

IPCC Fifth Assessment Report Synthesis Report

20th Conference of the Parties
UNFCCC
Lima, Perú

IPCC AR5 Synthesis Report

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INTERGOVERNMENTAL PANEL ON climate change



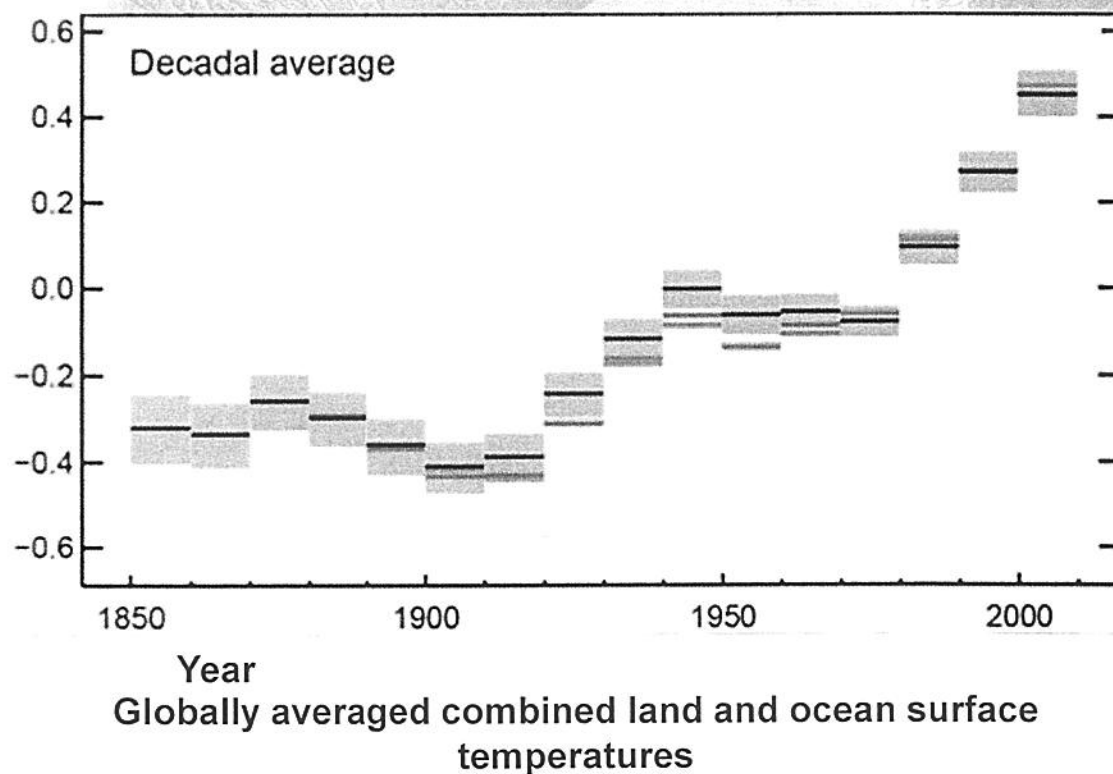
Key Messages

- **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**

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

