



DEBATE PACK

Number CDP 2018/0244, 9 November 2018

Extreme weather events related to climate change

This pack has been prepared ahead of the debate to be held in Westminster Hall on extreme weather events related to climate change on Tuesday 13 November 2018 at 9.30 am. The subject for the debate has been chosen by the Backbench Business Committee, and it will be opened by Darren Jones MP.

By Sara Priestley
Nikki Sutherland

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The House of Commons Library prepares a briefing in hard copy and/or online for most non-legislative debates in the Chamber and Westminster Hall other than half-hour debates. Debate Packs are produced quickly after the announcement of parliamentary business. They are intended to provide a summary or overview of the issue being debated and identify relevant briefings and useful documents, including press and parliamentary material. More detailed briefing can be prepared for Members on request to the Library.

1. Extreme weather events related to climate change

1.1 Backbench Business Committee submission

The application for this debate was made by Darren Jones MP with the following proposal:

I am applying for a 90-minute Westminster Hall debate to talk about the weather. That might sound frightfully British, but it is because we had a number of extreme weather patterns across the world over the summer recess this year, when we were of course not here to debate them. The really important Intergovernmental Panel on Climate Change report that came out on 8 October suggested that we have 12 years to limit world temperature increases to 1.5°C if we do not want to see substantive changes to the way we live our lives.

We have applied through the shuffle on a couple of occasions and been unsuccessful, which is why I have brought this application to the Committee. We checked with the House of Commons Library whether I missed the opportunity to take part in one of these important debates. There has not been one on the Floor of the House or in Westminster Hall. There were several debates recently on the clean growth strategy, which were welcome and which I took part in, but those focused specifically on domestic policy and the industrial strategy, as opposed to international collaboration—this is an international issue—and also the Government's view on the IPCC report and limiting temperature growth to 1.5°C.

As you can see from the application, we have had positive support from Members from across the House, with enough to fill a 90-minute debate. I suggest that it is really important for Parliament to debate the substance of the IPCC report in parliamentary time, which we have not had the chance to do yet, to understand the Government's view and then, off the back of the debate, to suggest whether it might require further debate in the House or further action through normal parliamentary procedures.¹

Some further information on the specific topics raised in the backbench business committee application is included below.

1.2 IPCC Special Report

The [Intergovernmental Panel on Climate Change](#) (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.

On 6 October 2018, the IPCC approved a [Special Report](#) on the impacts of global warming of 1.5°C above pre-industrial levels and related greenhouse gas emissions pathways, in the context of strengthening the global response to the threat of climate change, sustainable

¹ Backbench Business Committee, [Representations: Backbench Debates](#), 30 October 2018, Q7

development and efforts to eradicate poverty.² The [press release](#), [summary for policymakers](#) and [headline statements](#) set out useful overviews of the Report.

In the accompanying press release, on extreme weather events, the Co-Chair of IPCC Working Group I (Panmao Zhai) said:

One of the key messages that comes out very strongly from this report is that we are already seeing the consequences of 1°C of global warming through more extreme weather, rising sea levels and diminishing Arctic sea ice, among other changes.³

Government view on IPCC report

The Government pages on [Climate change explained](#) confirm that the UK Government fully supports the work of the IPCC in general:

The UK Government has always fully supported the work of the IPCC and regards its assessments as the most authoritative view on the science of climate change available.⁴

Following the publication of the IPCC's Special Report, the [Government wrote to the Committee on Climate Change](#) to ask them to update their October 2016 advice on UK climate action following the Paris Agreement. The letter was co-signed by Scottish and Welsh Ministers, requesting updated advice on the long-term emissions targets for Scotland and Wales.

More specifically, the Government is asking for advice on:

- setting a date for achieving net zero greenhouse gas emissions across the economy
- whether we need to raise our 2050 target of cutting emissions by at least 80% relative to 1990 levels to meet international climate targets set out in the Paris Agreement
- how emissions reductions might be achieved across the economy
- the expected costs and benefits in comparison to current targets.⁵

The letter asks for the advice to be provided by the end of March 2019.

A PQ response on 6 November on this topic stated:

Carbon Budgets: Climate Change

Asked by: Godsiff, Mr Roger | Party: Labour Party

To ask the Secretary of State for Business, Energy and Industrial Strategy, what (a) representations his Department has received and (b) assessment his Department has made since the publication of the IPCC report on global warming of 1.5 degrees on the potential (i) economic and (ii) climatic merits of amending the UK's third, fourth and fifth carbon budgets.

² IPCC Special Report on Global Warming of 1.5°C, October 2018

³ IPCC Press release, [Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments](#), 8 October 2018

⁴ [PO 186935](#) [on carbon budgets] 6 November 2018

⁵ Gov.uk press release, [UK climate targets: request for advice from the committee on climate change](#), 15 October 2018

Answering member: Claire Perry | Party: Conservative Party |
Department: Department for Business, Energy and Industrial
Strategy

The Department receives a wide variety of representations on many topics including the IPCC Special Report on global warming of 1.5 degrees.

We are leading the world in our response to the IPCC report – commissioning our independent experts, the Committee on Climate Change, for advice on our long-term targets a week after the report’s publication. We will consider the Committee’s advice carefully when received.⁶

A Library Insight on [Net Zero: a new UK climate change target?](#) provides further discussion of the net zero aspect.

1.3 Extreme weather events

The Met Office published a report on extreme weather events in the UK on 1 November 2018 to complement its *State of the UK Climate 2017* report.⁷ The study used a set of measures by the [World Meteorological Organization](#) and [World Climate Research Programme](#) which are widely used in global climate research.

The report summarises a set of core indices, which can be obtained from temperature and rainfall data. It also shows climate shifts for UK countries and regions, along with maps showing the data across four time periods: 1961-1990; 1981-2010; 2008-2017; and 2017. The report sets out the following key UK results:

Highest maximum temperature: highest value of daily maximum temperature for each calendar year, averaged over climatological reference periods.

UK: 1961-1990 average 26.0 °C; 2008-2017 average 26.8 °C.

