

Prof. Ottmar Edenhofer: " Mitigation of Climate Change: Key messages from IPCC's AR5"

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Climate change threatens irreversible and dangerous impacts, but options exist to limit its effects.

1. The Fifth Assessment Report (AR5) by the Intergovernmental Panel on Climate Change (IPCC) shows that human influence on the climate system is clear. Recent climate changes have had widespread impacts on human and natural systems.
2. Global emissions of greenhouse gases have risen to unprecedented levels despite a growing number of policies to reduce climate change. Emissions grew more quickly between 2000 and 2010 than in each of the three previous decades.
3. Without additional mitigation efforts beyond those in place today, and even with adaptation, greenhouse gases will cause long-lasting changes in all components of the climate system. Further warming will lead to high risks of severe, wide-spread and irreversible impacts.
4. Adaptation and mitigation are complementary strategies for reducing and managing the risks of climate change. Substantial cuts in greenhouse gas emissions over the next few decades can substantially reduce risks of climate change by limiting warming in the second half of the 21st century and beyond.
5. Mitigation does not involve the same possibility of severe, widespread, and irreversible impacts as risks from climate change. Risks of mitigation are manageable.
6. According to the Working Group III contribution to the AR5, it would be possible, using a wide array of technological measures and changes in behaviour, to limit the increase in global mean temperature to two degrees Celsius above pre-industrial levels. However, only major institutional and technological change will give a better than even chance that global warming will not exceed this threshold.
7. Climate policies in line with the two degrees Celsius goal need to aim for substantial emission reductions. There is a clear message from science: To avoid dangerous interference with the climate system, we need to move away from business as usual.
8. Scenarios show that limiting the increase in global mean temperature to two degrees Celsius with a likely chance, means lowering global greenhouse gas emissions by 40 to 70 percent compared with 2010 by mid-century, and to near-zero by the end of this century. Ambitious mitigation may even require removing carbon dioxide from the atmosphere. Scientific literature confirms that even less ambitious temperature goals would still require similar emissions reductions.

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9. Many different pathways lead to a future within the boundaries set by the two degrees Celsius goal. All of these require substantial investments. Avoiding further delays in mitigation and making use of a broad variety of technologies can limit the associated costs.
10. Estimates of the economic costs of mitigation vary widely. In business-as-usual scenarios, consumption grows by 1.6 to 3 percent per year. Ambitious mitigation would reduce this growth by around 0.06 percentage points a year. However, the underlying estimates do not take into account economic benefits of reduced climate change.
11. The core task of climate change mitigation is decoupling greenhouse gas emissions from the growth of economies and population. Through providing energy access and reducing local air pollution, many mitigation measures can contribute to sustainable development.
12. Climate change is a global commons problem. A price on emissions would reflect the limitations of the atmospheric disposal space for greenhouse gases. International cooperation is key for achieving mitigation goals. Putting in place the international institutions needed for cooperation is a challenge in itself.

The Working Group III contribution to the AR5

Since the last IPCC assessment report, published in 2007, a wealth of new knowledge about climate change mitigation has emerged. The authors of the new, fifth Working Group III report have included about 10,000 references to scientific literature in 16 chapters.

For the report, about 1200 scenarios from scientific literature have been analyzed. These scenarios were generated by 31 modelling teams around the world to explore the economic, technological and institutional prerequisites and implications of mitigation pathways with different degrees of ambition.

The Working Group III Summary for Policymakers, full report and further information are available at www.mitigation2014.org and www.ipcc.ch.