



Why has the UK set its 2050 Emissions Reduction Target at 80%?

1) Introduction

In 2008, the UK declared that its long-term target would be to reduce UK greenhouse gas (GHG) emissions by 80%, compared with 1990 levels, by 2050.

The more immediate targets, for 2010, 2015 and 2020 etc, had to be consistent with this long-term target. Even though the date to achieve it is a long way off, the 80% target is therefore very important because it determines what policies the Government must bring in right now in order to reach it. So why did the Government choose 80%?

2) 4 Steps

The decision (Ref 1) is based on answering four questions in turn:

- A) What maximum average global temperature rise, compared with pre-industrial levels, can the planet tolerate to avoid harmful climate change?
- B) What should the limit on global emissions be to achieve this chosen temperature limit?
- C) On what basis should the global target be apportioned between countries?
- D) What does that mean for the UK?

3) Step A: Target Limit for Global Average Temperature Rise

A Report by the International Panel on Climate Change (Ref 2) outlined the scientific evidence available at the time on the likely effects of various temperature increases, ranging from 1 - 5°C.

The effects considered included:

- Water
- Ecosystems
- Food
- Coasts
- Health
- One-off events (eg melting of the Greenland and Antarctic ice sheets)

The conclusion was that effects were 'non-linear', i.e. that effects with a 4°C rise would be much more than twice as bad as they would be in the event of a 2°C rise.

Therefore it was decided that the **appropriate target was 2°C**.

(Note that this target was adopted at the 2015 Paris Climate Conference, but it was also acknowledged that more recent scientific evidence suggests we should also *aspire* to a 1.5°C limit).

4) Step B: Target Limit for Global Greenhouse Gas Emissions

The analysis to determine the limit on GHG emissions to achieve the 2°C limit is complicated.

The temperature rise depends on the total amount of GHG emitted into the atmosphere over time. For instance you could reduce emissions very modestly now, and make extremely major cuts later, or you could make more ambitious cuts now and have to cut less later.

The trajectory that was ultimately chosen implied that annual global GHG emissions should peak before 2020, and should be **reduced by about 40% compared to 1990 levels by 2050**.

5) Step C: On what basis should the Global Reduction Target be apportioned?

The UN Framework Convention on Climate Change (Ref 3) established the principle that all countries should share responsibility for reducing global emissions, but that the level of reduction should reflect the different circumstances of each country.

This is because different countries start from different positions of emissions per capita, technological development, and levels of income.

There are many ways of deciding a fair apportionment method for the reduction target. For instance, it could be based on emissions per capita, or emissions per unit of economic output.

The choice depends not only on logic and ethics, but also on what is practically achievable in terms of getting a global deal.

In the end, the method chosen aimed to achieve equal emissions per capita by 2050. The calculation is as follows:

- The global GHG emissions in 1990 were 36 Gigatonnes of CO₂e/year (NB: a Gigatonne is 1 billion tonnes, and CO₂e stands for 'CO₂ equivalent' which takes non-CO₂ greenhouse gases, e.g. methane, into the equation.)
- A 40% reduction (Step B) therefore means emissions of about 22 Gigatonnes CO₂e/year.
- Assuming a global population of about 9 billion people by 2050, this implies emissions of about **2.4 tonnes CO₂e per person by 2050**.

6) Step D: What does this mean for the UK?

Total UK GHG emissions in 1990 were about 800 Mt CO₂e.

If you assume the UK population in 2050 will be about 75 million, emissions of 2.4 tonnes CO₂e per person would produce total emissions of about 180 Mt CO₂e.

This requires **a reduction of about 80% relative to 1990 levels**.

7) Questions to Explore:

Step A): What are the effects of different temperature increases of, say, between 2°C and 5°C?

Step B): Roughly what must be the peak concentration of CO₂ in parts per million (ppm)?

Step C): What are the pros and cons of the different methods of apportionment? And how does 2.4 tonnes of CO₂e per person compare with values in different countries now?

Step D) How is the UK getting on in achieving this target?

References

- 1) Committee on Climate Change 2008 Report: Building a low-carbon economy – the UK's contribution to tackling climate change. <https://www.theccc.org.uk/publications/>
- 2) IPCC Fourth Assessment Report on 'Impacts, Adaptation, and Vulnerability', 2007. <https://www.ipcc.ch/report/ar4/wg2/>
- 3) <http://newsroom.unfccc.int/>