Summer days: annual count of days where the daily maximum temperature was above 25.0 °C

UK: 1961-1990 average 4.5 days; 2008-2017 average 5.3 days.

Tropical nights: annual count of days where the daily minimum temperature was above 20.0 °C.

Currently not common in the UK climate.

Warmspell duration index: duration of at least six days with daily maximum temperature well above climatological average for the time of year.

UK: 1961-1990 average 5.3 days; 2008-2017 average 13.2 days.

Warm spells have more than doubled in duration between 1961-1990 and 2008-2017.

Lowest minimum temperature: Lowest value of the daily minimum temperature for each calendar year, averaged over climatological reference periods.

UK: 1961-1990 average -8.5 °C; 2008-2017 average -6.8 °C.

⁶

⁷ Met Office, [State of the UK Climate 2017: Supplementary report on Climate Extremes](#), 1 November 2018

Icing days: Annual count of days where the daily maximum temperature was below 0.0 C

UK: 1961-1990 average 4.8 days; 2008-2017 average 3.2 days.

Key rainfall indices and UK results:

Maximum 5-day precipitation: Highest value of the five-day precipitation amount (mm) for each calendar year, averaged over climatological reference periods.

UK: 1961-1990 average 77.8 mm; 2008-2017 average 81.4 mm.

Longest wet spell: Longest sequence of days with 1 mm or more of rainfall each calendar year, averaged over climatological reference periods.

UK: 1961-1990 average 12.4 days; 2008-2017 average 12.9 days.

Longest dry spell: Longest sequence of days with less than 1mm of rainfall for each calendar year, averaged over climatological reference periods.

UK: 1961-1990 average 20.5 days; 2008-2017 average 18.0 days.

Overall, the longest dry spells have decreased by 2.5 days, on average.

Rainfall from extremely wet days: Total annual precipitation from falling on the wettest days, averaged over climatological reference periods.

UK: 1961-1990 average 64.0 mm; 2008-2017 average 75.0 mm.

Total rainfall from extremely wet days has increased by about 17%.⁸

Extreme weather events can have a wide range of impacts, including on health, economies, infrastructure and buildings, and on the environment. The Government pages on [climate change explained](#) provide some discussion of these impacts and provides the following information on the impact of extreme weather events globally:

Growing populations and increasingly expensive infrastructure are making our societies more vulnerable to extreme weather events. Heat waves and droughts are expected to become more common and more intense over the coming century, and more frequent heavy rainfall events and rising sea levels will increase the risk of floods.

While not all extreme weather events can be directly linked to human influences, we are already seeing the huge impacts on society that extreme weather events can have. The World Meteorological Organization (WMO) reported that between 2001 and 2010 extreme weather events caused:

1. more than 370,000 deaths worldwide (including a large increase in heatwave deaths from 6,000 to 136,000) – 20% higher than the previous decade
2. an estimated US \$660 billion of economic damage – 54% higher than in the previous decade

Research has shown that the record global average temperature and the extreme heatwave in Asia during 2016 would not have happened without warming due to human activity. Human-

⁸ Met Office press release, [Extreme weather reveals changing climate](#), 1 November 2018

caused climate change also influenced other events in 2016, including extreme heat in the Arctic, the duration of coral bleaching in the Great Barrier Reef, the increased the risk of wildfires in the western US, extreme rainfall in China and drought conditions in South Africa that led to food shortages.⁹

There are many resources and reports on these impacts, with some further resources in section 5 of this pack. See (for example):

- Committee on Climate Change, [Preparing for climate change pages](#)
- National Infrastructure Commission, [The Impact of the Environment and Climate Change on Future Infrastructure Supply and Demand](#);
- World Health Organisation/UNFCCC, [Health and Climate country profiles](#) (2015);
- Public Health England blog, [A look at how our warming planet could impact on deaths](#) (14 November 2017);
- Environment Agency flood action campaign, [climate change means more frequent flooding](#) (16 February 2018).

1.4 International collaboration on climate change

The UK has domestic commitments to reduce emissions pursuant to the *Climate Change Act 2008* and is also part of an international effort to combat climate change. The [Library Briefing Paper on Brexit: energy and climate change](#) provides more detail on climate change policies in chapter 6.

On the international level, the [United Nations Framework Convention on Climate Change](#) (UNFCCC) was adopted during the 1992 Earth Summit, held in Rio de Janeiro. It entered into force in 1994 and has been ratified by 196 States (including the UK) which constitute the “Parties” to the Convention. The objective of the Treaty, set out in article 2 of the Convention, is to “stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” Every year a Conference of the Parties takes place (known as COPs).

The Kyoto Protocol was adopted at COP3 in Kyoto and entered into force in February 2005, with two commitment periods (2008-2012 and 2013-2020). Its main goal is to reduce certain greenhouse gas emissions¹⁰ and parties to the Protocol (including the UK) must meet their targets primarily through national measures. However, an additional means of meeting the targets is through the market-based mechanisms established by the Protocol: the clean development mechanism; joint implementation; and emissions trading. More

⁹ Gov.uk, [Climate change explained](#), last updated 31 July 2018 [accessed 8 November 2018]

¹⁰ Six greenhouse gases for the first commitment period; seven greenhouse gases for the second commitment period.

information on the mechanisms is available on the UNFCCC pages:
[Mechanisms under the Kyoto Protocol](#).

In December 2015, agreement was reached at COP21 in Paris to keep a global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C.¹¹ COP24 will be held in Katowice, Poland in December 2018 and will focus on agreeing and adopting a package of decisions to ensure the full implementation of the Paris Agreement.¹² The IPCC [Special Report](#) will be a key scientific input for parties at COP24.

Background information is available in the House of Commons Library Briefing Papers on the [Paris Climate Change Conference](#) (27 September 2016) and the [Paris Agreement and Marrakech Climate Conference](#) (25 November 2017).

