

CLIMATE CHANGE 2014

Mitigation of Climate Change

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IPCC reports are the result of extensive work from scientists around the world.

1 Summary for Policymakers
1 Technical Summary

16 Chapters

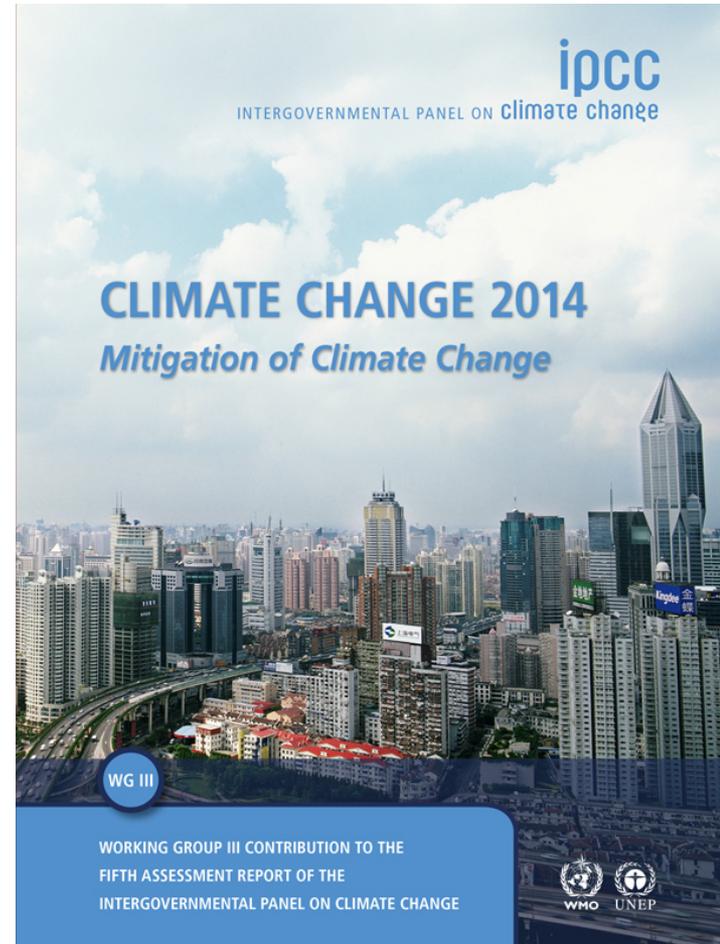
