



BRIEFING PAPER

Number CBP7555, 20 February 2019

UK Carbon Budgets

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Summary

The Climate Change Act 2008

Under the [Climate Change Act 2008](#) (the 2008 Act), the Government must set five-yearly carbon budgets, twelve years in advance, from 2008 to 2050. The Government is required to consider—but not follow—the advice of the [Committee on Climate Change](#) (CCC, also created under the 2008 Act) when setting these budgets. The aim is to meet the 2008 Act's target of reducing greenhouse gas emissions by 80% by 2050 compared to 1990 levels.

Since the 2008 Act became law, the UK has ratified the Paris Agreement with more ambitious aims to limit global temperature increase.

Carbon budgets 1, 2, 3 and 4

The [first three budgets](#) are for the following five-year periods: 2008-12, 2013-17 and 2018-22. These budgets were set in May 2009 and implemented via the [Carbon Budgets Order 2009](#). The fourth carbon budget (2023-2027) was set at 1,950 MtCO_{2e} and implemented via the [Carbon Budget Order 2011](#).

Setting the fifth carbon budget

The CCC's proposals for the [Fifth Carbon Budget](#) were published in November 2015, recommending a budget on a cost-effective path to the 2050 target. The CCC proposed the budget should be set at 1,765 MtCO_{2e} for 2028-2032 (or 1,725 MtCO_{2e} if international shipping emissions were excluded), which would equate to a 57% reduction in emissions compared to 1990 levels. The UK Government agreed the fifth Carbon Budget at 1,725 MtCO_{2e}, passing the [Carbon Budget Order 2016](#) in July 2016.

The Government published its [Clean Growth Strategy](#) in October 2017, setting out a "possible pathway" for meeting the fifth carbon budget. The [CCC's independent assessment of the Strategy](#) (January 2018) praised the Government's strong commitment to achieving the UK's climate targets, but called on the Government to close the gaps it identified in meeting the fourth and fifth carbon budgets. Furthermore, the CCC's Progress Report to Parliament in June 2018 called on the Government to bring forward new fully funded policies to ensure the fourth and fifth carbon budget are met.

Progress in meeting carbon budgets

The first carbon budget (2008-2012) was outperformed by one per cent and [official statistics indicated](#) that the second budget (2013-2017) was outperformed by around 14%.

The [Government's energy and emissions projections 2017](#) (published January 2018) predicted that the third carbon budget would be outperformed by 5.6% but predicted a projected shortfall of 3.3% and 6.7% against the fourth and fifth budgets respectively.

In the Clean Growth Strategy, the Government confirmed that it may consider using flexibilities available to it on when and how to reduce UK emissions on route to 2050, but that it would obtain the advice of CCC and consult the devolved Administrations before making a decision. The [CCC does not support](#) the use of outperformance being carried over to help meet later budgets.

1. Carbon Budgets

1.1 What does the *Climate Change Act 2008* require?

The [Climate Change Act 2008](#) (the 2008 Act) established long term statutory targets for the UK to achieve at least a 34% reduction in greenhouse gas emissions by 2020 and an 80% reduction in greenhouse gas emissions by 2050 against a 1990 baseline.

Under the 2008 Act, the Government must set five-yearly carbon budgets, twelve years in advance, from 2008 to 2050. The Government is required to consider—but not follow—the advice of the [Committee on Climate Change](#) (CCC, the statutory body set up to monitor and advise on progress towards the 2050 climate targets) when setting these budgets. The CCC is also required to publish an annual progress report to Parliament and the devolved legislatures on the progress that has been made towards meeting the carbon budgets and the 2050 target, the further progress that is needed to meet those targets, and whether or not the budgets and target are likely to be met.

The Paris Agreement

Since the 2008 Act became law, the UK has ratified the Paris Agreement with more ambitious aims to limit global temperature increase (see further in section 4.1 below).

While not required by the 2008 Act, the UK Energy Minister and the Scottish and Welsh Cabinet Secretaries wrote to the Committee on Climate Change in October 2018 asking for updated advice on the UK's long-term targets including on a possible net zero target for the UK. The CCC wrote to the relevant ministers in February 2019 confirming that it plans to deliver its report on 2 May 2019.¹ Further information on this is available in the Library blog [Net zero emissions: a new UK climate change target? \(19 October 2018\)](#)

1.2 Devolved Administrations

The devolved Administrations have their own targets to reduce emissions and also contribute to the UK's overall progress towards meeting carbon budgets. The CCC also provides advice to the devolved legislatures on carbon budgets and targets and reports on progress. The CCC's [2018 Progress Report to Parliament](#) stated that:

Scotland, Wales and Northern Ireland together accounted for 22% of UK emissions in 2016 (8%, 10%, and 4% respectively), while they account for 16% of the UK's population and 13% of economic output measured by GVA.²

¹ CCC, [Long-term targets report: Letter to UK Government and Devolved Administrations](#), 14 February 2019 [accessed 20 February 2019]

² CCC, [2018 Progress Report to Parliament](#),

Note: Emissions data for each devolved administration is produced one year later than the UK-wide data. The CCC use the recently published data for 2016, unlike the rest of the Progress Report which is mainly based on 2017 data.

Each devolved nation has varying levels of devolved powers in areas related to emissions reduction, but key areas of devolved responsibility include: transport, agriculture, land use, energy efficiency and waste.

Detailed information on the devolved Administrations progress in reducing emissions and the CCC's work and advice to each of the governments is set out in the CCC's [2018 Progress Report to Parliament](#) (Chapter 9).

Scotland

Scotland has its own [Climate Change \(Scotland\) Act 2009](#) which set a long-term target to achieve an 80% reduction in greenhouse gas emissions by 2050 against a 1990 baseline, with an interim target of 42% reduction by 2020. These targets include Scotland's share of emissions from international aviation and shipping. The Scottish Parliament sets annual targets in secondary legislation at least 12 years in advance. The Scottish Government published its [climate change plan](#) in February 2018 which sets out how it plans to meet Scottish climate change targets to 2032.

The *Climate Change (Emissions Reduction Targets) (Scotland) Bill* was introduced to Scottish Parliament on 23 May 2018 and includes a more ambitious 2050 target of a 90% reduction on 1990 emissions.

More information is available on the Scottish Government [webpages on climate change](#), including a progress page on the [new Climate Change Bill](#).

