments to consider climate change, energy, fuel poverty and air quality legislation while assessing departmental bids. HM Treasury expected departments to make use of the *Green Book* (a guide to appraisal and evaluation, including quantification and monetisation of environmental impacts) when preparing the value-for-money case for their bids (paragraphs 2.2 and 2.3).

10 **During the spending review, our case study departments provided relevant environmental information to HM Treasury.** HM Treasury told us that Defra in particular had improved the way it made the case for its spend on natural environment objectives and was better placed to quantify the associated benefits than in the 2010 spending review. Our review of 10 of the 112 capital bids found that environmental benefits were highlighted where this was the primary purpose of the project, and a range of environmental impacts were included in calculations of the cost–benefit case, though some tangential environmental impacts were not flagged in the bid summaries submitted to HM Treasury (paragraphs 2.3 and 2.4).

11 **There was clear improvement in the coordination of consideration of environmental issues across government compared to the 2010 spending review.** There were no coordinated bids relating to the environment in the 2010 review. In 2015, there was a coordinated bid relating to air quality and for projects intended to address issues relating to carbon reduction, such as the Office for Low Emission Vehicles and the International Climate Fund. HM Treasury identified the departments with the most material impacts on carbon emissions, requested and received a ‘carbon return’ from each, and collated this information to assess the cumulative impact on carbon budgets. We also saw evidence that spending proposals drew on existing cross-government coordination. HM Treasury linked in to the Inter-Ministerial Group on Clean Growth which was developing a new air quality plan at the time of the spending review, and HM Treasury delayed parts of the settlements to ensure alignment with the developing plan. Treasury officials also attended senior and working level groups involved in planning for carbon budgets at which the spending review was discussed (paragraphs 2.5 and 2.6).

12 **Nevertheless, HM Treasury did not make the most of the opportunity to encourage departments to work across government on environmental issues.** The spending review is still largely a bilateral process between HM Treasury and individual departments. HM Treasury could have done more to establish strong incentives for collaboration on environmental matters. For example, by signalling to departments that it would review carbon reduction proposals as a package, and by engaging more extensively with cross-government groups involved in planning for carbon budgets to do so. While not as critical as for air quality and carbon, a cross-government view of the impact of the spending review on biodiversity might have brought to light useful information on the cumulative impact of bids on habitats and wildlife preservation, and might have prompted greater collaboration between departments on biodiversity issues. HM Treasury could have made more use of the expertise that resides in independent statutory advisory bodies on the environment to scrutinise bids and test the combined merits of proposals (paragraphs 2.7 and 2.8).

13 **HM Treasury raised concerns about the merits of the carbon capture and storage competition given fiscal constraints, but neither DECC nor HM Treasury quantified the cost of delaying large-scale deployment of the technology.** HM Treasury agreed with DECC that carbon capture and storage (CCS) is required to meet decarbonisation targets in the long run, particularly for heavy industry. But it considered that the competition was aiming to deliver CCS before it was necessary and cost-efficient to do so. It also argued that the costs to consumers would be high and regressive, and the further investment required to expand CCS could not be guaranteed. DECC made a business case for CCS by comparing costs of meeting carbon targets with CCS to costs without CCS. However, the likely impact of the cancellation is a delay in CCS technology deployment: DECC did not quantify the costs but was clear that CCS deployment would be delayed until 2030 (Case study Part Four).

Impact

14 **The signs at this early stage are that spending review decisions will have a mixed impact on achievement of environmental targets.** The impact of the spending review on achievement of environmental and sustainability objectives is difficult to assess, particularly as departments have not finalised the design of policies, nor agreed much of the detail of funding allocations. We consider that the following are the most relevant indicators of impact at this stage: spend allocated for environmental objectives; government's own analysis of the impact of bids on carbon, air quality and biodiversity targets; and the quality of success and monitoring measures as set out in Single Departmental Plans (paragraphs 3.1 and 3.2).

15 **Following the spending review, departments with lead responsibility for the environment will be implementing substantial efficiency programmes alongside environmental policy work.** The 2015 settlements represent a cumulative resource budget reduction in real terms of 16% for DECC and 15% for Defra from 2015-16 to 2019-20, the sixth and seventh highest reductions among the 17 major departments respectively. Departments' plans are yet to be worked through but are likely to affect staff numbers in environmental areas. Implementing these efficiencies effectively will be critical to success against environmental targets. Spending review settlements included conditions to ring-fence funding for a number of projects and programmes expected to play a key role in achieving environmental targets, such as for national parks and public forests, low carbon innovation, and heat networks (paragraphs 3.3 and 3.4).

16 **HM Treasury took the valuable step of preparing a provisional analysis of the impact of the spending review on medium term carbon budgets.** Government's emissions projections published just before the spending review announcement forecast government was not on track to meet its carbon target for the mid 2020s (the fourth carbon budget, 2023 to 2027), with a gap of around 10%. Treasury analysis during the spending review concluded that bids would make a positive contribution to meeting carbon budgets, but might increase the gap slightly compared with the future assumed policy contributions already built into forecasts. However, it considered that there was scope to meet the gap through non spending measures or future fiscal events in advance of the start of the fourth carbon budget (2023). More recent analysis suggests that spending review bids may have improved the expected policy contribution to emissions reductions though a substantial gap remains. The next DECC emissions publication will include an updated assessment of the impact of spending review decisions. (paragraphs 3.5 to 3.8)

17 **Cancelling the CCS competition may affect the costs of meeting long-term carbon targets.** Cancelling the CCS competition will delay the large-scale deployment of this technology: independent government advisers believe that an early programme start would reduce the cost of meeting long-term targets, beyond the fourth and fifth carbon budgets (paragraph 4.17).

18 **The government considers that spending review decisions are consistent with meeting air quality targets in the shortest possible time frame.** Defra published a National Air Quality Plan in December 2015 which takes into account decisions made during the spending review. It expects these plans to bring the UK into compliance with EU requirements by 2025 for London and 2020 for the rest of the UK (paragraphs 3.9 and 3.10).

19 **The government considers that settlements are consistent with meeting biodiversity objectives.** Consideration of biodiversity during the spending review focused on Defra as it holds most of the policy levers. Defra and HM Treasury do not consider that spending review decisions in other government departments would have a material effect on government's ability to meet biodiversity objectives (paragraph 3.11).

20 **The role that Single Departmental Plans (SDPs) can play in improving public accountability over environmental commitments is limited.** Departments developed SDPs alongside the spending review as part of their reporting and monitoring processes, with the goal of improving clarity and accountability around strategic goals. The plans include some environmental commitments, primarily for departments' core responsibilities, but there is a lack of clear targets or time frames and there are some notable omissions in the public SDPs. For example, the DECC SDP makes commitments relating to carbon reduction, renewable energy and energy efficiency, but does not clearly refer to the potential wider impacts of the energy sector on air quality or biodiversity. Departments have developed more detailed internal plans but these do not entirely address the weaknesses in the public versions (paragraphs 3.12 to 3.14).

Issues the Committee may wish to consider:

- HM Treasury's responsibility for encouraging cross-government working on environmental issues and the part that spending reviews should play.
- The scope for more strategic collaboration with independent advisory bodies in future spending reviews.
- HM Treasury's role in reviewing departmental funding's consistency with achieving environmental targets, during spending reviews and throughout the Parliament.
- How HM Treasury assessed the strategic case for delaying public sector investment in carbon capture and storage technology as part of the spending review, and how HM Treasury will support DECC in developing a new strategy for development of carbon capture and storage technology at scale.
- The adequacy of the coverage of environmental issues in Single Departmental Plans and how reporting against the plans can best support accountability to Parliament on environmental targets.

Part One

The significance of the spending review for meeting environmental objectives

1.1 In this part of the briefing we:

- explain the purpose of the spending review;
- give an overview of the extent to which government's environmental targets are met through government spending; and
- set out our view of what 'good' consideration of environmental issues in the spending review would look like.

The purpose of the spending review

1.2 Spending reviews are important political and fiscal events, led by HM Treasury, which set multi-year budgets for departments.[1] They set firm limits on spending and define the outcomes that the public can expect the government to achieve with its resources in the medium term. In 2015, the spending review allocated almost £2 trillion in departmental spending, and another £2 trillion in welfare and benefits payments, over five years. It was a significant logistical exercise, involving a wide range of teams across HM Treasury and departments.

1.3 Since 2010, spending reviews have focused on fiscal consolidation, and the announcement of the 2015 spending review highlighted its main purpose as identification of the savings required to eliminate the deficit by 2019-20. The Chancellor subsequently announced that the spending review had identified £21.5 billion of gross resource spending cuts to 2019-20, £9.5 billion of which was to be reinvested in the government's priorities.

1 Comptroller and Auditor General, *Managing budgeting in government*, Session 2012-13, HC 597, National Audit Office, October 2012, paragraph 1.7.

