



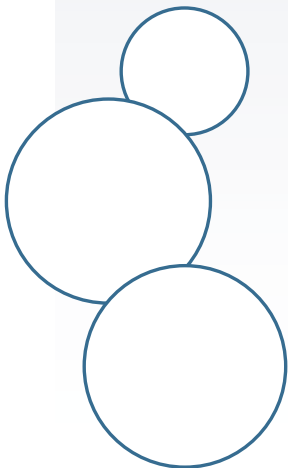
Environment fact sheet: **climate change**



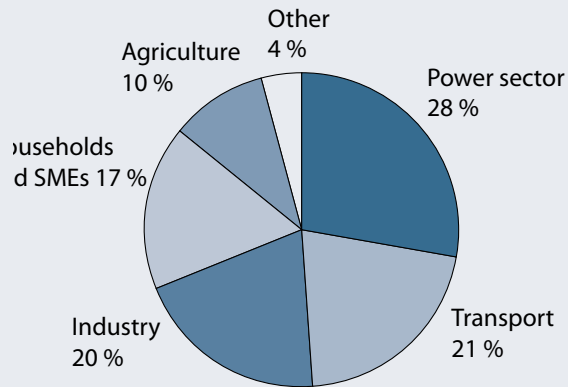
- A rapid warming of the planet is under way, with the threat of far-reaching environmental changes that could have very severe impacts on societies across the world.
- Experts blame the warming trend on 'greenhouse gases' emitted by human activities since the Industrial Revolution. In Europe, energy and transport are the biggest sources.
- The European Union has been in the vanguard of international action on climate change and is committed to taking decisive measures to control it.
- The Kyoto Protocol is an important first step towards reversing the build-up of gases. We need to go further to reduce global emissions significantly.
- The European Union believes that the global temperature rise should be limited to no more than 2 °C above the pre-industrial level in order to prevent the worst impacts of climate change.
- Among the numerous initiatives it is taking to reduce emissions, the EU has pioneered the world's first international greenhouse gas emissions trading scheme.

Some impacts of climate change

- Sea levels are rising, putting at risk coastal communities and low-lying islands and threatening to contaminate freshwater supplies through salt-water intrusion.
- The huge Greenland ice sheet is melting, which could affect the Gulf Stream that warms north-western Europe. The ice sheet's complete disappearance in the long term would raise sea levels around the world by a staggering seven metres.
- Glaciers are also melting, putting people at risk of floods and depriving them of water resources in the longer term.
- Extreme weather events — storms, floods, droughts and heatwaves — are becoming more frequent, more severe and more costly in some parts of the world. Their impacts include reducing crop yields and thus jeopardising food production.
- Infectious diseases such as malaria may spread to new areas as they get warmer.
- Most of the world's endangered species — some 25 % of mammals and 12 % of birds — may be pushed into extinction over the coming decades as global warming alters their habitats.



Sources of EU greenhouse gas emissions



Source: European Environment Agency

Fact 1: Climate change is happening now ...

The Earth is rapidly getting warmer. This change in the climate threatens serious and even catastrophic disruption to our societies and to the natural environment on which we depend for food and other vital resources. It is being caused mainly by a build-up of 'greenhouse gases' that are released by human activities, in particular the burning of fossil fuels (coal, oil and gas), deforestation and certain types of agriculture. These gases trap the sun's heat in the atmosphere in the same way as a greenhouse.

Over the course of the 20th century the average surface air temperature increased by around 0.6 °C globally, by almost 1 °C in Europe and by no less than 5 °C in the Arctic. This man-made warming is already having many discernible impacts around the globe. Climate change will affect all countries but developing countries are particularly vulnerable while being least able to afford the cost of adapting to it.

Fact 2: ... and it is projected to get worse

The UN Intergovernmental Panel on Climate Change (IPCC) has projected that the average global temperature will rise further by between 1.4 °C and 5.8 °C by 2100 if the world continues with 'business as usual'. Even an increase at the lower end of these projections would represent the fastest warming since the last Ice Age ended 10 000 years ago. A temperature rise of anywhere near 5.8 °C within the relatively short space of one century is likely to have catastrophic consequences in human, economic and environmental terms.

As a global problem, climate change requires global solutions.

The idea, first mooted in the 19th century, that carbon dioxide (CO₂) and other gases emitted from human activities could be changing the composition of the atmosphere and warming the planet has attracted growing scientific interest since the 1950s. This led the UN in 1988 to set up the IPCC, comprising the world's top experts in the field, with a mandate to produce authoritative assessments of the state of knowledge on climate change.



Fact 3: The Kyoto Protocol is a first step towards the low-carbon economy

Building on the IPCC's increasing certainty that climate change is being caused by human activities, two major international agreements to address the problem have been adopted: the 1992 UN Framework Convention on Climate Change (UNFCCC) and the 1997 Kyoto Protocol. Both are based on the principle that industrialised countries should take the lead in acting to combat climate change as they are responsible for the bulk of emissions since the Industrial Revolution and have greater resources.

The UNFCCC, which has been ratified by 188 countries plus the EU, establishes a framework for international cooperation on climate change with the ultimate objective of preventing dangerous man-made interference with the climate. The Kyoto Protocol, which entered into force in February 2005, is a first step towards reversing the global trend of rising emissions. The Protocol sets legally binding targets for industrialised countries to reduce or limit their emissions of a basket of six greenhouse gases by 2012. Importantly, it also creates flexible, market-based instruments to help these countries achieve their targets cost-effectively and to encourage the transfer of clean technologies to developing countries.

