

## FACTSHEET



# Climate Change

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When talking about climate change in relation to human activities climate change can be said to mean -

'the build-up of man-made gases in the atmosphere that trap the sun's heat, causing changes in weather patterns around the world'.

## What is Climate?

Climate is 'the general weather in one place over a long period of time'. So it's not what the weather is like today, it is the average weather conditions over a decades. Meteorologists (scientists who measure the weather) collect detailed information about the weather every day, often using high-tech satellite and computer systems. Hundreds of measurements are calculated and the results compared to previous readings.



### Climate Change

From their readings, meteorologists have noticed that the world's climate is getting warmer. But they also know that changes in the climate are nothing new. For example, 50 million years ago there was no ice at the Poles, but 18,000 years ago there was ice 2 miles thick in Scotland.

Have you heard of the Ice Age? Not the film, but the condition that the earth was in many thousands of years ago? Earth has been in and out of ice ages all through its billions of years of existence. Much of the planet was regularly covered in huge ice sheets and glaciers as the air temperatures plummeted then rose again, causing the ice to melt. This is one reason why the woolly mammoth is thought to have become extinct. Its habitat melted and it couldn't survive in the warmer climate.

### **A fuss about nothing?**

So why does it matter that climate change is happening again? Because it is happening more quickly now than ever. Humans are believed to be speeding up the rate at which the climate is getting warmer, and many plants and animals cannot adapt quickly enough to the changes in order to survive, like the poor old woolly mammoth.



## **The Problem: People!**

10,000 years ago there were no cars, planes, buses, trains or motorbikes. There was no electricity – no TVs, electric lights, fridges, microwaves, washing machines, computers, mobile phones (imagine that – no computers or mobile phones!), central heating, factories, power stations and so on. Things stayed like this for thousands of years. Humans used horses and oxen for farming and transport.



**1700s:** Then humans invented more complicated machines, which needed some sort of energy to power them. Coal, oil and natural gas (fossil fuels) were discovered underground.

**1800s to present day:** Then came electricity and the combustion engine. These both involved burning fossil fuels, which created energy for electricity and the machines, such as cars. Since their invention, industry and technology have improved rapidly, increasing the amount of power used in transport, manufacturing (making things in factories) and electricity. The population (number of people) of the world has also increased dramatically, which means even more people use transport, manufactured goods and electricity.

For more information on over-population see the factsheet *Our Crowded Planet* in the resources section below.

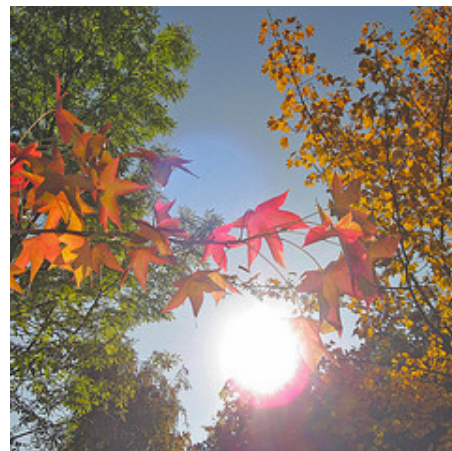
## **Greenhouse Gases and the Greenhouse Effect**

Greenhouse gases are responsible for the Greenhouse Effect. But before we investigate that, let's find out what greenhouse gases are. Can you name any of them?

The most well-known greenhouse gas is Carbon Dioxide, also known as CO<sub>2</sub>. Other greenhouse gases are methane, carbon monoxide, sulphur dioxide, nitrous oxide and water vapour.

But greenhouse gases are not always bad. We actually need some greenhouse gases in the atmosphere in order for life on Earth to exist:

- Trees and plants would not survive without CO<sub>2</sub> as they need it for photosynthesis.
- The plants in turn provide food for animals and humans and they give out oxygen for animals to breathe.
- Greenhouse gases also keep the planet warm enough for life to exist.



Without them the world would be 33°C colder than it is now and life would not be possible (the average temperature for November in the UK is around 6°C. This means it would be more like -27°C here instead). This is because the greenhouse gases form a protective layer in the atmosphere that stops all the sun's warmth disappearing back up into space.

### **So why are they thought of as bad?**

The trouble now is that the amount of greenhouse gases in the atmosphere is higher than it would be naturally, and this is changing the world's climate.

The greenhouse effect means that in general, the planet is getting hotter. But in some places around the world it is also getting wetter; some are getting drier (the Sahara desert is expanding and it is likely that this will continue due to climate change) and others are getting windier. So it depends on where you live as to what effect climate change may have on you:

- The Inuits in the Arctic regions have noticed the ice melting more in the summer months and freezing less in the winter months.
- The Shanty towns in Asia and Latin America are suffering more floods and storms than in the past.
- The Europeans are witnessing more forest fires, melting glaciers and heat waves than ever before. Many locations in England experience hose pipe bans in the summer.