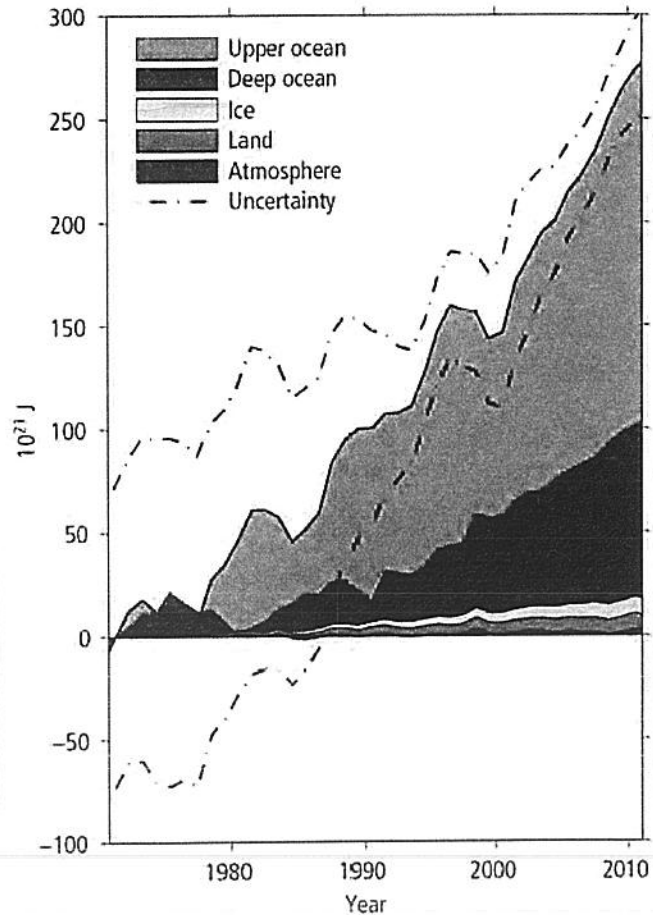
Temperatures continue to rise

- Each of the past 3 decades has been successively warmer than the preceding decades since 1850
- It is extremely likely that human influence has been the dominant cause of warming since the mid-20th century



Oceans absorb most of the heat

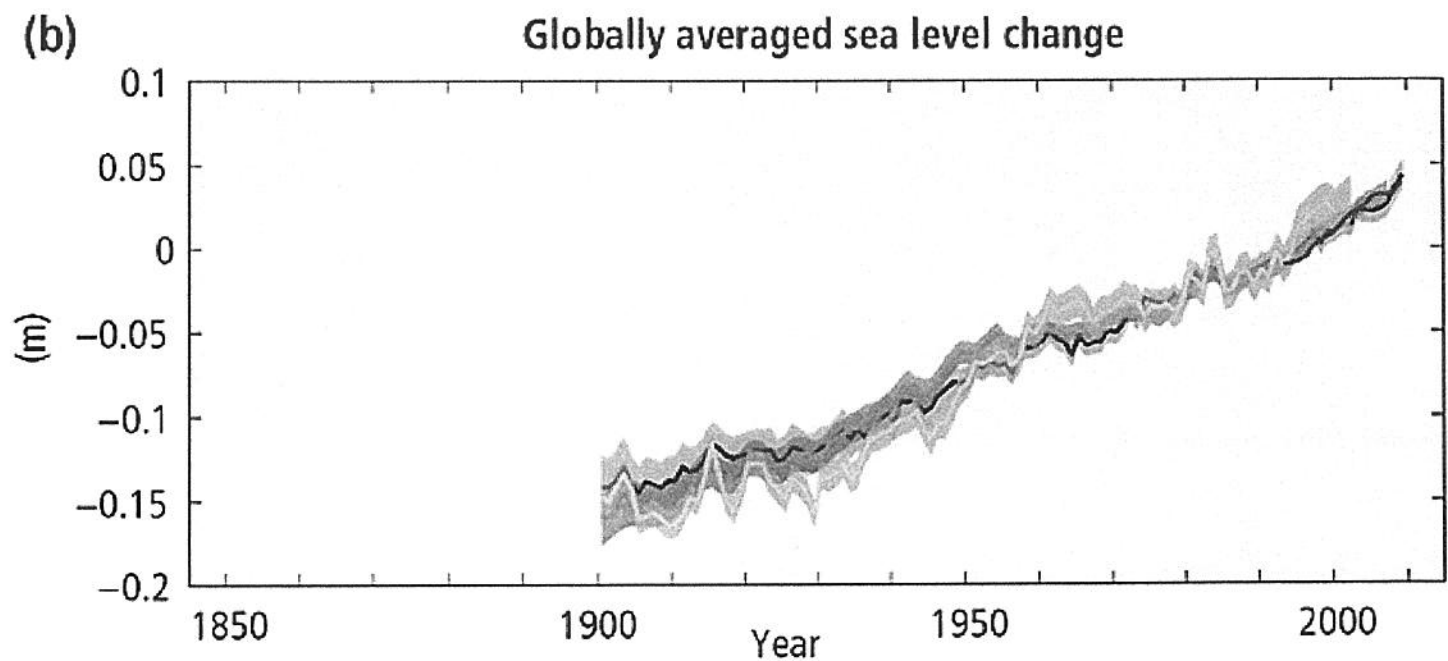
Energy accumulation within the Earth's climate system



