



MAN-MADE DISASTER

The effects of global warming on planet Earth

Scientists **envision**¹ a terrifying future for planet Earth. By 2100 the sea levels will rise, coastlines disappear, Amsterdam and New York will be underwater. 100–200 million people will become homeless. And all because of global warming. So what is this threat? Is the danger real? And what can we do to stop it? To understand this complex subject, besides global warming, the greenhouse effect and climate change must also be explained.

The greenhouse effect

All life on our small blue planet depends on a thin **layer**² of gases, called the atmosphere. Like a **transparent blanket**³, the atmosphere keeps the surface of the Earth warm. Without it the average temperature on Earth would be around minus 18°C. With this atmospheric blanket the average temperature is actually around plus 14 degrees Celsius.

The energy from the Sun, in the form of **ultraviolet radiation**⁴, **streams in**⁵ through the atmosphere and warms the surface of the Earth. In a similar way, the energy is **reflected back**⁶ out into space as **infrared radiation**⁷, and absorbed by the gas molecules, which trap the heat inside, like in a greenhouse. This is called the greenhouse effect. The main greenhouse gases that absorb the heat in this way are **water vapour**⁸, **carbon dioxide**⁹, and **methane**¹⁰.

Global warming

In the 18th and 19th centuries people discovered that burning coal, oil or gas, commonly referred to as fossil fuels*, released energy which could be used to power industry. However, burning more and more fossil fuels to generate heat and electricity for all those aeroplanes and motor vehicles has produced a large amount of **emissions**¹¹ of the major greenhouse gas, carbon dioxide (CO₂).

Normally, CO₂ is absorbed in the process of photosynthesis* by green plants like trees, and

phytoplankton* in the seas. Since more forests are being cut down in the tropical rainforests, less carbon dioxide can be absorbed.

The combined effects of CO₂ overproduction and lower levels of absorption have increased the level of carbon dioxide in the atmosphere. The layer of greenhouse gasses has thickened (in the last 150 years by about a third). As a result, more heat gets trapped and the temperature of the planet and the atmosphere rises. However, climatologist Dr Jan Pretel from the Czech Hydrometeorological Institute points out that “it is not only the CO₂ emissions that affect the temperature and climate, but also other human activities such as urbanization, soil degradation, etc”.

Climate change

Global warming and climate change are closely related. Scientists claim that the increase in overall global temperature is changing the climate (= the long-term weather patterns). Global warming doesn't necessarily mean that the weather will be warmer and that beach resorts **will spring up**¹³ in northern countries, rather the weather will become more **unpredictable**¹⁴. That could mean hurricanes and floods in some places, and **spells of drought**¹⁵ in others. And we have all seen the evidence of this **erratic**¹⁶ weather behaviour. There have been summer floods and very little

“In the next 30 years, the global warming might become a ‘small cooling’, or there might be sudden change between extremely hot and cold periods. As for our lifetime, the biggest danger is the change in the direction of winds and consequently of precipitation¹².”

Dr Václav Čílek
geologist and climatologist



The Czech President Václav Klaus is a strong opponent of climate change, claiming that the increase in the global temperatures has been small and the forecasts are speculative.



The latest talks about climate change in Copenhagen in December 2009 ended without an agreement. The developed countries didn't reach consensus on how to finance the reduction of CO₂ in developing countries.

snow in Europe, and in comparison lots of snow this year even in places like Great Britain. Hurricanes are much more violent than in the past, causing a lot of damage and loss of life in the Caribbean and the southern states of the USA.

Politics and climate change

Today, a good lifestyle in a developed country means having lots of **electrical appliances**¹⁷ and at least one car.

Developing countries¹⁸, led by China and India, are now improving their standard of living too. Their industries are producing tonnes of carbon dioxide.

Because of the CO₂ increase developed countries decided to take action. In 1997 the leaders of these countries met in Kyoto in Japan and agreed that the production of greenhouse gases should be reduced by 5.2% in 2012.

Climate-change sceptics

Not all scientists believe in the existence of global warming. They say that the overall warming of the planet is part of a natural cycle and not due to the increase in carbon dioxide in the atmosphere at all. They also doubt the predictions about climate change made by computers. Nevertheless Dr Pretel says "experts who understand climate and deny global warming are in a **significant minority**¹⁹."

Nigel Haward (UK)

The carbon footprint

When you walk across the beach, you leave footprints. Scientists have used this idea to describe the effect we have on the environment in our daily lives. It is called the **carbon footprint**²⁰. The **culprit**²¹ is of course CO₂, a dangerous pollutant.

The footprint comes directly from burning fossil fuels for electricity, heat and transport. It is also created indirectly from the things that are produced for us.

YOUR TURN

How to reduce your carbon footprint

Look at what you can do to reduce the amount of CO₂ in the atmosphere. Which things are you willing to do?



Hang out the washing instead of **tumble drying**²² it.



Switch off lights when not required.



Turn down the hot water setting by two degrees.

Fill the **kettle**²³ with only as much water as you need.



Share your car journeys with someone else and plan how often you use the car.



Turn down the central heating by one or two degrees. Put on an extra jumper. Don't expect to wear a T-shirt in the house!



Buy locally grown fruits and vegetables because the transport of goods from distant places produces lots of CO₂.

VOCABULARY

¹ to envision [en'viʒ(ə)n] – předvídat

² layer ['leɪə] – vrstva

³ transparent blanket [træn'spær(ə)nt 'blæŋkɪt] – průhledná pokrývka

⁴ ultraviolet radiation [ultrə'vaɪələt reɪdɪ'eɪʃ(ə)n] – ultrafialové záření

⁵ to stream in – pronikat

⁶ to reflect back – odrážet zpátky

⁷ infrared radiation – infračervené záření

⁸ water vapour ['veɪpə] – vodní pára

⁹ carbon dioxide ['kɑ:b(ə)n dar'ɒksaɪd] – oxid uhličitý

¹⁰ methane ['mæθeɪn] – methan

¹¹ emissions [ɪ'mɪʃ(ə)nz] – emise

¹² precipitation – srážky

¹³ to spring up – objevit se

¹⁴ unpredictable [ʌnpri'dɪktəb(ə)l] – nepředvídatelný

¹⁵ spells of drought [draʊt] – období sucha

¹⁶ erratic – nevyzpytatelný

¹⁷ electrical appliance [ə'plaiəns] – elektrický spotřebič

¹⁸ developing countries – rozvojové země

¹⁹ significant minority – výrazná menšina

CARBON FOOTPRINT

²⁰ footprint – stopa

²¹ culprit ['kʌlprɪt] – viník

²² to tumble dry ['tʌmb(ə)l] – sušit v sušičce

²³ kettle ['ket(ə)l] – elektrická konvice

GLOSSARY *

fossil fuels (fosilní paliva) – sources of energy formed from dead animals and plants million of years ago; these include gas, coal and oil

photosynthesis – the production of sugar-like substances through synthesis of CO₂ and water with the aid of sunlight and the chlorophyll pigment, a process in which carbon dioxide gets absorbed

phytoplankton – plankton consisting of microscopic plants