¹¹ UNFCCC, [The Paris Agreement](#) [accessed 3 August 2017]

¹² See: UNFCCC, [COP24 page](#) for further detail

2. News items

Guardian

2 November 2018

UK heatwaves lasting twice as long as 50 years ago – Met Office

Tropical nights starting to be recorded and ice days becoming less frequent

<https://www.theguardian.com/science/2018/nov/02/uk-heatwaves-lasting-twice-as-long-as-50-years-ago-met-office>

Business Green

15 October 2018

Net Zero: Government to instruct Committee on Climate Change to explore how to meet 1.5C goal

<https://www.businessgreen.com/bg/news/3064464/government-instructs-committee-on-climate-change-to-explore-15c-target>

Independent

11 October 2018

UK growers warn of shortages of onions, potatoes and other vegetables after extreme weather decimates crops

Onion crop down by half and potatoes down by a third after summer heatwave

<https://www.independent.co.uk/environment/vegetable-food-shortage-uk-crops-farming-extreme-weather-climate-change-a8578846.html>

Guardian

8 October 2018

We have 12 years to limit climate change catastrophe, warns UN

Urgent changes needed to cut risk of extreme heat, drought, floods and poverty, says IPCC

<https://www.theguardian.com/environment/2018/oct/08/global-warming-must-not-exceed-15c-warns-landmark-un-report>

Guardian

27 July 2018

Extreme global weather is 'the face of climate change' says leading scientist

<https://www.theguardian.com/environment/2018/jul/27/extreme-global-weather-climate-change-michael-mann>

3. Press releases

Met Office

Extreme weather reveals changing climate

1 November 2018

A new report by the Met Office, published today, reveals further details about changes in the UK's climate since the 1960s. By documenting temperature and rainfall climate extremes, including periods of warmth, cold and spells of wet or dry weather, the report reveals changes in some types of extreme weather.

By comparing different meteorological reference periods, a number of interesting trends can be observed. For example, the hottest day of each year over the most recent decade (2008-2017) in the UK has been on average 0.8 °C warmer than the hottest day of each year over the period 1961-1990. Conversely, the lowest temperature of the year has shown an even greater increase, becoming 1.7 °C milder between the two periods in the UK.

This [study](#) uses a set of measures agreed around the globe by the [World Meteorological Organization](#) and [World Climate Research Programme](#), and are widely used in global climate change research. These metrics include at least one measure – Tropical Nights – which is currently not a common feature of the UK climate, but it could become more widespread in future. Tropical nights are defined as 24-hour periods when the minimum temperature doesn't fall below 20.0 °C.


[Dr Mark McCarthy](#) is the head of the Met Office's National Climate Information Centre, the team which produced the report. He said:

Monthly, seasonal and annual climate data provide a valuable record of the changing climate in the UK. However, these average figures have a tendency to mask extreme weather and climate events. So in our latest report we have focussed on those measures which record weather extremes – complementing our recently published State of the UK climate 2017 report – which shows how the UK's climate is changing.









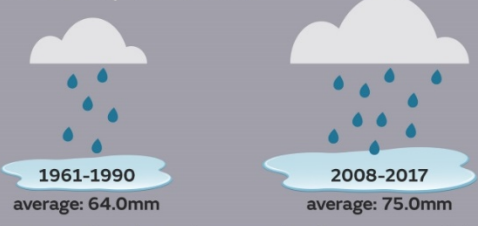
Commenting on the tropical nights measure, Dr McCarthy added:

Minimum overnight temperatures of over 20.0 °C in the UK are rare currently and even during this summer this threshold was only exceeded on a few occasions. However, with projections in climate suggesting warmer temperatures, it is useful to have this metric in place, so that future changes can be monitored.




The report summarises a set of core indices, which can be obtained from temperature and rainfall data. It also shows climate shifts for UK countries and regions, along with maps showing the data across four time periods: 1961-1990; 1981-2010; 2008-2017; and 2017.

 **Met Office**
State of the UK Climate

Changes in extremes from 1961-90 to 2008-17

<p>Higher maximum temperatures</p> <p>The average hottest day of the year has increased by 0.8 °C</p>  <p>  2008-2017 average: 26.8 °C  1981-2010 average: 26.7 °C  1961-1990 average: 26.0 °C </p>	<p>Longer warm spells</p> <p>Warm spells have more than doubled in length – increasing from 5.3 days in 1961-90 to 13.2 days in 2008-2017</p> 
<p>Higher minimum temperatures</p> <p>The average coldest day of the year has become 1.7 °C milder</p>  <p> 2008-2017 average: -6.8 °C 1981-2010 average: -7.6 °C 1961-1990 average: -8.5 °C </p>	<p>Fewer very cold days</p> <p>The number of days where max temps don't rise above 0 °C has been decreasing</p>  <p> 1961-1990 average: 4.8 days 1981-2010 average: 3.6 days 2008-2017 average: 3.2 days </p>
<p>Shorter dry spells</p> <p>Overall, the longest dry spells have decreased by 2.5 days on average</p> 	<p>More rain on wettest days</p> <p>Total rainfall from extremely wet days* has increased by about 17%</p>  <p> 1961-1990 average: 64.0mm 2008-2017 average: 75.0mm </p> <p><small>*days exceeding the 99th percentile of 1961-90 rainfall</small></p>

*For detailed definitions about how these metrics are calculated please refer to the extremes supplement report

 @metoffice
 /themetoffice
 /metoffice

For more information about climate science and climate change visit our climate guide
www.metoffice.gov.uk/climate-change

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The Committee on Climate Change

CCC launches zero carbon economy Call for Evidence

30 October 2018

The Committee on Climate Change (CCC) has today launched a new Call for Evidence to support its forthcoming advice to the UK Government and the Devolved Administrations on long-term targets for greenhouse gas emissions and the UK's transition to a net zero-carbon economy.