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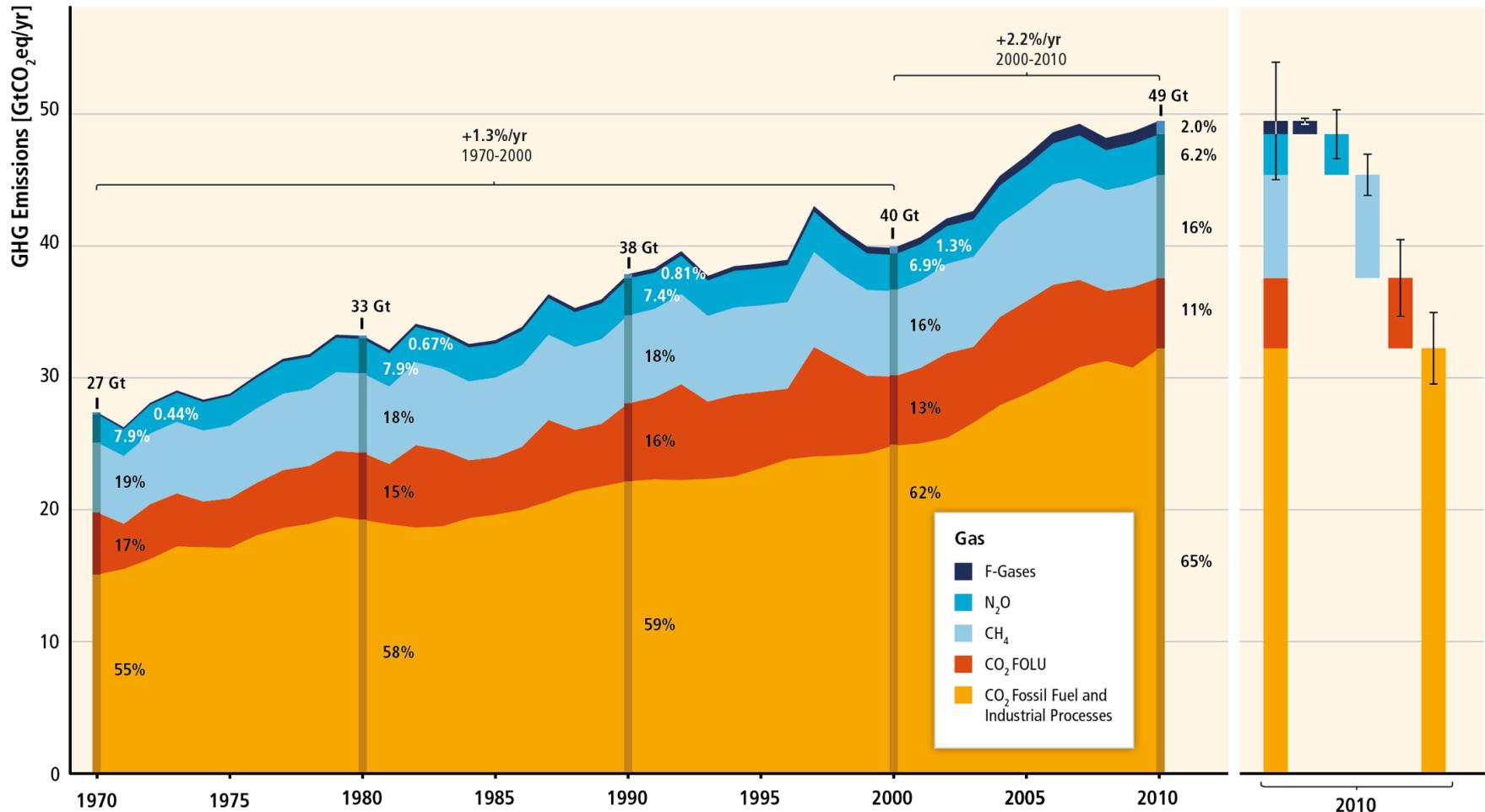
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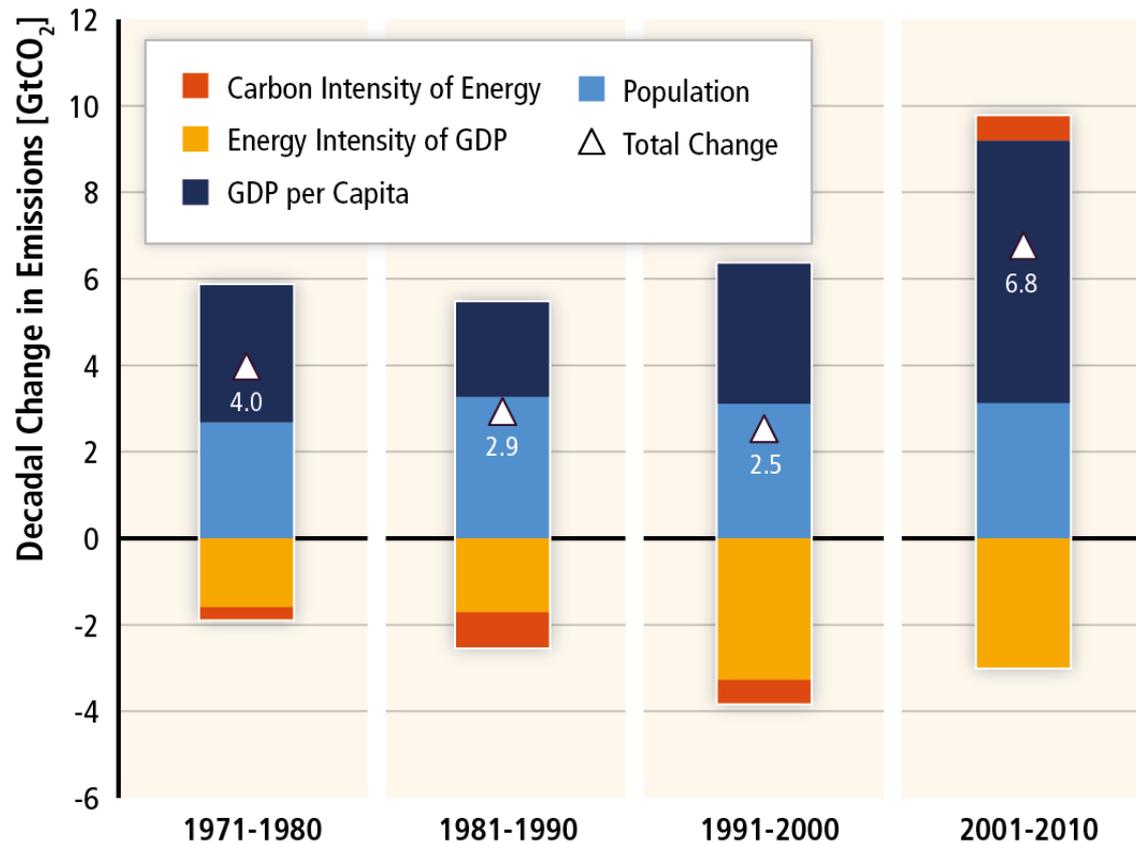
GHG emissions accelerate despite reduction efforts. Most emission growth is CO₂ from fossil fuel combustion and industrial processes.

