

---

# Executive summary

The fourth carbon budget, covering 2023-2027, was set in June 2011 following advice from the Committee in December 2010. It was designed to reflect the cost-effective path to the 2050 target in the Climate Change Act (i.e. to reduce emissions by at least 80% relative to 1990), taking into account the range of criteria in the Act including affordability, competitiveness and security of supply.

As part of the agreement to set the budget, the Government announced that it would be reviewed in 2014. If there is to be a review, then the Climate Change Act states that it must be based on advice from the Committee, and must consider whether there has been a significant change in the circumstances upon which the budget was set.

Only if there is a significant change, demonstrable on the basis of evidence and analysis, can the budget be changed.

We are publishing the results of our review in two stages:

- This report focuses on developments in three categories of circumstance on which the budget was set: climate science, international circumstances and EU pathways.
- We will set out our final advice in December of this year. That report will reassess the cost-effectiveness of the budget given the findings in this report together with updated projections of emissions and fossil fuel prices and the latest evidence on the costs and feasibility of options to reduce emissions. It will also assess again the impact of the budget on the various criteria in the Climate Change Act (i.e. affordability, competitiveness, fiscal circumstances, security of supply).

We conclude in this report that, in respect of science, international and EU criteria, there has been no significant change in the circumstances upon which the budget was set. In this regard, there is therefore no basis to support a change in the fourth carbon budget.

- **Climate science.** The latest evidence on climate science confirms that without action to reduce emissions the world will be exposed to significant risks of very dangerous climate change. In particular, there is a significant risk of warming of 4°C or more by the end of the century, which would result in very high economic, social and environmental costs and consequences. The best way to limit these risks is to cut global emissions very significantly, such that these peak around 2020 and halve by 2050, with further reductions in the second half of the century. This implies the need for cuts in the UK at least to the level of the legislated fourth carbon budget, which was designed as a minimum UK contribution to required global emissions reduction.

- 
- **International circumstances.** The UK is not acting alone. Rather, many countries have made progress towards delivering the commitments made under the Copenhagen Accord, often beyond what was envisaged when the fourth carbon budget was set. The UN process working towards global agreement continues slowly but broadly as expected; the aim is that there is a new agreement by the end of 2015 to deliver deep emissions cuts compatible with limiting warming to 2°C. Given these developments, the global emissions pathways assumed when designing the fourth carbon budget remain feasible if challenging. They continue to be an appropriate basis for policy given the high costs and risks associated with lower ambition. An ambitious fourth carbon budget is important in the context of the UN process given the key role of the UK in international negotiations.
  - **EU pathways.** EU developments have been consistent with the assumptions underpinning the fourth carbon budget. While there is not yet an agreed path for EU emissions in the 2020s, the budget is broadly consistent with the EC analysis of cost-effective emissions pathways, and is at the low end of ambition currently being discussed in the EU for 2030 emissions targets. Consistency of the budget with EU ambition will have to be revisited when EU agreement is reached, with a possible adjustment to ensure that the budget aligns with the agreed EU approach. For example, if the Government successfully secures its stated objectives for a 2030 EU package then the budget would need to be tightened.

## Climate science

- The latest evidence generally gives more confidence in the reality of climate change, in its cause and in projections for the future. For example, the IPCC's Fifth Assessment concludes that warming of the climate system since the mid-20<sup>th</sup> Century is unequivocal, and it is extremely likely that human activity is the dominant cause.
- The recent slowdown in surface temperature rise can be explained in terms of short-term fluctuations and cooling from other natural factors. Similar periods occurred in the 20<sup>th</sup> Century, and they are consistent with longer-term warming.
- Recent assessments of the likely temperature change in response to greenhouse gas concentrations confirm previous ones. In particular, the IPCC provides the same likely range for climate sensitivity as in its first three assessments in 1990, 1995 and 2001, with a slight revision from the fourth assessment in 2007.
- In a scenario where global greenhouse gas emissions continue to increase, it is likely that global temperature will increase by 4°C or more above pre-industrial levels by the end of the century.
- The latest evidence on risks and damages reinforces our climate objective: to limit central estimates of warming to as close to 2°C as possible, and keep the probability of an extremely dangerous rise of around 4°C to very low levels. To achieve this, global emissions should peak around 2020 followed by rapid cuts, such that emissions are halved by 2050 and fall further thereafter. Delaying peaking to 2030 would raise the costs and risks of achieving the objective, and probably make it unattainable.