Background

On 15 October 2018 the governments of the UK, Scotland and Wales [asked](#) the Committee on Climate Change (CCC) to provide advice on the UK and Devolved Administrations' long-term targets for greenhouse gas emissions and the UK's transition to a net zero-carbon economy. Specifically: when the UK should reach net zero emissions of carbon dioxide and/or greenhouse gases as a contribution to global ambition under the Paris Agreement; if that target should be set now; the implications for emissions in 2050; how such reductions can be achieved; and the costs and benefits involved in comparison to existing targets.

The advice has been requested by the end of March 2019.

The UK's long-term emissions target is currently for at least an 80% reduction in greenhouse gas emissions from 1990 to 2050. It covers all sectors, including international aviation and shipping and is measured on a 'territorial' basis (i.e. based on emissions arising in the UK). On a comparable basis, emissions in 2017 were estimated to be 38% below 1990 levels.

The current target was set in 2008 based on [advice](#) from the Committee. That advice considered that to avoid the worst impacts of climate change, the central expectation of global temperature rise should be limited "to, or close to, 2°C", while the probability of crossing "the extreme danger threshold of 4°C" should be reduced to an extremely low level. That meant global emissions would roughly have to halve by 2050. The 2008 advice made the assumption that the UK should not plan to have a higher level of per capita emissions in 2050 than the global average.

The long-term target guides the setting of carbon budgets (sequential five-year caps on emissions that currently extend to 2032 and require a reduction in emissions of 57% from 1990 to 2030). Both the 2050 target and the carbon budgets guide the setting of policies to cut emissions across the economy (for example as set out most recently in the 2017 [Clean Growth Strategy](#)).

Any change to the long-term targets would therefore be expected to have significant implications, not just in the long-term but on current policies to drive the transition.

The Committee will advise based on a thorough consideration of the relevant evidence. We expect that to cover:

- The latest climate science, including as contained in the [IPCC Special Report on 1.5°C](#).
- The terms of the [Paris Agreement](#).
- Global pathways (including those reported by the IPCC) consistent with limiting global average temperature rise in line with the goals of the Paris Agreement.
- International circumstances, including existing plans and commitments to cut emissions in other countries, actions

to deliver on those plans and opportunities for going further.

- An updated assessment of the current and potential options for deep emissions reductions in the UK and emissions removals from the atmosphere, including options for going beyond the current 80% target towards net zero.
- An appraisal of the costs, risks and opportunities from setting a tighter long-term target.
- The actions needed in the near term that would be consistent with achieving the long-term targets.

This Call for Evidence will contribute to that advice.

Responding to the Call for Evidence

We encourage responses that are brief and to the point (i.e. a maximum of 400 words per question, plus links to supporting evidence, answering only those questions where you have particular expertise), and may follow up for more detail where appropriate. You do not need to answer all the questions, please answer only those questions where you have specific expertise and evidence to share.

[Please download the question and response form here](#) and then e-mail your response to: communications@theccc.gsi.gov.uk using the subject line: 'Zero carbon economy – Call for Evidence'. Alternatively, you can complete the following question and answer form below.

If you would prefer to post your response, please send it to:

The Committee on Climate Change – Call for Evidence
7 Holbein Place
London SW1W 8NR

The deadline for responses is 12 noon on Friday 7 December 2018.

Committee on Climate Change

CCC to advise Government on UK's long-term emissions targets

15 October 2018

Lord Deben, Chairman of the Committee on Climate Change, has welcomed the Government's formal request for the Committee's expert advice on setting the UK's long-term emissions targets.

In April, the [Government announced it would seek advice from the Committee](#) following the publication of [Intergovernmental Panel on Climate Change's \(IPCC\) Special Report](#) on the impacts of global warming of 1.5 degrees.

In response to a [letter from Claire Perry MP](#), Minister for Energy and Clean Growth, Lord Deben, said:

Just last week the IPCC issued a stark warning about the very serious threat posed by climate change. The difference in the impacts that we can expect to see with 1.5 and 2 degrees of warming is considerable. Today, I am pleased to accept the Government's request for new advice from my Committee about the UK's long-term climate change targets.

As part of that work, we will consider how and by when the UK can effectively eliminate carbon emissions from its economy. We will also look at whether the current 2050 target – which requires an 80% reduction in emissions by 2050, compared to levels in 1990 – is still fit for purpose. And, we'll set out the necessary steps to clean up the UK's homes, industry, transport and agriculture to help drive down emissions further, as well the associated costs and benefits.

We will be consulting widely, with citizens, industry, business and academia and expect to deliver our advice within six months.

IPCC

8 October 2018

Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments

Limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society, the IPCC said in a new assessment. With clear benefits to people and natural ecosystems, limiting global warming to 1.5°C compared to 2°C could go hand in hand with ensuring a more sustainable and equitable society, the Intergovernmental Panel on Climate Change (IPCC) said on Monday.

The Special Report on Global Warming of 1.5°C was approved by the IPCC on Saturday in Incheon, Republic of Korea. It will be a key scientific input into the Katowice Climate Change Conference in Poland in December, when governments review the Paris Agreement to tackle climate change.

With more than 6,000 scientific references cited and the dedicated contribution of thousands of expert and government reviewers worldwide, this important report testifies to the breadth and policy relevance of the IPCC,

said Hoesung Lee, Chair of the IPCC.

Ninety-one authors and review editors from 40 countries prepared the IPCC report in response to an invitation from the United Nations Framework Convention on Climate Change (UNFCCC) when it adopted the Paris Agreement in 2015.

The report's full name is Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

One of the key messages that comes out very strongly from this report is that we are already seeing the consequences of 1°C of global warming through more extreme weather, rising sea levels and diminishing Arctic sea ice, among other changes,

said Panmao Zhai, Co-Chair of IPCC Working Group I.

The report highlights a number of climate change impacts that could be avoided by limiting global warming to 1.5°C compared to 2°C, or more.

For instance, by 2100, global sea level rise would be 10 cm lower with global warming of 1.5°C compared with 2°C.

The likelihood of an Arctic Ocean free of sea ice in summer would be once per century with global warming of 1.5°C, compared with at least once per decade with 2°C.

Coral reefs would decline by 70-90 percent with global warming of 1.5°C, whereas virtually all (> 99 percent) would be lost with 2°C.

