



TIMETO  
CHANGE

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# WHAT IS CLIMATE?

Each morning we wake up and look out of the window. Outside there is weather.

It is different every day.

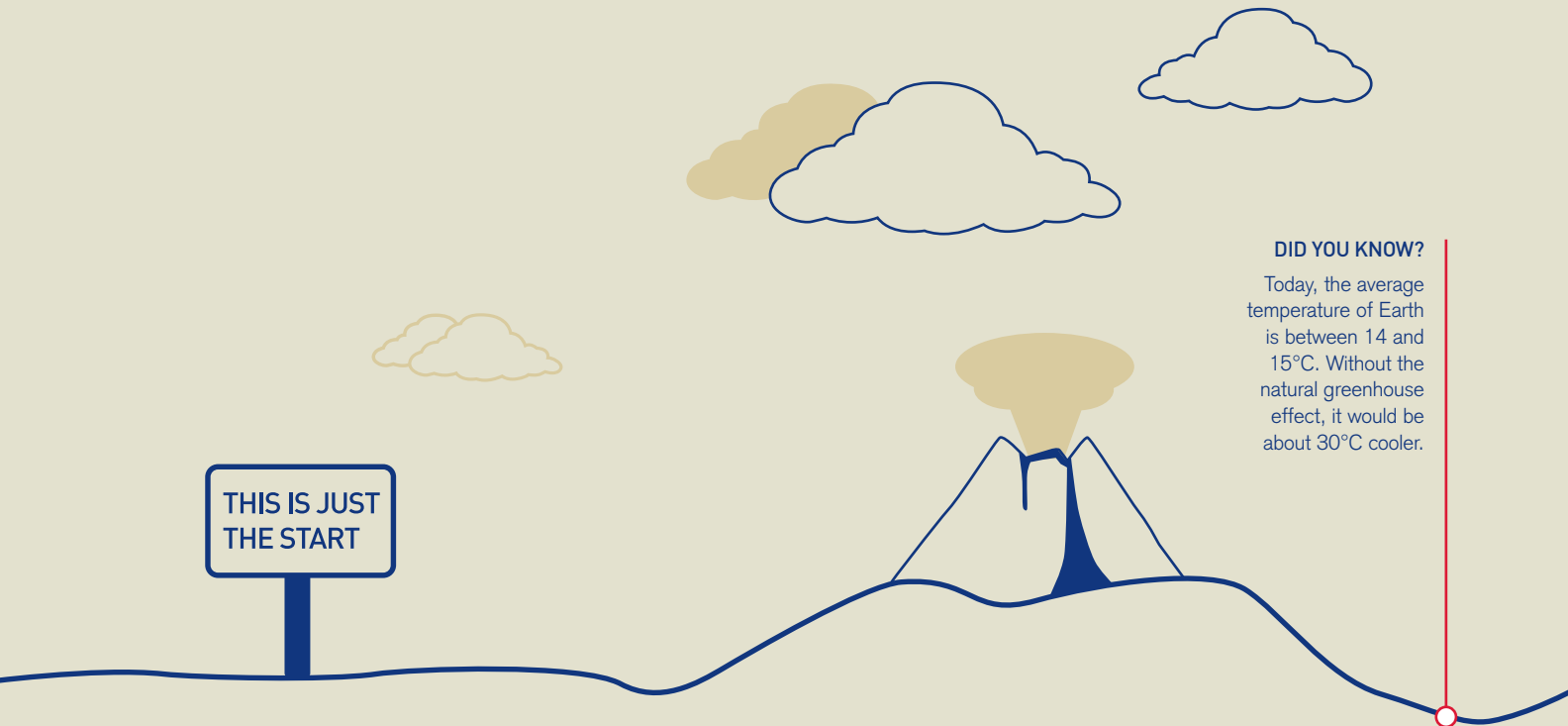
But weather is not climate.

Climate is the general character of weather in a particular place, and how it varies over time, measured in terms of years not days, weeks or months.

