



BRIEFING PAPER

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Net zero in the UK

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Summary

On 12 June 2019 the Government laid the draft [Climate Change Act 2008 \(2050 Target Amendment\) Order 2019](#) to amend the *Climate Change Act 2008* by introducing a target for at least a 100% reduction of greenhouse gas emissions (compared to 1990 levels) in the UK by 2050. This is otherwise known as a net zero target because some emissions can remain if they are offset by removal from the atmosphere and/or by trading in carbon units. The [Order](#) came into force on 27 June 2019.

This legislation broadly puts into effect a May 2019 recommendation from the Committee on Climate Change (the independent statutory body set up to monitor and advise on progress towards the UK's emission targets). However, it diverges from the recommendation that the target be achieved by domestic action only by retaining the ability to use international carbon credits. The new target was announced by then Prime Minister Theresa May in a [Downing Street Press release](#) in June 2019 and was widely welcomed by the Committee on Climate Change and other stakeholders including industry and environmental groups.

If met, this target would effectively mean that the UK will end its contribution to global emissions by 2050. Before this amendment, the UK had a long-term emissions reduction target of reducing greenhouse gas emissions by 80% by 2050, compared to 1990 levels, set by the [Climate Change Act 2008](#).

Since passing this legislation, the Government has announced a HM Treasury [Net Zero Review](#). This included a priority to ensure a fair balance of contributions from all those who will benefit, including considering how to reduce costs for low income households. The Review will also consider how to avoid offshoring emissions i.e. how to reduce UK emissions without causing those emissions to be created by another country. A final report is expected in Autumn 2020.

More information on existing decarbonisation targets and progress against them is available in the House of Commons Library briefing paper on [UK Carbon Budgets](#) (20 February 2019). Background on net zero is available in the Library's October 2018 insight [Net zero emissions: A new UK climate change target?](#)

1. Net zero recommendations and commitments

1.1 International context

The UK is a Party to the UN Framework Convention on Climate Change (UNFCCC) and has signed and ratified [the Paris Agreement](#): an international agreement on climate change. The key aim of the Paris Agreement is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C. The Agreement also included a widely-acknowledged net zero global greenhouse gas emissions aim for the second half of this century.¹

Following the Paris Agreement, the Intergovernmental Panel on Climate Change (IPCC) published a Special Report in October 2018 which found that limiting global warming to 1.5°C is possible but would require unprecedented “rapid and far reaching” changes in all aspects of society, including a need to reach ‘net zero’ by around 2050.²

The UK will host the UN climate change conference (COP26) at the end of 2020 in Glasgow, which will focus on implementing the Paris Agreement’s aims. Claire Perry is the UK nominated President for COP26.

Further background and information on international climate change action is available in the [Library Briefing paper on the Climate change conference \(COP24\): Katowice, Poland](#).

1.2 Committee on Climate Change recommendation

On 15 October 2018, following the publication of the IPCC Special Report, the then Minister for Energy and Clean Growth (Claire Perry) wrote to the Committee on Climate Change (CCC) to ask for updated advice on a date by which the UK should achieve a net zero greenhouse gas emissions target (including whether now is the right time for the UK to set such a target).³ The Scottish and Welsh Cabinet Secretaries co-signed the letter.

Prior to this, the UK Government had requested and followed CCC advice on UK action following the Paris Agreement from October 2016: that it was then too early to set a UK net zero target but to keep it under review.⁴ In a further commitment to keep the approach under

¹ Article 4 includes an aim “to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century”

² IPCC, [Summary for policymakers of IPCC special report on global warming of 1.5°C approved by governments](#), 8 October 2018

³ Gov.uk, [UK climate targets: request for advice from the Committee on Climate Change](#), 15 October 2018

⁴ See: [PQ 34423](#) [on Climate Change Convention: Paris] 22 April 2016 and Committee on Climate Change, [UK climate action following the Paris Agreement](#), October 2016

review, Prime Minister May's June 2019 announcement on legislating for net zero retained a review mechanism by including a commitment that the UK will conduct a further assessment within five years to confirm that other countries are taking similar action and to ensure that UK industries do not face unfair competition.⁵

On 2 May 2019, the CCC published its [Report on Net Zero: the UK's contribution to stopping global warming](#) which recommended the Government legislate for a new emissions target for the UK of net-zero greenhouse gases by 2050. The executive summary included the following:

The UK should set and vigorously pursue an ambitious target to reduce greenhouse gas emissions (GHGs) to 'net-zero' by 2050, ending the UK's contribution to global warming within 30 years.

Reflecting their respective circumstances, Scotland should set a net-zero GHG target for 2045 and Wales should target a 95% reduction by 2050 relative to 1990.

A net-zero GHG target for 2050 will deliver on the commitment that the UK made by signing the Paris Agreement. It is achievable with known technologies, alongside improvements in people's lives, and within the expected economic cost that Parliament accepted when it legislated the existing 2050 target for an 80% reduction from 1990.

