



Climate Change - Did You Know? Fact Sheet

What is the greenhouse effect?

Greenhouse gases have always been a natural part of the atmosphere and can be helpful to the Earth. They absorb the sun's heat which keeps the Earth warm enough for plants and animals, including us, to survive and grow. This is what we call the greenhouse effect.

Unfortunately, we now have too much greenhouse gas because of human activities both today and over the past two hundred years. This extra gas has been trapped in the atmosphere and is causing the world to warm. This is what we call the enhanced greenhouse effect.

Is the Earth really getting hotter?

Yes. Thirteen of the 14 warmest years on record have occurred between 1995 and 2008.

Although some of the heat is from natural causes, greenhouse gases are the main cause of climate change since the 1950s.

Hasn't the Earth's climate always changed?

The Earth has had cold and warm cycles since it began (for example, the Ice Ages). Some of these natural climate changes were because of the way the Earth moved closer to and further away from the sun. However, research indicates that the climate changes over the past 50 years have mostly been caused by the greenhouse gases produced by human activities.

How do we know if climate change is caused by humans?

Scientists have measured the volume of greenhouse gases in the atmosphere and compared it with how much was in the atmosphere in the past. Their studies have shown that greenhouse gases have increased over the past few hundred years coinciding with human activity such as burning coal, oil and gas.

Will it matter if our Earth becomes a few degrees warmer?

It might seem as though a few degrees will not make much difference to us because in our daily lives the temperature changes all the time.

However, the temperatures in our daily lives and the global climate are very different. For example, during the last Ice Age (about 70,000 years ago) the average temperatures were only about 5°C lower than they are today!

This shows us that if the climate becomes warmer by just a few degrees it will make a big difference to many ecosystems on Earth.

How do scientists measure the Earth's temperature?

The Earth's temperature is measured in many ways:

- thermometers record air and ocean temperatures
- cutting across the trunk of a dead tree to study its rings can show us how temperatures have varied in the possibly thousands of years since it was a sapling





- drilling into the deepest snow and ice can also tell us about temperatures from the distant past
- satellites and weather balloons can record temperatures in the atmosphere and on the Earth's surface.

How do scientists predict our climate in the future?

Scientists predict the climate into the future and study it in the past by using climate models. Scientists use mathematics and computers to create 3-dimensional climate models of our planet and its atmosphere. They also study and record the sun's interactions with the Earth's atmosphere, oceans, polar ice and land surface.

Other experts study and model other factors that affect our climate, such as how many people will be living on Earth and how this will affect the production of greenhouse gases.

How much will sea levels rise as the world gets warmer?

As the Earth's surface becomes warmer and the oceans absorb the heat, their water expands, making the sea level rise. Melting ice from areas such as Greenland and Antarctica also causes the level to rise. Average sea levels rose by about 17cm during the 20th century, but experts predict that the sea level may rise by another 18 to 59 cm or more over the next century.

Is there a link between climate change and the ozone hole?

Certain types of gases - called CFCs - are the main cause of the ozone hole and also contribute to climate change. Some CFCs can remain in the atmosphere for two hundred years, so they will be affecting the ozone layer and our climate for a long time into the future.

How much will the Earth warm up? Can we stop it?

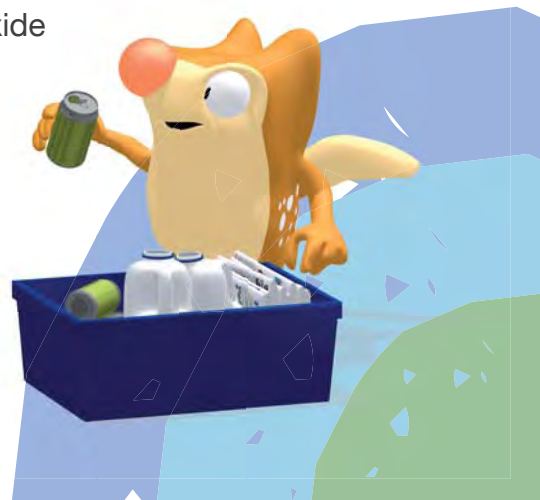
Many scientists are confident that climate change is already happening. When carbon dioxide (the main greenhouse gases) is in the atmosphere, it stays there for 50 to 200 years. The Earth may warm up by about 2°C over the next hundred years and we probably cannot stop this. However, if we all work together to reduce our greenhouse gas emissions we can limit how severe the changes in our climate will be.

Does methane add to the greenhouse effect?

Although carbon dioxide is the most common cause of the greenhouse effect, methane is the second greatest contributor. Methane comes from many sources (farming cows and sheep, rice, landfill, fires, mines, fossil fuels and natural wetlands). Although methane is a dangerous greenhouse gas, over the past 10 years the amount in the atmosphere has stayed the same. Experts believe that carbon dioxide will continue to be the greenhouse gas that is likely to cause most problems in the future.

How can we live with climate change?

Many scientists believe that the climate will change more in the future and if we do not change our behaviour the Earth's





temperature will rise by many more degrees. So we need to be ready to deal with some changes, whether they are big or small.

Are droughts in Australia due to climate change?

It is difficult to say whether climate change has contributed to recent and current droughts in Australia because droughts can also be linked to natural changes in the world's atmosphere and oceans. However, scientists have shown that our temperatures are higher and we are having less rain in some areas and more in others because of climate change. Although we cannot say how much climate change has contributed to recent Australian droughts, we know that droughts are likely to last for longer and be more frequent in the future.

What is the Kyoto Protocol?

The Kyoto Protocol is the first ever agreement to keep track of how many emissions are produced in countries all over the world. Almost 200 countries met to decide how many greenhouse gases developed countries could produce. Each country was given permits equal to that amount.

Countries can also earn permits by doing other things that help reduce carbon pollution in our atmosphere. For example, a country could earn permits by growing forests (because trees absorb carbon dioxide).

Countries can choose whether or not they want to join the Kyoto Protocol. Australia joined the Protocol in 2008.