1.4 The spending review is the start of the process of allocating spend in order to meet government priorities during the course of a parliament. It determines budgets at a high level, setting annual departmental expenditure limits for resource expenditure (eg administration costs and day to day running of services) and capital expenditure (investment). Other than ring-fenced funding, departments can use allocated funds according to their own priorities, providing they meet the conditions in their settlement letter. Departmental allocations are reassessed each year, through fiscal events (Budget and Autumn Statement) and the Estimates processes. However, past spending reviews have shown a close correlation between departmental allocations and actual spend.

The government's sustainable development and environmental protection objectives and the role of public expenditure

1.5 Sustainability is a long-running agenda in political and civil society which developed from concerns about achieving social and economic development alongside environmental protection. This government does not have a separate strategy for sustainable development, but it does have a range of related objectives, stemming from manifesto commitments and national strategies as well as UK legislation, European Directives and international conventions. 'Sustainability' covers a wide range of policies, but for this briefing we focus on three: decarbonisation, air quality and biodiversity. Government has several approaches available to support these objectives, including regulation, taxation, and public spending (**Figure 1** overleaf).

1.6 The spending review is only one part of wider processes examining cross-government environmental impacts. It required coordination with several ongoing environmental planning processes such as the development of the fifth carbon budget (set at the end of June 2016) and the development of new air quality plans (published in December 2015) (**Figure 2** on pages 14 and 15). Some cross-government priorities are coordinated through ministerial-led Implementation Taskforces, however there is no taskforce for sustainability. There is, however, a cross-Whitehall Ministerial Group on Clean Growth, which considers sustainability issues.

Figure 1

Government's approach to its main sustainable development and environmental commitments and targets

	Carbon	Air Quality	Biodiversity
Significant Commitments	**Climate Change Act 2008:** commits UK to 80% reduction in greenhouse gas emissions by 2050 (from 1990 levels). It established a process of interim carbon budgets, which must be set no later than 12 years in advance of the period to which they relate. **EU Renewable Energy Directive 2009:** requires the UK to generate 15% of energy from renewable sources by 2020.	**EU Ambient Air Quality Directive 2008:** set annual limits for airborne pollutants in urban areas, to be met by 2010. **Air Quality in the UK:** plan to reduce nitrogen dioxide in 38 zones where air quality issues have been identified. Submission of a national plan was required by the Supreme Court following failure to meet the Air Quality Directive.	**Biodiversity 2020:** Defra plan linked to achieving the Convention on Biological Diversity's Strategic Plan and its Aichi Biodiversity Targets. The Aichi targets represent aspirations for achievement at the global level, and a flexible framework for the establishment of national targets. **25 year plan for the environment:** plan announced in response to Natural Capital Committee report, currently under development.
The role of regulation	DECC projections indicate that regulations are the most significant contributors to government plans to meet carbon budgets. These regulations include, for example, road vehicle efficiency policies and building regulations.	Central Government sets the overall approach to delivering air quality improvements, including through regulatory interventions such as Clean Air Zone legislation. Local authorities take decisions on the granting of permits and planning permission required for projects which may have an air quality impact.	Regulations are used to place requirements on public bodies to consider biodiversity (eg **Natural Environment and Rural Communities Act 2006**) and to support conservation (eg **EU Conservation of Habitats and Species Regulation** 2010).
The role of taxation	The Climate Change Levy aims to promote energy efficiency and reduce carbon emissions. Vehicle Excise Duty is based on carbon emissions.	The London Congestion Charge is a local tax with a potential impact on air quality.	There are currently no taxes supporting biodiversity.
The role of spend	Government spend is used to support carbon reducing technologies. Prior to the spending review this included: • Renewable Heat Incentive; • rail electrification; • grants for ultra-low emission vehicles; and • Carbon Capture and Storage competition.	Government spend provides support to local authorities and to consumers, such as through the Office for Low Emission Vehicles and the Local Sustainable Transport Fund. Spend on major infrastructure can also impact air quality, such as via the Road Investment Strategy.	Funding is provided through the Common Agricultural Policy and through wider investment, such as funding for National Parks.

Source: National Audit Office analysis

Good practice

1.7 We have developed a series of principles that should underpin a 'good' spending review, based on insights from our previous work (**Figure 3** on page 16). In our view, these principles are fundamental to ensuring that the spending review forms an effective part of government's framework for planning to the medium term and beyond, to allow government to make achievable plans, and to understand what it needs to know to stay on track.

1.8 For the environment, this means that a 'good' spending review would be informed by:

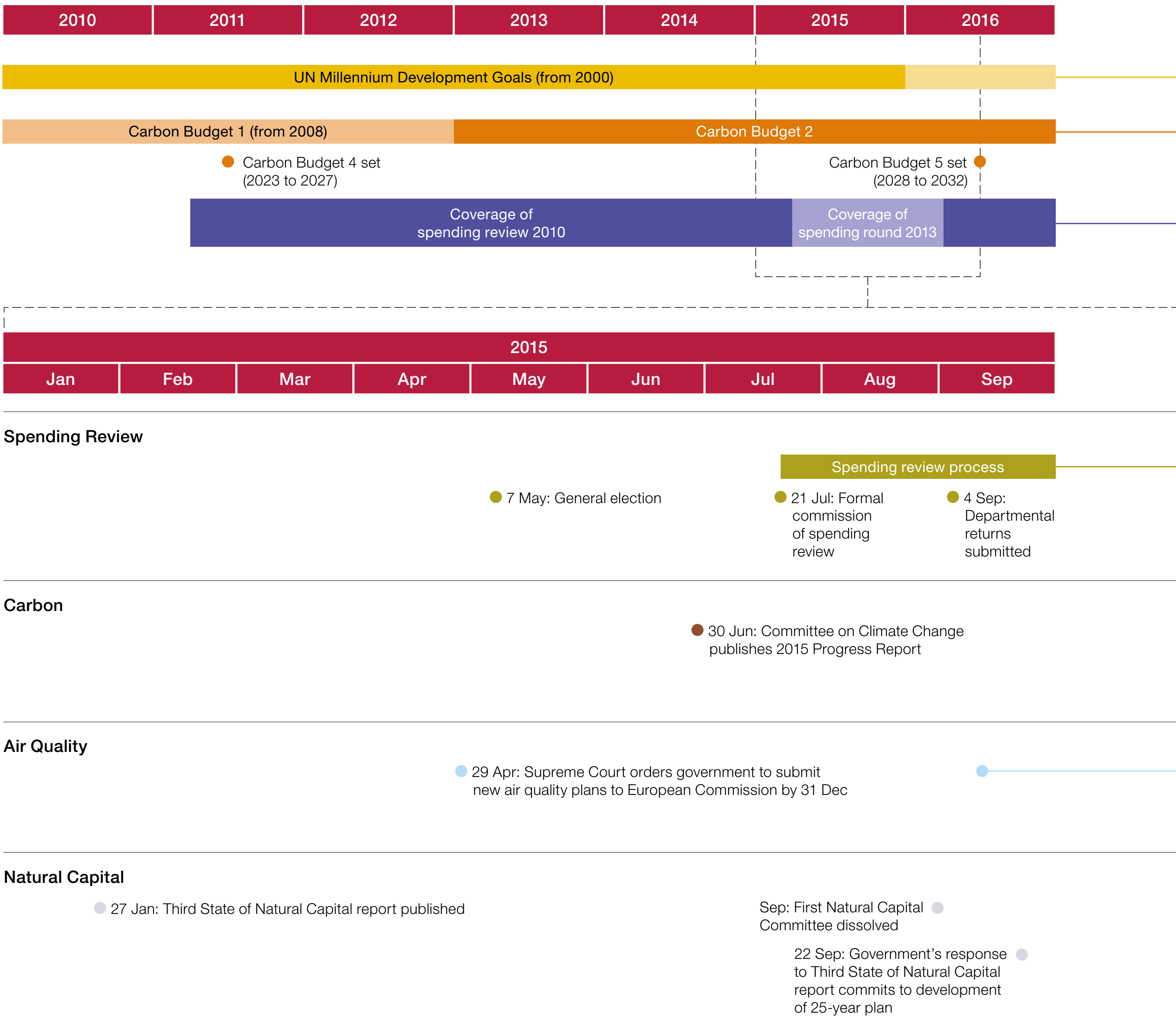
- the best available evidence on long-term environmental risks, including a framework that considers environmental risks/impacts alongside economic and social risks/impacts;
- an integrated view of government activity to meet major environmental targets such as air quality, carbon and biodiversity across organisational boundaries; and
- an awareness and understanding of the potential long-term environmental impacts of decisions made in the spending review.

1.9 It is particularly important that spending reviews promote cross-government coordination on environmental issues. Departments with overall responsibility for environmental issues do not hold all the policy levers which can affect sustainability. Hypothetically, for example, the Department for Transport reducing funding for low emission vehicles would increase the pressure on long-term carbon targets, requiring a response from other departments. These might include increased carbon taxation (HM Treasury responsibility), revised building regulations (Department for Communities and Local Government) or higher consumer funded subsidies for renewable energy (Department for Energy & Climate Change).