However, this is only possible if clear, stable and well-designed policies to reduce emissions further are introduced across the economy without delay. Current policy is insufficient for even the existing targets.

A net-zero GHG target for 2050 would respond to the latest climate science and fully meet the UK's obligations under the Paris Agreement [...].⁶

1.3 Political support

Prior to her announcement, more than 192 cross-party MPs and 53 members of the House of Lords had signed a letter calling on Prime Minister May to back a net zero emissions target ahead of 2050.⁷

A net zero target was also backed by opposition parties in the lead up to the new target. An announcement at the [Labour Party conference 2018](#) stated a Labour government would back a net zero emissions by 2050 target, while the [Liberal Democrats](#) would legislate for net zero by 2050. The [SNP](#) agreed that a net zero target for 2050 or sooner is "the right goal" but that statutory targets must be credible and responsible. There have also been calls for earlier targets: the [Green Party policy on climate change](#) calls for net zero by 2030.

⁵ Gov.uk press release, [PM Theresa May: we will end UK contribution to climate change by 2050](#), 12 June 2019 (updated 19 June 2019) [accessed 24 June 2019]

⁶ Committee on Climate Change, [Net Zero – The UK's contribution to stopping global warming](#), 2 May 2019

⁷ The Climate Coalition, [cross-party MP joint letter](#): let's create a future where the UK no longer contributes to climate change [accessed 24 June 2019]

Furthermore, each of these parties committed to achieving net zero in their 2019 manifestos (see Box 1), albeit that some aimed for an earlier date than 2050.

Box 1: 2019 manifesto commitments to net zero

The **Conservative Party** pledged to lead the global fight against climate change by delivering on its world-leading target of Net Zero greenhouse gas emissions by 2050, as advised by the independent Committee on Climate Change. Pledges included: investment in clean energy solutions and green infrastructure; consulting on the earliest date by which the sale of new conventional petrol and diesel cars can be phased out; and a £640 million Nature for Climate fund with an additional 75,000 acres of trees a year by the end of the next Parliament.⁸

The **Labour Party** pledged to put the UK on track for a net zero carbon energy system within the 2030s; to achieve net zero carbon food production in Britain by 2040; and to phase out combustion engine vehicles by 2030.⁹ The Labour Party also pledged to plant two billion trees by 2040 in its [Plan for Nature](#).

The **Liberal Democrats** pledged to deliver a ten-year emergency programme to cut emissions substantially straight away, and phase out emissions from the remaining hard-to-treat sectors by 2045 at the latest. Priorities included: insulating all Britain's homes by 2030; achieving at least 80% of UK electricity being generated from renewables by 2030; planting 60 million trees a year; electrifying Britain's railways and ensuring all new cars are electric by 2030.¹⁰

The **Scottish National Party** pledged to demand that the UK accelerates its action to meet Scotland's climate change targets of a 75% reduction in emissions by 2030, net zero carbon emissions no later than 2040 and net zero of all emissions by 2045.¹¹

Plaid Cymru pledged to create tens of thousands of new jobs throughout Wales by kick-starting a multi-billion investment programme in renewable energy, transport infrastructure and digital technology, with the goal of making Wales a carbon free nation by 2030.¹²

The **Green Party** introduced a "Green new deal" with a combined investment of over £100 billion a year and pledged that it would get the UK on track to achieve net zero by 2030.¹³

⁸ [Conservative and Unionist Party Manifesto 2019](#): Get Brexit Done, Unleash Britain's Potential

⁹ [The Labour Party Manifesto 2019](#): It's time for real change

¹⁰ [Liberal Democrats Manifesto 2019](#): Stop Brexit, Build a brighter future

¹¹ [Scottish National Party manifesto 2019](#): Stronger for Scotland

¹² [Plaid Cymru manifesto 2019](#): Wales, it's us

¹³ [Green Party manifesto 2019](#): If not now, when?

2. Amending the Climate Change Act 2008

2.1 Climate Change Act 2008 (2050 Target Amendment) Order 2019

The [Climate Change Act 2008 \(2050 Target Amendment\) Order 2019](#) (the 2019 amendment Order) amends Section 1 of the *Climate Change Act 2008* to change the target for the net UK carbon account from at least 80% lower than the 1990 baseline to at least 100% lower. It came into force on 27 June 2019. It is accompanied by an [Explanatory Memorandum](#). The Government did not produce an accompanying impact assessment for the draft Order. The then interim Minister for Energy and Clean Growth (Chris Skidmore) explained the reason for this as follows:

The way that the legislation from the Climate Change Act 2008 has been framed means that impact assessments are not needed specifically for the SI. We did not have an impact assessment when we moved from 60% to 80%, because the risk is incumbent on Government in making the legislation. The impact assessments that are needed under the framework of the Act arise through the carbon budgets themselves.¹⁴

The House of Lords Secondary Legislation Scrutiny Committee published a report which drew special attention of the House of Lords to the draft Order and stated that the economic and societal changes that will be required should have been acknowledged by the Government:

Given the significant economic and wider societal changes that will be required to meet the zero emissions target, the Committee believes that the Department should have acknowledged in the Explanatory Memorandum this far-reaching impact and summarised the work that is underway to assess the significant costs and wider implications of the transition.¹⁵

These points were picked up in the subsequent debate on the draft Order in the House of Lords and are discussed further in section 4 of this paper.