Total Annual Anthropogenic GHG Emissions by Groups of Gases 1970-2010



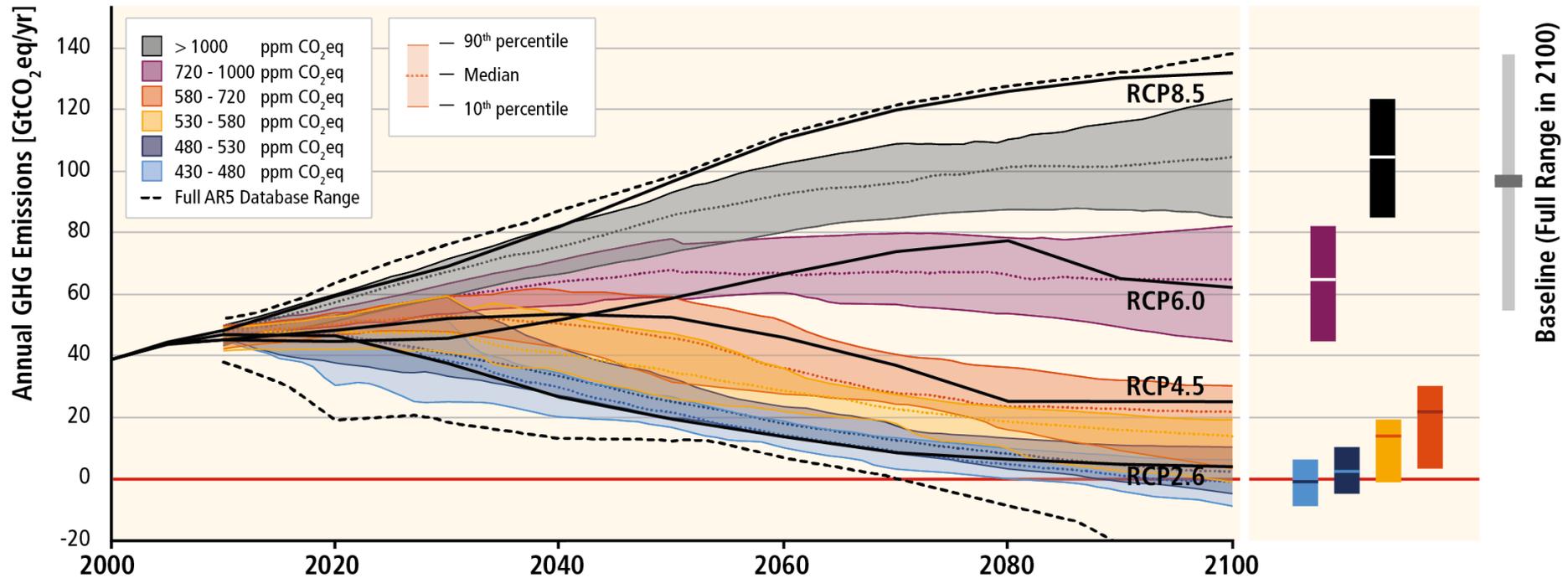
GHG emissions rise with growth in GDP and population; long-standing trend of decarbonisation of energy reversed.