1.10 Where one department holds the majority of policy levers, such as Department for Environment Food & Rural Affairs (Defra) for biodiversity, there remains potential for other departments to impact on achievement of the targets. Funding decisions outside Defra with potential impacts on habitat scale and connectivity includes bids for large transport infrastructure projects, and the scale of recurring spend needed to meet local authorities' statutory obligations on biodiversity.

Figure 2

Timeline of the spending review and concurrent environmental actions



Source: National Audit Office

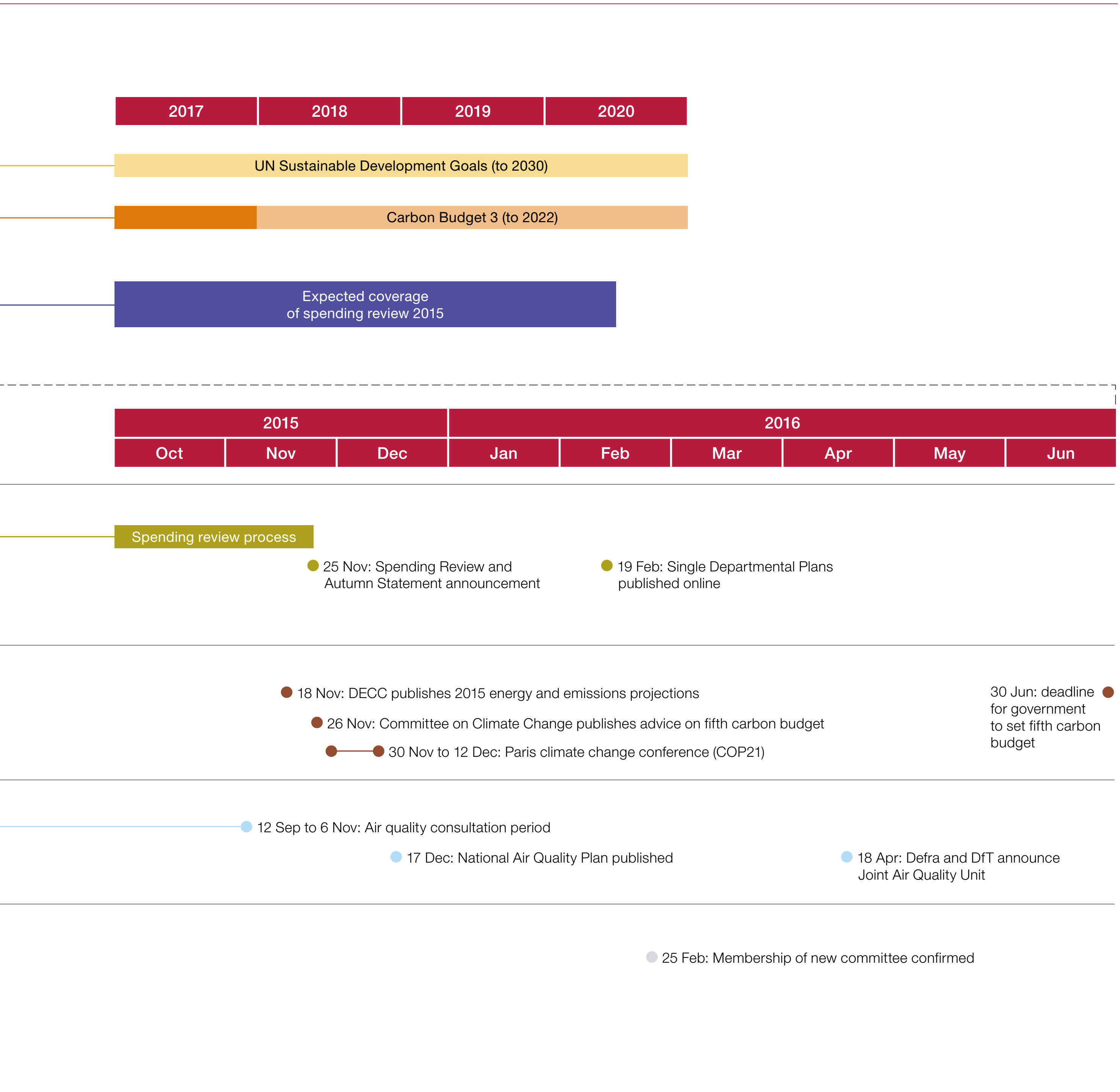
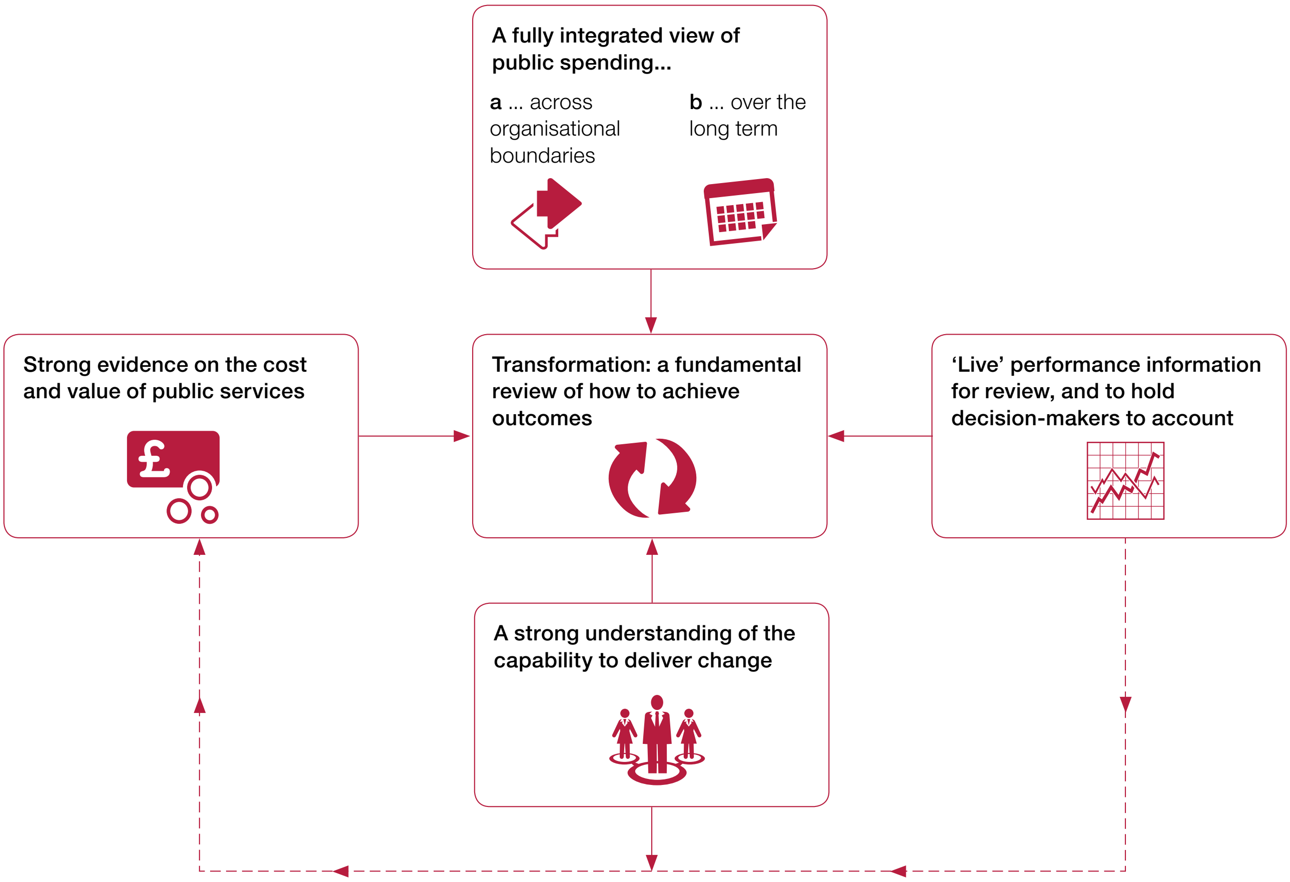

2017
2018
2019
2020
UN Sustainable Development Goals (to 2030)
Carbon Budget 3 (to 2022)
Expected coverage of spending review 2015
2015
2016
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Spending review process
25 Nov: Spending Review and Autumn Statement announcement
19 Feb: Single Departmental Plans published online
18 Nov: DECC publishes 2015 energy and emissions projections
26 Nov: Committee on Climate Change publishes advice on fifth carbon budget
30 Nov to 12 Dec: Paris climate change conference (COP21)
30 Jun: deadline for government to set fifth carbon budget
12 Sep to 6 Nov: Air quality consultation period
17 Dec: National Air Quality Plan published
18 Apr: Defra and DfT announce Joint Air Quality Unit
25 Feb: Membership of new committee confirmed

Figure 3

Principles for making well-informed decisions



Source: National Audit Office

Part Two

Effectiveness of design and implementation

2.1 In this part of the briefing we explain the approach taken by the spending review to environmental issues. We examine the strength of the processes to ensure that the spending review followed good practice through being informed by the factors previously identified (in paragraph 1.8), namely:

- the best available evidence on long-term environmental risks and impacts, including a framework that considers environmental risks and impacts alongside economic and social risks and impacts;
- an integrated view of government activity to meet major environmental targets such as air quality, carbon and biodiversity across organisational boundaries; and
- an awareness and understanding of the potential long-term environmental impacts of decisions made in the spending review.

