



1: COP26, Net Zero, 1.5 degrees, and other jargon

What is Global Warming?

The sun's rays warm the surface of the Earth, and heat then radiates back into space. **Greenhouse gases** (carbon dioxide, water vapour, methane and nitrous oxide) trap some of this heat in the atmosphere. Over the Earth's history this 'greenhouse effect' has helped keep the planet warm enough for life to flourish.

However in recent years the concentrations of greenhouse gases (particularly CO₂ but also methane) in the atmosphere have increased rapidly. The increase in CO₂ has been caused mainly by the burning of coal, oil and natural gas – known as **fossil fuels**. The clearing of forest land around the world has also contributed to the changes in the atmosphere: trees absorb CO₂ when they grow and release greenhouse gases if they are cut down and are burned, while grazing livestock on cleared land produce methane.

Carbon dioxide is now at concentrations approaching one and a half times those seen 200 years ago. Pre-industrial CO₂ levels were around 280 parts per million (ppm) and today, we stand near 420 ppm. The more CO₂ there is in the atmosphere, the more heat is trapped, and the hotter the Earth becomes.

How much have global temperatures increased?

The temperature of the air at the earth's surface has risen rapidly, especially over the last fifty years. The global average surface temperature over the decade 2006-2015 was the hottest recorded since modern records began in late 1800s, and is currently increasing by around **0.2°C per decade**.

In recent years the global average surface temperature has reached around 1°C above what it was in 1875. Warming of around 1°C over the last 150 years may sound unimportant, but conditions on our planet are sensitive to changes of only a few degrees. For example when ice last covered large parts of Northern Europe and North America during the last Ice Age, the global average surface temperature was only 4–9°C colder than temperatures today.

Some areas are also getting warmer much faster than others. Land areas warm more than the oceans, and the **Arctic** is warming considerably faster than other parts of the planet. Large areas of the Arctic are now about 2°C warmer than they were 150 years ago.

The IPCC and the COPs

The **Intergovernmental Panel on Climate Change** (IPCC) is the UN body for assessing the science related to climate change. It was set up in 1988 by the World Meteorological Organization and United Nations Environment Programme to provide policymakers with regular assessments of the science and impacts of climate change. The IPCC does not carry out its own research, but instead undertakes systematic reviews of all global literature on climate change, involving thousands of scientists, and representing the largest peer review process in the global scientific community. The IPCC has produced an Assessment Report roughly once every six years since its foundation. The first part of the sixth report (AR6) was published in 2021, with the remainder due in 2022.

COP26, held in Glasgow last autumn, was the 26th '**Conference Of the Parties**' to the UN Framework Convention on Climate Change (UNFCCC). The first COP took place in 1995 in Berlin, and there has been a COP each year since. COP21 in Paris in 2015 produced the Paris Agreement, which was the first time that all parties had agreed to limit greenhouse gases in order to stay within set temperature limits.

Global agreements to date

The **UN Framework Convention on Climate Change**, signed in 1992 at the Rio Earth summit, bound almost all of the world's nations to "avoid dangerous climate change". However, it did not set out in detail how to do so. The first attempt to turn the UNFCCC's resolution into action was the 1997 **Kyoto Protocol**, which set targets on emissions cuts for each developed country, stipulating a 5% cut in global greenhouse gases overall by 2012. Developing countries, including China, were allowed to increase their emissions. The Protocol eventually came into force, without US backing, in 2005, but by then was largely irrelevant, so countries began to work on a new treaty that would fulfill the UNFCCC aims, resulting eventually in the 2015 Paris Agreement.

The main goal of the **Paris Agreement** was to limit global heating to "well below" 2°C above pre-industrial levels, while "pursuing efforts" to stay within the lower, safer threshold of 1.5°C. Countries set out targets to stay within those limits, in the form of **Nationally Determined Contributions** (NDCs).

NDCs are national plans containing targets on emissions cuts, usually pegged to 2030, and some details on how they will be met. In the negotiations leading up to the Paris COP, each government offered the NDC emissions reductions it thought feasible. However, this resulted in a set of NDCs that would result in catastrophic heating of more than 3°C. So the Paris Agreement contains a "ratchet" mechanism by which every five years countries must return to the negotiating table with fresh commitments, to bring emissions in line with the overarching temperature targets.

Why 1.5°C?

The world has already warmed by 1.1-1.2°C above pre-industrial levels, and some of the impacts of the current heating are irreversible, so even if the world succeeds in cutting emissions drastically, we will still need to adapt to the impacts of more extreme weather.

