

The Relevance of Science for Climate Policy: IPCC's AR5

12th November 2014 Oslo West Rotary Club



Key Messages

- → Human influence on the climate system is clear
- → The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts

→ We have the means to limit climate change and build a more prosperous, sustainable future

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Humans are changing the climate

It is extremely likely that we are the dominant cause of warming since the mid-20th century





Temperatures continue to rise

Each of the past 3 decades has been successively warmer than the preceding decades since 1850





Oceans absorb most of the heat



→ More than 90% of the energy accumulating in the climate system between 1971 and 2010 has accumulated in the ocean

→ Land temperatures remain at historic highs while ocean temperatures continue to climb

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GHG emissions growth between 2000 and 2010 has been larger than in the previous three decades





Sources of emissions

Energy production remains the primary driver of GHG emissions



























WMO

UNE







Some of the changes in extreme weather and climate events observed since about 1950 have been linked to human influence



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Impacts are already underway

- Tropics to the poles
- On all continents and in the ocean
- Affecting rich and poor countries





Projected climate changes

Continued emissions of greenhouse gases will cause further warming and changes in the climate system

Oceans will continue to warm during the 21st century



Global mean sea level will continue to rise during the 21st century

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It is very likely that the Arctic sea ice cover will continue to shrink and thin as global mean surface temperature rises



Global glacier volume will further decrease

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Potential Impacts of Climate Change





Climate Change Poses Risk for Food Production



INTERGOVERNMENTAL PANEL ON Climate change

WMO

Stabilization of atmospheric concentrations requires moving away from the baseline – regardless of the mitigation goal.



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IPCC AR5 Synthesis Report

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Figure SPM.10, A reader's guide

From climate change risks to GHG emissionse







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Limiting Temperature Increase to 2°C



Measures exist to achieve the substantial emissions reductions required to limit likely warming to 2°C



A combination of adaptation and substantial, sustained reductions in greenhouse gas emissions can limit climate change risks

Implementing reductions in greenhouse gas emissions poses substantial technological, economic, social, and institutional challenges

But delaying mitigation will substantially increase the challenges associated with limiting warming to 2°C

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Mitigation Measures



More efficient use of energy



Greater use of low-carbon and no-carbon energy

Many of these technologies exist today



Improved carbon sinks

- Reduced deforestation and improved forest management and planting of new forests
- Bio-energy with carbon capture and storage



Lifestyle and behavioural changes

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Ambitious Mitigation Is Affordable

- → Economic growth reduced by ~ 0.06% (BAU growth 1.6 - 3%)
- → This translates into delayed and not forgone growth
- → Estimated cost does not account for the benefits of reduced climate change
- → Unmitigated climate change would create increasing risks to economic growth

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The Choices We Make Will Create Different Outcomes





Article 2 of the UNFCCC

"The ultimate objective of this Convention [...] stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."



Some scientific facts related to Article 2 of the UNFCCC

Effective decision making to limit climate change and its effects is informed by a wide range of analytical approaches, recognizing the importance of governance, ethical dimensions, equity, value judgments, economic assessments and diverse perceptions and responses to risk and uncertainty.

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Some scientific facts related to Article 2 of the UNFCCC

- → More intense and more frequent extreme precipitation events over many regions (very likely).
- → Likely that the Arctic Ocean will become nearly ice-free in September before mid-century (RCP8.5).
- → Very likely that global sea-level rise will continue in the 21st century, (RCP2.6 = 0.26-0.55 m / RCP 8.5 = 0.45-0.82 m).
- → Projections of reductions of renewable surface water and groundwater resources in some regions.
- → Projections of increasing displacement of people, and risks of violent conflicts.
- → The risk associated with crossing certain thresholds increases with rising temperatures.





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The window for action is rapidly closing

65% of our carbon budget compatible with a 2°C goal already used





IPCC Fifth Assessment Report

Synthesis Report