2.2 HM Treasury took a different approach to agreeing budgets for resource and capital spend (**Figure 4**), and so we consider the environmental evidence that informed each separately. We focus throughout this chapter on our case study departments: the Department for Energy & Climate Change (DECC), the Department for Environment, Food & Rural Affairs (Defra) and the Department for Transport (DfT). We also consider design and implementation in the context of the CCS decision: this is examined in more detail in Part Four.

Figure 4
HM Treasury's approach to assessing resource and capital budgets during the spending review

Resource budgets cover a department's spending on day-to-day resources and administration costs. Departments developed resource bids using scenario planning showing the achievability of 25% and 40% spending reductions against a baseline. This baseline was derived from past spending review settlements, with departments negotiating with HM Treasury to ensure it reflected all recurring spend.

Capital budgets cover a department's spend on investment and things that will create growth in the future. HM Treasury agreed capital settlements from a 'zero base', with departments submitting bids for each proposed capital project using a standard template. A central team at HM Treasury assessed the capital bids and determined the priority projects through a capital ranking exercise, with support from spending teams and an expert panel. The team ranked projects for each department by their net present value (NPV) divided by the total cost over the life of the project. This formed the basis of decision-making, alongside the bid narrative, covering impacts which could not be monetised, and engagement with departments to determine priorities and the overall capital budget envelope.

Source: National Audit office

Use of environmental evidence

2.3 Although HM Treasury did not explicitly direct departments to consider environmental impacts during the spending review, the design of the spending review gave departments the scope to put forward information on environmental risks, impacts and obligations as part of their bids and HM Treasury took steps to encourage departments to do so. We found that case study departments provided relevant environmental information to HM Treasury as part of the spending review (**Figure 5**).

2.4 Our survey of finance directors indicates that senior-level consideration of environmental matters was not widespread across government, despite all departments having a potential role in ensuring that their spending review proposals did not mitigate against achievement of environmental objectives. Five of the 14 finance directors that responded to an NAO survey, including DECC and Defra, said that they sought to assess the environmental impacts of their spending proposals on the environment.

Figure 5

The environmental evidence that HM Treasury requested, received and used as part of the spending review

	Environmental information that HM Treasury requested	Environmental information that HM Treasury received	How HM Treasury used that information
Resource bids	HM Treasury guidance did not direct departments to consider environmental impacts despite requiring other impact assessments, such as an equalities assessment (covering protected characteristics such as race, age and gender). However, HM Treasury expects departments to follow the *Green Book* guidance in all appraisal and evaluation which clearly states that assessments should factor in environmental impacts. Before the spending review began, the deputy directors of relevant HM Treasury spending teams discussed environmental commitments and their implications for particular departments. HM Treasury circulated a note to its spending teams to remind them of government targets for carbon, renewable energy, and fuel poverty when evaluating departmental bids.	Our case study departments provided briefings (both written and oral) to explain their environmental priorities, the pressures on them and the areas where savings might be achievable. In particular, HM Treasury told us that the Department for Environment Food & Rural Affairs (Defra) had improved the way it made the case for spending on natural environment objectives since the previous spending review, with clearer and more robust quantification of benefits.	HM Treasury used the information provided by departments as the basis of negotiations to determine the level of spending for the final settlement. We saw evidence that the challenge process included an awareness of the risks to environmental targets. For example, Defra's overview of environmental policies highlighted potential fines from not meeting EU obligations, and HM Treasury were informed of legal and stakeholder concerns during the challenge process. A Treasury internal evaluation template included a section for climate impacts and team leaders were asked to record these impacts there, however, this template was not always used.

Figure 5 *continued*

The environmental evidence that HM Treasury requested, received and used as part of the spending review

	Environmental information that HM Treasury requested	Environmental information that HM Treasury received	How HM Treasury used that information
Capital bids	Guidance issued to departments specifically required use of the *Green Book* for capital bids, which requires monetisation of environmental impacts where possible and gives guidance on highlighting non quantifiable factors. The capital bid template did not prompt departments to consider environmental impacts, but it asked for a narrative explaining the departmental analysis of the project, major assumptions and uncertainties, and delivery risks, as part of which departments could raise environmental issues. HM Treasury requested a carbon return from the departments identified as having a significant impact on carbon budgets.	A sample of 10 capital bids from the 112 submitted by case study departments showed clear communication of environmental impacts that formed part of the primary purpose of a project, and a range of environmental impacts were monetised and factored into net present value calculations. However, secondary impacts were not always highlighted in the bid summary submitted to HM Treasury: • Defra's capital bid for floods monetised benefits from preventing flood damage to environmental sites, but did not assess the potential impact on overall biodiversity, landscape or water quality. HM Treasury told us that such an assessment would not have been feasible as the project pipeline was too uncertain, and that requirements to consider environmental impacts at the project level are sufficient to avoid harm. • DfT's bid for local rail electrification did not highlight the potential benefits for carbon or air quality. HM Treasury told us these were monetised in the underlying appraisal, but this was not clear from the submission.	The inclusion of a range of environmental impacts in net present value calculations allowed HM Treasury to factor these into its ranking exercise. Greater clarity over the secondary environmental impacts of bids may have helped HM Treasury develop its assessment of cumulative environmental impacts across government.

The Carbon Capture and Storage (CCS) case study in Part Four provides an example of the capital process. The bid was based on a comparison of the cost of meeting the 2050 carbon target with CCS against the cost without. As part of the spending review process HM Treasury discussed the impact of cancelling the competition with Department of Energy & Climate Change (DECC). While DECC concluded that this would result in a delay to the deployment of CCS, it did not quantify the financial impact this would have.

Source: National Audit Office analysis

An integrated view of government activity

2.5 HM Treasury's lead role in the spending review meant it was in the best position to carry out a central assessment of environmental issues. It did so for carbon, however, for other issues it looked to departments to determine the need for a coordinated assessment.

2.6 HM Treasury expected that assessment of cross-government issues such as sustainability would be achieved through joint bidding and coordinated work between departments. In practice, coordination of bids on environmental issues was limited and varied based on the extent of existing cooperation between departments (**Figure 6**). Three out of 14 respondents, including DECC and Defra to an NAO survey of finance directors said they considered cross-departmental issues relating to the environment or sustainability. Coordination was, however, a clear improvement on the 2010 spending review when there were no coordinated bids relating to the environment.[2]

2.7 Figure 6 describes some of the informal cooperation and coordinated bidding which took place within or influenced the spending review, and this was rightly encouraged by HM Treasury. However, HM Treasury's submission process remains set up along individual departmental lines, which does not encourage cross-departmental working. There were no formal joint bids for environmental issues. Without the structure of a formal joint bid there may be limits to the accountability of such arrangements. Where informal arrangements are unsuccessful, it will be more difficult for the government to identify how to take the issue forward.

Figure 6

Coordination of major cross-government environmental issues

	What HM Treasury did to encourage a coordinated approach	The extent of coordination in practice
Carbon	HM Treasury drew on a range of evidence to identify that Department for Environment, Food & Rural Affairs (Defra), Department of Energy & Climate Change (DECC) and Department for Transport (DfT) would make the most significant contributions to carbon budgets. It requested carbon returns from these departments so as to analyse the contribution of spending review bids to future carbon budgets. HM Treasury's Energy and Environment Team engaged with Treasury spending teams for departments other than DECC, Defra and DfT. This was to discuss the emissions impacts of departments beyond those with the greatest potential impact. Based on these conversations, HM Treasury judged that bids from other departments would have no material impact on the achievement of carbon budgets, and so did not request carbon returns from them. DECC did not have access to detailed bid information from HM Treasury or other departments to complete its own assessment of cross-government impacts of the spending review before any decisions were made.	DfT's bid for the Office of Low Emission Vehicles was supported by evidence coordinated with Department for Business, Innovation & Skills (BIS) and DECC. The International Climate Fund bid was coordinated between Department for International Development (DFID), DECC, and Defra. BIS coordinated with DECC and Innovate UK to prepare a bid to support energy and climate innovation. HM Treasury used submissions from Defra, DECC and DfT to prepare an advice note to ministers on potential carbon impacts from spending review options. HM Treasury told us that the cross-government analytical group on carbon budgets discussed spending review bids but this was not a formal agenda item and there are no minutes of the meeting. HM Treasury also participated in the National Emissions Board, a group established to provide senior oversight of carbon budget management and national climate policy, which also discussed the spending review. We did not see evidence that HM Treasury engaged with the Board on the specifics of potential bids, nor that it used the Board to help review the combined merits of carbon related bids.

