

# Climate change



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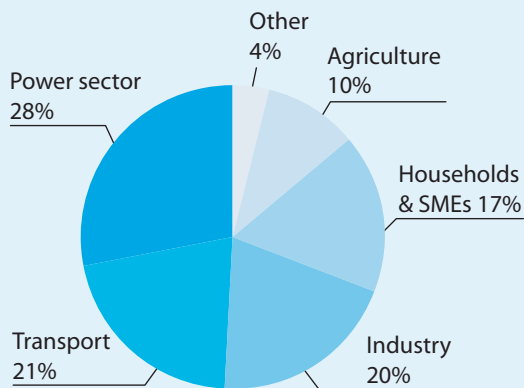
- 'Greenhouse' gases emitted by mankind are rapidly warming the Earth, causing changes in the global climate that will have increasingly severe environmental, economic and social impacts over the coming decades.
- Long in the vanguard of international efforts to combat climate change, the European Union aims to ensure the world takes action to stop global warming from reaching dangerous levels.
- The 1997 Kyoto Protocol is an important first step towards limiting greenhouse gas emissions, but a much more ambitious international agreement involving all major emitters will be needed for the period from 2013.
- As a first step the EU has put in place measures to cut its emissions 20% by 2020 and is committed to increasing this reduction to 30% provided other countries agree to do their fair share under a new global climate pact.
- In parallel with cutting emissions, Europe and the rest of the world need to adapt to the current and future changes in climate. This will minimise the impact and cost of these changes.

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## Fact 1: Climate change is happening now...

The Earth is becoming rapidly warmer. Twelve of the 13 hottest years on record have occurred since 1995. The vast majority of the world's leading climate experts attribute this warming mainly to a build-up of 'greenhouse' gases (GHG) emitted by human activities, in particular the burning of fossil fuels — coal, oil and gas — and the destruction of forests. Greenhouse gases are so called because they trap the sun's heat in the atmosphere in the same way as the glass of a greenhouse.

### Sources of EU greenhouse gas emissions



source: European Environment Agency

This man-made warming is causing discernible climatic and environmental changes, such as more frequent extremes of weather, rising sea levels, and melting glaciers and polar ice. In the longer term these changes threaten to cause serious damage to our economies and the environment we depend on, putting the lives of millions of people in danger and causing the extinction of animal and plant species.

The 27 EU member countries are responsible for around 14% of world GHG emissions. More than 80% of EU emissions come from the production and use of energy and from transport.

## Fact 2: ...and will become dangerous without urgent action

There is considerable scientific evidence that the risk of irreversible and possibly catastrophic environmental changes, such as unstoppable melting of polar land ice or Arctic tundra, will greatly increase if global warming reaches 2° C or more above the pre-industrial temperature (equivalent to around 1.2°C above today's level).

By 2005 the average global temperature was 0.76° C above the pre-industrial level, according to the UN Intergovernmental Panel on Climate Change (IPCC), which brings together the world's leading climatologists. And the IPCC projects further global warming of 1.8°-4° C this century, and in the worst case as much as 6.4° C, unless the international community acts to cut GHG emissions.

The European Union's position is that the international community must take urgent and strong action to prevent global warming from reaching 2° C. This is both technologically feasible and economically affordable, with the cost estimated at around 1% of global GDP. This is far less than letting climate change take its destructive course, which is expected to cost at least 5% of global GDP and could reach 20% or more in the long term — with an economic impact equivalent to the world wars of the 20<sup>th</sup> century.

## Fact 3: The Kyoto Protocol is a first step ...

Two major international agreements have been adopted to address climate change: 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 combating climate change since they are responsible for the bulk of emissions since the Industrial Revolution and have greater financial resources.

The UNFCCC, which has been ratified by 191 countries plus the European Community, establishes a framework for international cooperation on climate change with the ultimate objective of preventing dangerous man-made interference with the climate system.

The Kyoto Protocol, which entered into force in 2005, is a first step towards reversing the global trend of rising emissions. The Protocol

## Some impacts of climate change

- The polar ice caps are melting, sea levels are rising and glaciers are retreating. Sea level rise threatens the existence of low-lying island states and coastal communities. The complete disappearance of the Greenland ice sheet would raise sea levels by a staggering seven metres. The melting of glaciers is putting people at risk of floods and will deprive them of water resources in the longer term.
- Extreme weather events such as floods, droughts and heat-waves 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.
- Climate change has direct impacts on human health. The summer 2003 heatwave in southern Europe contributed to the premature deaths of more than 70,000 people. Global warming may encourage the spread of tropical diseases such as malaria and dengue.
- 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 changes their habitats.
- In the long term climate change could threaten regional and international security by triggering conflicts, famines and refugee movements as essential resources become scarce.



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sets legally binding targets for 37 industrialised countries to reduce their emissions of six GHG by an average of 5% by 2012. Among these countries only the United States has not ratified the Protocol.

Under Kyoto the 15 older EU Member States ('EU-15') took on a target of cutting their collective emissions to 8% below the level in their chosen base year (1990 in most cases) by 2012. This shared target has been translated into a specific legally binding target for each member country based on its capacity to curb emissions. Most of the 12 countries that joined the EU in 2004 and 2007 also have national reduction targets of 6 or 8%.

By the end of 2007, emissions from the EU-15 stood 5.0% below base year levels, while combined emissions from all 27 Member States were 12.5% lower. Projections of future emissions show the EU-15 well on track to reach its 8% reduction target.