Section 2(1) of the *Climate Change Act 2008* gives the Secretary of State the power to amend the target (either by amending the percentage or the baseline year) through secondary legislation. The target can only be amended if certain conditions are met. In this case the following are relevant:

- The power in subsection (1)(a) may only be exercised—
- (a) if it appears to the Secretary of State that there have been significant developments in—
 - (i) scientific knowledge about climate change, or
 - (ii) European or international law or policy,

¹⁴ HC Deb 24 June 2019 [Col 509](#)

¹⁵ House of Lords Secondary Legislation Scrutiny Committee, 53rd Report of Session 2017-19, 20 June 2019, [HL Paper 838](#)

that make it appropriate to do so¹⁶

The 2019 amendment Order states that “there have been significant developments in scientific knowledge about climate change” since the Act was passed that make it appropriate to amend the percentage set out in section 1(1) of the Act.

This power has not been used before. When the target was previously increased from 60% to 80% in 2008 under the then Labour Government, the *Climate Change Bill* was still progressing through Parliament.¹⁷

Section 2(6) of the *Climate Change Act 2008* states that an order to amend the target for the net UK carbon account will be subject to the affirmative resolution procedure, meaning it must be approved by both Houses of Parliament. The [draft instrument](#) was debated and approved by the House of Commons on 24 June 2019;¹⁸ and by the House of Lords (with a Labour amendment to the motion being agreed) on 26 June 2019.¹⁹ The key areas of debate in both Houses are discussed further in section 4 of this paper below.

2.2 Devolved Administrations

The 2019 amendment Order amends the *Climate Change Act 2008* which applies to the whole of the UK. The Explanatory Memorandum confirmed that the Government had taken into account representations from the devolved Administrations who had not raised any issues with the amendment proposed.²⁰ In its net zero report, the CCC recommended a UK wide target, but suggested that, in order to reflect their respective circumstances, Scotland should set an earlier target (net zero by 2045) and Wales should target 95% emissions reduction by 2050. The CCC’s report noted that in the absence of a Minister, Northern Ireland officials indicated their support for the advice being sought. Northern Ireland does not currently have its own long-term target for emissions but is included within UK targets.²¹

In addition to the *Climate Change Act 2008*, Wales and Scotland have their own legislation on decarbonisation targets. Shortly after the CCC published its report, the Scottish Ministers proposed amendments to the Scottish Climate Change Bill which would set a 2045 target for net-zero in Scotland.²² The resulting [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Act 2019](#) amends the *Climate Change (Scotland) Act 2009* and set new targets for Scotland to reduce Scotland's emissions of all greenhouse gases to net zero by 2045 at the latest, with interim

¹⁶ Section 2(2) *Climate Change Act 2008*

¹⁷ HC Deb 16 October 2008, [Col 939](#). The *Climate Change Act 2008* received [Royal Assent](#) on 26 November 2008.

¹⁸ HC Deb 24 June 2019

¹⁹ HL Deb 26 June 2019 [Col 1084](#)

²⁰ [Explanatory Memorandum to the Climate Change Act 2008 \(2050 Target Amendment\) Order 2019](#)

²¹ Committee on Climate Change, [Net Zero – The UK’s contribution to stopping global warming](#), 2 May 2019, footnote 2

²² Scottish Government, [Policy: climate change](#) [accessed 16 December 2019]

targets for reductions of at least 56% by 2020, 75% by 2030, 90% by 2040.

The [Environment \(Wales\) Act 2016](#) places a duty on Welsh Ministers to ensure that net emissions are 80% lower than the baseline by 2050. The Welsh Government said that it accepts the CCC's recommendation but wants to go beyond it. The Welsh Minister for Environment, Energy and Rural Affairs announced in June that the Welsh Government will therefore bring regulations before the Assembly in 2020 on a net-zero by 2050 target for Wales.²³

²³ Welsh Government, [Wales accepts Committee on Climate Change 95% emissions reduction target](#), 11 June 2019

3. Commentary and analysis

In its debate on the draft amendment Order, the House of Lords approved a Labour amendment to the motion “That the draft Order laid before the House on 12 June be approved” (155 Contents; 116 Not Contents) as follows:

“and that this House supports the objective of achieving net-zero carbon emissions by 2050, and acknowledges the substantial implications of this Order for the United Kingdom; but regrets that Her Majesty’s Government have (1) given little detail of how the emissions target will be met; (2) made a substantial change in policy without the full and proper scrutiny that such a change deserves; and (3) not introduced regulations under section 30 of the Climate Change Act 2008 to include greenhouse gases from (a) international aviation, or (b) international shipping, as part of the emissions target”²⁴

These points, along with some others, are discussed in more detail below.