2 National Audit Office, *Managing Budgeting in government*, October 2012. Available at: www.nao.org.uk/wp-content/uploads/2012/10/1213597.pdf

Figure 6 *continued*

Coordination of major cross-government environmental issues

	What HM Treasury did to encourage a coordinated approach	The extent of coordination in practice
Air quality	HM Treasury reviewed Defra and DfT's air quality bids as a single funding envelope. It delayed Defra's final resource funding settlement for air quality until the overall approach for the national plan had been agreed. This helped ensure that the bids represented a coherent package. HM Treasury mainly drew on existing joint working on the development of the national air quality plan to ensure sufficient cross government coordination beyond Defra and DfT. HM Treasury prepared an advice note for ministers on the spending review air quality package, drawing on the results of other cross-government work to explain the costs associated with the proposed approach of mandatory clean air zones. The Treasury spending team for Defra contacted other HM Treasury spending teams to remind them of legal targets and to ask for contact regarding any policies likely to have consequences for air quality. It did not receive any replies to this request and did not follow up to confirm that there really were no policies with potentially detrimental impacts, as it felt existing coordination was sufficient to ensure material impacts were identified.	Defra and DfT submitted a coordinated bid, informed by their work on the national air quality plan. The development of this plan was led by an inter-ministerial group on clean growth, which included representation from departments including Defra, DfT, DECC, Department for Communities and Local Government's (DCLG), Department of Health (DH), BIS, HM Treasury and the Cabinet Office. This briefing does not review whether the extent of coordination to develop the national air quality plan was sufficient. The final settlement letters for Defra and DfT indicate that funding for clean air zones will be managed jointly, with Defra receiving resource funding and DfT receiving capital funding. Any extra costs of compliance are to be met through re-prioritisation within the departments before seeking extra funding from HM Treasury.
Biodiversity	Treasury agreed with Defra's view that cross-government coordination of bids aimed at improving biodiversity was unnecessary as Defra holds the majority of policy levers. HM Treasury saw Defra as responsible for ensuring its bids would enable targets to be met. Defra had and took the opportunity to explain how different spending scenarios for local authorities might affect their ability to meet environmental statutory requirements. Biodiversity was not specifically referenced.	There was no integrated cross-government approach to consideration of biodiversity during the spending review. While not as critical as for air quality and carbon, a more substantive cross-government approach might have brought to light useful information on the cumulative impact of bids on habitats and wildlife preservation, and might have prompted greater collaboration between departments on biodiversity issues. HM Treasury's view is that this would not have brought material added value and that their proposed spending settlement alongside statutory protections will be sufficient to meet biodiversity goals.

Source: National Audit office

2.8 HM Treasury told us that it engaged with expert environmental bodies to inform its approach to environmental issues on the spending review:

- Senior representatives of the Treasury spending team for Defra and DECC met with the Chair of the Natural Capital Committee and the Chief Executive of the Committee on Climate Change during the spending review period.
- The third State of Natural Capital Report from the Natural Capital Committee played a significant role in helping Defra to identify priority areas for environmental investment and in making the case for this spend. This included successful bids to promote environmental restoration.

HM Treasury could have done more to make the most of the expertise that resides in these independent bodies by involving them in scrutinising bids and in testing the summary impact of proposals on targets.

The long-term perspective

2.9 The spending review allocated capital budgets to 2020-21 and resource budgets to 2019-20. However, meeting environmental targets often requires sustained action over a longer period, and/or large up-front investment with long payback periods. For example, approved bids included spending to support energy and climate research that will make future interventions less expensive.

2.10 We found some evidence of consideration of long-term environmental issues within individual elements of the spending review but there was no central assessment of whether the best results for long-term sustainability had been achieved. The clearest example of HM Treasury taking a long-term perspective was with regard to carbon budgets: a summary assessment was made of the contribution that significant carbon reducing projects would make for periods up to Carbon Budget 5 (2028–2032). However, while HM Treasury took the valuable step of summarising the impact of the spending review on medium-term carbon budgets, it did not bring together information on the potential long-term impacts of cancelling the CCS competition or increasing spend on low-carbon innovation. This was because HM Treasury chose to focus in this summary on the quantifiable impacts on carbon budgets to 2032.[3] Part Four explains HM Treasury's separate analysis of the potential impacts of the CCS decision.

3 Emissions reductions in the power sector do not directly impact carbon budgets before 2032 because these sectors are currently part of the EU Emissions Trading Scheme (ETS). Under the ETS, emissions reductions from power and industry in UK will be offset by increases elsewhere in the EU. The government therefore assumes a set level of emissions from these sectors in its carbon budgets.

2.11 Aspects of HM Treasury's methodological approach to evaluating the relative merits of bids during the spending review favoured projects that deliver benefits in the short term rather than the long term, though for rational reasons:

- For most appraisals *Green Book* guidance mandates a discount factor of 3.5% for costs and benefits over the first 30 years, with a schedule of declining rates thereafter.[4] There is substantial academic literature on the most appropriate discount rate, but this approach is well established and government argues that it is the most practical and reasonable.

- HM Treasury used the net present value (NPV) to rank projects by dividing the NPV by total capital invested to reflect fiscal constraints. This calculation made no adjustment for when this capital would be required: this can disadvantage long-term projects, as the already discounted NPV is divided by undiscounted costs. The ranking of a project was, however, not the only factor in determining allocation of capital budgets.

2.12 Quantification of the costs and benefits of long-term projects can be difficult, therefore it is positive that the capital ranking calculation was not the only factor considered when determining whether a project bid was successful. However, there was not a consistent framework for the other factors influencing the assessment. For example, undertaking a cost–benefit analysis of CCS programmes is challenging because of the long time frames involved. HM Treasury did not specify what alternative criteria it would consider and placed the onus on DECC to set out the strategic justification for public spending on the competition.

2.13 Nine out of 14 respondents to an NAO survey of finance directors said that HM Treasury only considered the impact of funding on departmental activity during the spending review period, with only four (including Defra but not DECC) stating that medium-term impacts beyond this (5 to 10 years) were considered. Capital bids submitted by departments were heavily skewed towards projects which align with the spending review period. Although it is reasonable to expect the number of projects with predictable spend to decline further into the future there was a significant reduction past 2020-21 with 54% of bids seeking funding for 2020-21, but only 9% indicating the need for funding beyond this.

4 When assessing proposals where the effects involve the very long term (in excess of 50 years) and involve very substantial and, for all practical purposes, irreversible wealth transfers between generations, supplementary guidance advises sensitivity analysis using a lower schedule of discount rates.

Part Three

Impact on delivery of environmental objectives

3.1 In this part of the briefing we examine:

- the scale and nature of environmental spend announced in the spending review;
- government's assessment of the likely impacts of these announcements on progress against environmental targets; and
- the quality of the accountability arrangements provided through Single Departmental Plans.

3.2 We consider that these issues are the most relevant indicators of impact available at this early stage. The eventual impact of the spending review on environmental objectives will depend on policy design and departmental decisions on detailed budget allocations.

