

climate change

this house would give up non-essential flying to help curb dangerous climate change

rising temperatures

Climate change (or global warming) describes the recent increase in our planet's temperature which is caused by humans. Since the 1900s there has been a rise in the levels of 'greenhouse gases'. These gases - like carbon dioxide, methane, and nitrous oxide raise the earth's temperature by trapping energy from the sun and stopping it escaping back into space. Without any greenhouse gases the earth would be too cold for us, but in recent decades their levels have been rising at such an alarming rate that scientists predict dangerous changes to our environment.

Some of the increase in our planet's temperature can be explained by natural causes but the majority of scientists think that human activities - like burning fossil fuels (oil and coal), and chopping down forests - are mainly to blame. Methane has the strongest greenhouse effect but carbon dioxide stays in the atmosphere for ten times as long (100 years compared to 10 for methane). Governments around the world have committed to reduce carbon emissions, for example by encouraging new forms of energy for transport, industry and homes. However, progress is very slow. According to analysis of government figures (by Cambridge Econometrics) the UK has missed its 2010 target of cutting CO₂ emissions by 20% from 1990 levels.



Airplane contrails
(photo François Roche/creative commons)

As fossil fuels continue to be burnt, some countries are exploring Carbon Capture and Storage. At a coal-fired power plant, for example, carbon dioxide is separated from other waste gases, transported, and stored deep underground. At present, the process is expensive and uses up to a third more fuel.

tipping point

In 2010 global CO₂ emissions hit record levels and scientists are now warning that there's limited time left to act. They believe that climate change will reach a 'tipping point' - that is where a small increase in temperature triggers a serious change in the environment, which then sets off a bigger rise in global temperature. Once a tipping point is reached, any cuts in greenhouse gases will not be able to reverse it. For example: a huge area of western Siberia is the world's largest frozen peat-bog. It has started to melt for the first time since it was formed at the end of the last Ice Age. The fear is that, as it continues to melt, it will release billions of tonnes of methane into the atmosphere which will trigger further warming of the planet.



Earth - Antarctic sea ice
(photo NASA/Goddard Space Flight Centre)

Apart from reducing carbon emissions, are there any other options?

The world may have to find the means of adapting to a warmer climate, or come up with geo-engineering solutions as a final attempt to reverse or halt climate change. Geo-engineering - the "deliberate, large scale manipulation of the planetary environment" - is very controversial (see fast facts) as no-one knows how worldwide weather patterns could be affected.

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fast facts

- Climate change is already with us: global temperature has risen by around 0.75°C during the last century. In the last 4 decades the earth has warmed at a faster rate. Scientists predict global temperatures could rise further, by between 1.1°C and 6.4°C by the end of this century.
- The organisation set up by governments to research and report on Climate Change - the IPCC (www.ipcc.ch) says that 77% of the world's energy needs could be met by renewables by mid century. If this could be achieved, it thinks the global temperature rise could be held to 2°C.
- People in the Torres Strait Islands in Northern Australia expect to become the world's first climate change refugees as rising sea levels swamp their land.
- Geo-engineering - sometimes called climate engineering - is the idea of using technology to deliberately change the earth's climate. Some ideas include limiting the amount of sunlight reaching earth by erecting space sunshades; or by spraying reflective aerosols into the atmosphere. This option is under investigation by a team of British scientists.

climate change in fiction

The Carbon Diaries

Exodus

The Hunger Games (trilogy)

Saci Lloyd

Julie Bertagna

Suzanne Collins

find out more

- The BBC's learning zone has a series of film clips you can watch <http://www.bbc.co.uk/learningzone/clips/>
<http://news.bbc.co.uk/weather/hi/climate> for the latest news about climate change
<http://www.metoffice.gov.uk/climate-change>
http://ec.europa.eu/clima/sites/campaign/index_en.htm
Includes short film clips from teenagers across Europe on their ideas to curb climate change
<http://video.nationalgeographic.com/video/player/>
Use the menu to watch environment videos on the US site
<http://www.transportdirect.info/Web2/JourneyPlanning/JourneyEmissionsCompare.aspx>
Calculate carbon emissions by mode of transport
http://www.ted.com/talks/lee_hotz_inside_an_antarctic_time_machine.html
A video talk describing an Antarctic drilling project to find out about climate change

questions to ask

- What evidence is there that our climate is warming?
- How do scientists know global warming is due to human activity?
- Is climate change already having an impact on the planet?
- What can I do? What can governments do?
- What would have the biggest impact on reducing climate change?
- Will geo-engineering solve the problem? Who will decide what is safe?

alternative motions: this house...

- ...believes geo-engineering will be the only solution to climate change
- ...would become vegetarian to help curb climate change
- ...would put a limit on the world's population to help tackle climate change
- ...would pay developing countries to stop them using polluting industries