Every extra bit of warming matters, especially since warming of 1.5°C or higher increases the risk associated with long-lasting or irreversible changes, such as the loss of some ecosystems,

said Hans-Otto Pörtner, Co-Chair of IPCC Working Group II. Limiting global warming would also give people and ecosystems more room to adapt and remain below relevant risk thresholds, added Pörtner. The report also examines pathways available to limit warming to 1.5°C, what it would take to achieve them and what the consequences could be.

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 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.

Allowing the global temperature to temporarily exceed or ‘overshoot’ 1.5°C would mean a greater reliance on techniques that remove CO₂ from the air to return global temperature to below 1.5°C by 2100.

The effectiveness of such techniques are unproven at large scale and some may carry significant risks for sustainable development, the report notes.

Limiting global warming to 1.5°C compared with 2°C would reduce challenging impacts on ecosystems, human health and well-being, making it easier to achieve the United Nations Sustainable Development Goals,

said Priyadarshi Shukla, Co-Chair of IPCC Working Group III.

The decisions we make today are critical in ensuring a safe and sustainable world for everyone, both now and in the future,

said Debra Roberts, Co-Chair of IPCC Working Group II.

This report gives policymakers and practitioners the information they need to make decisions that tackle climate change while considering local context and people's needs. The next few years are probably the most important in our history,

she said.

The IPCC is the leading world body for assessing the science related to climate change, its impacts and potential future risks, and possible response options. The report was prepared under the scientific leadership of all three IPCC working groups. Working Group I assesses the physical science basis of climate change; Working Group II addresses impacts, adaptation and vulnerability; and Working Group III deals with the mitigation of climate change.

The Paris Agreement adopted by 195 nations at the 21st Conference of the Parties to the UNFCCC in December 2015 included the aim of strengthening the global response to the threat of climate change by "holding the increase in the global average temperature to well below 2°C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

As part of the decision to adopt the Paris Agreement, the IPCC was invited to produce, in 2018, a Special Report on global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways. The IPCC accepted the invitation, adding that the Special Report would look at these issues in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

Global Warming of 1.5°C is the first in a series of Special Reports to be produced in the IPCC's Sixth Assessment Cycle. Next year the IPCC will release the Special Report on the Ocean and Cryosphere in a Changing Climate, and Climate Change and Land, which looks at how climate change affects land use.

The Summary for Policymakers (SPM) presents the key findings of the Special Report, based on the assessment of the available scientific, technical and socio-economic literature relevant to global warming of 1.5°C.

The Summary for Policymakers of the Special Report on Global Warming of 1.5°C (SR15) is available at <http://www.ipcc.ch/report/sr15/> or www.ipcc.ch .

Key statistics of the Special Report on Global Warming of 1.5°C

- 91 authors from 44 citizenships and 40 countries of residence
- 14 Coordinating Lead Authors (CLAs)
- 60 Lead authors (LAs)

- 17 Review Editors (REs)
- 133 Contributing authors (CAs)
- Over 6,000 cited references

A total of 42,001 expert and government review comments (First Order Draft 12,895; Second Order Draft 25,476; Final Government Draft: 3,630)

The Special Report on Global Warming of 1.5 °C , known as SR15, is being prepared in response to an invitation from the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change in December 2015, when they reached the Paris Agreement, and will inform the Talanoa Dialogue at the 24th Conference of the Parties (COP24).

The Talanoa Dialogue will take stock of the collective efforts of Parties in relation to progress towards the longterm goal of the Paris Agreement, and to inform the preparation of nationally determined contributions.

Details of the report, including the approved outline, can be found on the report page.

The report was prepared under the joint scientific leadership of all three IPCC Working Groups, with support from the Working Group I Technical Support Unit.

What is the IPCC?

The Intergovernmental Panel on Climate Change (IPCC) is the UN body for assessing the science related to climate change. It was established by the United Nations Environment Programme (UN Environment) and the World Meteorological Organization (WMO) in 1988 to provide policymakers with regular scientific assessments concerning climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation strategies. It has 195 member states.

IPCC assessments provide governments, at all levels, with scientific information that they can use to develop climate policies. IPCC assessments are a key input into the international negotiations to tackle climate change.

IPCC reports are drafted and reviewed in several stages, thus guaranteeing objectivity and transparency.

The IPCC assesses the thousands of scientific papers published each year to tell policymakers what we know and don't know about the risks related to climate change.

The IPCC identifies where there is agreement in the scientific community, where there are differences of opinion, and where further research is needed. It does not conduct its own research.

To produce its reports, the IPCC mobilizes hundreds of scientists. These scientists and officials are drawn from diverse backgrounds. Only a dozen permanent staff work in the IPCC's Secretariat.

The IPCC has three working groups:

- Working Group I, dealing with the physical science basis of climate change;
- Working Group II, dealing with impacts, adaptation and vulnerability; and
- Working Group III, dealing with the mitigation of climate change.

It also has a Task Force on National Greenhouse Gas Inventories that develops methodologies for measuring emissions and removals.

IPCC Assessment Reports consist of contributions from each of the three working groups and a Synthesis Report.

Special Reports undertake an assessment of cross-disciplinary issues that span more than one working group and are shorter and more focused than the main assessments.

Sixth Assessment Cycle

At its 41st Session in February 2015, the IPCC decided to produce a Sixth Assessment Report (AR6).

At its 42nd Session in October 2015 it elected a new Bureau that would oversee the work on this report and Special Reports to be produced in the assessment cycle.

At its 43rd Session in April 2016, it decided to produce three Special Reports, a Methodology Report and AR6. The Methodology Report to refine the 2006 IPCC Guidelines for National Greenhouse Gas Inventories will be delivered in 2019.

Besides Global Warming of 1.5°C, the IPCC will finalize two further special reports in 2019: the Special Report on the Ocean and Cryosphere in a Changing Climate and Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.

The AR6 Synthesis Report will be finalized in the first half of 2022, following the three working group contributions to AR6 in 2021.