Wales

The [Environment \(Wales\) Act 2016](#) places a duty on Welsh Ministers to ensure at least an 80% emissions reduction from 1990 levels in 2050 and five-yearly carbon budgets. The [Climate Change \(Carbon Budgets\) \(Wales\) Regulations 2018](#) were passed in December 2018 and set the first two carbon budgets for Wales.

Further information is available on the Welsh Government [webpages on climate change](#), including a [page on reducing Welsh emissions](#).

Northern Ireland

Northern Ireland has a [draft Programme for Government](#) that contains indicators for future emissions reductions.

Further information is available on the Northern Ireland Executive [pages on climate change](#).

1.3 UK carbon budgets 1-3

The [first three budgets](#) run from 2008-12, 2013-17 and 2018-22. These budgets were set in May 2009 and implemented via the [Carbon Budgets Order 2009](#). They were set as follows based on the advice of the CCC:

	Budget 1	Budget 2	Budget 3
	(2008-12)	(2013-17)	(2018-22)
Carbon budgets	3018	2782	2544
(MtCO₂e)³			
Percentage reduction below 1990 levels	25	31	37 by 2020

The carbon budget is set out as an average percentage reduction compared to 1990 levels and as the resulting total emissions for the whole five-year period.

[Gov.uk guidance on carbon budgets](#) and the CCC's webpage on [Carbon budgets: how we monitor emissions targets](#) contain further resources on each of the UK's carbon budgets.^{4 5}

1.4 The fourth carbon budget

In line with the main recommendation from the CCC, the fourth carbon budget (2023-2027) was set at 1,950 MtCO₂e and implemented via the [Carbon Budget Order 2011](#).

While announcing the fourth budget, the then Minister (Chris Huhne) also made clear that the budget would be reviewed by 2014.⁶ This intention to review the budget within three years of accepting it (in light of whether or not the EU committed to a 30% reduction in emissions) was criticised by the Environmental Audit Committee in its report on [Carbon Budgets](#) published in October 2011:

A review of the carbon budgets threatens to undermine the benefit of the Climate Change Act, producing uncertainty about the trajectory for emissions reductions upon which key Government policies will be formulated and technologies developed.⁷

The Government commissioned the CCC to carry out the review, which it did in 2013, publishing its [conclusions](#) in December 2013. The Committee concluded that there was no basis for scaling back targets and argued for early action:

³ Metric tons of carbon dioxide equivalent (MtCO₂e) is the unit of measurement used. The unit CO₂e represents an amount of a greenhouse gas whose atmospheric impact has been standardised to that of one unit mass of carbon dioxide, based on the global warming potential of the gas.

⁴ Gov.uk, [Carbon Budgets](#), last updated 22 July 2016

⁵ CCC, [Carbon budgets: how we monitor emissions targets](#) [accessed 20 February 2019]

⁶ DECC, [Fourth Carbon Budget: oral ministerial statement by The Rt Hon Chris Huhne MP - 17 May 2011](#), 17 May 2011

⁷ EAC, [Carbon Budgets](#), 7th Report Session 2010-12, HC 1080, October 2011

There has been no change in the circumstances upon which the fourth carbon budget (2023 – 2027) was originally set in 2011 that would justify a lowering of ambition.

(...)

The [report](#) compares a strategy of reducing emissions through the 2020s with one where action is delayed until the 2030s. It shows that there are significant savings associated with early action (e.g. over £100 billion in present value terms under assumptions that the gas price remains at the current level, with much higher savings in a world with a high gas price). The only situation where early action would be more costly is if there were to be a combination of a low carbon price and low fossil fuel prices. This would be counter to UN ambition and to expectations for the oil and gas markets.⁸

1.5 Setting the fifth carbon budget

The CCC's proposals for the [Fifth Carbon Budget](#) were published in November 2015 recommending a budget on a cost-effective path to the 2050 target.

CCC's recommendation to the Government was that the target for the fifth carbon budget (2028 to 2032) should be set at 1,765 MtCO_{2e}, including emissions from international shipping. This would equate to an average 57% reduction in emissions compared to 1990 levels. The CCC noted that on the current accounting basis (i.e. if international aviation and shipping emissions were excluded) then an emission limit of 1,725 MtCO_{2e} would be appropriate over the 2028-2032 period:

1. The budget. The fifth carbon budget should be set at 1,765 MtCO_{2e} for 2028-2032, including emissions from international shipping. On the current accounting basis (i.e. excluding emissions from international aviation and shipping), the budget would be 1,725 MtCO_{2e}.

2. International aviation. Emissions from international aviation should continue to be allowed for by setting the budget on the path to meeting the 2050 target with international aviation emissions included. However, the accounting for these emissions remains uncertain, so they should not be formally included in the fifth carbon budget.

3. Credits. The budget should be met without the use of international carbon units (i.e. credits) outside the EU Emissions Trading System. If unexpected circumstances mean the budget cannot be met cost-effectively without recourse to purchase of credits, the Committee would revisit this advice, including an assessment of the strength and validity of the credit market at that time. Credits could also be used to go beyond the proposed budget to support international action to reduce emissions.

4. Policy: low-carbon power. The Government should develop policy approaches consistent with reducing carbon intensity of the power sector to below 100 gCO₂/kWh in 2030 (compared to 450 gCO₂/kWh in 2014 and 200-250 gCO₂/kWh expected by 2020).

5. Policy: other sectors. For sectors outside the EU Emissions Trading System the Government should develop policies to drive

⁸ CCC, [CCC concludes that there is no basis to change the fourth carbon budget – 11 December 2013](#)

an average rate of emissions reduction of 2% (6 MtCO_{2e}) per year from 2014 to 2030. The Carbon Accounting Regulations should be set to ensure that emissions from these sectors are limited to 1,175 MtCO_{2e} over 2028-2032 (1,135 MtCO_{2e} excluding emissions from international shipping), which is the Committee's best estimate of the cost-effective path to the statutory 2050 target.⁹

The Committee set out some of its thinking behind the recommendations in a [2016 blog post](#):

The basic premise behind the Committee's advice is that the budget should follow the lowest cost path to the long-term target. That lowest cost path is likely to involve steady action, avoid stop-start investment and ensure sufficient lead time for making more difficult changes. That has been the clear message from the Committee's extensive discussions with [businesses and other stakeholders](#). It is also borne out by the analytical evidence set out in the Committee's [reports](#).