3.1 An earlier target?

While the net-zero target commitment has widespread support, some argue it should be met earlier. For example, the environmental charity [WWF](#) and the campaign group [Extinction Rebellion](#) have both suggested that the net zero target could be met by 2045 and 2025 respectively. See Box 1 for the main political party’s views on when the target should be.

These calls were examined further by the Business Energy and Industrial Strategy (BEIS) Committee as part of its [Clean Growth Strategy inquiry](#). On 18 June 2019 the BEIS Committee examined the rationale for alternative targets proposed by environmental organisations in an evidence session with Extinction Rebellion, WWF and the Environmental Defense Fund.²⁵ The Labour Chair of the BEIS Committee summed up the views as follows in a subsequent House of Commons debate:

Our Committee took evidence last week, including from the World Wide Fund for Nature, which said that a target of 2045 was eminently possible. We heard other evidence that by 2050 we should be looking not at net zero, but at taking carbon out of the atmosphere, as my hon. Friend the Member for Southampton, Test (Dr Whitehead) said earlier, with a 120% target to do exactly that. I hope that when we have the five-year review we can look at being more radical and going further, so that we achieve net zero before 2050 and continue to be a world leader and ensure that we are at the forefront of creating green jobs and taking the opportunities that meeting this target will offer.²⁶

The Committee on Climate Change advised against an earlier target at this time and explained 2050 was an appropriate target for the following reasons:

²⁴ HL Deb 26 June 2019 [Col 1087](#)

²⁵ BEIS, Oral evidence: Clean Growth Strategy and International Climate Change Targets, [HC 871](#), 18 June 2019

²⁶ HC Deb 24 June 2019 [Col 524](#)

Based on our current understanding, it is the latest date for the UK credibly to maintain its status as a climate leader and the earliest to be credibly deliverable alongside other government objectives.²⁷

The CCC's Report goes onto to explain further:

We have considered whether an earlier date than 2050 should be targeted. An earlier date has been proposed by some groups and might send a stronger signal internationally to those considering increasing their own ambition, but only if it is viewed as credible.

While our scenarios demonstrate that some sectors (e.g. the power sector) could reach net-zero emissions by 2045, for most sectors 2050 currently appears to be the earliest credible date. An earlier date would also give less time to develop currently speculative options as alternatives to make up for any shortfall from other measures. That could lead to a need for punitive policies and early capital scrappage to stay on track to the target.²⁸

3.2 International credits

The CCC recommended that the target should be met through UK domestic effort only, i.e. that international carbon credits should not be used. International carbon credits refer to the international emissions trading market, which is explained further by the [UNFCCC pages on international emissions trading](#). Counter to the CCC recommendation, the [Government press release](#) stated that it would "retain the ability to use" international carbon credits in meeting the target, explaining that:

Using international credits within an appropriate monitoring, reporting and verification framework is the right thing to do for the planet, allowing the UK to maximise the value of each pound spent on climate change mitigation.²⁹

The then Secretary of State for Business, Energy and Industry Strategy subsequently reassured the House of Commons that the Government did "not intend to use" international credits:

While we retain the ability in the Act to use international carbon credits that contribute to actions in other countries, we want them to take their own actions and we do not intend to use those credits.³⁰

However, some commentators, such as Green Party MP Caroline Lucas, have called for the use of international credits to be explicitly ruled out, in line with the CCC's recommendation:

The second door that has been left open is to the offshoring of our remaining emissions using international carbon credits. When I asked the Business Secretary to close that loophole earlier this month, he attempted to reassure me by saying that the Government would not be making use of these credits, but I am not reassured simply by those words. This Government might

²⁷ Committee on Climate Change, [Net Zero – The UK's contribution to stopping global warming](#), 2 May 2019, p.17

²⁸ Committee on Climate Change, [Net Zero – The UK's contribution to stopping global warming](#), 2 May 2019, p.21

²⁹ Gov.uk press release, [PM Theresa May: we will end UK contribution to climate change by 2050](#), 12 June 2019 (updated 19 June 2019) [accessed 24 June 2019]

³⁰ HC Deb 12 June 2019 [Col 663](#)

have no intention of using international carbon credits, but who can say whether a new Administration in five years' time—or, dare I say it, five weeks' time—will share such scruples?³¹

Cross-bench Peer Baroness Worthington took a different view, arguing that international credits could be used to go even further than the 100% target:

However, the Government have not fully accepted all the advice from the Committee on Climate Change and have said that they do not rule out using international offsets to get to our target. I do not object to this if they are well done and well regulated, and it will make no practical difference in law, because we do not set out limits and offsets until 18 months before the start of any budgetary period. However, having deviated from the very clear advice of the CCC, we can now go even further than the 100% reduction target because it will be far cheaper and easier should we allow international offsets into this system. In meeting this goal, if we want to stay at the costs we have accepted—1% to 2% of GDP—we can go further. It opens up the opportunity to go into minus figures—minus 120% or minus 150%. This is now possible, and it would be the right thing to do.³²

3.3 International aviation and shipping

The CCC recommended that the target should include the UK's share of emissions from international aviation and shipping. To date the UK's legally binding emissions reduction targets have not formally included such emissions but they have been taken into account by setting aside "headroom" within the carbon budgets.³³

Box 2: Action on international aviation and shipping emissions

Together, international shipping (816MtCO₂e in 2012³⁴) and aviation (895MtCO₂e in 2018³⁵) are responsible for around 4-5% of global CO₂ emissions. Without policies or new technologies to reduce emissions, these sectors are forecast to be responsible for an even larger share of total emissions in the future.

Recognising this sizeable contribution to global emissions, the two UN agencies responsible for international aviation and shipping have resolved to find ways to reduce emissions in accordance with the Paris Agreement.

- In 2016, the International Civil Aviation Organization (ICAO) reached an agreement to implement a global [Carbon Offsetting and Reduction Scheme for International Aviation \(CORSIA\) system](#). CORSIA stipulates that airlines are obliged to offset their increases in emissions after 2020 by purchasing credits from projects that reduce emissions outside the aviation sector.
- In April 2018, the International Maritime Organization [adopted an "initial strategy" on the reduction of greenhouse gas emissions](#) from ships.³⁶ This initial strategy set a target of reducing GHG emissions by at least 50% by 2050 with a strong emphasis by many countries on reducing this to 100% by 2050 wherever possible.

The [Government press release](#) was silent on international aviation and shipping but a Carbon Brief article analysing the new target quoted the

³¹ HC Deb 24 June 2019 [Col 528](#)

³² HL Deb 26 June [Col 1098](#)

³³ See [Library Briefing Paper on UK Carbon Budgets](#) for further information.

³⁴ IMO, [Third IMO Greenhouse Gas Study 2014](#), p1

³⁵ Jocelyn Timperley, [Corsia: The UN's plan to 'offset' growth in aviation emissions after 2020](#), CarbonBrief, 4 Feb 2019

³⁶ IMO, [UN body adopts climate change strategy for shipping](#), 13 Apr 2018

Prime Minister's office in response to its questions as stating: "this is a whole economy target...and we intend for it to apply to international aviation and shipping".³⁷ The Explanatory Memorandum addressed international aviation and shipping as follows (see further Box 2):

The Government recognises that international aviation and shipping have a crucial role to play in reaching net zero emissions globally. However, there is a need for further analysis and international engagement through the appropriate frameworks. For now, therefore, we will continue to leave headroom for emissions from international aviation and shipping in carbon budgets to ensure that emissions reduction strategies for international aviation and shipping can be developed within International Maritime Organisation and International Civil Aviation Organisation frameworks at the appropriate pace, and so that the UK can remain on the right trajectory for net zero greenhouse gas emissions across the whole economy.³⁸

This approach was questioned by opposition MPs in the debate on the 2019 amendment Order, including the Labour Chair of the BEIS Committee:

Other such areas are international aviation and shipping, which I am disappointed are not included in the SI we are debating today. The chief executive of the Committee on Climate Change, Chris Stark, who gave evidence to our Select Committee, said that it was absolutely imperative to include international aviation and shipping in our climate change commitments, because they contribute 10% of our carbon emissions. I hope the Government will look at that evidence again and update our legislation in light of it.³⁹

Labour Peer Lord Grantchester, who moved the Lords amendment to the motion referenced above, referred to the Explanatory Memorandum explanation as a "hollow commitment":

[...] this is a hollow commitment, as the Government are already failing to abide with the fourth and fifth carbon budgets, which were drawn up within the pathway of reaching 80% carbon emissions reduction at 2 degrees of global warming. Let us state it again: this order is to reach 100% reductions to reach net zero at 1.5 degrees of warming. The latest, updated emissions projections from the department are that we are some 7% over the requirements for the fourth carbon budget and 13% over those for the fifth. What urgent steps are the Minister and the Government taking to get the UK back on track to meet the already-agreed carbon budgets?⁴⁰

3.4 Potential costs of net-zero

The CCC stressed that the overall costs of reaching net zero by 2050 are "manageable but must be fairly distributed". The Committee estimated the cost of meeting the net-zero target as 1-2% of GDP, the same as the previously predicted cost of the current 80% target, due to rapid

³⁷ Carbon Brief, [In-depth Q&A: The UK becomes the first major economy to set net-zero climate goal](#), 12 June 2019

³⁸ [Explanatory Memorandum to the Climate Change Act 2008 \(2050 Target Amendment\) Order 2019](#), para 10.5