For more information, including links to the IPCC reports, go to:

www.ipcc.ch

4. Parliamentary material

Statement

[Green GB Week and Clean Growth](#)

Claire Perry: With permission, Mr Speaker, I will make a statement to this House.

As the Prime Minister said earlier this year, the international determination to address climate change and deliver a cleaner future is one of the facts of our time and one of our greatest opportunities. Only this month, we had a reminder of the importance and urgency of our mission in the form of the publication of the Intergovernmental Panel on Climate Change's latest special report.

The report's conclusions are stark and sober. They show that we are not on track to cap global average temperature rises to below 2° from pre-industrial levels, let alone to reach 1.5°. The implications of this difference in warming are spelt out in the science: from flooding risk going up to fisheries going down; from extreme weather events to extinctions due to loss of habitat—serious, challenging and difficult outcomes. To mitigate against the impact of climate change, we need to understand how to best transform our energy generation, land use, transport systems, industrial processes, homes and buildings. That is why, earlier today, I officially requested the advice of our UK independent advisers, the Committee on Climate Change, on the implications of the Paris agreement, and this latest IPCC report, for the UK's long-term emissions reduction targets.

We are the first major industrial economy to seek such advice, which again reaffirms our determination to lead the world in this area. I have asked for this advice on when and how we could achieve a net zero target for our economy, including whether this is the right time to set such a target, and how reductions might be achieved across sectors in the most cost-effective way.

This request was the first event in our very first Green GB Week, which is designed to bring together businesses, government and civil society to celebrate the extensive cuts in emissions that we have achieved in the UK, and to open up the discussion about the challenges and opportunities from cleaner growth. The week involved tens of partner organisations, more than 100 events, and thousands of participants right across the UK.

No country other than the UK has done more to prove that action on climate change and economic growth can go hand in hand. Since 1990, we have led the G7 group of countries in cutting emissions and also in growing our economy. Since 2000, according to a recent report, the UK has cut emissions per unit of economic growth by an average of 3.7% a year—I know it is a bit technical, but the reduction of carbon for every

unit of growth we deliver is how it is measured—which is well ahead of the G7 average of 2.2%. Last year, 2016-17, we achieved minus 4.7% compared with a global average of 2.6%.

This low carbon transition offers huge opportunities for the UK, which is why clean growth sits at the heart of our modern industrial strategy. It creates jobs. There are already more than 400,000 jobs in the UK's low carbon economy, and this thriving sector could grow by 11% a year up to 2030—four times faster than the rest of the economy. We are already seeing UK businesses leading the world. We have more offshore wind installed in the UK than any other country. Auction clearing prices for offshore wind have halved in the past two years, which is great news for industries and consumers alike, and this progress is opening up new markets from North America to South Korea.

In the first half of 2018, one in five of electric vehicles sold in Europe was made right here in the UK. In the service sector, the UK is consulting, and engineering firms are international leaders for global sustainable and low carbon projects. Since 2010, we have invested £52 billion in renewable energy projects in this country and the result is that we now generate more than half our electricity from low carbon sources—32% came from renewables in 2017.

We have committed more than £2.5 billion in Government investment in low carbon innovation in this Parliament, and we have galvanised action and initiative internationally, helping to secure the historic agreement of 195 countries to sign up to the Paris climate agreement. We have also established the Powering Past Coal Alliance, which has seen more than 70 countries, cities, states and businesses commit to transition away from coal power generation. We are leading from the front. In April this year, our power sector was entirely coal free for three days and we will phase out coal entirely from our power generation by 2025.

In the last seven years, we have delivered international climate finance to over 200 programmes in more than 75 countries, improving access to clean energy for over 17 million people and building the foundations for cleaner economic development in some of the poorest parts of the globe. Our progress to date is cause for celebration. I am proud to think of the UK—through successive Governments' actions—as one of the greenest nations in the world. But while the world continues to deal with the implications of man-made climate change, we must not be complacent, and there is almost always more that we should be doing.

Today we publish our response to the annual progress report of the Committee on Climate Change, setting out what we have done since publishing our clean growth strategy this time last year and our next steps. The pace of innovation means that we cannot predict with certainty the most cost-effective path to our long-term carbon targets, but I can predict this: from how we travel to how we build our homes, we will need to make profound changes. Our strategy sets out some of the paths that we will need to take to do so.

This Government have set out the ambition to be the first to leave the environment in a better state than the one we inherited, but this must be consistent with strengthening our economy and providing opportunities for young people right across the country. Clean growth—which we are celebrating today and this week during the inaugural Green GB and Northern Ireland Week—can deliver all three, but to build on this success will require ongoing ambition and leadership from politicians right across the House, business, academia and civil society.

Ten years after the groundbreaking Climate Change Act 2008 was passed with almost unanimous support in this place, we want Green GB Week to bring the whole country together to celebrate the UK's success and to set our ambitions for the future. Crucially, we need to understand that there are profound risks to our planet from uncontrolled warming, but that there are also huge opportunities in rising to this challenge. This Government are committed to maximising those opportunities. I commend this statement to the House.

HC Deb 15 Oct 2018 | Vol 647 cc439-441 [followed by Questions]

PQs

[Carbon Budgets: *Climate Change*](#)

Asked by: Godsiff, Mr Roger

To ask the Secretary of State for Business, Energy and Industrial Strategy, pursuant to the Answer of 26 October 2018 to Question 181237 on Carbon budgets: Climate change, if he will bring forward legislative proposals to amend the fourth and fifth carbon budgets and place the UK on the steeper decarbonisation pathway recommended by the Committee on Climate Change.

Answering member: Claire Perry | Department: Department for Business, Energy and Industrial Strategy

The UK was the first country to introduce long-term legally binding emission reduction targets through the Climate Change Act 10 years ago, and since then we have galvanised action and initiative across the UK and internationally, including helping secure the landmark Paris Agreement in 2015 and launching the Powering Past Coal Alliance.