By following that steady-action path, the Committee's recommended budget best satisfies the multiple criteria, including affordability, competitiveness and security of supply, laid out in the [Climate Change Act](#).¹⁰

The UK Government accepted the CCC's advice and agreed the fifth Carbon Budget at 1,725 MtCO_{2e} (excluding international shipping and aviation emissions from the formal total for the budget).

According to the 2008 Act, the fifth carbon budget should have been set no later than 30 June 2016.¹¹ The draft [Carbon Budget Order 2016](#) was [laid before the House](#) on 30 June 2016. It was subject to the affirmative resolution procedure. The [Carbon Budget Order 2016](#) was made 20 July 2016 and came into force on 21 July 2016.¹²

International shipping and aviation emissions

International aviation and shipping emissions are not currently included in the UK's carbon budgets, nor are they explicitly included in the Paris Agreement. However, the UK's long-term target of at least an 80% reduction in greenhouse gas emissions for 2050 (compared to 1990 levels) covers all sectors, including international aviation and shipping.¹³

The CCC have confirmed that it intends to provide an updated view on the appropriate long-term ambition for aviation emissions within its advice on the UK's long-term targets due on 2 May 2019 (see section 4.1 below).¹⁴ Further information on the CCC's views on UK aviation are set out in its [aviation letter](#) from February 2019.

⁹ CCC, [The fifth carbon budget – The next step towards a low-carbon economy](#), November 2015: page 12

¹⁰ Mike Thompson, CCC, [The fifth carbon budget – a balanced path to a necessary goal](#), 31 March 2016

¹¹ Section 4 of the Climate Change Act 2008.

¹² [The Carbon Budget Order 2016, SI 2016/785](#)

¹³ See: CCC, [Building a zero carbon economy – Call for Evidence](#) [accessed 20 February 2019]

¹⁴ CCC, [Aviation letter from Lord Deben to Chris Grayling](#), 12 February 2019 [accessed 20 February 2019]

The Energy and Climate Change Select Committee¹⁵ published a report, [Setting the Fifth Carbon Budget](#), in April 2016 in which it supported the CCC's recommendation that the fifth budget should be broadened to include shipping emissions and that progress and international developments on aviation emissions should be kept under review. The 2015 Government did not agree to include international shipping emissions in carbon budgets:

The Government has considered the CCC recommendation and has come to the conclusion that it is not the appropriate time for the inclusion of international shipping emissions in carbon budgets. A decision to include international shipping emissions in carbon budgets at this stage could be seen as the UK taking unilateral policy action on this issue, which could undermine our ability to achieve a global solution within the International Maritime Organization (IMO)—our preferred approach to dealing with these emissions.¹⁶

Shipping is regulated by the UN body, the International Maritime Organization (IMO). Since the fifth carbon budget was set, in April 2018, the IMO agreed the first ever international shipping emissions reduction target as part of a wider climate deal for the shipping sector. The main target is to reduce greenhouse gas emissions by at least 50% by 2050, compared to 2008 levels. The agreement also calls for emissions to be phased out completely, but without a timeframe.¹⁷

CO₂ emissions from aviation have been included in the EU emissions trading system (EU ETS) since 2012, encompassing all airlines operating in Europe. The International Civil Aviation Organization (ICAO) agreed a Resolution in October 2016 for a global market-based measure to address CO₂ emissions from international aviation as of 2021: the [Carbon Offsetting and Reduction Scheme for International Aviation](#) (CORSIA). It aims to stabilise CO₂ emissions at 2020 levels by requiring airlines to offset the growth of their emissions after 2020.¹⁸ This policy has an end date of 2035 and the Government has committed to negotiate in the ICAO for a long-term goal for global international aviation emissions that is consistent with the Paris Agreement. The CCC has welcomed this commitment, stating that:

A new long-term objective would provide a strong and early signal to incentivise the investment in new, cleaner, technologies that will be required for the sector to play its role in meeting long-term targets. This is particularly important in aviation given the long lifetimes of assets.¹⁹

¹⁵ On 10 October 2016 the House of Commons approved changes to Standing Orders to establish a Business, Energy and Industrial Strategy Committee with a remit covering the energy and climate change brief. Energy and Climate Change Committee reports are archived.

¹⁶ Government Response to Energy and Climate Change Committee Report on Setting the fifth carbon budget, [Second Special Report of Session 2016-17](#), HC 518, 7 July 2016

¹⁷ IMO, [Initial IMO Strategy on reduction of GHG Emissions from Ships](#), 13 April 2018 [accessed 14 February 2019]

¹⁸ See: Gov.uk press release, [UK secures historic deal to combat global aviation emissions](#), 6 October 2016 [accessed 20 February 2019]

¹⁹ CCC, [Aviation letter from Lord Deben to Chris Grayling](#), 12 February 2019 [accessed 20 February 2019]

More information on both these approaches is available on the [European Commission pages on Climate Action: reducing emissions from aviation](#).

2. Policies for meeting the fifth carbon budget

2.1 Publication of the Clean Growth Strategy

The *Climate Change Act 2008* requires the Secretary of State to publish a report setting out an indicative annual range for the net UK carbon account for each year within a carbon budget; and a report setting out the Government's proposals and policies for meeting the carbon budgets for the current and future budgetary periods (sections 12 and 14 of the 2008 Act).

In response to a PQ in January 2016, the then Secretary of State for Energy and Climate Change (Amber Rudd) committed to publish an Emission Reduction Plan before the end of the year.²⁰ It was subsequently renamed the Clean Growth Plan and then the Clean Growth Strategy.

The [Clean Growth Strategy](#) was published by Government to meet the requirements of section 12 and 14 of the *Climate Change Act 2008* on 12 October 2017.²¹ The Government received criticism for the publication delay, particularly in relation to the requirement under the 2008 Act which requires that the plan is published "as soon as is reasonably practicable after making an order to setting the carbon budget".²²

In the executive summary to the Strategy, the Government highlighted the different sectors it focused on:

We have achieved significant results in the power and waste sectors and now need to replicate this success across the economy, particularly in the transport, business and industrial sectors. We also need to reduce the emissions created by heating our homes and businesses, which account for almost a third of UK emissions.²³

The Strategy also notes that the 25-year environment plan would also contain details of future actions. The Library Briefing Paper on the [25 year environment plan](#) (17 January 2018) provides further information on the content of the plan.