- 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

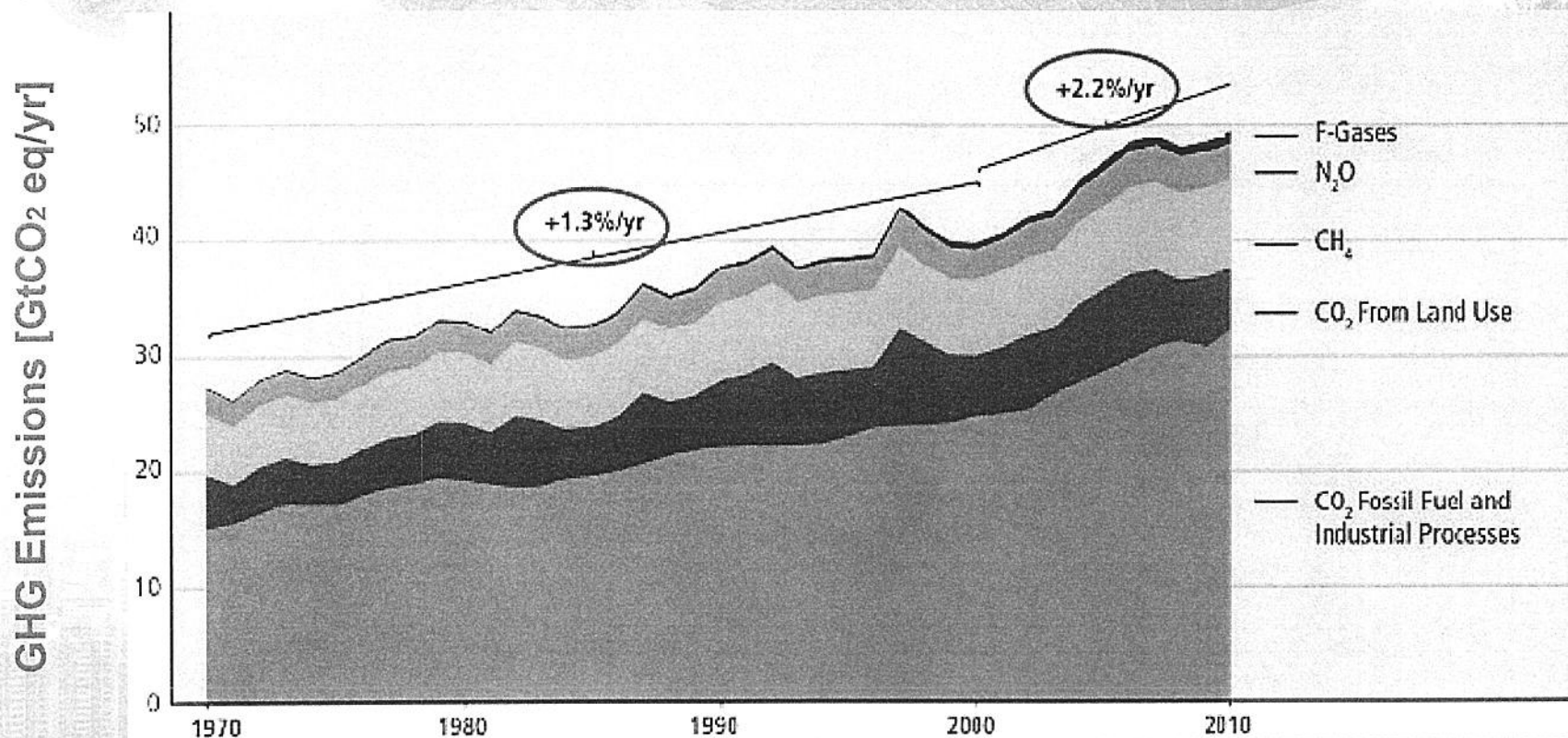
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Over the period 1901 to 2010, global mean sea level rose by 0.19 m



AR5 SYR SPM

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



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Sources of emissions

Energy production remains the primary driver of GHG emissions



2010 GHG emissions

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



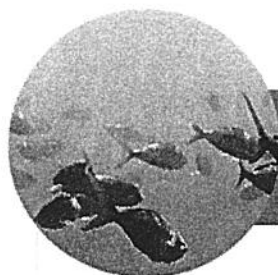
Impacts are already underway:

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

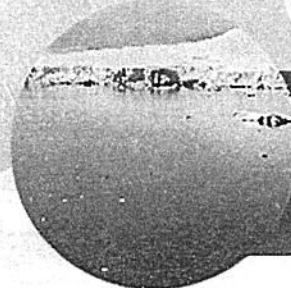
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Projected climate changes