Earth's climate changes naturally. Some changes can be very rapid; for example global temperatures can drop for a year or two after a large volcanic eruption; or change can happen over much longer periods of time, like the ice ages.

The current discussion over climate change is about whether the activities of mankind, particularly over the past 300 years of industrialisation, are changing the climate again.

Most climate scientists think it is.  
And Anglo American agrees.



## DID YOU KNOW?

Today, the average temperature of Earth is between 14 and 15°C. Without the natural greenhouse effect, it would be about 30°C cooler.

# WHAT IS CAUSING CLIMATE CHANGE?

Almost all life on Earth needs energy from the sun.

A portion of this energy passes through the atmosphere, and is absorbed by the Earth's surface. The surface cools by re-radiating the energy towards space in the form of heat. There are gases in the atmosphere which trap this heat. This is known as 'the greenhouse effect'. Without it we would not be here. This is a natural process.

But, over the past few hundred years, mankind has been converting forests to farmland and burning increasing amounts of coal, oil and gas. These 'fossil fuels' give off carbon dioxide (CO<sub>2</sub>) – and other gases – when they are burnt.

These human activities add to the natural concentration of greenhouse gases, some of which stay in the atmosphere for hundreds of years.

So, some of the heat that should be escaping into space is trapped by these greenhouse gases causing what is known as 'the enhanced greenhouse effect'.

The results of this include an increase in the average temperature on Earth, changes in rainfall patterns and sea level rise – often referred to as 'climate change'.

## WHAT IS A 'GREENHOUSE GAS'?

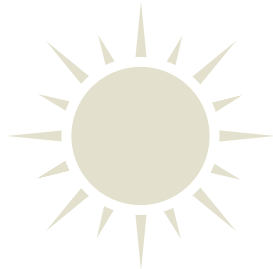
The main greenhouse gases are carbon dioxide (CO<sub>2</sub>), water vapour, methane and nitrous oxide.

CO<sub>2</sub> has been by far the largest contributor to climate change over the past few decades. But the others should not be ignored.

For example, methane, which is often released as a result of coal mining and farming, has a very strong warming influence but stays in the atmosphere for a much shorter time. Overall, methane has a warming effect about 25 times that of CO<sub>2</sub> when consequences are compared over 100 years.

Nitrous oxide is stronger still with a global warming potential almost 300 times greater than that of CO<sub>2</sub>. It is mainly produced by the fertilisers farmers use.

Some of the chemicals used in refrigeration and in fire suppression are also very strong greenhouse gases.

