GreenFacts
Facts on Health and the Environment

This is a faithful summary of the leading scientific consensus report produced in 2014 by the IPCC : "Climate Change 2014: Mitigation of Climate Change"

Climate Change mitigation: practical measures to limit global warming IPCC report 2014 Working Group III

How are uncertainties handled in this report?

The IPCC uses a very specific language when it comes to expressing the degree of uncertainty or agreement for each statement in the fifth assessment report. For an overview of the specific meaning of each qualifier, you can read the relevant section in our *summary of the Working Group I report.*

What is projected by emission scenarios?

For scenarios without mitigation efforts beyond those in place today, greenhouse gas concentrations would reach 750 to over 1300 ppm CO_2eq by 2100 (versus 400 ppm now). Global surface temperature would increase by 2.5 to 7.8 °C over pre-industrial levels (high confidence).
Greenhouse gases emissions are expected to continue to grow in all sectors except agriculture, forestry and other land uses (robust evidence, medium agreement). By 2050, the emissions from the energy supply sector are projected to triple compared to 2010, mainly from the electricity used in buildings and industry. Emissions from transport and buildings are projected to almost double, unless improvements in energy efficiency are accelerated (medium evidence, medium agreement).
Scenarios limiting CO_2eq concentrations to about 450 ppm by 2100 – necessary to limit global warming to 2°C above pre-industrial levels – require greenhouse gas emissions that are 40% to 70% lower in 2050 than in 2010, and near zero in 2100. This requires large-scale global changes in the energy supply sector (robust evidence, high agreement).
Scenarios that exceed 650 ppm CO_2eq by 2100 are unlikely to limit global warming to 2°C above pre-industrial levels.

How can climate impact mitigations objectives best be reached?

If mitigation efforts are delayed, it would be more difficult to limit global warming to 2°C and the range of options would be more limited (high confidence). Infrastructure development and long-lived products can lock a society into a pathway of high greenhouse gas emissions, something that can be difficult and costly to change. This reinforces the importance of early action for ambitious mitigation (robust evidence, high agreement).
Since most greenhouse gases accumulate over time and mix globally, climate change can only be effectively mitigated if collective actions are taken at the global scale. International cooperation is needed to help developing and spreading environmentally sound technologies.
In order to accurately estimate the benefits of mitigation, the full range of possible impacts of climate change need to be taken into account by social, economic and ethical analyses.

What are the possible mitigation measures?

Major options needed to reach the maximum concentration objective of 450 ppm CO_2eq include:
Replacing coal-fired power plants with modern, highly efficient natural gas power plants, provided that natural gas is available and that gas leaks are kept low during extraction and distribution;
More efficient energy use, as well as tripling to nearly quadrupling the share of zero- and low-carbon energy sources by the year 2050; this includes renewables, nuclear energy, fossil energy with CO_2 capture and storage (CCS), and bioenergy with CCS (BECCS).
Reducing CO_2 emissions in all transport modes, through technical improvements, behavioural changes, as well as new infrastructure and urban redevelopment investments.

Would decarbonising and CO_2 storage technologies be effective mitigation tools?

The energy supply is currently largely dominated by carbon intensive fossil fuels. Decarbonising it, i.e. reducing the amount of carbon it releases, is a key requirement to stabilize emissions below 580 ppm CO_2eq by 2100 (robust evidence, high agreement). However in the near-term, there may be more to be gained by increasing energy efficiency than by decarbonising energy supply.
Carbon Storage technologies currently exist, but there is a need for regulatory incentives to deploy them on a large scale. Combining bioenergy with carbon capture and storage (BECCS) can bring net negative emissions.

How can individuals contribute to the reduction of greenhouse gas emissions?

Individuals could substantially lower emissions by changing their diet, reducing food waste, and modifying consumption patterns such as mobility demand and modes, energy use in households, choice of longer-lasting products. Such changes in behaviour may improve energy efficiency by 20 to 30 % in 2030 (medium evidence, medium agreement).
In developed countries, lifestyle and behavioural changes could reduce energy demand in buildings by up to 20% in the short term and by up to 50% by mid-century.

What would be the cost of climate change mitigation?

If all countries would begin mitigation measures immediately and on the same basis, reaching concentrations of about 450ppm CO_2eq by 2100 entails losses in global consumption of 1 to 4% in 2030, 2 to 6% in 2050, and 3 to 11% in 2100. This is quite small considering that global consumption should grow anywhere from 300% to over 900% during this century. Delaying mitigation would increase the costs.
The distribution of the costs would vary: the majority of mitigation efforts would take place in countries where future emissions are expected to be highest, as well as in sectors where key mitigation technologies are effective.
Mitigation measures entail a wide range of possible adverse side-effects as well as co-benefits, which have not been well quantified. For instance, the land used to plant trees as carbon sink cannot be used for human food, animal feed or bioenergy crops.

How will mitigation affect the energy industry?

Revenues from the export of coal and oil are expected to decrease (high confidence). The effect on natural gas exports is more uncertain.
Nuclear energy could make an increasing contribution to low-carbon energy supply, but a variety of barriers and risks exist (robust evidence, high agreement). New technologies addressing some of these issues are being investigated and progress has been made in nuclear safety and waste disposal.
Methane, biofuels and electricity produced from low-carbon sources are already increasing their share in the transport sector; hydrogen fuels from low-carbon sources are an option for the longer term.soil. European policies of air quality have had considerable success in the past in reducing air pollution.

You can find this summary, along with a more detailed one on the GreenFacts website at:
http://www.greenfacts.org/en/climate-mitigation-limiting-warming/index.htm
The source document for this summary can be found on the IPCC website:
http://www.ipcc.ch/

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