Environmental spend announced in the spending review

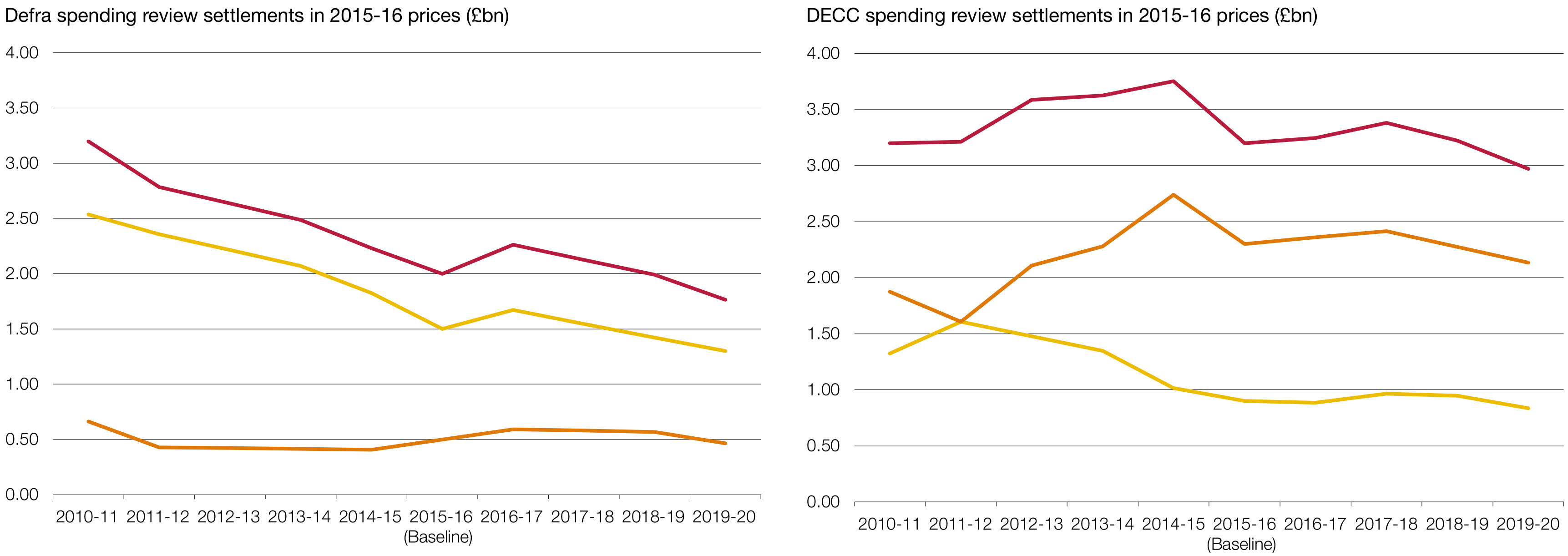
3.3 Overall, the 2015 spending review continued the trend of reducing budgets in non-protected departments, including those with lead environmental responsibilities (**Figure 7**). HM Treasury reports that the 2015 settlements represent a cumulative resource budget reduction in real terms of 16% for the Department of Energy & Climate Change (DECC) and 15% for the Department for Environment Food & Rural Affairs (Defra) from 2015-16 to 2019-20. These are the sixth and seventh highest reductions among the 17 major departments respectively, though are less severe than the mean reduction reported for unprotected departments of 19%.

3.4 Defra expected to achieve most of its resource budget reductions through organisational reform, with the streamlining of corporate services targeting a 40% real term reduction. It expected funding for its natural environment programmes to reduce by around 7% between 2016-17 and 2019-20. DECC expected to achieve most of its budget reductions through efficiencies in the Nuclear Decommissioning Authority; its scenarios anticipated a 22% reduction on staffing costs for low carbon policies over the spending review period. Significant announcements on ring-fenced environmental spend included those on flood defence for Defra, and on heat networks for DECC (**Figure 8** on page 26). The Defra settlement letter included budget protections for environmental issues, totalling over £3.2 billion over the spending review period, 12 times more than during the 2010 spending review. Announcements relating to environmental spend were not restricted to DECC and Defra (**Figure 9** on page 26).

Figure 7

Spending review settlements for the two lead environmental departments

The 2015 spending review continues a trend of declining budgets for environmental departments



- Total departmental expenditure limit
- Resource departmental expenditure limit
- Capital departmental expenditure limit

Notes

1 Settlements cover all the Departments' resource and capital expenditure and therefore are not restricted to environmental spending.

2 Settlements are expressed in 2015-16 prices using the GDP deflator indexes published alongside the Spending Review and Autumn Statement in November 2015.

Source: National Audit Office analysis

Figure 8

Significant ring-fenced funding for environmental projects in Defra and DECC announced during the spending review

Defra

Protection of flood defence funding, including £2.3 billion in capital spend over six years.

Protected funding for National Parks and public forests (£350 million).

Countryside enhancement via the Common Agricultural Policy (£3 billion, part EU funded).

DECC

Support for heat networks (£300 million).

Support for public sector energy efficiency (£295 million).

Doubling of spend in the innovation programme to £500 million over five years, to fund research into energy supply improvements, and bring down the future costs of decarbonisation.

Extension of Renewable Heat Incentive (RHI) funding to £1.15 billion in 2021.

Source: Spending review announcement

Figure 9

Environment related announcements by departments without an environmental lead role

Department for Transport

Support for uptake and manufacturing of ultra-low emission vehicles (ULEVs) in the UK (£600 million between 2015-16 and 2020-21).

Cycling investment between 2015-16 and 2020-21 (£300 million).

Department for Business, Innovation & Skills

Cash compensation paid to industry in response to renewables levies will be replaced with an exemption so as to save £410 million a year. Offsetting action will also be taken to mitigate the impact of renewable levies on household energy bills.

Department for International Development

Fifty per cent increase in government spending across DfID, DECC and Defra) through the International Climate Fund, to support resilience to climate change.

Local Government

As part of the spending review increased responsibility has been devolved to local authorities, who are an important partner for delivering environmental outcomes.

Source: National Audit Office analysis of spending review announcements

Impact of spending review on forecast carbon emissions

3.5 DECC publishes emissions projections annually, usually towards the end of the year. Publications before the start of the spending review indicated that the fourth carbon budget (2023–2027) was not expected to be met through projected emissions reductions from current policies, with an estimated gap of 133 $MtCO_2e$ (7% of the agreed budget). Shortly before the spending review was finalised, DECC published updated emissions projections which increased the size of the gap to 187 $MtCO_2e$ (10% of the budget) due to methodological changes such as in the way that land use and land use change is accounted for.[5] There is significant uncertainty within these projections, with 95% confidence levels putting the gap at between 122 $MtCO_2e$ and 256 $MtCO_2e$.

3.6 The June 2015 Committee on Climate Change Progress Report made 25 recommendations to central government on actions to reduce carbon emissions and so close the policy gap. These were not all related to spending policies and the extent to which they could be addressed by the spending review varies. However, the government's response to the progress report, published in October 2015, highlights several areas within the remit of the spending review. The spending review made clear announcements of additional spending for the Renewable Heat Incentive and Heat Networks. It did not clarify government's approach to supporting large-scale deployment of industrial CCS following the cancellation of the power sector CCS competition (**Figure 10** overleaf).

3.7 As part of the spending review process HM Treasury collated provisional analysis from DECC, Defra and the Department for Transport (DfT) to indicate the contribution of bids to carbon budgets. This estimated that a number of bids would make a positive contribution to meeting carbon budgets. If all bids were accepted, HM Treasury anticipated a potential marginal increase to the 187 $MtCO_2e$ policy gap over the fourth carbon budget of up to 5 $MtCO_2e$ (approximately). This is because published emissions forecasts assumed continuation of policies which had not been decided – the spending review bids were lower than those assumptions, which explains the resulting increase in the gap. Aside from the provisional nature of these estimates, HM Treasury concluded that there was scope to meet the fourth carbon budget gap through non-spending measures or future fiscal events in advance of the start of the fourth carbon budget (2023).

3.8 Since the spending review government has progressed the design of policies. More recent analysis suggests that the carbon savings from spending review bids may be greater than previously assumed. However a substantial gap remains. An updated analysis of the government's performance against carbon budgets, including reflecting the impact of spending review decisions, will be published in DECC's next set of annual energy and emissions projections, expected to be published towards the end of 2016.

5 Department of Energy & Climate Change, *Updated Energy and emissions projections 2015*, November 2015

Figure 10

Aspects of Committee on Climate Change (CCC) recommendations covered in the spending review

Issue highlighted by government response as relevant to the spending review	Coverage within spending review announcement
Long-term support for heat networks: support beyond that provided by the Heat Network Delivery Unit would be determined through the spending review.	Announced over £300 million of funding for up to 200 heat networks.
Extension of the Renewable Heat Incentive (RHI) to 2020: budgets beyond 2015 were to be determined by the spending review.	Increased funding for RHI to £1.15 billion by 2020-21, although this was a lower increase than had been estimated by the Office for Budget Responsibility in the July 2015 fiscal forecast and used in DECC's November 2015 emissions projections (which did not take into account the impact of spending review decisions).
Development of action plans to improve industry's contribution to carbon targets: the government response stated that implementation of plans for Energy Intensive Industries beyond 2015-16 depended on spending review funding decisions.	No announcement of actions relating to the development of action plans for industry. However, there was an announcement of an exemption for Energy Intensive Industries from the policy costs of the Renewables Obligation and Feed-in Tariffs.
Joining up industrial CCS with power sector projects to set an approach for the commercialisation of industrial CCS: decisions on future CCS work programmes were to be made in the spending review.	The existing CCS competition (for power CCS) was cancelled, although this was not included in spending review announcements. There was no announcement relating to industrial CCS.

Source: National Audit Office Analysis

Impact of spending review on air quality

3.9 The government considers that spending review decisions are consistent with meeting air quality targets in the shortest possible time frame. Defra published a new plan to improve air quality in December 2015, shortly after the spending review, which aims to ensure UK legal compliance by 2020, or 2025 in London. A major component of this plan involves mandating clean air zones across the most affected cities. The Supreme Court has granted a request from an environmental charity, ClientEarth, to pursue a judicial review of the plan and whether it meets the requirement to achieve compliance in the shortest possible time frame.