## Fact 4: ...but now a much more ambitious global pact is needed

To prevent climate change from reaching dangerous levels, far-reaching action to curb GHG emissions will be needed after the Kyoto targets expire in 2012.

Negotiations on an international climate agreement for the post-2012 period are due to be concluded at the UN climate conference in Copenhagen in December 2009. The EU wants this pact to be global, comprehensive and ambitious.

To limit global warming to less than 2° C above the pre-industrial temperature, worldwide emissions must peak within the next 10 years and then be reduced by at least half of 1990 levels by 2050. Developed countries have a duty to take the lead in building the low-carbon global economy needed to achieve these deep emission cuts. The EU is proposing that, as a first step, developed countries reduce their collective emissions to 30% below 1990 levels by 2020. Each country should do its fair share.

But limiting climate change will also require action by developing countries — particularly the big emerging economies like China and India — to contain their emissions, which are rising fast. Recent scientific evidence shows that for warming to stay below 2° C, developing world emissions need to be held to 15-30% below the levels they would otherwise reach in 2020. It is clear that, under a new global agreement, developing countries will require significant financial and technical support from industrialised nations both to limit their emissions and to adapt to the impacts of climate change. It is also essential that the new international pact create effective incentives to slow and then halt tropical deforestation, which causes almost 20% of global emissions today.

## Greenhouse gases

The Kyoto Protocol limits developed countries' emissions of six GHG released by human activities:

- Carbon dioxide (CO<sub>2</sub>). 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 (CH<sub>4</sub>). Releases come from a wide range of natural sources and human activities, including fossil fuel production, livestock husbandry, rice cultivation and waste management.
- Nitrous oxide (N<sub>2</sub>O). 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 (SF<sub>6</sub>).

Certain other industrial gases, such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), 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.

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## The EU Emissions Trading System (EU ETS)

To help reduce emissions most cost-effectively, the EU has developed the world's largest company-level system for trading in allowances to emit greenhouse gases (GHG). The 'cap-and-trade' system limits emissions from currently around 11,000 large emitters in the power generation industry and in other energy-intensive industrial sectors across the 27 EU Member States plus Iceland, Liechtenstein and Norway.

These installations, accounting for some 40% of total EU GHG emissions, receive allowances to emit a certain tonnage of GHG each year. Those that emit less can sell their surplus allowances. Those that expect to emit more than their allowance can either invest in technologies to reduce their emissions or buy additional allowances on the market to cover some or all of their excess. This ability to trade within the limits of the overall 'cap' creates flexibility, ensuring that emissions are cut where it is cheapest to do so and investments directed to where they buy the greatest emission saving.

The cap on overall emissions is being reduced over time. It is currently some 6.5% below the 2005 level and by 2020 will be 21% lower. From 2012 the EU ETS will include emissions from airline flights to and from EU airports. A year later the system will be strengthened through a revision of its rules. Companies will increasingly have to buy their emission allowances instead of receiving most of them for free as now.

## Fact 5: The European Union is leading the battle against climate change

The European Union, long in the vanguard of international efforts to tackle climate change, is committed to becoming a highly energy-efficient, low-carbon economy. It has set itself the world's most ambitious climate and energy targets for 2020 and beyond, and is putting in place the policies and measures to achieve them.

A package of legislative measures agreed in 2008 will reduce GHG to 20% below 1990 levels by 2020 and also ensure that by then 20% of Europe's energy comes from renewable sources like wind and solar — more than double today's share. A series of measures is also being implemented to improve energy efficiency by 20% by the same deadline.

Moreover, the EU is committed to increasing its emissions reduction from 20% to 30% provided that, under a new global climate agreement, other developed countries do their fair share and developing nations take appropriate action.

The cornerstone of the EU's strategy for combating climate change is the EU Emissions Trading System (EU ETS), launched in 2005. The world's first and biggest international greenhouse gas emissions trading system, the EU ETS has made climate change a boardroom issue for companies by putting a price on their carbon emissions. A revised system from 2013 will play a central role in achieving the Union's climate and energy targets for 2020 and beyond.

## Fact 6: While cutting emissions, we must also adapt to climate change

Even if the world cuts GHG emissions sharply, climate change will continue to become more pronounced for decades to come because of the delayed effect of past emissions. Adapting to climate change has therefore become an indispensable complement to reducing emissions.

Adaptation means anticipating the adverse effects of climate change and acting to prevent or minimise the damage they can cause. Early action will save on costs later. Examples of adaptation measures include developing crops that can tolerate drought and strengthening coastal flood defences against sea level rise.

The poorest developing countries are especially vulnerable and the EU is giving them financial and other support to help with adaptation. In Europe itself adaptation is needed at all levels, from the European right down to the local and even the personal level. The European Commission has set out a framework for strengthening Europe's resilience to climate change with a view to establishing a comprehensive EU adaptation strategy by 2013.

### Useful resources:

**European Commission climate change website:**  
[http://europa.eu.int/comm/environment/climat/home\\_en.htm](http://europa.eu.int/comm/environment/climat/home_en.htm)

**European Environment Agency climate change pages:**  
[http://themes.eea.eu.int/Environmental\\_issues/climate](http://themes.eea.eu.int/Environmental_issues/climate)

**UNFCCC/Kyoto Protocol website:**  
[www.unfccc.int](http://www.unfccc.int)



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