2.2 Meeting the fourth and fifth carbon budgets

In order to meet the fourth (2023-2027) and fifth carbon budgets (2028-2032) the Government stated that it needed to "drive a significant acceleration in the pace of decarbonisation" and set out

²⁰ [PO 20813](#) [on carbon emissions] 7 January 2016

²¹ HM Government, [The Clean Growth Strategy](#), October 2017

²² See, for example, HC Deb 27 June 2017, [Col 455. Requirement set out in section 14\(1\) of the Climate Change Act 2008](#)

²³ Gov.uk, [Clean Growth Strategy](#), 12 October 2017, p8

domestic policies that “keep us on track to meet our carbon budgets”.²⁴

The Government stated that the Clean Growth Strategy set out a “possible pathway” for meeting the fifth carbon budget:

Our Clean Growth Strategy sets out in detail a possible pathway for meeting the fifth carbon budget through domestic action, including many of the policies and proposals set out here. The route we ultimately take to meeting our targets will depend on a range of factors, in particular ensuring we are mindful of any impact on energy costs for households and businesses, and changes in costs as a result of innovation.²⁵

However, the Government went on to state that its approach was “pragmatic”. The Strategy used the latest available projections at the time of publication which was the [Government’s updated energy and emissions projections 2016](#) (March 2017) (see Box 1 on comparing data). At that time, it stated that current estimated projections suggest that 94% and 93% of the required budgets would be met respectively:

Our current estimated projection for the fourth and fifth carbon budget suggests that we could deliver 94 per cent and 93 per cent of our required performance against 1990 levels.²⁶

The Government’s Energy and Emissions Projections 2017 (published 2 January 2018) updated these projections to 97% and 95% respectively:

The updated projections for the fourth and fifth carbon budgets (including estimates of emission reductions from a subset of Clean Growth Strategy policies and proposals) suggests that we could deliver 97 per cent and 95 per cent of our required performance against 1990 levels – for carbon budgets which will end in ten and fifteen years’ time respectively. As policies and proposals in the Clean Growth Strategy are developed more fully, their impacts will be included as appropriate in future EEP editions.²⁷

Box 1: Comparing data

The Clean Growth Strategy quoted data based on the latest available projections available at that time: the [Updated Energy and Emissions Projections 2016](#).

The emissions projections from the Clean Growth Strategy are therefore not directly comparable to the projections in the [Updated energy and emissions projections 2017](#) or any subsequent projections.

Much of the commentary and publications referenced in this Library Briefing Paper refer to the Clean Growth Strategy data. These remain relevant to the issue, debate and analysis, but more recent data is now available.

The CCC comment on the new projections as follows:

Emission projections are of course uncertain and subject to change (e.g. new projections are published annually). New government energy and emission projections were published in January 2018, and these imply a smaller policy gap than previously projected:

- *The new projections reduce ‘business-as-usual’ baseline emissions by around 3% in 2025 and 2030, compared to the previous projections used in the Clean Growth Strategy. This reflects a range of factors unrelated to Government policies. These include changes in projected fossil fuel prices, and inclusion of outturn data for the previous year on energy demand and temperatures.*

²⁴ Gov.uk, [Clean Growth Strategy](#), 12 October 2017, p9

²⁵ Gov.uk, [Clean Growth Strategy](#), 12 October 2017, p54

²⁶ Gov.uk, [Clean Growth Strategy](#), 12 October 2017, p.40

²⁷ Gov.uk, [Updated energy and emissions projections 2017](#), 2 January 2018, p18 [accessed 15 March 2018]

- *The implication of this change is that future emissions are now projected to be lower than they were previously, and the gap to meeting the carbon budgets is smaller than previously projected.*
- *The total change is a lowering of emissions by around 50 MtCO₂e over both the fourth and fifth carbon budgets. This implies that the policy gaps may have reduced to around 10 MtCO₂e, rather than 65 MtCO₂e under the previous projections, although it may also be appropriate to revise down estimates of emissions savings.*

Policy and ambition should be consistent in the face of these changes, whilst evolving over time in response to sustained changes. In particular, we would not expect a reduction in policy ambition in response to a downward adjustment to the projections given the risk that this is reversed in later years and given the commitment in the Paris Agreement to increase effort and deliver beyond existing targets.

Overall, these new projections do not change our key conclusion: there remains a gap to meeting the fourth and fifth carbon budgets, and new policies beyond those in the Clean Growth Strategy are required to close this gap.²⁸

Using flexibilities to meet budgets?

There are powers under section 17 of the *Climate Change Act 2008* to "borrow" or "bank" amounts from one budgetary period to another. This allows the government to increase the budget by borrowing up to 1% from the succeeding period, which is consequently reduced by the amount borrowed. Conversely, if it has a surplus in a budgetary period, it can carry all or some of it forward to the next period. These powers are subject to consulting with the other national authorities and subject to obtaining and taking account of the advice of the CCC.

The Clean Growth Strategy referenced these powers and stated that the Government was "prepared to use the flexibilities available to us to meet carbon budgets, subject to the requirements in the Climate Change Act, if this presents better value for UK taxpayers, businesses and domestic consumers".²⁹ It went on to say that it may not need to use this option and will make the decisions following consultation with the devolved Administrations and advice from the CCC:

The Act allows Government some flexibility on when and how to reduce UK emissions on route to 2050 but before doing so the Government must obtain and take into account the advice of the Committee on Climate Change and consult the Devolved Administrations. There are three options:

1. Carry forward over-achievement from earlier budgets: The Act allows for Government to carry forward overachievement from one carbon budget to the next, so that early action to reduce emissions increases the following budget.
2. Carry back from later carbon budgets: The Act allows for the Government to increase the carbon budget in one period with a corresponding tightening of the next carbon budget. This 'borrowing' is limited to one per cent of the later carbon budget.