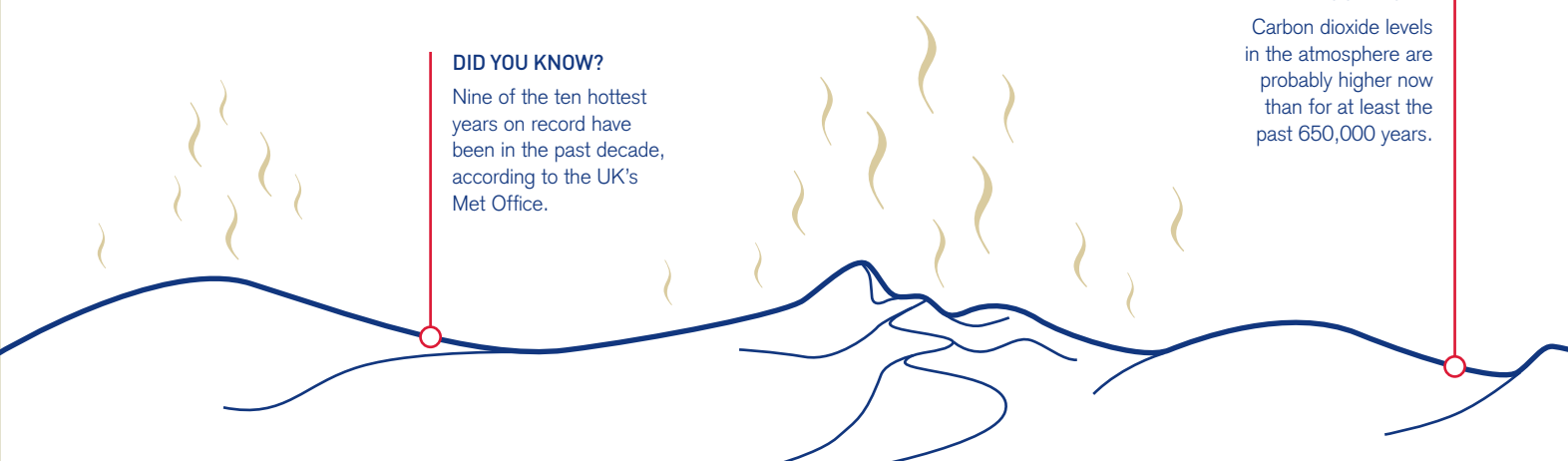


## DID YOU KNOW?

Nine of the ten hottest years on record have been in the past decade, according to the UK's Met Office.

## DID YOU KNOW?

Carbon dioxide levels in the atmosphere are probably higher now than for at least the past 650,000 years.



# HOW MIGHT CLIMATE CHANGE AFFECT THE WORLD?

As the climate continues to change, there are likely to be a number of effects.

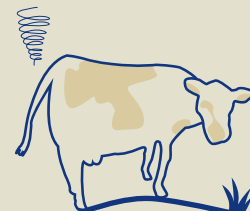
Increasing the temperature of sea water causes it to expand. Many land-based glaciers and ice sheets are decreasing in size as temperatures rise. When combined, these lead to rising sea levels around the world.

For low lying countries such as Bangladesh, this could be devastating. And 13 of the world's 20 largest cities are also on a coast.

Rising temperatures, variations in rainfall and changes to extreme weather could also mean that some plants and animals might be affected. Some might thrive, some might be able to adapt while others may struggle to survive. Meanwhile, we humans may also be affected, the old and the vulnerable are at most risk from heat stress, disease, hunger. There is no question that we will need to adapt.

## DID YOU KNOW?

Climate change could be a significant challenge for biodiversity, with some plants and animals unable to adapt, and others migrating.



## DID YOU KNOW?

Farm animals are a significant source of methane emissions. Around one third of all New Zealand's greenhouse gas emissions are from cows and sheep.

# HOW DOES ANGLO AMERICAN AFFECT CLIMATE CHANGE?

Anglo American uses a great deal of energy in its mining operations, much of which is produced from fossil fuels. These contribute to climate change.

Coal is one of our main commodities. The mining of coal can release methane. This is a significant issue for our Metallurgical Coal business in Australia.