Decomposition of the Change in Total Global CO₂ Emissions from Fossil Fuel Combustion

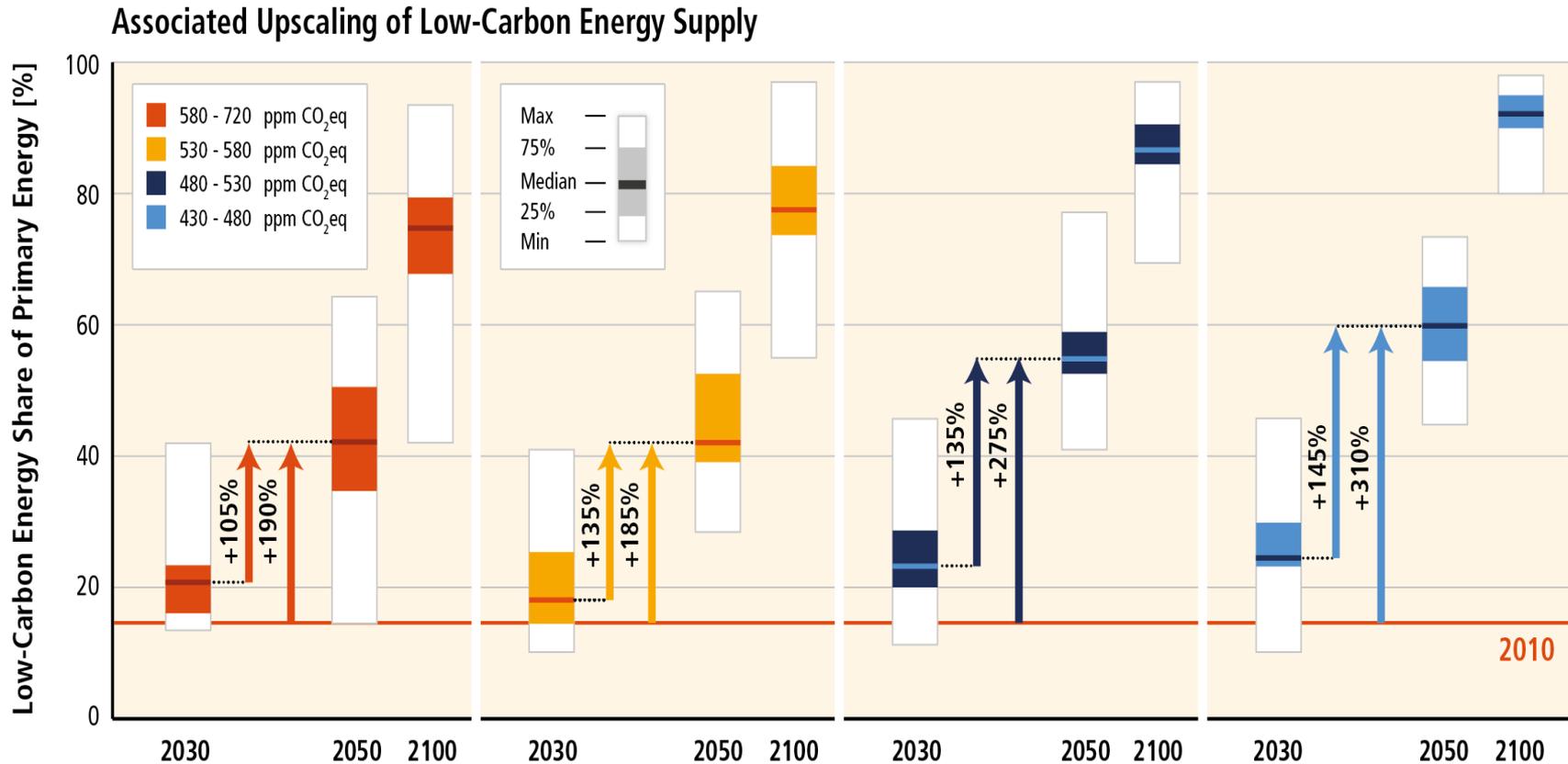


Without more mitigation, global mean surface temperature might increase by 3.7° to 4.8°C over the 21st century.