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



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



Food and water shortages



Increased displacement of people



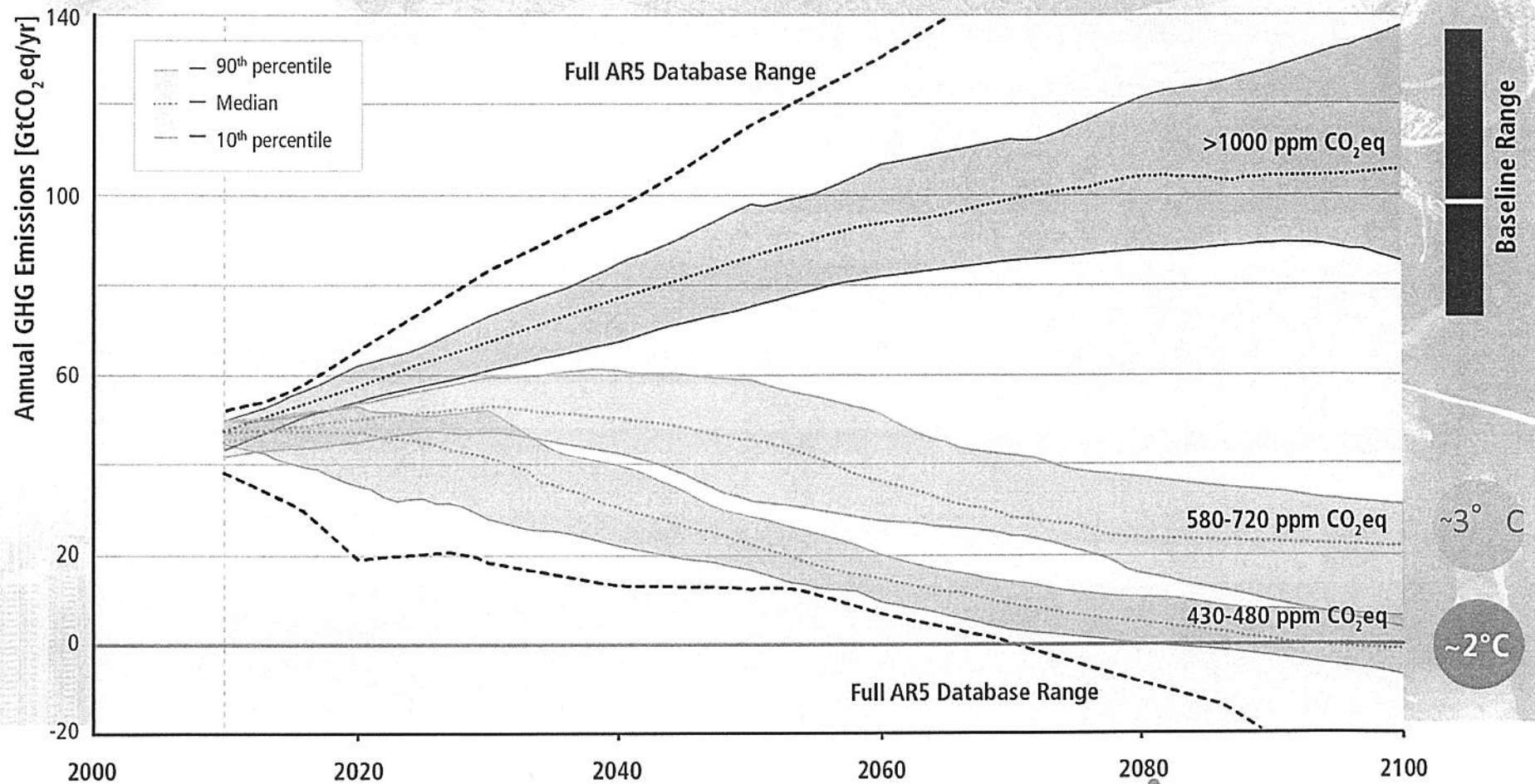
Increased poverty



Coastal flooding

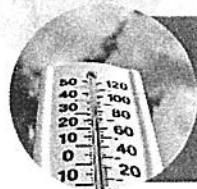
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Stabilization of atmospheric concentrations requires moving away from the business-as-usual – regardless of the mitigation goal.

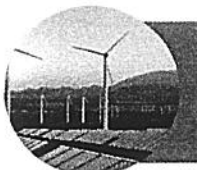


Based on Figure 6.7

Limiting Temperature Increase to 2°C



Measures exist to achieve the substantial emission reductions required to limit likely warming to 2° C (40-70% reduction in GHGs globally by 2050 and near zero or below emissions levels in 2100)



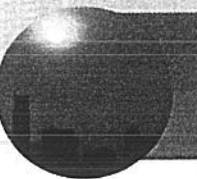
A combination of adaptation and substantial, sustained reductions in greenhouse gas emissions can limit climate change risks



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



Ambitious mitigation is affordable and translates into delayed and not foregone growth (economic growth reduced by ~ 0.06% / BAU growth 1.6-3%). Estimated costs do not account for the benefits of reduced climate change



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

Mitigation Measures



More efficient use of energy



Greater use of low-carbon and no-carbon energy

- Many of these technologies exist today
- Nearly a quadrupling of zero- and low-carbon energy supply from renewable energy by 2050



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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"...stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system..." ~ Article 2 of the UNFCCC

Effective decision making to limit climate change recognizes the importance of ethical dimensions, equity, value judgments, economic assessments, and diverse perceptions and responses to risk and uncertainty.