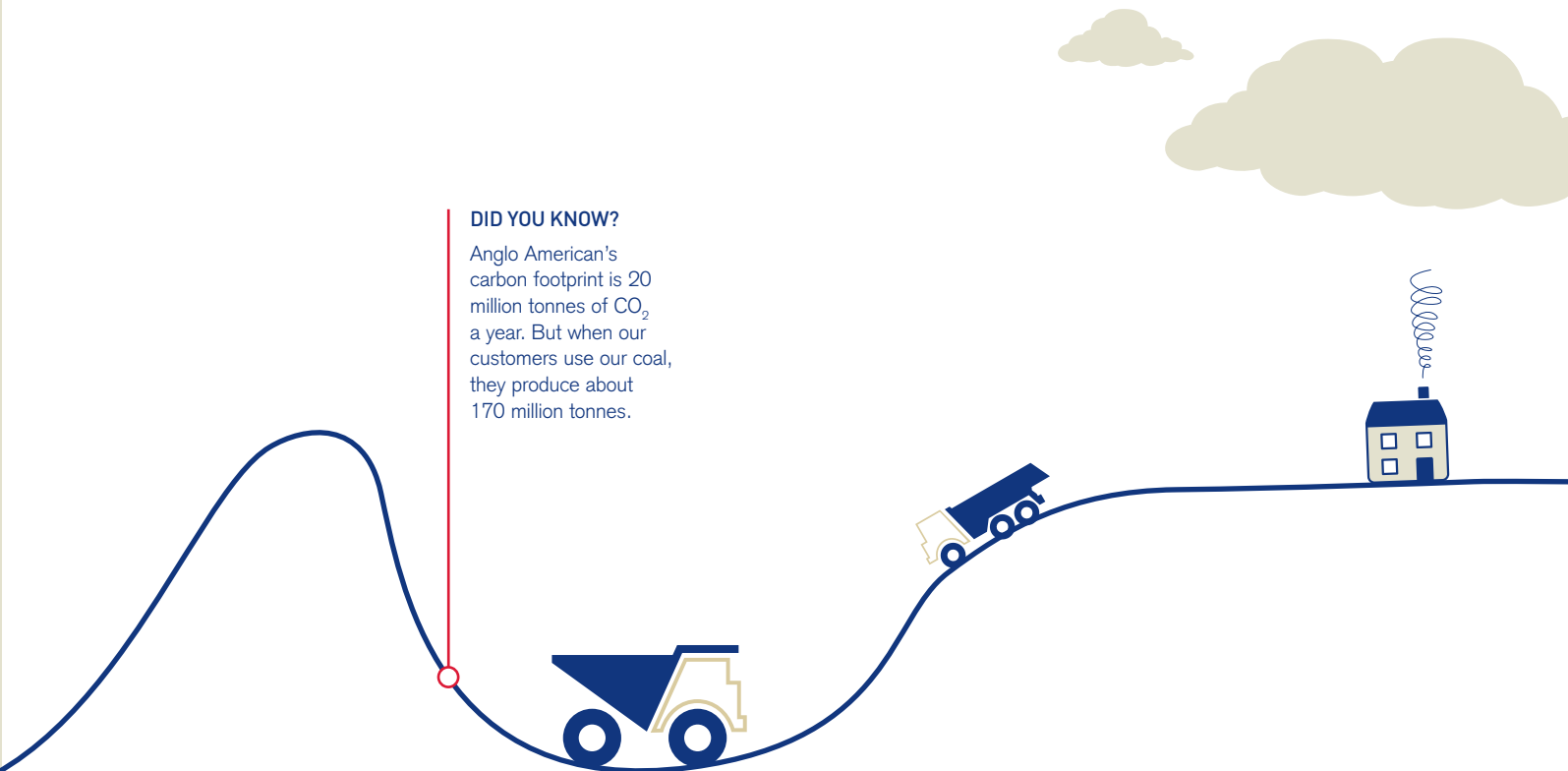
Our coal is then used by our customers for generating electricity and making steel. These are significant sources of greenhouse gases.

However, other Anglo American commodities have a role to play in tackling climate change. Copper, for example, is the most cost-effective metal for carrying electricity. It is heavily used in wind turbines and in hybrid and electric vehicles.

Platinum is also widely used in the car industry in the form of auto-catalysts which actually reduce greenhouse gas emissions. And there is considerable potential for platinum-based fuel cells in the generation of low-carbon electricity.

## DID YOU KNOW?

Anglo American's carbon footprint is 20 million tonnes of CO<sub>2</sub> a year. But when our customers use our coal, they produce about 170 million tonnes.



# WHAT IS THE SOLUTION FOR TACKLING CLIMATE CHANGE?

The simple answer is that there is no simple answer.

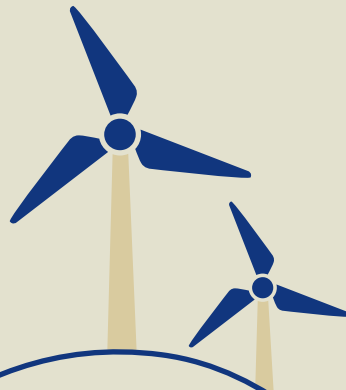
The science of climate change is clear, but solutions are not. They are highly political.