The fourth and fifth carbon budgets require ambitious emissions reductions equivalent to 51% and 57% over the periods 2023-27 and 2028-32 from a 1990 baseline, and we have some of the most stringent legislative targets in the world.

Following the recent IPCC report, we commissioned advice from the Committee on Climate Change on our long-term targets. As noted by the CCC, this may include an update of their advice on the most cost-

effective pathway for emission reduction. We will consider that advice carefully when it is received.

HC Deb 08 November 2018 | PQ 186934

[Carbon Budgets: *Climate Change*](#)

Asked by: Godsiff, Mr Roger

To ask the Secretary of State for Business, Energy and Industrial Strategy, what (a) representations his Department has received and (b) assessment his Department has made since the publication of the IPCC report on global warming of 1.5 degrees on the potential (i) economic and (ii) climatic merits of amending the UK's third, fourth and fifth carbon budgets.

Answering member: Claire Perry | Department: Department for Business, Energy and Industrial Strategy

The Department receives a wide variety of representations on many topics including the IPCC Special Report on global warming of 1.5 degrees.

We are leading the world in our response to the IPCC report – commissioning our independent experts, the Committee on Climate Change, for advice on our long-term targets a week after the report's publication. We will consider the Committee's advice carefully when received.

HC Deb 06 November 2018 | PQ 186935

[Carbon Budgets: *Climate Change*](#)

Asked by: Lucas, Caroline

To ask the Secretary of State for Business, Energy and Industrial Strategy, for what reason the Fourth and Fifth Carbon Budgets are not within the scope of his Department's recent request to the Committee on Climate Change to advise on the implications of the Paris Climate Agreement and Intergovernmental Panel on Climate Change's Special Report on 1.5 degrees for the UK's long-term emissions reduction targets.

Answering member: Claire Perry | Department: Department for Business, Energy and Industrial Strategy

We are leading the world in our response to the IPCC report – commissioning our independent experts, the Committee on Climate Change (CCC), for advice on our long-term targets a week after publication of the IPCC report. The Climate Change Act 2008 establishes the functions of the CCC which include providing advice on the level of 2050 target, as well as providing advice in connection with carbon budgets. The CCC's focus for this particular advice will rightly be on our long-term targets, including the costs, benefits and deliverability of more ambitious targets.

The UK carbon budgets already set in legislation are among the most stringent in the world, requiring a 57% cut in emissions by 2028 - 2032 from a 1990 baseline. The Government's focus is on delivering those challenging targets as part of our Clean Growth Strategy. As part of their ongoing analysis on our progress, the CCC already advise on a decarbonisation pathway that takes us on a steeper trajectory than legislated carbon budgets (see the CCC's [Progress Report](#) of June this year).

Under the Climate Change Act, the CCC will next advise us on carbon budget levels in 2020 when they set out their views on the sixth carbon budget (2033-2037).

HC Deb 26 October 2018 | PQ 181237

[Climate Change: International Cooperation](#)

Asked by: Moon, Mrs Madeleine

To ask the Secretary of State for Business, Energy and Industrial Strategy, what steps he is taking to work with his counterparts from other countries to ensure that global temperatures do not exceed 1.5 degrees C.

Answering member: Claire Perry | Department: Department for Business, Energy and Industrial Strategy

One hundred and eighty one of the 197 parties to the UN Framework Convention on Climate Change (UNFCCC) have now ratified the Paris Agreement, and I am proud that the UK is one of them. The UK is fully committed to working with other countries to achieve the Paris Agreement goals including limiting global average temperature increase to well below 2°C and pursuing efforts to limit warming to 1.5°C. We are actively involved in the UNFCCC negotiations and are fully committed to finalising the rulebook that will underpin the Paris Agreement at COP24 this December. We drive the work of several progressive groups, comprising developed and developing countries, such as the High Ambition Coalition. We are one of the largest contributors of international climate finance, helping developing countries mitigate and adapt to climate change through coalitions and partnerships, and we will spend at least £5.8bn on this between 2016 and 2020. Additionally, we are promoting global alliances to encourage clean growth, such as the Powering Past Coal Alliance, to reduce emissions from the most polluting fuel, which I launched last year, and which now has over 70 members. We are also working to build on the progress made at the UK Zero Emission Vehicle (ZEV) Summit, hosted by the Prime Minister in September 2018, to help the development of the ZEV market around the world and tackle carbon emissions. The UK is also showing leadership through domestic action, between 1990 and 2017 we have reduced our emissions by 43% whilst growing our economy by 71%, demonstrating that it is possible to grow your economy while reducing emissions.

HC Deb 25 October 2018 | PQ 180662

[Greenhouse Gas Emissions](#)**Asked by: Daniel Zeichner**

What his policy is on achieving net zero greenhouse gas emissions by 2050.

Answering member: The Minister for Energy and Clean Growth (Claire Perry) | Department: Business, Energy and Industrial Strategy

As the hon. Gentleman will know, on Monday I wrote to the chair of the Committee on Climate Change for advice on how to get to a zero-carbon future. We did not ask for a specific date. We asked for advice on what date would be appropriate, as well as an analysis of the costs and benefits. I expect a response by next March. He will know, as the proud representative of one of the finest universities in the world, that so much of that change will be based on innovation and research, much of which is going on in his fine city. That is why we have contributed more than £2.5 billion during this Parliament to support that research, which can help us to save the planet.

HC Deb 16 October 2018 | Vol 647 c493

[Economic Growth and Emissions](#)**Asked by: Barry Gardiner**

Yesterday the Minister requested that the Committee on Climate Change update its advice on the action necessary to respond to the report on 1.5° by the Intergovernmental Panel on Climate Change. For a brief moment, I thought she had done the right thing, but then I read her letter, which says:

Carbon budgets already set in legislation...are out of scope of this request.

The committee has already written to her twice, warning that the country is not on track to meet the lesser targets in those budgets. By saying that those budgets are out of scope, the Minister is pushing back the necessary change by 12 years. When did she become a follower of St Augustine—"Lord, make me virtuous, but not yet"?