The Paris Agreement contained two key goals, of limiting global heating to "well below" 2°C, while "pursuing efforts" to limit temperature rises to **1.5°C above pre-industrial levels**. These temperature goals have their roots in previous IPCC reports. The 2007 IPCC 4th Assessment Report suggested the world is likely to warm by at least 1.8°C even if measures were taken to limit emissions, and by 4°C if emissions continued unabated. Keeping warming to about 2°C was regarded as the outer limit of safety, beyond which the impacts of climate change – heatwaves, droughts, floods, sea level rises, fiercer storms and other extreme weather – would become catastrophic and irreversible.

Some big emitters of greenhouse gases, including China, argued 2°C was the only realistic limit and opting for a lower goal would be economically difficult. However small island states pointed to science showing they were likely to be inundated by sea level rises and storm surges, at warming above 1.5°C. The conflict was eventually resolved in the compromise of two goals at Paris. A further IPCC report in 2018 found extreme weather and severe impacts from even a 1.5°C rise, so for COP26 the UK hosts made "**keeping 1.5°C alive**" the core aim of the conference.

What did COP26 in Glasgow actually achieve?

During COP26, new NDCs submitted by 120 countries together only added up to reducing projected warming by about 0.2°C. If warming is to be limited to 1.5°C above pre-industrial levels, additional emissions reductions before 2030, over and above current NDC pledges, will need to equate to reducing global emissions by the equivalent of two years of current annual emissions.

The **Glasgow Climate Pact** that emerged from COP26 "requests" that countries "revisit and strengthen" their climate pledges by the end of 2022, in order to keep alive the hope that warming may be kept within 1.5°C. It calls for a "phasedown" of **coal**, and sets up processes towards delivering "a global goal on

adaptation". It urged countries to commit to \$100 billion of **climate finance**, and finance for **loss and damage** suffered by countries most exposed to the effects of climate change. There was also a new pledge to halt **deforestation** by 2030, and an agreement on **methane**.

Taken together, if all commitments and requests made at Glasgow were implemented, global temperature increase may be limited to 1.8°C above pre-industrial levels, though many analysts consider that figure will be nearer to 2.4°C, because of vagaries and credibility gaps in the figures.

What does Net Zero mean?

Net Zero basically means **reducing** greenhouse gas emissions as far as possible and then **offsetting** any remaining emissions (for instance from industrial processes that emit carbon dioxide, or sectors such as aviation where alternative technologies are not available) by creating or improving **carbon sinks**, such as forests. It could also include using technologies to suck CO₂ out of the atmosphere. The concept has come under attack from campaigners who argue that some companies and governments are using net zero as a fig leaf by assuming they can offset emissions rather than reducing them.

Climate Change and the Biodiversity Crisis

Until recently the international climate change conversation was kept very separate from discussions over the loss of global biodiversity. However there was acknowledgment at COP26 that the world will have to tackle the climate and the species extinction crises simultaneously, or not at all.

The Earth's land and oceans already **absorb** about half of the greenhouse gases that human activity emits. Wild animals, plants, fungi and microbes help maintain this carbon sink by keeping soils, forests and other ecosystems healthy.

Failing to tackle climate change meanwhile will accelerate **biodiversity loss**, as higher temperatures and changing rainfall patterns make survival for many species more difficult. Both problems are intertwined, and so solutions to one which exacerbate the other are doomed to fail.

There are options for addressing climate change and biodiversity loss together, called **nature-based solutions**, which can enhance the richness and diversity of wild habitats while helping them **store more carbon** and reduce emissions of greenhouse gases, making ecosystems more **resilient** while slowing the rate at which the planet warms.

Further reading

These links are just a small selection of good sources of further information which builds on the information in this document.

- https://royalsociety.org/topics-policy/projects/climate-change-evidence-causes/?gclid=CjwKCAiAzrWOBhBjEiwAq85QZzMIzX99BdonyeZC4YYBlpVBUfaJx7N1VfExoUZWV41sP_UIha1yORoCqcEQAvD_BwE
- <https://www.ipcc.ch/assessment-report/ar6/>
- https://earth.org/data_visualization/a-brief-history-of-co2/?gclid=Cj0KCQiAt8WOBhDbARIsANQLp96GvJb86DskQPCZuzH9rKgWyewFmT2fCF80EMwM4xOk_n_HzgKWjsaApmqEALw_wcB
- <https://www.climateassembly.uk>
- <https://www.un.org/sustainabledevelopment/blog/2021/06/tackling-biodiversity-climate-crises-together-and-their-combined-social-impacts/>
- <https://commonslibrary.parliament.uk/the-history-of-global-climate-change-negotiations/>