---

## International circumstances

- Progress towards a global deal has been slow but broadly as expected when the fourth carbon budget was set. The UN has formally adopted an objective to limit warming to 2°C and is working towards an agreement aimed at peaking and reducing emissions consistent with this goal. The aim is to resolve that process in Paris at the end of 2015.
- The UK is not acting alone. Many countries have made ambitious commitments to reduce emissions, and are delivering against these commitments. There is now widespread coverage by low-carbon policies of major emitting sectors around the world. This provides a good basis for agreeing and implementing an ambitious global deal.
  - Amongst the major emitters, China (29% of global CO<sub>2</sub> emissions) has made significant progress on low-carbon investment. It has made commitments to reduce carbon-intensity by 40-45% from 2005 to 2020, and introduced policies to deliver this as part of the 12th five-year plan. With ongoing action, China's emissions could peak in the early 2020s.
  - The United States (16% of global CO<sub>2</sub> emissions) has a good chance of delivering its Copenhagen Accord commitment to reduce 2020 emissions by 17% on 2005 levels. Going beyond this, there is a major challenge to develop and implement approaches to drive further cuts required through the 2020s.
  - Commitments comparable to the UK's have been made by a range of developed and developing countries: Germany in terms of medium-term emissions reduction; China and the US against a 2005 baseline on the basis of carbon-intensity; the US, Japan, the EU and Mexico in terms of 2050 commitments.
  - Coverage of low-carbon laws and policies has increased internationally: legally-binding legislation requiring emissions reduction has been passed in South Korea and Mexico; global coverage of carbon pricing is now 20% of non-transport emissions and rising (e.g. this has been introduced in parts of China and the US and is being considered by Brazil, Chile, the Ukraine, Turkey, Mexico and others); vehicle standards now cover around 80% of global emissions from road transport.
- Our climate objective and the global emissions reduction required to achieve it remain feasible, but very challenging. These remain an appropriate basis for policy, both because of the very significant risks associated with dangerous climate change and the costs of delayed-action pathways. An ambitious fourth carbon budget is important to the global process because of the key role of the UK in securing an effective global agreement.

---

## EU circumstances

- EU ambition for both 2020 and 2030 are relevant for the path through the 2020s and therefore to the fourth carbon budget.
- In relation to 2020, the fourth carbon budget is consistent with the current EU target for a 20% reduction relative to 1990. If a 30% target were to be agreed, which is the UK Government's objective, tightening of the budget might be justified.
- In relation to 2030, negotiations are ongoing, with various options being considered; the legislated budget is towards the low end of ambition being discussed.
  - The EC's Low-Carbon Roadmap, published in 2011, identifies cost-effective decarbonisation pathways, and suggests at least a 40% reduction in 2030 emissions relative to 1990. These pathways broadly match the ambition in the fourth carbon budget.
  - The range currently being discussed for EU ambition in 2030 goes beyond this. For example, the Government has stated a negotiating position to secure an EU emissions reduction of 30% in 2020 and 50% in 2030 relative to 1990 in the context of an effective global deal; this would require a tightening of the budget.
- There is a default trajectory for the EU Emissions Trading System (EU ETS) to continue the slow rate of decline from the pre-2020 phase should the negotiations fail to agree a new package. A strategy of aligning to this now and then realigning later once an EU package is agreed would not be legal, practical or sensible:
  - It would amount to a change in the budget without a corresponding change in circumstances and would represent a significant departure from the cost-effective path to the 2050 target. As such, it would not meet the criteria under the Climate Change Act.
  - The precise level of carbon budget implied by the default trajectory is unclear, given that the detailed rules for calculating the UK share of the EU ETS cap in the 2020s are not yet known.
  - Such a strategy and the frequent changes in the budget that it entails would undermine investor confidence. Moreover, it would undermine credibility of the UK in EU negotiations.
  - It would not offer any benefits for competitiveness or a more favourable share for the UK when negotiating how EU-wide targets are split across countries.
- The Government has rightly considered it essential that the UK continues to push for an ambitious EU 2030 package. The UK has an important role in these discussions and an ambitious package is required as part of an effective global response to climate change.

---

## Next steps

We will continue to monitor climate science, international circumstances and EU pathways as part of our ongoing statutory work and draw out any implications for carbon budgets as appropriate. In the particular case of the EU, this report should be regarded as our advice on current circumstances. If and when there are developments, we will provide further advice, consistent with the Climate Change Act, on whether this constitutes a significant change in the circumstances upon which the budget was set and if a change in the budget to tighten or loosen it would be appropriate.

We will publish our full assessment of costs and benefits associated with the fourth carbon budget, building on the analysis in this report, in December of this year.

Our assessment of the cost-effectiveness of the carbon budgets depends on assumptions over the international carbon price, which in turn depends on international action to reduce emissions. When updating this assessment in December, we will use a range of scenarios for global and EU emissions, including stress testing the budget against scenarios that are insufficiently carbon-constrained to meet the climate objective.

We set out the analysis that underpins the conclusions above and the implications for our December report in four chapters:

1. Update on climate science
2. Latest evidence on international action to reduce emissions
3. EU emissions pathways and targets
4. Global emissions pathways and carbon price projections.