3.10 The spending review allocated funds to both Defra and DfT to support the National Air Quality Plan. This is intended to help local authorities implement clean air zones, and meet new burdens associated with implementing the zones. Settlement letters instruct the two departments to consider air quality funding as a 'joint pot', re-prioritising within their own budgets if funding proves insufficient and only applying to HM Treasury for additional funding if this proves impossible.

Impact of the spending review on biodiversity

3.11 The government considers settlements to be consistent with meeting biodiversity objectives. It is difficult to test this view, given the long-term and broad nature of government's biodiversity objectives. Key opportunities and challenges associated with achieving these objectives, given spending review decisions, include:

- Meeting biodiversity targets relies on action by other parts of government as well as Defra, particularly local authorities, which could be affected by budget constraints. This may be mitigated by the Natural Environment and Rural Communities Act 2006, which requires all public bodies to consider biodiversity conservation when carrying out their functions.
- Government's 25-year plan for the natural environment will be an opportunity to review the scale of action across government on biodiversity.

Accountability arrangements following the spending review

3.12 Departments are reporting and monitoring their performance in a number of different ways, including Single Departmental Plans (SDPs), developed alongside the spending review and published in summary in February 2016. The SDPs are intended to improve business planning and performance management in government, and are a high profile reporting tool which could be used to promote sustainability.

3.13 The public SDPs provide a high level overview of government's environmental objectives. Defra, DECC and DfT's SDPs all have environmental issues as a significant focus: Defra's covers issues of flooding, air quality, biodiversity, waste and natural capital; DECC's covers carbon reduction, energy efficiency and renewable energy; and DfT's covers carbon reduction, air quality and Ultra Low Emission Vehicles.

3.14 However, published SDPs have limitations as an accountability tool for environmental objectives because:

- Despite referring to environmental issues the commitments that are in plans are vague, lacking targets or time frame in most cases and rarely making intended actions clear. Of the 53 clear environmental commitments made by the six departments that reference the environment, only eight had a clear time frame within which the commitment would be achieved. Only 11 had a clear output and 13 had a clear input.
- There are also notable issues which do not have clear public commitments. Defra did not refer to carbon impacts or to noise in its public SDP, DECC did not refer to air quality or biodiversity, and DfT did not explicitly refer to renewable energy. Only two of the environmental commitments referred to joint working with other departments despite the environment being a cross-government issue.

3.15 Defra and DECC shared more detailed internal versions of their SDPs with us, created for internal reporting, which address some of the above issues. Defra's internal plan includes more precise environmental commitments than the published version, and most of these have associated metrics and time-bound milestones, outputs and outcomes. It also addresses the gaps in the public plan through including commitments for carbon and noise reduction. DECC's internal plan improves on the published SDP by including more detailed implementation plans. However, it is focused on what actions will be taken rather than the impact these are intended to have, and still has no mention of air quality or biodiversity.

Part Four

Case Study: the cancellation of the CCS competition

4.1 One of the government's largest capital decisions as part of the spending review was the withdrawal of £1 billion capital funding available to support Carbon Capture and Storage (CCS) projects. This case study:

- considers the significance of the CCS programme for UK's climate objectives;
- assesses how the Department of Energy & Climate Change (DECC) and HM Treasury interacted in the build-up to the decision; and
- evaluates the potential consequences of the decision.

This case study considers the process that preceded the decision to cancel the CCS competition. We will report on DECC's management of the programme prior to the cancellation later in 2016.

Significance for environmental objectives

4.2 CCS technology enables the capture of carbon dioxide prior to its emission into the atmosphere, followed by transportation to a storage site, usually underground. It is therefore one way of decarbonising power generation, if it is deployed at gas or coal-fired power stations. Additionally, it is currently the only option for decarbonising energy intensive industries, such as steel and chemicals. There are not any examples of CCS in the UK yet, and only one power plant in the world (in Canada) that uses CCS with the specific aim of reducing carbon dioxide emissions. The capture and transport technology is more established in the United States and Canada, where oil companies pump CO_2 into wells to recover oil more efficiently.

4.3 Compared to other forms of low carbon electricity, such as wind and solar, CCS is currently expensive. As with many technologies, first-of-a-kind projects in any country are more expensive. In the case of CCS, this is mainly because of the costs involved in building the infrastructure, such as pipelines and storage sites, needed to support the first projects. In addition, investors require a higher return given the risks of supporting a new sector, increasing financing costs. It is widely expected that the costs of CCS would come down over time, becoming more competitive with alternative options for decarbonisation. This is because, as it is deployed in more places, the cost of capture technologies is expected to fall, infrastructure could be shared and investor risk would be reduced.

The competition to deliver commercial scale CCS

4.4 The government first launched a competition for financial support to build a commercial-scale CCS demonstration project in 2007. The government brought that competition to a close in 2011 when there was only one bidder left. The Department was concerned about the lack of competitive pressure to drive down costs and decided it could not agree a deal that would represent value for money. We have previously reported on DECC's handling of this competition.[6]

4.5 In April 2012, DECC launched its CCS Commercialisation Programme, including a second competition offering up to £1 billion to support construction of up to two commercial scale power plants that use CCS. The government's main objective of the programme, starting with the competition, was to enable CCS to be cost competitive with other low carbon technologies in the 2020s. To support this aim, the terms of the competition required DECC and the bidders to agree risk sharing arrangements and for the two projects to put in place infrastructure that could be used for subsequent projects. This increased the costs of the two projects significantly, but DECC intended that it would reduce the costs of future projects to access infrastructure.

4.6 DECC required bidders to pass different negotiation stages before they could bid for part of the £1 billion. DECC shortlisted two projects: Shell's 'Peterhead'; and 'White Rose', led by a consortium named Capture Power. DECC awarded over £80 million to the two projects to complete front end engineering designs, and spent an additional £18 million in external advisory costs. It was due to decide whether both, one or none of the bidders would receive capital funding in early 2016. At the same time, DECC was going to negotiate Contracts for Difference, to provide revenue for the two plants once operational.

6 Comptroller and Auditor General, *Carbon capture and storage: lessons from the competition for the first UK demonstration*, National Audit Office, Session 2010–2012, HC 1829, March 2012.

CCS in the spending review 2015

DECC's bid

4.7 CCS was considered as part of the capital budgeting process described in Part Two. This meant DECC submitted a request for funds which included a net present value analysis of the competition to HM Treasury. Undertaking any cost–benefit analysis of CCS programmes is challenging because of the long time frames involved. In the long term, there are wide uncertainty ranges around the price of carbon; the cost of alternative low carbon technologies; the viability of the technology; and the additional investment needed from the public sector to get the technology to the point where it will be commercially viable.

4.8 As part of the spending review process, DECC presented two bids for CCS:

- The first bid was for sufficient funds to complete the competition (the £1 billion), with capital funding paid to any winning bidders between 2016-17 and 2020-21. This bid presented two options: to support both projects or to support one project with other activities facilitating the development of successive plants.
- The second bid covered a new programme for CCS in heavy industry. This was contingent on the successful implementation of the power sector programme.

4.9 DECC's bid for power sector CCS showed a return of £4.50 per pound invested, with most benefits arising after 2030. It estimated net social benefits of £3.7 billion to 2050. DECC calculated the benefits on the basis that without CCS it would cost an additional £30 billion to meet the 2050 carbon targets. This is because a more expensive mix of low-carbon technologies would be required to decarbonise the power sector. DECC calculated that the two projects would bring the cost of CCS down by 23% and so attributed that percentage of the total forecast CCS benefits to the competition. During the course of our study, DECC found that the net social benefits in the bid should have been £4.3 billion as it had used inconsistent discounting base years between the costs and benefits.

4.10 DECC's bid included an accompanying narrative on the strategic case for CCS. It expected the competition to set the commercial foundation for cost competitive deployment of CCS from the 2020s by testing CCS's commercial viability and laying storage and transport infrastructure for subsequent projects to use. The narrative did not include the future cost of supporting the running costs of the two competing CCS plants through Contracts for Difference (CfD) in its bid, even though it did not expect the benefits to accrue without them. DECC's central estimate for the cost of the CfDs if both projects received support was around £570 million per year for 15 years. The Department told us that the costs of CfDs for the competition and subsequent CCS projects are consumer-funded and therefore part of a separate process so were not included in its capital bid.

4.11 DECC's bid did not consider the impact of CCS on meeting the carbon budgets, which extend to 2032, because it considered its CCS strategy would have little impact on emissions before 2030. In addition, power and industrial emissions do not directly impact carbon budgets because they are currently part of the EU Emissions Trading Scheme (ETS). Under the ETS, emissions reductions from power and industry in the UK will be offset by increases elsewhere in the EU. The government therefore assumes a set level of emissions from these sectors in its carbon budgets. In the long term CCS could also contribute to decarbonise sectors that are covered by carbon budgets such as heat.[7]

4.12 After DECC had submitted its bid, HM Treasury asked DECC to analyse the impacts of withdrawing the money for the competition. While DECC's analysis stated that cancelling the competition would lead to delays in the deployment of CCS, it did not calculate what the cost or benefits of such a delay would be. It told us that without an alternative deployment programme to compare with it would not have been possible to determine with the length of the delay of CCS deployment that would follow the cancellation of the competition. Nor would it have been possible in the time available to quantify the cost or savings derived from any such delay. HM Treasury and DECC held qualitative discussions about the impacts of cancellation, including potentially delaying deployment, and these fed into decisions made.