³⁹ HC Deb 24 June 2019 [Col 524](#)

⁴⁰ HL Deb 26 June 2019 [Col 1088](#)

cost reductions in key technologies such as offshore wind. It also recommended that HM Treasury should review how the transition will be funded:

HM Treasury should undertake a review of how the transition will be funded and where the costs will fall. It should develop a strategy to ensure this is, and is perceived to be, fair. A broader strategy will also be needed to ensure a just transition across society, with vulnerable workers and consumers protected.⁴¹

Following the publication of the CCC's net zero report there were press reports of a leaked letter from the then Chancellor of the Exchequer (Philip Hammond) warning the Prime Minister the new target would hurt public spending and could render key industries economically uncompetitive. The article highlighted the Chancellor's concerns about the potential costs of "more than £1trn" to achieve net-zero.⁴² These concerns were contested as "simply incorrect" by a commentary piece by a visiting research fellow at the Grantham Research Institute on Climate Change and the Environment, which presents the findings of the [Report to the Committee on Climate Change of the Advisory Group on Costs and Benefits of Net Zero](#) as the evidence for this.^{43 44}

The potential economic impact of the proposed changes was picked up by the House of Lords Secondary Legislation Scrutiny Committee and debated in more detail in the House of Lords debate on the amendment Order. Some, such as Conservative peer Viscount Ridley, argued that the Treasury review should have been run before the amendment Order was debated and agreed.⁴⁵

On 2 November 2019, HM Treasury launched a [Net Zero Review](#) to "assess how the UK can maximise economic growth opportunities from its transformation to a green economy". This included a priority to ensure a fair balance of contributions from all those who will benefit, including considering how to reduce costs for low income households. The Review will also consider how to avoid offshoring emissions i.e. how to reduce UK emissions without causing those emissions to be created by another country. A final report is expected in Autumn 2020.⁴⁶

On 5 June 2019, the House of Commons Treasury Committee launched an [inquiry into the decarbonisation of the UK economy](#), scrutinising the role of HM Treasury, regulators and financial services firms in supporting the Government's climate change commitments. It is also examining the

⁴¹ Committee on Climate Change, [Net Zero – The UK's contribution to stopping global warming](#), 2 May 2019, p.15

⁴² Jim Pickard, [UK net zero emissions target will 'cost more than £1trn'](#), *Financial Times*, 5 June 2019 [subscription only]

⁴³ Dmitri Zenghelis (Visiting Research Fellow) Grantham Research Institute on Climate Change and the Environment, [Why the Chancellor's statement on the cost of a net-zero transition in the UK could imperil the country's climate ambitions](#), 6 June 2019 [accessed 25 June 2019]

⁴⁴ Committee on Climate Change, [Report to the CCC of the Advisory Group on costs and benefits of net zero](#) [accessed 26 June 2019]

⁴⁵ HL Deb 26 June 2019 [Col 1100](#)

⁴⁶ Gov.uk, [Net Zero Review launched to support UK's world leading climate commitment](#), 2 November 2019 [accessed 25 November 2019]

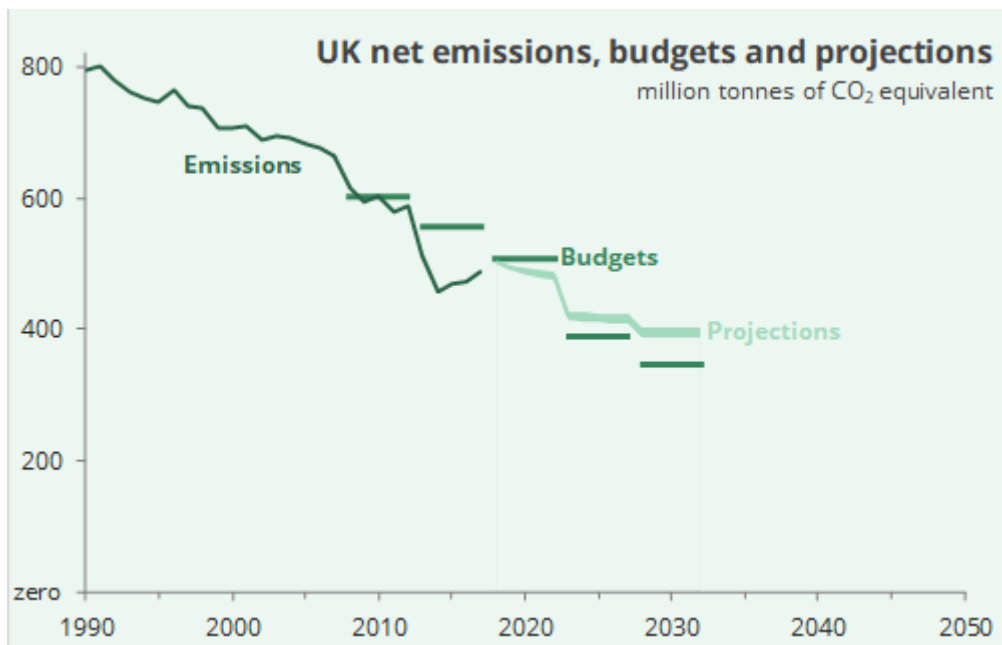
economic potential of decarbonisation for the UK economy in terms of job creation and growth.⁴⁷ Due to the general election on 12 December 2019, the Committee closed this inquiry.