²⁸ Committee on Climate Change, [An Independent assessment of the UK's Clean Growth Strategy](#), January 2018, Box 1 [accessed 9 March 2018]

²⁹ HM Government, [The Clean Growth Strategy](#), October 2017, p.40

3. Use international carbon credits: The Act allows for the purchase of good quality international carbon credits to contribute to meeting carbon budgets but with a limit on the use of these credits set 18 months in advance of the relevant carbon budget.³⁰

The Committee on Climate Change initially commented on the Strategy as follows:

New policies included in the strategy will begin to close the significant gap between existing policies and what is required to meet the carbon budgets. We welcome the new thinking and ambition. We also recognise that the Government has identified areas where it will aim to do more and acknowledges there is work to be done to develop effective new policies.³¹

The press release went on to indicate that the CCC would not support the use of flexibilities to meet the fourth and fifth carbon budgets, emphasizing that the goal should be to deliver the budgets through domestic action alone:

We note that the Clean Growth Strategy suggests that 'flexibilities' in the Climate Change Act could be used to meet the carbon budgets in place of domestic action. This should not be the plan. The clear intention of the UK's fourth and fifth carbon budgets is that they are delivered through domestic action to keep the UK on the lowest cost path to the 2050 target to reduce emissions by at least 80% compared to 1990 levels. That should be the goal, without the use of accounting flexibilities or reliance on international carbon credits.³²

The CCC subsequently published its Independent Assessment of the Clean Growth Strategy (Jan 2018) which repeated its opposition to the use of flexibility mechanisms to help meet the fourth and fifth budgets, explaining (amongst other things) that the Committee's recommendations for the levels of these budgets were based on an assumption that outperformance of earlier budgets would not be carried forward.³³ The CCC also pointed to the Paris Climate Change Agreement, stating that:

The Paris Agreement is likely to require more ambitious long-term emissions targets than currently legislated. Should any carbon budget be outperformed, these lower emissions should provide the basis to prepare for tighter targets to be met in future; outperformance of carbon budgets should not be used to reduce ambition under existing targets.³⁴

The Government's approach was criticised by Opposition Members, including that the Strategy does not set out measures to fully meet the fourth or fifth carbon budgets. For example Dr Alan Whitehead (Labour) stated:

³⁰ Gov.uk, [Clean Growth Strategy](#), 12 October 2017, p41

³¹ Committee on Climate Change, [CCC Welcomes publication of the UK Government's Clean Growth Strategy](#), 12 October 2017

³² Committee on Climate Change, [CCC Welcomes publication of the UK Government's Clean Growth Strategy](#), 12 October 2017

³³ Committee on Climate Change, [An Independent assessment of the UK's Clean Growth Strategy](#), January 2018, Box 2 [accessed 9 March 2018]

³⁴ Committee on Climate Change, [An Independent assessment of the UK's Clean Growth Strategy](#), January 2018, Box 2 [accessed 9 March 2018]

Even with the additional measures set out in this plan, as the report states on page 41, it is estimated that the UK will over-emit at the conclusion of the fourth carbon budget by 6% above that budget and at the conclusion of the fifth carbon budget by 9.7%. What additional proposals does the Minister have in mind to rectify that deficit—or does she consider that somehow we will get there without anything other than what is in this plan?³⁵

The Minister for Climate Change (Claire Perry) responded that her intention was that the Government would not have to use the flexibilities between budgets:

[...] we can use flexibilities. My intention is that we do not have to use them.³⁶

The CCC wrote to the Minister for Energy and Clean Growth on 18 February 2019 about the carry-forward of surplus emissions from the UK's second carbon budget. The letter stated that “carry forward of the surplus undermines the integrity of the framework for emissions reduction under the Climate Change Act”. It went onto state:

Our conclusion is made stronger in the context of the UK's commitment to the Paris Agreement and the possibility of a strengthened UK emissions target, on which you have asked my Committee for advice. Reducing ambition in Carbon Budgets 3-5 by carrying forward surplus emissions would not be consistent with the Paris Agreement. It makes the existing 80% target for 2050, and any more ambitious target(s) that might be set, more difficult and expensive to meet. It would also make the Government's commitment to clean growth harder to deliver at a time when even greater ambition is required. The aim should be to meet and outperform carbon budgets through actions to reduce emissions, rather than relying on statistical revisions which can go both up and down.³⁷

³⁵ HC Deb 12 October 2017, [Col 486](#)

³⁶ HC Deb 12 October 2017, [Col 488](#)

³⁷ CCC, [Letter from Lord Deben to Claire Perry on carry-forward of surplus emissions](#), 18 February 2019 [accessed 20 February 2019]

3. Performance against carbon budgets

3.1 The UK Net Carbon Account

Under the 2008 Act, performance against carbon budgets is measured by the 'net UK carbon account'.

This measure is currently defined as the sum of three components:

- 1 Emissions allowances allocated to the UK under the EU ETS: the 'traded' sector refers to those sectors of the economy covered by the EU Emissions Trading System (EU ETS), primarily electricity generation and energy-intensive industry. The emissions attributed to the traded sectors is the UK's allocation of allowances under the EU ETS, rather than the actual UK territorial emissions in those sectors
- 2 UK emissions not covered by the EU ETS: the 'non-traded' sector covers all emissions outside the EU ETS, including transport, heating in buildings, agriculture, waste and some industry. The emissions attributed to the non-traded sectors reflects the actual emissions from the UK in those sectors.
- 3 Credits / debits from other international crediting systems.³⁸

The measure therefore allows carbon credits bought from the EU ETS to improve budget performance, by decreasing the measurement of emissions. Conversely, carbon credits sold to the EU ETS can worsen performance, by increasing the overall total emissions attributed to the UK account. This has been the subject of Parliamentary debate, with some arguing that the UK's performance should be measured using actual UK territorial emissions only (see Box 2).

Box 2: amending the UK net carbon account?

The [Energy Bill 2016](#) was introduced in the Lords, and was amended there to include a clause that would have adjusted the performance measure used in the carbon budgets so that performance was measured using actual UK territorial emissions only. With this change, credits or debits from the EU ETS would no longer contribute towards the UK's performance against its carbon budgets. The amendment was removed in the Commons. On returning to the Lords, opposition amendments were tabled to require the Secretary of the State to review whether the net carbon account for the Fifth Budget should include EU ETS credits, and requiring regulations to be introduced. None were successful. The *Energy Act 2016* does not therefore adjust the performance measurement.

The change would have meant that the CCC would need to produce a new Fifth Carbon Budget recommendation. Any new budget recommendation may well have been based on the cost effective path for territorial emissions that the CCC outlined (but did not recommend) in the [5th Carbon Budget Executive Summary](#).