Very likely more intense and frequent extreme precipitation events in many regions.

A likely nearly ice-free Arctic Ocean in September before mid-century (RCP8.5).

Very likely that global sea-level rise will continue in the 21st century (0.26-0.55m in RCP2.6 / 0.45-0.82m in RCP8.5).

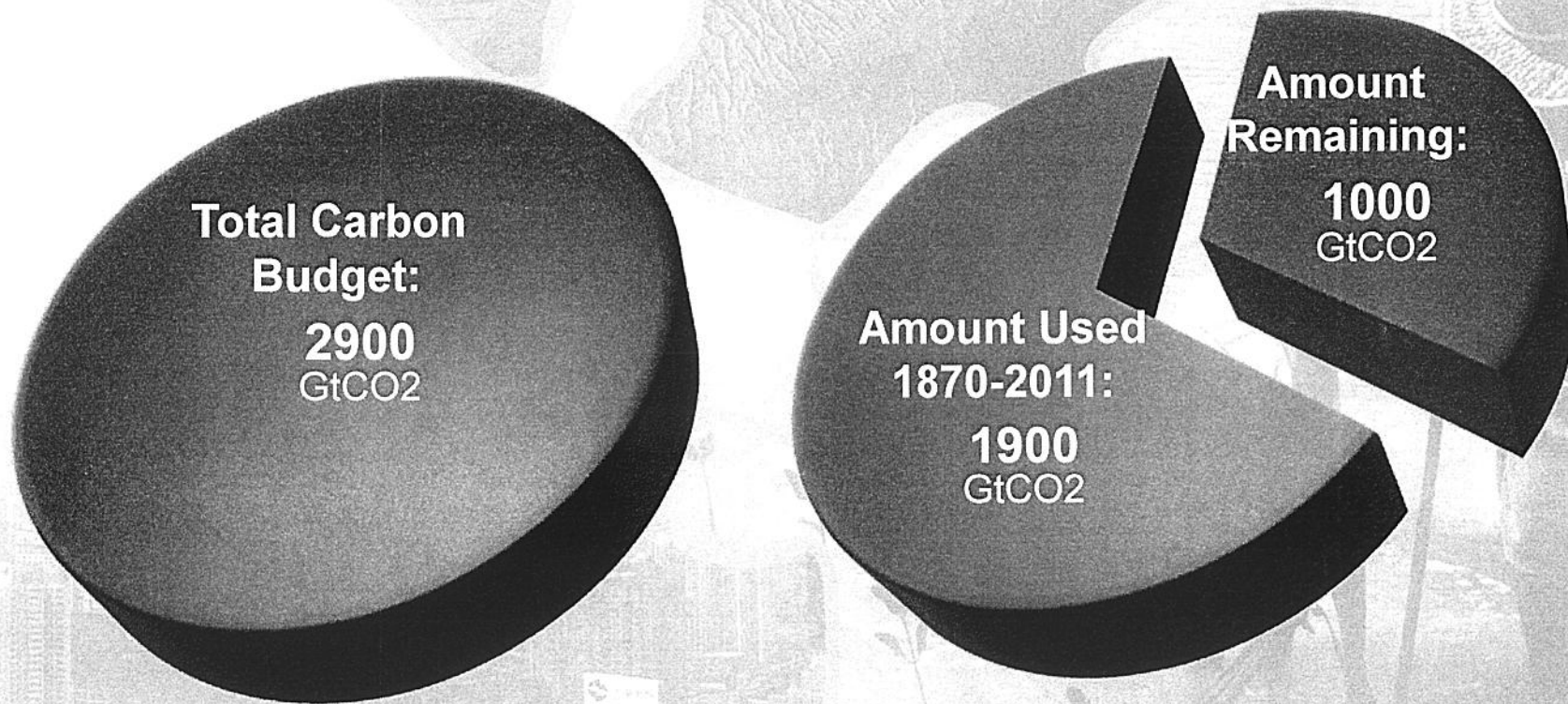
Projections of reductions of renewable surface- and groundwater resources in some regions.

Projections of increasing displacement of people, and risks of violent conflicts.

The risk associated with crossing certain thresholds increases with rising temperatures.

The window for action is rapidly closing

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



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Synthesis Report