⁴⁷ House of Commons Treasury Committee, [Inquiry into the decarbonisation of the UK economy](#)

4. Policy actions to meet net zero

4.1 Progress so far

The Chart below shows the UK's net emissions, performance against existing carbon budgets and projections of emissions. The *Climate Change Act 2008* has been a tool for driving down emissions in the UK as it sets a long-term legally binding emissions reduction target, as well as requiring interim five-yearly carbon budgets to be set. This Chart shows progress and budgets that were achieved and set *before* the net zero target was legislated for. The Committee on Climate Change is expected to publish its advice on the sixth carbon budget in September 2020, which will take into account the new net zero target.⁴⁸ Its [call for evidence](#) is open until 5 February 2020.



Sources: Department for Business, Energy & Industrial Strategy, [Updated energy and emissions projections: 2018](#) (16 May 2019); [Final UK greenhouse gas emissions national statistics: 1990-2017](#) (28 March 2019)

Further information on carbon budgets and the UK's progression against them is set out in the [Library Briefing paper on UK Carbon Budgets](#).

4.2 Commentary and debate

The CCC emphasised that the target is “just the first step” and needs to be reinforced by credible UK policies.⁴⁹ The BEIS Secretary of State acknowledged this in his statement to the House of Commons on 12

⁴⁸ Committee on Climate Change, [CCC to publish Sixth Carbon Budget in September 2020](#), 17 October 2019

⁴⁹ Committee on Climate Change, [Response to Government plan to legislate for net Zero UK emissions target](#), 11 June 2019

June 2019, pointing to existing strategies in place (such as the Clean Growth Strategy) that form the foundations for the changes needed:

In fulfilling the scale of the commitment we are making today, we will need technological and logistical changes in the way we use our land, with more emphasis, for example, on carbon sequestration. We will need to redouble our determination to seize the opportunity to support investment in a range of new technologies, including in areas such as carbon capture, usage and storage, and in hydrogen and bioenergy.

However, as the committee also found, the foundations for these step changes are already in place, including in the industrial strategy and the clean growth strategy. Indeed, there is no reason whatever to fear that fulfilling this commitment will do anything to limit our success in the years ahead—quite the reverse. In our industrial strategy, we have backed technology and innovation, including the UK's biggest ever increase in public investment in research and development.⁵⁰

Calls for concrete action were echoed in the House of Commons debate on 24 June 2019, including by Labour MP Ed Miliband: “if you will the end, you have to will the means”⁵¹; and Conservative MP Peter Aldous:

Other pieces of the jigsaw are missing, however, such as a route map for decarbonising transport, a flexible policy framework for promoting local bespoke heating schemes and a comprehensive plan for meeting the domestic energy efficiency targets in the clean growth strategy, as put forward by my hon. Friend the Member for Truro and Falmouth (Sarah Newton) in her ten-minute rule Bill last week. The UK has made significant strides in decarbonising the nation's power supply, with offshore wind providing a means of regenerating coastal communities such as Lowestoft, but more work needs to be done, including providing a clear route to market for other clean energy technologies and getting on with delivering those big-ticket items of nuclear power and carbon capture, utilisation and storage, which are absolutely vital to delivering on the zero carbon goal. It is important for us not to be not a one-trick pony and concentrate only on power. We must immediately set about making significant strides in decarbonising transport and heat, as well as improving our performance in relation to energy efficiency.⁵²

The then interim Minister, Chris Skidmore, committed to an energy White Paper and a number of other documents and consultations to demonstrate forthcoming actions from the Government:

My hon. Friend is right that the legislation today is not simply about warm words or passing a law. We need to be able to demonstrate the action that lies beneath it. Action will come relatively quickly with the publication of an energy White Paper in the summer that will look at the future of our energy supply, at a household level and an industrial level, and the energy network itself. The White Paper will demonstrate the action that the Government are taking and it will lead to a series of future consultations.⁵³

⁵⁰ HC Deb 12 June 2019 [Col 663](#)

⁵¹ HC Deb 24 June 2019 [Col 522](#)

⁵² HC Deb 24 June 2019 [Col 521](#)

⁵³ HC Deb 24 June 2019 [Col 510](#)

The energy White Paper was not published before the general election.