Moreover, if the UK leaves the EU ETS following Brexit, there will be consequential impacts on the way that the UK measures its performance against domestic carbon budgets by the net UK carbon account. One clear-cut change would be to measure the UK carbon

³⁸ Gov.uk, [Updated energy and emissions projections 2017](#), 2 January 2018, Box 1 [accessed 15 March 2018]

budget by actual UK emissions, although previous attempts to make this change have been unsuccessful (see Box 2). The UK Government has not yet indicated what its approach might be. Any such change to measuring the net UK carbon account would likely require the UK's future carbon budgets to be revisited. Detailed discussion of the potential impact of Brexit on climate change policies in the UK (including the EU ETS and carbon pricing) is set out in the [Library Briefing Paper on Brexit: energy and climate change](#) (section 6).

3.2 Performance to date

The UK met the first and second carbon budgets. The first carbon budget (2008-2012) was outperformed by one per cent, and official statistics indicate that the second budget (2013-2017) was outperformed by around 14%.³⁹ Overall, UK emissions were 43% below 1990 levels in 2017.⁴⁰

The Department for Business, Energy and Industrial Strategy attributed the reduction in emissions largely to a decrease in the use of coal for electricity generation and identified transport as the largest emitting sector of UK greenhouse gases in 2017.⁴¹ The CCC attributed the outperformance of the second budget "very largely due to accounting changes in the EU Emissions Trading System and the lasting effects of the recession" and stated it was "not due to policy".⁴²

Government projections in January 2018 expected the UK to outperform against the third carbon budget (2018-2022) with headroom of 5.6% (143 MtCO₂). However, there was a predicted shortfall for the fourth and fifth carbon budgets (3.3% and 6.7% respectively).⁴³

The charts below set out actual and predicted performance against carbon budgets under existing and new Government policies and proposals,⁴⁴ along with the percentage difference between the relevant budget and the actual or estimated result.

³⁹ Gov.uk DBEIS national statistics, [Final UK greenhouse gas emissions national statistics: 1990-2017](#), 5 February 2019 [accessed 8 February 2019]

Note that a final statement for the second carbon budget, covering the period 2013-17, will be published by the Government in May 2019 to confirm overall performance against the budget level set.

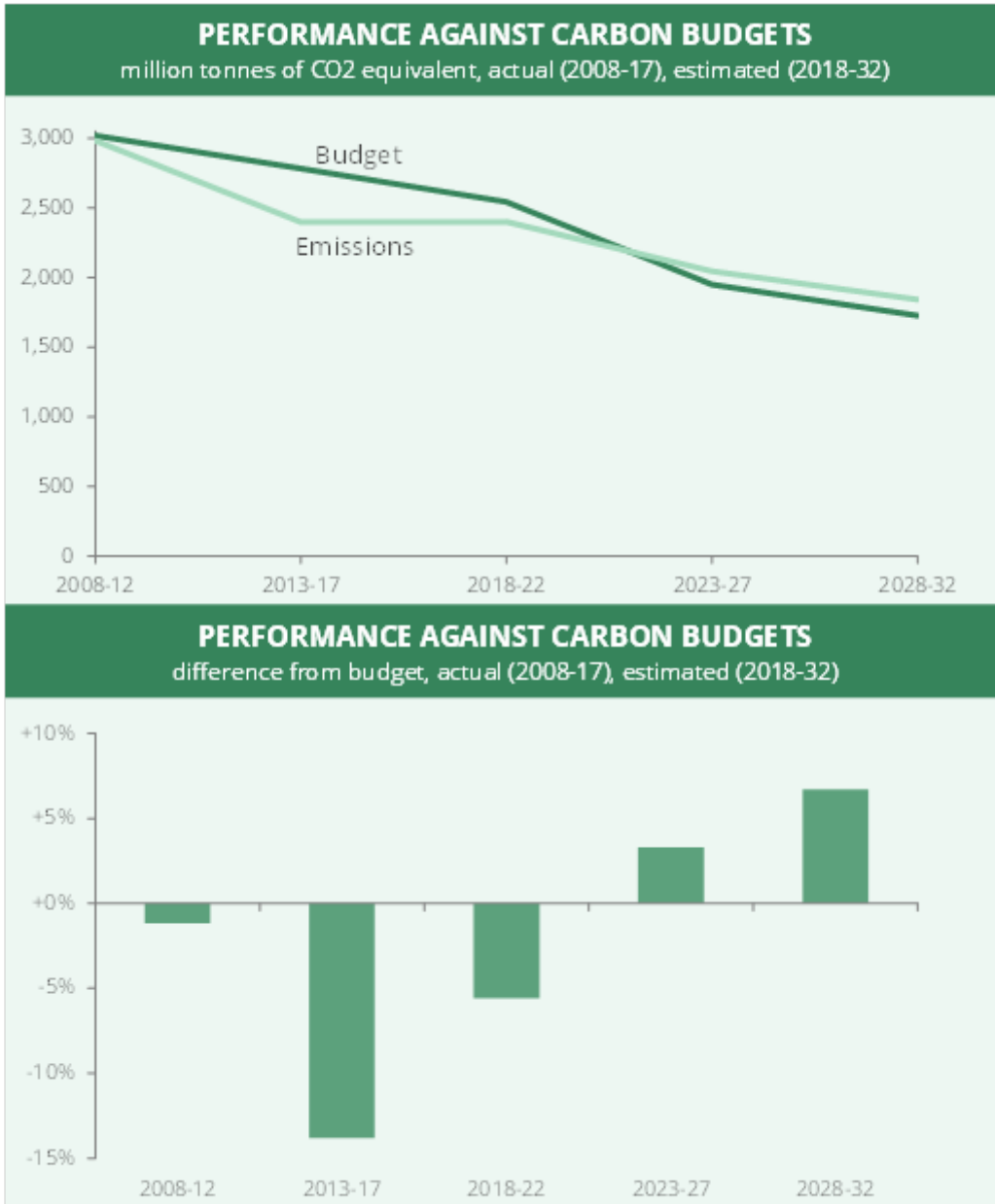
⁴⁰ Ibid.