The USA and China are the world's largest producers of CO<sub>2</sub>. But China and many other developing countries insist on their right to lift their people out of poverty.

Developed countries have a moral obligation to do more.

## DID YOU KNOW?

According to the International Energy Agency, carbon capture and storage (CCS) is a key emissions reduction option in limiting the long term global average temperature rise to 2°C.



## DID YOU KNOW?

From 2005 to 2010, wind power grew at an average rate of 27% per year, and solar photovoltaic at an average rate of 56%.



# HOW MIGHT CLIMATE CHANGE AFFECT ANGLO AMERICAN?

**1. Carbon pricing:** Governments all over the world are planning to charge for CO<sub>2</sub> emissions by introducing 'carbon taxes' on greenhouse gases. These could be very expensive. Australia's carbon pricing proposals alone could cost the company in excess of US\$1.4 billion by 2020.

The main sources of greenhouse gases in Anglo American are the coal-fired electricity we use in South Africa and methane emissions from our Metallurgical Coal operations in Australia.

**2. Energy bills:** Last year our electricity bill was US\$900 million and we spent US\$630 million on diesel. These bills will more than double by 2020.

**3. Changing markets:** Suppliers and customers who want to reduce their carbon footprints might use gas instead of coal.

But other customers might develop new products using copper – which Anglo American produces – rather than energy-intensive aluminium.

And brand new applications could develop for platinum, which can help to reduce carbon emissions.

We need to be able to respond.

**4. Longer-term risks:** The climate is changing and some of the regions in which we operate are likely to suffer more flooding. Others could suffer more drought. In either case, production could be affected as well as the communities in which we operate.

We are also likely to face greater competition for access to resources such as water and energy.

Extreme weather events could affect our ability to load or unload our bulk products.

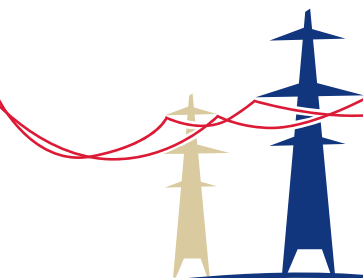
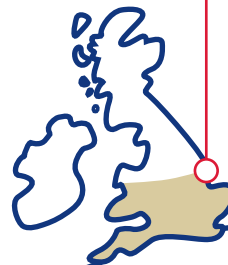
Anglo American invests in long-term assets, so we are looking at where we are at risk.

## DID YOU KNOW?

Anglo American's copper, nickel and Brazilian iron ore businesses account for 38% of the Group's total energy use, but only 9% of our carbon emissions. This is because they use electricity from renewable sources.

## DID YOU KNOW?

Anglo American's total energy consumption each year is about the same as the electricity consumption of one quarter of all the households in the UK.



# WHAT IS ANGLO AMERICAN DOING?

As a company that has been involved in South Africa for almost 95 years, we are playing an active role in COP17 – the United Nations' climate change conference that will be taking place in Durban in December.

The Group has a strategy for climate change covering the next 10 years. It will mean us setting – and meeting – targets to cut our carbon emissions and our energy consumption.

At the moment we have implemented the ECO<sub>2</sub>MAN programme to drive our energy and greenhouse gas savings at all our operations, including the setting of site level targets.

Then each site will have to make its own energy and carbon reductions. Some targets will be tough, but will be designed to encourage sites and businesses to come up with fresh ideas.

We are also working with expert climate scientists to try to work out more precisely:

- how climate change will affect the places where we operate – and the people who live there; and
- when the impact might happen.

We do not have all of the answers. But we know what questions we need to ask.

# WHAT CAN YOU DO?

**The simple answer is 'REDUCE and ADAPT'.**

Everyone has a role to play: individuals, companies and governments. We can all make a difference to climate change by making conscious greener choices; from driving less and using more fuel efficient vehicles to identifying new technologies that improve energy efficiency and REDUCE emissions.

But as climate change is already happening we also need to change and adapt to its effects and prepare for the future; such as insulating our homes, using heat reflective paint on our homes and drought-resistant plants in our gardens.