4.3 Citizens' Assembly

On 20 June 2019, six Select Committees of the House of Commons⁵⁴ announced plans to hold a Citizen's Assembly on combatting climate change and achieving the pathway to net zero carbon emissions. In early November 2019, some 30,000 invitations were sent across the UK to randomly selected households inviting people to join Climate Assembly UK. The project is being run by the House of Commons, with involve, Sortition Foundation and mySociety. The Climate Assembly will have over 100 members representative of the UK population and will meet over four weekends in early 2020. More information is available on the [Climate Assembly UK webpages](#).

4.4 Removing emissions

Net zero allows for emissions to be removed from the atmosphere to reach the 100% target. There are a number of ways that emissions can be removed from the atmosphere. Broadly speaking, these can be split into natural processes or technologies. A POST Note on [Greenhouse gas removal](#) provides further discussion of the potential options.

Natural solutions

The best-known natural approach is planting trees. Trees absorb and store CO₂ from the air as they grow (see Box 1 for manifesto 2019 pledges to plant trees). Other natural solutions include restoring peatlands and restoring natural ecosystems (sometimes referred to as rewilding). Avoiding deforestation and destruction of existing ecosystems and peatland would also serve to ensure CO₂ that is already stored in plants and the soil is safeguarded.

Some natural solutions, such as rewilding and planting trees, can be controversial as they have been seen by some as conflicting with continued agricultural land use.⁵⁵ Farmers can currently voluntarily improve practices under an industry [Greenhouse Gas Action Plan](#). Financial incentives could support farmers to act further and the Committee on Climate Change has called for England's Farm Emissions Reduction Plan (due out in 2020) to include firm policies and an implementation plan to reduce greenhouse gas emissions in agriculture. The Conservative Government's [Agriculture Bill 2017-19](#) included measures to pay farmers for taking steps like reducing emissions or sequestering carbon.

There was a House of Commons debate on an e-petition to "restore nature on a massive scale to help stop climate breakdown" on 28 October 2019.⁵⁶ The Government response to the petition included the following:

⁵⁴ BEIS; Environmental Audit; Housing, Communities and Local Government; Science and Technology; Transport and Treasury

⁵⁵ Civil Society, [Rewilding Britain pulls out of £3.4m project after concerns about its involvement](#), 22 October 2019

⁵⁶ [HC Deb 28 October 2019](#)

Our woodlands and wetlands provide vital services, such as carbon sequestration and flood prevention that can help to mitigate climate change and help us adapt to its impacts. Tree planting is one of the main contributors to nature-based carbon sequestration and the Government supports this in a number of ways. Our manifesto committed to planting 11 million trees by 2022, and in addition a further 1 million trees in our towns and cities, and we also have a long term aspiration to increase woodland cover from 10% to 12% by 2060. To achieve these goals, in the Autumn Budget the Chancellor announced £10 million for an Urban Trees Challenge Fund and £50 million to help plant new woodlands through the Woodland Carbon Guarantee.

Peatlands are our largest terrestrial carbon store. Drained peatlands release their carbon, adding greenhouse gases to the atmosphere. Organic or peat soils make up 11% of England's total land area, over 70% of which are drained or in poor condition. We have committed to publishing an England Peatland Strategy. The strategy will set out our vision to reverse decline in peatlands and restore them, which is in line with the Government's commitment to be the first generation to leave the natural environment of England in a better state than we found it. Work is underway on four large-scale peatland restoration projects across England, to which we have allocated £10 million, and will restore 5,851 ha of degraded peatlands.⁵⁷

Technologies

There are a number of emerging technologies which remove emissions from the atmosphere which are at various stages of development. The most well-known is carbon capture and storage (CCS) which involves capturing CO₂ and then transporting it to storage in deep geological formations. The CCC identify CCS as a "necessity not an option" to achieving the UK's net zero target.⁵⁸

More recently carbon capture and usage (CCU) has been focused on. This involves capturing waste CO₂ from power production and industrial processes, and using it in a broad number of economically productive ways such as: the production of chemicals, minerals, synthetic fuels, plastics, or as a solvent. Further information is available in the [POST Briefing on Carbon Capture and Usage](#) (2 November 2018).

⁵⁷ UK Government and Parliament Petitions, [Closed petition: Restore nature on a massive scale to help stop climate breakdown](#). Government response published 2 May 2019.

⁵⁸ CCC, [Net Zero – The UK's contribution to stopping global warming](#), May 2019, p23

5. Further reading

- House of Commons Library collection of climate change-related publications, [Climate change: an overview](#).
- Office for National Statistics, [Net zero and the different official measures of the UK's greenhouse gas emissions](#), 24 July 2019
- The Energy and Climate Intelligence Unit (a non-profit initiative aiming to support informed debate on energy and climate issues) has a number of briefings on net zero, including a [net zero scorecard](#) noting the countries, cities, companies and industries who have committed to net zero.
- The [UN Environment Programme pages on climate change](#).
- Carbon Brief [In-depth article: the UK should reach 'net-zero' climate goal by 2050, says CCC](#), 2 May 2019

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