## **Global Wetting More Like!**

Did you know? Serious floods around the world, which used to occur every 100 years are now occurring between every 10 to 20 years.

Why? Because warmer air temperatures lead to more evaporation, which eventually causes more heavy rainfall.

Unfortunately it's not just happening in the UK. The USA suffers from hurricanes every year, but the number and intensity is rising:

Between 1975 and 1989 there were 171 severe hurricanes in the USA. Between 1989 and 2005 there were 269 severe hurricanes in the USA.

Hurricane Katrina in New Orleans last year was the costliest and one of the deadliest hurricanes in the history of the United States. Hurricanes develop as a result of air warming up over warm seas, causing the air to rise rapidly and develop into major storms. The warmer the sea, the warmer the air, the worse the hurricane.



### Coastal Flooding

The ice caps at the North Pole (The Arctic) and the South Pole (The Antarctic) are slowly melting and this is causing the sea levels to rise. The Intergovernmental Panel on Climate Change has estimated that sea levels may rise by 40 cm over the next 100 years, but some scientists estimate the rise could be much higher. This shows that we don't really know what's going to happen, but we are sure that something is and the effects could be dramatic:

If the sea levels continue to rise, many countries and cities could be flooded by the sea. Bangladesh is one example (they already suffer from severe annual flooding); nearer to home, cities like London, Bournemouth, Cardiff, Newcastle, Carlisle and Edinburgh could also be at serious risk.

## The Effect on Wildlife

Many, many species of plants and animals are likely to be affected by climate change. Let's pick out a few examples:

**Polar Bears** – These wonderful animals need ice to live on; it is their habitat and they are specifically adapted to hunting and breeding on and around it.



Seals need ice flows too – to rest and give birth to their pups. If the ice flows continue to melt as quickly as they are, the seals and polar bears will die out as their habitat disappears. If the seals die out it means less food for the polar bears, too.

**Plankton and Krill** – at the beginning of the food chain, microscopic plankton and the tiny krill provide food for a huge number of animals in the sea, from barnacles, to fish and even sharks and whales. Plankton and krill are very easily affected by changes in sea temperatures and will move



away or die if the temperature changes, even slightly. This reduces the amount of available food for other species in the food chain.

For many animals, such as mosquitoes and egrets, global warming could be a good thing as it means they can spread further afield into parts of the world that were previously too cold. The little egret used to be a rare sight in the UK; now it can be seen regularly in good numbers in estuaries in the South of England. Sadly slower animals like snails and frogs are not faring so well (they can't move away as easily).



Many plants are not coping as well with climate change either. At least many of the faster animals (ones that can fly, in particular) can move or migrate to other areas if the conditions in their habitat change for the worse. But plants can't move at all, so they are particularly vulnerable.

The climate is changing faster than the plants and some animals can adapt to the changes.

## **The Effect on Farming**

Some experts are predicting that by 2060 the British climate will be more like that of the Loire Valley, France. This means that crops of sunflowers, oil seed rape (for cooking oil and cattle feed) and vineyards (growing grapes for eating and for making wine) are becoming more popular in some parts of the UK – they like a warm, dry climate like parts of France.

So that is the good news. However, the bad news is that a lot of pests like locusts are now spreading into areas where they never used to be found. Aphids, (greenfly) are hatching earlier in the year and eating young, delicate seedlings.



## **The Effect on Our Health**

Some scientists are worried that human health is at risk from some effects of climate change.

1. Our winters are now not cold enough to kill off nasty germs and bacteria, which means they multiply and cause more of a problem.

2. Mosquitoes carrying the disease malaria used only to be found in hot Tropical countries; now they are spreading further northwards because the warmer climate suits them. There are fears that they could soon reach Britain.
3. There are more heat-related deaths and cases of heatstroke and dehydration in Europe every year.



## Credits

Image: Climate Change by [Gareth Thompson](#)

Information sourced from:

DC Bureau (2015), *The Expanding Sahara: Deforestation in Morocco* [online], Available from: <http://www.dcbureau.org/201305138562/bulldog-blog/the-expanding-sahara-deforestation-in-morocco.html> [accessed 29/05/2015].

Carbon Footprint (2014), *Climate Change, What will happen if we do nothing?* [online], Available from: <http://www.carbonfootprint.com/warming.html> [accessed 29/05/2015].



The Young People's Trust for the Environment is a charity which aims to encourage young people's understanding of the environment and the need for sustainability.

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