7 CCS could be used to extract carbon from natural gas before it is injected into the gas grid. This would require replacing all current appliances, such as gas boilers, with more advanced ones.

HM Treasury's assessment

4.13 The Treasury concluded that while CCS could help achieve long-term decarbonisation objectives there were strong arguments for the competition to stop:

- **The competition was aiming to deliver CCS before it was cost-efficient to do so.** HM Treasury expects the international carbon price to rise in the coming decade. CCS would require less government or bill payer support if the costs of emitting carbon dioxide are higher, as this would make it a better commercial option for investors.

- **The costs to consumers would be high and regressive.** HM Treasury anticipated that the Contracts for Difference for the projects would be at a strike price of around £170/MWh, leading to a significant impact on consumer bills in the 2020s. It acknowledged that this cost was likely to be higher for the first two CCS projects as they provide transport and storage infrastructure that could be used by subsequent projects.

- **The competition would not guarantee the further investment required to expand CCS.** DECC's bid showed that the benefits of CCS would not be realised until the 2030s, and only once CCS had been deployed more widely to bring down costs. HM Treasury challenged the strength of DECC's long-term strategic plan and concluded the two competition projects could not guarantee a subsequent stream of projects required to justify the initial outlay. It also expected any further projects would need significant additional government or consumer support.

- **There were better uses for the £1 billion.** The capital envelope across government was extremely tight and continuing to fund the competition would mean reducing spending in other areas.

4.14 HM Treasury advice to ministers acknowledged that there were risks involved with cancelling the competition. It recognised that suspending the competition would mean delaying the deployment of CCS and could mean the government may have to compensate bidders for some of their sunk costs, but this would be in the low tens of millions. It also acknowledged the potential damage to the government's reputation with industry and with the international community.

Potential consequences of the decision to close the competition

4.15 HM Treasury withdrew the £1 billion it had previously made available for the competition. Following the decision, both bidders announced that without government support they would be unable to continue their projects.

4.16 The decision to withdraw the funding has some immediate consequences:

- Up to £100 million of taxpayers' money has been spent so far. DECC estimates that the private sector has invested a further £80 million. Some of this investment could be useful for future CCS projects, such as lessons learned about the technical and project management aspects of the two bids. DECC has published these as 'knowledge deliverables'.[8] However, the value that could be derived from this competition relies partly on the people that have gained knowledge and skills required to deploy CCS. There is a significant risk that this value will dissipate over time as people move on to other projects.
- One of the competition projects planned to reuse an oil well for its storage site. Cancelling the competition has delayed the deployment of CCS, meaning this well could be decommissioned rather than being reused. Future CCS projects could be more expensive if they need to build new transport and injection sites, rather than using existing wells. Maintaining operative wells is expensive and uncertainty around the deployment of CCS may bring oil companies to decommission them. The government aims to mitigate this risk by giving the newly-created Oil and Gas Authority the power to manage legacy and decommissioning sites, including considering their potential to be used to store CO_2.
- Given it is government policy that the private sector should pay to build and run energy infrastructure, DECC is likely to be reliant on private investment to deliver CCS at scale in the future. This is the second time the government has withdrawn from a CCS competition, causing losses to businesses that invested in the programme. These precedents increase the risk that investors will be deterred from dealing with the government or require a higher return to do so, which would increase the cost of a future CCS policy. Further, the bidders and wider CCS sector did not expect the cancellation, which came at a late stage in the competition. The timing of the announcement could reduce investors' confidence even further when dealing with government in the future.

8 Available at https://www.gov.uk/government/collections/carbon-capture-and-storage-knowledge-sharing

4.17 DECC estimates cancelling the competition has removed the option of CCS contributing meaningfully to decarbonisation before 2030. As a result:

- There is no viable way to achieve deep emissions reductions from the industrial sector in the near future. This means industry needs to buy more carbon permits in the European trading scheme market, increasing its exposure to variations in permit prices.
- There is now less time to build the CCS infrastructure required for it to contribute to the UK's decarbonisation target. This could increase the burden on the supply chain, which, according to government advisers such as the Energy Technology Institute, has a high chance of significantly increasing the cost of meeting the 2050 target. However, the additional cost is uncertain, and varies according to the set of assumptions used, such as how much investment is required to get CCS to being cost competitive with other technologies.

Appendix One

Our audit approach

1 This study examined whether the 2015 spending review acted as an effective medium- and long-term planning tool in relation to government's environmental protection and sustainable development objectives. We reviewed:

- the significance of the spending review for meeting environmental and sustainability objectives.
- the extent to which the design and implementation of the 2015 spending review enabled full and robust consideration of environmental issues across government; and
- the potential impacts of the 2015 spending review on the government's approach to environmental objectives, and on the achievability of targets.

2 We applied an analytical framework with evaluative criteria, which included assessing the spending review against principles derived from past NAO work on what a 'good' spending review process would look like when incorporating sustainability into decision-making. By good, we mean a process that is well integrated within wider financial and environmental management, and follows our principles for making well-informed decisions.

3 In examining the spending review, the work focuses on how the process enables sound, evidence-based decision-making, rather than the decisions themselves. We have not evaluated the quality of departmental bids or the choice of approach made by decision-makers.

4 Our audit approach is summarised in **Figure 11**. Our evidence base is described in Appendix Two.

Figure 11
Our audit approach

The objective of government

Government launched the spending review 2015 to continue the process of fiscal consolidation. This requires identification of opportunities to reduce spend without compromising the ability to meet environmental commitments.

How this will be achieved

The government uses the spending review process to negotiate medium-term budgets between departments and HM Treasury. Engagement between departments and the Treasury is required to understand departmental priorities.

Our study

The study examined whether the spending review was an effective medium- and long-term planning tool in relation to government's environmental protection and sustainable development objectives, and whether it fully considered commitments on carbon, air quality and biodiversity.

Our evaluative criteria

Significance of the spending review for meeting environmental and sustainability objectives.	Extent to which the design and implementation of the spending review enabled consideration of environmental issues.	Impacts of the spending review on the government's approach to environmental objectives, and on the achievability of targets.

Our evidence

(see Appendix Two for details)

We assessed significance by: • drawing on previous and concurrent NAO studies; and • interviewing officials and external stakeholders.	We assessed design and implementation by: • analysing web survey responses; • interviewing officials from HM Treasury and case study departments; and • reviewing internal documents from HM Treasury and departments.	We assessed impact by: • reviewing published documents; and • reviewing internal documents.

Appendix Two

Our evidence base

1 Our independent conclusions on whether the spending review 2015 was an effective medium- and long-term planning tool in relation to government's environmental protection and sustainable development objectives were reached following our analysis of evidence collected between March and June 2016.

2 We applied an analytical framework partly based on principles for well-informed decision-making incorporating sustainability objectives. Our audit approach is outlined in Appendix One.

3 We assessed the significance of the spending review for meeting environmental targets:

- We drew on **previous work** on sustainability and liaised with NAO staff working on **concurrent studies** on the spending review and on Single Departmental Plans.
- We conducted **interviews** to help us understand the role of the spending review in relation to environmental objectives. These included officials from departments with a lead role in environmental sustainability, HM Treasury staff, and external stakeholders.

4 We assessed the effectiveness of the design of the spending review process and how this was implemented in practice:

- We conducted a **web survey** of finance directors in 17 Whitehall departments to understand how they deal with the spending review, and how it incorporated sustainability. Fourteen finance directors responded, an 82% response rate.
- We selected **three case study departments** on the basis of their environmental impact: the Department for Transport, the Department of Energy & Climate Change, and the Department for Environment, Food, & Rural Affairs. We held interviews with officials who worked on the spending team focused on departmental preparations for the 2015 spending review, any joint-working between departments, and interactions with HM Treasury. We also held interviews with officials who worked on the department's environmental objectives focused on the ways they contributed to the spending review bid and the extent to which it supported their environmental priorities. This helped shed light on how the spending review considered environmental issues in practice.
- We conducted a **review of internal HM Treasury and departmental documents**. Documents reviewed included spending review submissions, internal timelines and project tracking documents, guidance to departments on preparing their spending review submissions, internal data, and communications between HM Treasury and departments.

5 We sought evidence of the impact of the spending review on environmental objectives:

- We **reviewed published documents** from the spending review and from environmental reporting processes. This included reports from the Committee on Climate Change and the Single Department Plans published by government.
- Our **review of internal HM Treasury and departmental documents** included examination of the expected impacts of proposals.

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