GHG Emission Pathways 2000-2100: All AR5 Scenarios

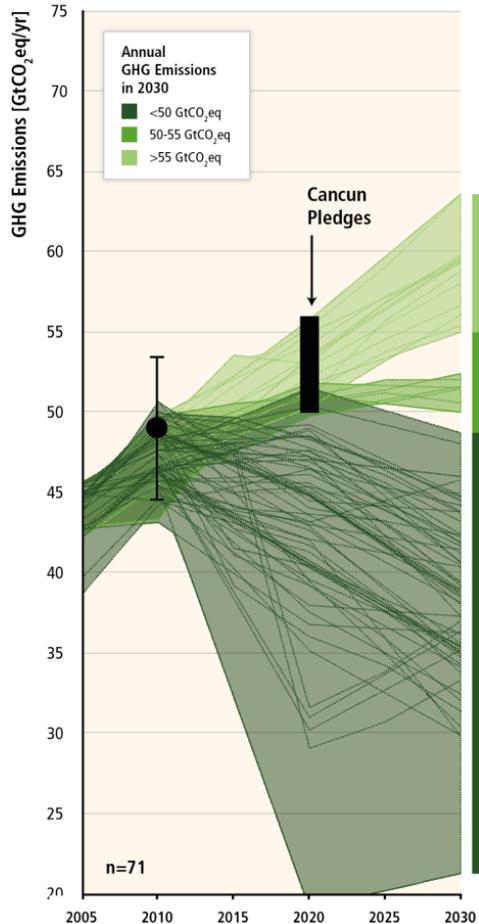


Mitigation requires major technological and institutional changes including the upscaling of low- and zero carbon energy

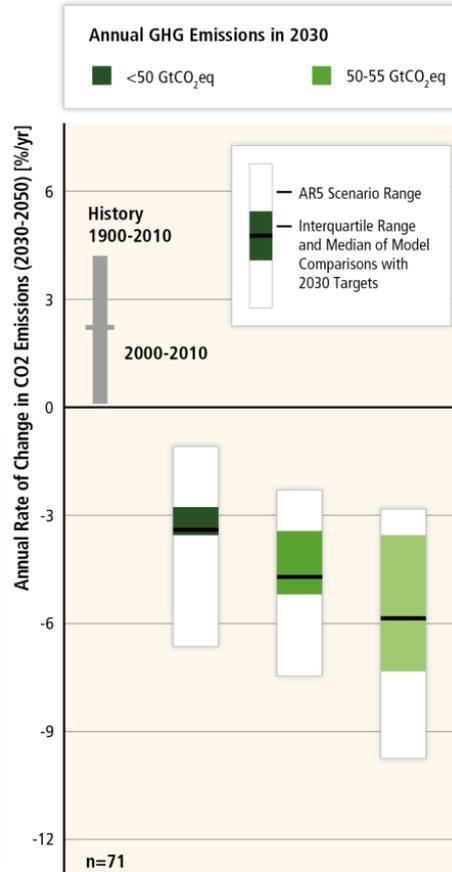


Delaying mitigation is estimated to increase the difficulty and narrow the options for limiting warming to 2°C.

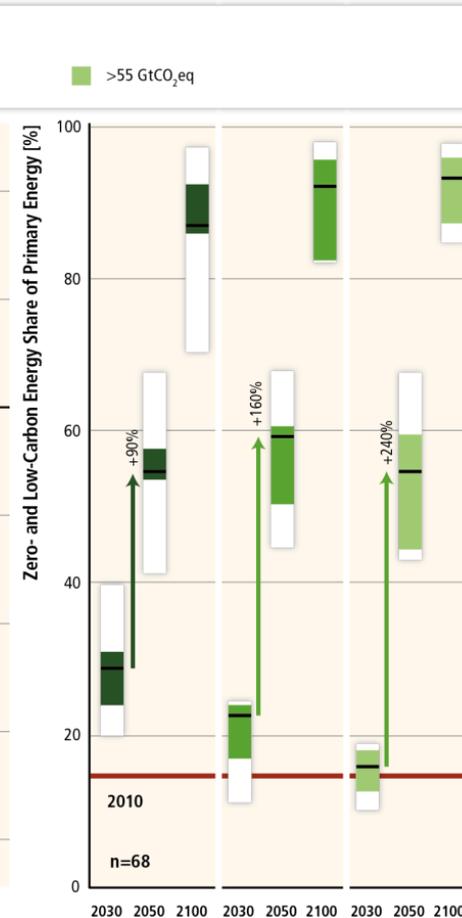
GHG Emissions Pathways to 2030



Implications of Different 2030 GHG Emissions Levels for the Rate of Annual Average CO₂ Emissions Reductions from 2030 to 2050