Fact 4: The European Union is leading the battle against climate change

The European Union, responsible for around 14 % of global greenhouse gas emissions today, has always been in the vanguard of international efforts to tackle climate change. As early as 1990, the EU voluntarily committed to stabilising its emissions of CO₂ at the 1990 level by 2000, a target it succeeded in achieving. Under the Kyoto Protocol the 15 older Member States (EU-15) are committed to cutting their combined emissions of the greenhouse gases controlled by the Protocol to 8 % below the 1990 level by 2012. This overall target has been translated into a specific legally binding target for each Member State based on its capacity to curb emissions. Most of the 10

Greenhouse gases

The main greenhouse gas is water vapour which occurs as clouds. These reflect some of the sun's heat back into space but also trap some of it in the atmosphere. The latter phenomenon creates the natural greenhouse effect that keeps the Earth at a comfortable temperature to support life.

The Kyoto Protocol focuses on controlling six gases released by human activities that are enhancing the greenhouse effect and consequently making the world warmer. They are:

- carbon dioxide (CO₂) — the most important greenhouse gas released by human activities in terms of quantity; it is emitted by combustion of fossil fuels, wood or anything else containing carbon, but is also absorbed by plants and trees;
- methane (CH₄) — releases come from a wide range of natural sources and human activities; the latter include fossil fuel production, livestock husbandry, rice cultivation and waste management;
- nitrous oxide (N₂O) — emission sources are fertilisers, fossil fuel combustion and industrial chemical production using nitrogen;
- three types of gases developed specifically for industrial applications — hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

Certain other industrial gases, such as chlorofluorocarbons and hydrochlorofluorocarbons, contribute to both global warming and the depletion of the ozone layer. They are not covered by the Kyoto Protocol as they are being phased out under the Montreal Protocol on protecting the ozone layer.

The EU emissions trading scheme

To help meet its Kyoto targets cost-effectively, the EU has developed the world's largest company-level scheme for trading in emissions of CO₂. The 'cap-and-trade' scheme covers just over 11,400 large emitters in the power and heat generation industry and in certain other energy-intensive industrial sectors across the 25 EU Member States. These installations, accounting for around 45 % of the EU's total CO₂ emissions, are given allowances by their governments to emit a certain amount of CO₂. Those that emit less can sell their surplus allowances. Those that expect to emit more than their allowance have the option either of investing in ways to reduce their emissions or of buying additional allowances on the market to cover some or all of their excess. This flexibility ensures that emissions are reduced where it is cheapest to do so and investments are made where they buy the greatest emission reduction. The emissions trading scheme is open to linking with similar schemes in other countries. It supports the Kyoto Protocol's market-based mechanisms for encouraging emission-saving projects in third countries by accepting the credits earned from these. The scheme could later be extended to other greenhouse gases and industrial sectors.

countries that joined the EU in 2004 also have reduction targets of 6–8 %. By the end of 2003, EU-25 emissions stood 5.5 % below 1990 levels, while EU-15 emissions averaged over the five years to 2003 were 2.9 % lower than in 1990.

Fact 5: Energy and transport are the main emission sources

More than 80 % of the EU's emissions come from the production and use of energy and from transport. As a complement to national action by Member States, the European Commission has developed a wide range of regulatory and market-based measures to reduce greenhouse gas emissions in cost-effective ways. This is being done under the European climate change programme (ECCP), a Commission initiative involving major stakeholders. One of the most promising measures to emerge from the ECCP is the emissions trading directive, which led to the creation of the EU's pioneering emissions trading scheme on 1 January 2005. Other measures include increasing the use of renewable energy sources, improving the fuel efficiency of new cars and the energy efficiency of buildings, reducing methane emissions from landfills and controlling fluorinated gases used in air conditioning.

Fact 6: A global solution requires action from all major emitters

If the further large rise in global temperatures projected over the coming decades is to be prevented, or at least limited, far-reaching action to curb greenhouse gas emissions will be needed after 2012, the year by which the Kyoto Protocol targets are to be met. To be effective this action will have to involve all major emitting nations. This includes the USA (responsible for around 25 % of global emissions), which has opted out of the Kyoto Protocol, as well as China (14 %), India (6 %) and other big developing countries which do not have emission reduction targets under the Protocol.

The EU believes that the global temperature rise should be limited to not more than 2 °C above the pre-industrial level, since the available evidence suggests that beyond this threshold severe impacts could increase markedly. To stay within this ceiling, emission reductions by industrialised countries on the order of 15–30 % below 1990 levels by 2020, and deeper cuts after that, may need to be considered. The EU wants international discussions on post-2012 action to start as soon as possible, and is working actively with its partners to prepare a new round of global negotiations.

Useful resources

Commission communication 'Winning the battle against global climate change': COM(2005) 35 final

European Commission climate change website:
http://europa.eu.int/comm/environment/climat/home_en.htm

European Environment Agency climate change pages:
http://themes.eea.eu.int/Environmental_issues/climate

UNFCCC website: www.unfccc.int

August 2005