⁴¹ Gov.uk DBEIS national statistics, [Final UK greenhouse gas emissions national statistics: 1990-2017](#), 5 February 2019 [accessed 8 February 2019]

⁴² CCC, [Letter from Lord Deben to Claire Perry on carry-forward of surplus emissions](#), 18 February 2019 [accessed 20 February 2019]

⁴³ These projections are provided by the Department for Business, Energy and Industrial Strategy, [Updated Energy and Emissions Projections 2017](#) (EEP), January 2018 and includes emission reduction estimates of a subset of new early stage policies and proposals from the Clean Growth Strategy. For details of the assumptions the data uses, please refer to the EEP.

⁴⁴ These projections are provided by the Department for Business, Energy and Industrial Strategy, [Updated Energy and Emissions Projections 2017](#) (EEP), January 2018 and includes emission reduction estimates of a subset of new early stage policies and proposals from the Clean Growth Strategy. For details of the assumptions the data uses, please refer to the EEP.



Note: projected emissions following existing and new policies and proposals

Sources: Final UK greenhouse gas emissions national statistics: 1990-2017, DBEIS; Updated energy and emissions projections: 2017, DBEIS

3.3 Commentary on progress

In its 2017 Clean Growth Strategy, the Government noted success in meeting the first carbon budget and the (then) projections to outperform against the second and third budgets:

Since 1990, we have cut emissions by 42 per cent whilst our economy has grown by two thirds. This means that we have reduced emissions faster than any other G7 nation, while leading the G7 group of countries in growth in national income over this period.

This progress has meant that we have outperformed the target emissions reductions of our first carbon budget (2008 to 2012) by one per cent and we project that we will outperform against our second and third budgets, covering the years 2013 to 2022, by

almost five per cent and four per cent respectively. Our economy is expected to grow by 12 per cent over that time. This will be a significant achievement.⁴⁵

The Committee on Climate Change published its [independent assessment of the UK's Clean Growth Strategy](#) in January 2018. Its conclusions included that gaps remained of around 10-65 MtCO₂e to meeting both the fourth and fifth carbon budgets on the basis of central projects and that these gaps must be closed (see Box 1 on comparing data):

Gaps to meeting the fourth and fifth carbon budgets remain. These must be closed. Whilst the Strategy sets out a '2032 Pathway' for sectoral emissions that would just meet the fifth carbon budget, there is no clear link to the policies, proposals and intentions that the Strategy presents. Our assessment of the policies and proposals set out in the Strategy indicates that, even if these deliver in full, there remain gaps of around 10-65 MtCO₂e to meeting both the fourth and fifth carbon budgets on the basis of central projections.

– **Fourth carbon budget (2023 to 2027).** There is a particular risk around meeting the fourth carbon budget, given that it begins in only five years' time and that plans set out so far are insufficient. The Government should set out in 2018 the additional policies that will close the remaining gap to meeting the budget (e.g. on energy efficiency, low-carbon heating, afforestation, waste). By 2020 there should be a plan that provides confidence that the fourth carbon budget will be met through UK domestic action.

– **Fifth carbon budget (2028 to 2032).** There are only 10 years until the start of the fifth carbon budget. Lead-times, particularly for UK supply chains, mean that clarity is required soon in order to drive the necessary investments. It is urgent that the Government sets out how the Strategy's ambitions and intentions will be delivered in full, and develops new policies to close the remaining gap.⁴⁶

The CCC subsequently published its [2018 Progress Report to Parliament](#) in June 2018.⁴⁷ The Committee's headline findings included:

- UK greenhouse gas emissions have reduced by 43% compared to 1990 levels, on the way to a target of at least an 80% reduction by 2050.
- 75% of emission reductions since 2012 have come from the power sector, but all other sectors are flat (transport, industry, buildings, agriculture, waste and F-gases).

The CCC's 2018 Report echoed its [2017 Progress Report to Parliament](#)⁴⁸ with a clear message to the Government that the UK is not on course to meet the legally binding fourth and fifth carbon budgets, calling on the Government to bring forward new fully funded policies to address this:

⁴⁵ Gov.uk, [Clean Growth Strategy](#), 12 October 2017, p5

⁴⁶ Committee on Climate Change, [An Independent assessment of the UK's Clean Growth Strategy](#), January 2018, Executive Summary [accessed 9 March 2018]

⁴⁷ CCC, [Reducing UK emissions: 2018 Progress Report to Parliament](#), 28 June 2018

⁴⁸ CCC, [Meeting the Carbon Budgets: closing the policy gap, 2017 Report to Parliament](#), June 2017

The UK is not on course to meet the legally binding fourth and fifth carbon budgets. It will not be on course unless risks to the delivery of existing policies are reduced significantly and until Government brings forward new fully funded policies, beyond the achievements to date on electricity generation and waste.⁴⁹

The Committee went on to lay out four key messages:

- **Support the simple, low-cost options**
Low-cost, low-risk options to reduce emissions are not being supported by Government. This penalises the consumer. There is no route to market for cheap onshore wind; withdrawal of incentives has cut home insulation installations to 5% of their 2012 level; woodland creation falls short of stated Government ambition in every part of the UK. Worries over the short term cost of these options are misguided. The whole-economy cost of meeting the legally binding targets will be higher without cost-effective measures in every sector.
- **Commit to effective regulation and strict enforcement**
Tougher long-term standards, for construction and vehicle emissions for example, can cut emissions, while driving consumer demand, innovation, and cost reduction. Providing long line of sight to new regulation also reduces the overall economic costs of compliance. Regulations must also be enforced to be effective: the consumer is cheated when their car's fuel consumption and real emissions exceed the quoted test-cycle numbers; or when higher energy bills are locked-in for generations when stated building standards are not enforced.
- **End the chopping and changing of policy**
A number of important programmes have been cancelled in recent years at short notice, including Zero Carbon Homes and the CCS Commercialisation Programme. This has led to uncertainty, which carries a real cost. A consistent policy environment keeps investor risk low, reduces the cost of capital, provides clear signals to the consumer and gives businesses the confidence to build UK-based supply chains.
- **Act now to keep long-term options open**
An 80% reduction in emissions has always implied the need for new national infrastructure - to transport and store CO2 for example, or to provide decarbonised heat. The deeper emissions reductions implied by the Paris Agreement make these developments even more important. We cannot yet define the 2050 systems for carbon capture, zero-carbon transport, hydrogen or electrification of heat, but the Government must now demonstrate it is serious about their future deployment. Key technologies should be pulled through to bring down costs and support the growth of the low-carbon goods and services sector.