Answering member: Claire Perry | Department: Business, Energy and Industrial Strategy

Blimey! Let me just clarify some of the hon. Gentleman's misinformation. The reason those budgets are out of scope is that we already have a set of policies and procedures that will deliver 97% and 95% of the decarbonisation—[Interruption.] If he listens for a second and stops mansplaining, he might learn something. I live in hope; which saint said that?

The point is that the Committee on Climate Change told us last time we discussed the challenge of zero carbon that it was not technically

feasible now. It would be pointless to ask for its advice again when we already have some of the most ambitious carbon reduction plans in the world up to 2032, set in statute. We need to know what to do from 2032 onwards, so that we can start planning for it now. Just once, it would be lovely to have some cross-party consensus on the challenging, vital issue of the destruction that climate change will cause. I live in hope.

HC Deb 16 October 2018 | Vol 647 c488

[UN: Global Goals for Sustainable Development](#)

Asked by: The Earl of Sandwich

My Lords, in view of all the bad news about climate change that we have been reading, are the Government making more effort and looking harder at sustainable development goal 13, which is about climate change? What action will they take?

Answered by: Lord Bates

We have taken a number of pieces of action. Some of the action required of us is under the Climate Change Act, which was introduced in 2008 under the previous Labour Government. Of course, a major step forward was the Paris agreement. There will be a follow-up to that agreement. We have introduced international climate finance as a way of scaling up the amount of investment available for that very important area. The IPCC made those announcements in Seoul, South Korea, just a couple of days ago, which grabbed the headlines. They will be followed up at a special meeting in Katowice in Poland in December and we will play a full and leading part in that.

HL Deb 09 October 2018 | Vol 793 c6

[Climate Change Convention](#)

Asked by: Sturdy, Julian

To ask the Secretary of State for Business, Energy and Industrial Strategy, what steps his Department is taking to ensure the UK meets its commitments under the Paris Climate Change Agreement.

Answering member: Claire Perry | Party: Conservative Party | Department: Department for Business, Energy and Industrial Strategy

The UK is making strong progress towards its commitments under the Paris Agreement. Between 1990 and 2016, we reduced our emissions by over 40 per cent while growing the economy by more than two thirds. Our Clean Growth Strategy, published last year, set out our policies and proposals for decarbonising the UK economy through the 2020s while maximising the advantages from the global shift to clean growth for UK businesses.

We are also committed to helping developing countries meet their Paris Agreement commitments - the UK is among the largest contributors of climate finance, committing to provide at least £5.8 billion from 2016 to 2020, to help developing countries mitigate and adapt to the impacts of climate change, reduce deforestation and support cleaner economic growth. Latest results of our investments are available from:

<https://www.gov.uk/guidance/international-climate-finance#our-results>.

HC Deb 13 September 2018 | PQ 170861

[Carbon Emissions](#)

Asked by: Sturdy, Julian

To ask the Secretary of State for Business, Energy and Industrial Strategy, if he will make an assessment of the feasibility of a UK net emissions target of zero before 2050.

Answering member: Claire Perry | Department: Department for Business, Energy and Industrial Strategy

The Clean Growth Strategy made clear that the Government believes the UK will need to legislate for a net zero emissions target at an appropriate point in the future.

We announced in April that we will seek the Committee on Climate Change's (CCC) advice on the implications of the Paris Agreement for the UK's long-term emissions reductions targets, once the Intergovernmental Panel on Climate Change publish their special report on 1.5°C later this year. We will consider the CCC's advice carefully when it is received.

HC Deb 13 September 2018 | PQ 170860

Committee reports

House of Commons Environmental Audit Committee [Heatwaves: adapting to climate change](#) HC 826 2017-19 Published on 28 July 2018

[Government Response](#) HC 1671 2017-19 Published on 24 October 2018

House of Commons Environmental Audit Committee [The Government's 25 Year Plan for the Environment](#) HC803 2017-19 24 July 2018

[Government Response](#) HC1672 2017-19 Published on 6 November 2018

House of Commons Environment, Food and Rural Affairs Committee
[Future flood prevention](#) HC115 2016/17 Published 02 November
2016

[Government Response](#) HC1032 2016/17 Published on 23 February 2017

House of Commons Environmental Audit Committee [Flooding:
Cooperation across Government](#) HC183 2016/17 Published 09 June
2016

[Government Response](#) HC645 2016/17 Published 09 September 2016

5. Useful links and further reading

Climate change: too true to be good Speech by Sir James Bevan, Chief Executive of the Environment Agency Royal Society of Arts 24 September 2018

<https://www.gov.uk/government/news/speech-climate-change-too-true-to-be-good>

COP24 United Nations Climate Change Conference Katowice December 2018

<http://cop24.katowice.eu/>

IPCC *Global Warming of 1.5°C: an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* October 2018

<http://www.ipcc.ch/report/sr15/>

Global Climate Action Summit, San Francisco September 2018

<https://www.globalclimateactions summit.org/>

Committee on Climate Change *Reducing UK emissions – 2018 Progress Report to Parliament* 28 June 2018

<https://www.theccc.org.uk/publication/reducing-uk-emissions-2018-progress-report-to-parliament/>

Committee on Climate Change's 2018 progress report: Government response 15 October 2018

<https://www.gov.uk/government/publications/committee-on-climate-changes-2018-progress-report-government-response>

House of Commons Library Briefing Paper *Flood risk management and funding* November 22, 2017

<https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7514>

Department for Business, Energy and Industrial Strategy, Welsh Government, Scottish Government *UK climate targets: request for advice from the Committee on Climate Change* 15 October 2018

Letter to the CCC asking for advice following the IPCC special report on the impact of global warming of 1.5°C.

<https://www.gov.uk/government/publications/uk-climate-targets-request-for-advice-from-the-committee-on-climate-change>

United Nations Climate Change - The Paris Agreement

<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement/>

and [Progress tracker: Work programme resulting from the relevant requests contained in decision 1/CP.21](#) (version of 22 October 2018)

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