



Climate change is one of the biggest challenges that humanity faces. Changes in the Earth's temperature are already having drastic effects. We are already seeing increased loss of sea ice, loss of available drinking water, food insecurity, increased in frequency and severity of droughts and other major weather events such as storms, flash flooding, heatwaves, wildfires. Climate change is a risk to human and all other life on the planet.

To better understand the issues, let's first explore what climate change is and the science behind it. Climate is the word we use to describe the weather patterns over time. The Earth's climate has been changing for millions of years, with long periods of ice and cold followed by periods of global warming. This cyclical pattern has been relatively constant.

Global Temperatures

However, when we refer to climate change today, what we usually mean is anthropogenic climate change. This is the significant temperature increase caused by humans over the last 200 years since the industrial revolution. The [Intergovernmental Panel on Climate Change \(IPCC\) Report 2023](#) states that global temperatures have increased 1.1°C above pre-industrial levels (1850-1900) and this is unequivocally due to human activity causing an increase in levels of greenhouse gases within the atmosphere (IPCC, 2023).

Atmosphere

The Earth's atmosphere is made up of various gases, mainly nitrogen, oxygen and argon. There are also some trace gases (found in small concentrations), these include the greenhouse gases (GHG) such as carbon dioxide, nitrous oxide,

methane and ozone. Whilst these gases make up less than 0.1 of our atmosphere, the effect they have is huge.

As the Sun's energy reaches Earth as heat and light, some of it is absorbed by the Earth, what isn't absorbed is reflected back into the atmosphere where the greenhouse gases trap some of that energy in what is called the greenhouse effect. The greenhouse effect is a good thing, it keeps the Earth's temperature consistent and liveable. You can imagine the greenhouse effect as a warming blanket surrounding the Earth.

Human Activity

Human activity such as burning of fossil fuels like coal, oil and natural gas release carbon dioxide, trapping energy within the atmosphere, creating an over-warming of the planet. Imagine this as multiple blankets over the Earth, causing it to overheat.

So how are humans changing the planet? When looking at global GHG emissions, almost three quarters is related to energy, burning fossil fuels to power industry, buildings and transport. Nearly 20% is related to agriculture, forestry and land use change, this includes the meat industry, as well as the production and use of nitrogen-based fertilisers on crops (Ritchie, 2020). It's not just what we're putting into the atmosphere, it's also what we're taking away. Deforestation for conversion to cropland or pasture means less trees to absorb carbon dioxide. Losses in soil quality through industrial farming means the soil is less able to absorb carbon. Trees, the soil and the ocean are vital carbon sinks, meaning they absorb carbon, preventing it from being released into the atmosphere.

Why Carbon Dioxide?

You might be wondering why such focus is put on carbon reduction when there are a number of gases that contribute to global warming. Essentially, carbon dioxide is the most abundant in the atmosphere, accounting for approximately 73% of GHG in the

atmosphere (WRI, 2023) and whilst other gases have a greater potential for warming, they are in much smaller concentrations.

So, what can be done in response to help lessen the effects of climate change?

The responses fall into two categories:

- Mitigation (limiting or preventing greenhouse gas emissions e.g. switching to renewable energy, reducing waste).
- Adaptation (living with climate change e.g. building flood defences, engineering drought-resistant crops).

In order to make the greatest difference then mitigation must be the priority to lessen the extent of climate change. However, we will also need to adapt to the challenges that come with climate change.

What is being done?

Global action is needed if we are going to significantly reduce greenhouse gas emissions. In 2015, 195 parties came together to join the [Paris Agreement](#) (United Nations, 2015) a global and legally-binding treaty, with the aim to significantly reduce greenhouse gas emission in order to keep global temperatures between 1.5-2°C above pre-industrial levels. Participating countries set their own plans on how they will reduce emissions. The Paris Agreement also includes commitments for developed countries to assist developing countries meet their targets, this could be financial assistance or sharing of knowledge or technology.

Whilst there is a lot that can be done by governments and large organisations, there's also actions we can take in our own lives in order to reduce our impact on the planet. Think about how you might make a difference within your various possible roles: as a student, a friend, parent, a consumer. A common tool is the 5 R's (Refuse, Reduce, Re-use, Repurpose, Recycle), where the focus is first on lowering consumption. Some examples might include reducing fossil-fuelled travel, using less energy in our homes or even switching to renewable sources. Another way is to think

about the processes behind what we eat and what we buy or the miles it has travelled to get to us.

3 things you can do to help climate change

- **Communicate** – now you have this knowledge, try discussing with tutors, colleagues, friends and family. The more people are aware of the facts and the positive steps that need to be taken, the more will change
- **Get involved** – Find out about climate and sustainability issues that relate to you, perhaps in your local community or within your field of study or work. There is a lot you can do for these issues by offering your time, expertise and enthusiasm.
- **Start Small** – Climate change is daunting, it's a huge problem, so try to focus on one small thing as a time. Can I walk more? Can I change the way I eat to reduce carbon emissions.

There are also steps we are taking as a University to reduce our emissions and we'd like you to be a part of our journey. To find out more, or get involved with our Student Sustainability Panel, visit [Sustainability | University of Bolton](#)

References

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