

**CEN public briefing: Climate Science**

**Key points**

- **There is a global scientific consensus on three key facts when it comes to climate change.**
  - The climate is warming.
  - This will lead to more frequent extreme weather events
  - This change is caused by increased carbon emissions which are primarily human-led and humans can therefore take action to prevent further warming.
- **The UN facilitates a meta-study of climate science every six to seven years through the Intergovernmental Panel on Climate Change (IPCC).** This is the world's biggest peer review of scientific research for any subject. The IPCC has been largely accurate in forecasting changes since it was set up in 1988. Where there have been discrepancies these have been both too high and too low, and it has accurately predicted the overall direction of warming.
- **[The last IPCC report](#) was published in 2021/22** and comprised an overview of the science of global warming, the impacts of this climate change, and potential mitigation measures. The report considered four different emissions scenarios and assessed what these scenarios would mean for global temperatures.

**IPCC report findings**

- **The climate is warming.**
  - **Global surface temperatures are rising and will continue to increase until at least the middle of this century**, even if action to cut carbon emissions happens immediately.
  - **Depending on human activity the planet may warm by 1.4 to 4.4 degrees by 2100 and will very likely exceed 1.5 degrees** for at least a short while in the middle of the century.
  - **The report states that levels of carbon dioxide in the atmosphere are higher than they have been for the past two million years**, with increases in the rate of greenhouse gases unprecedented in at least the past 800,000 years.
- **This will lead to more frequent extreme weather events and other impacts**
  - **Both water scarcity and flood risks will increase in severity as warming increases.** The report estimates that half the world's population already experience water scarcity for at least one month a year and that 163 million people live in 'unfamilarly dry areas'. Meanwhile, half a billion people live in 'unfamilarly wet areas'.
  - **Global mean sea levels have risen by 20 cm since 1901.** The rate of sea level rise has almost doubled since 2008 and is accelerating. This is due to melting ice in the Arctic and Antarctic. The Arctic is likely to experience an ice-free September at least once by 2050.
  - **Heavy rainfall events have increased in frequency and severity since 1950**, likely due to human influence on the climate, with an increase in water vapour

content of 7% for every degree of warming. **This change is caused by increased carbon emissions which are primarily human-led and humans can therefore take action to prevent further warming.**

- **This change is caused by increased carbon emissions which are primarily human-led and humans can therefore take action to prevent further warming.**
  - **Human influence has warmed the climate at a rate unprecedented in at least the last 2000 years** and the IPCC is even more certain about the impact human activity has had on warming than its last report.
  - **A sustained reduction in emissions is possible.** At least 18 countries, including the UK, have managed to reduce both consumer and producer emissions over the last 10 years.
  - **Scaling up renewable energy will be necessary in order to reach net zero emissions.** Electricity and heat production account for around a quarter of global emissions. Fortunately, renewable technologies have rapidly decreased in price since 2010 with the cost of solar PV decreasing by 85% in the last 12 years.

#### Why is it important to limit warming to 1.5 degrees?

- **While many impacts are proportional to the rates of emissions and warming and can therefore be avoided, the report warns starkly about “tipping points”, which are irreversible impacts that cannot be undone by mitigation.** The IPCC reports include expected tipping points for if the climate warms by 1.5 degrees and if the climate warms by 2 degrees. These include;
  - Having an ice-free Arctic Ocean once every 100 years (at 1.5 degrees) or once every 10 years (at 2 degrees)
  - Exposing 271 million people to water scarcity (1.5 degrees) vs. 288 million (2 degrees).
  - Losing 70% of global coral reefs (1.5 degrees) or 99% of coral reefs (2 degrees)

#### How can we limit warming to 1.5 degrees?

- To limit warming to 1.5 degrees with “no or limited overshoot”, **global carbon emissions must fall by about 45% from 2010 levels by 2030 and reach net zero by around 2050.** This would also require cuts in non-carbon greenhouse gas emissions such as methane.
- **It is possible to reach net zero emissions but it will require both government and individual action** such as investment in carbon capture, a wider rollout of renewable energy and using electric vehicles to reduce land-based transport emissions.