In response the Government recognised the CCC's view that further action was needed to reduce the risks to delivery of future carbon

⁴⁹ CCC, [Reducing UK emissions: 2018 Progress Report to Parliament](#), 28 June 2018, p.12

budgets, and that “ambitious implementation of the policies and proposals set out in the Clean Growth Strategy” was its “priority”:

[...]

Our approach has two guiding objectives – to meet our domestic commitments at the lowest possible net cost to UK taxpayers, consumers and businesses, and to maximise the social and economic benefits for the UK from this transition. To meet these objectives, we need to support innovation in both technologies and processes, to help drive down costs and secure the UK’s economic advantage. We also need to acknowledge that we cannot predict every technological breakthrough. Therefore we need to ensure that we are creating the best possible environment for the private sector to innovate and invest. We also acknowledge the areas where we face the greatest uncertainty and challenge. For these areas, we are laying the groundwork for the major decisions our analysis shows we need to make. To help demonstrate the steps needed to make these decisions, we have updated the milestones and actions table from the Clean Growth Strategy, with the actions we will be taking over the coming months.

We agree with the CCC that ambitious implementation of the policies and proposals set out in the Clean Growth Strategy is vital to meet our carbon budgets, and that is our priority. Looking forward, we recognise the CCC’s view that further action and detailed policy measures are needed to reduce the risks to delivery of our future carbon budgets. Our key focus in the coming months and years will be to ensure we are addressing those risks. As part of this we have set up new processes to ensure that departments across the Government are delivering on the commitments made in the Clean Growth Strategy and looking for opportunities to go further, including through our Environment and Clean Growth InterMinisterial Group. [...]⁵⁰

⁵⁰ HM Government, [Delivering Clean Growth. Progress against meeting our carbon budgets – the Government Response to the Committee on Climate Change](#), October 2018

4. International commitments and Brexit

4.1 Implications of the Paris Climate Change Agreement

The [Paris Agreement](#)'s central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. More detailed information on the Paris Agreement is available in the [Library Briefing Paper on Climate Change Conference \(COP24\): Katowice, Poland](#).

The CCC published advice in light of the Paris Agreement in October 2016 where it concluded that the most important contribution the UK Government could make was publishing a robust plan to meet the UK carbon budgets and delivering policies in line with the plan.⁵¹

The CCC's independent assessment of the UK's Clean Growth Strategy reiterated its previous view and noted that proposals for meeting the carbon budgets should "also leave open the possibility of reducing emissions more quickly than required by the budgets, given that the Paris Agreement has more ambitious aims to limit global temperature increase than the aims on which the UK's carbon budgets are based".⁵² It also said that once the Intergovernmental Panel on Climate Change (IPCC) published its Special Report on the implications of the Paris Agreement's 1.5°C ambition, the Government should request further advice from the CCC on the implications of the Paris Agreement for the UK's long-term emissions targets.⁵³

The IPCC Special Report was published in early October 2018.⁵⁴ The IPCC press release noted that limiting warming to 1.5°C is possible but would require "rapid and far-reaching" transitions across multiple sectors:

"The good news is that some of the kinds of actions that would be needed to limit global warming to 1.5°C are already underway around the world, but they would need to accelerate," said Valerie Masson-Delmotte, Co-Chair of Working Group I.

The report finds that limiting global warming to 1.5°C would require "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO₂) would need to fall by about 45

⁵¹ CCC, [UK climate action following the Paris Agreement](#), 13 October 2016

⁵² Committee on Climate Change, [An Independent assessment of the UK's Clean Growth Strategy](#), January 2018, p32 [accessed 9 March 2018]

⁵³ Committee on Climate Change, [An Independent assessment of the UK's Clean Growth Strategy](#), January 2018, p31 [accessed 9 March 2018]

⁵⁴ IPCC, [Special Report on the impacts of global warming of 1.5°C](#), October 2018 [accessed 20 February 2019]

The IPCC is the leading international body for the assessment of climate change. It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide.

percent from 2010 levels by 2030, reaching 'net zero' around 2050. This means that any remaining emissions would need to be balanced by removing CO₂ from the air.

"Limiting warming to 1.5°C is possible within the laws of chemistry and physics but doing so would require unprecedented changes," said Jim Skea, Co-Chair of IPCC Working Group III.⁵⁵

On 15 October 2018, the Minister for Climate Change (Claire Perry) wrote to the CCC asking them to update their advice from October 2016, in order to "inform consideration of the UK's long term targets" including advice on a possible net zero greenhouse gas or carbon target.⁵⁶ The letter explicitly excluded carbon budgets 3, 4 and 5 from the scope of the advice. The Government has asked the CCC to deliver its advice by the end of March 2019. Further information on net zero is available in the [Library Insight: Net Zero Emissions: an new UK climate change target?](#) (19 October 2018).

4.2 Potential impact of Brexit

The Clean Growth Strategy explained the Government's view of the potential impact of Brexit on climate change policies, stating that domestic commitments would not be affected but the exact nature of the UK's future relationship with the EU, including in areas such as the EU ETS were "still to be determined":

Leaving the EU will not affect our statutory commitments under our own domestic Climate Change Act and indeed our domestic binding emissions reduction targets are more ambitious than those set by EU legislation. The exact nature of the UK's future relationship with the EU and the long-term shape of our involvement in areas like the EU Emissions Trading System are still to be determined. There are also emerging opportunities to drive more action – for example by putting emission reductions and land stewardship at the heart of a post EU agricultural support policy. We will therefore carefully examine each area of common interest with our EU partners and work to deliver policies and programmes that are at least as beneficial as the current arrangements.⁵⁷

The future of the UK's participation in the EU ETS has an impact on UK carbon budgets insofar as the UK net carbon account is measured (see above). Detailed discussion of the potential impact of Brexit on climate change policies in the UK (including the EU ETS and carbon pricing) is set out in the [Library Briefing Paper on Brexit: energy and climate change](#) (section 6).

⁵⁵ IPCC Press Release, [Summary for Policymakers](#) of IPCC Special Report on Global Warming of 1.5°C approved by government, 8 October 2018 [accessed 20 February 2019]

⁵⁶ Department for Business, Energy and Industrial Strategy, [Letter to CCC](#), 15 October 2018 [accessed 11 February 2019]

⁵⁷ Gov.uk, [Clean Growth Strategy](#), 12 October 2017, p10

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