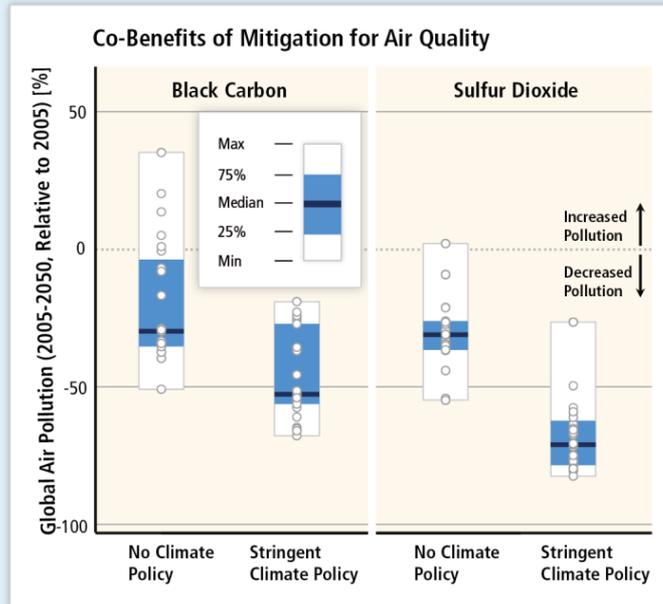
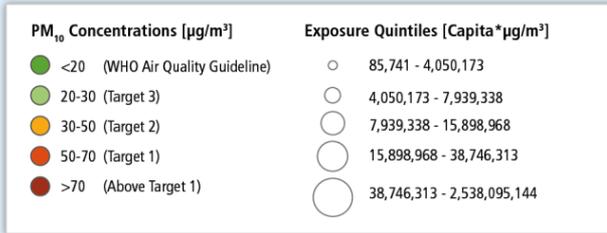
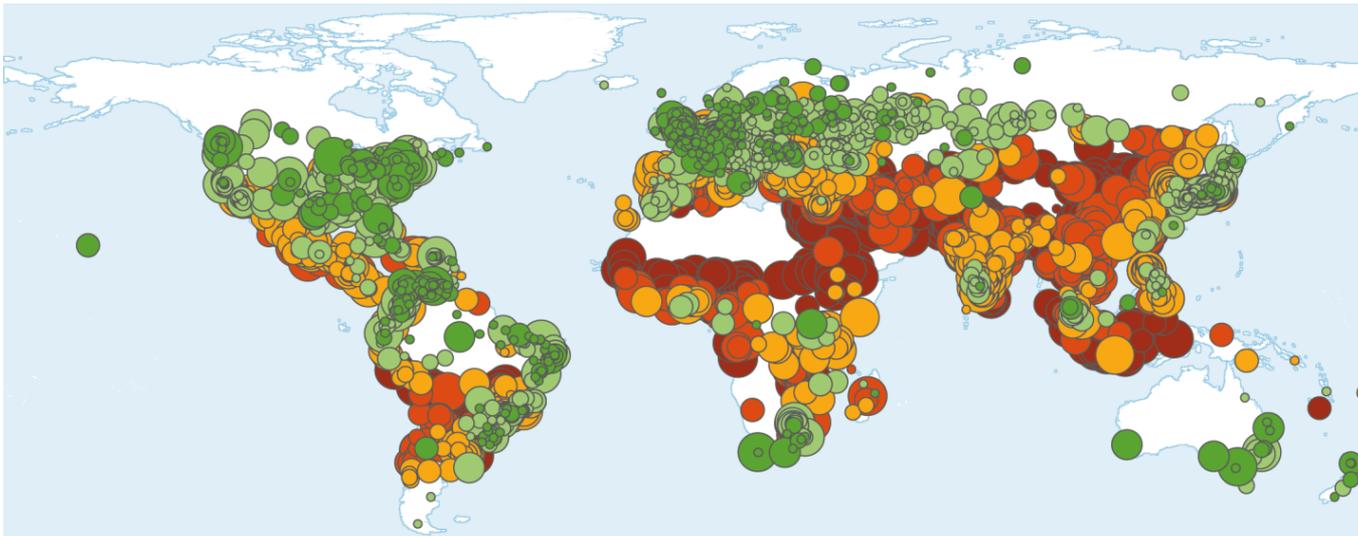


Implications of Different 2030 GHG Emissions Levels for Low-Carbon Energy Upscaling



Estimates for mitigation costs vary widely.

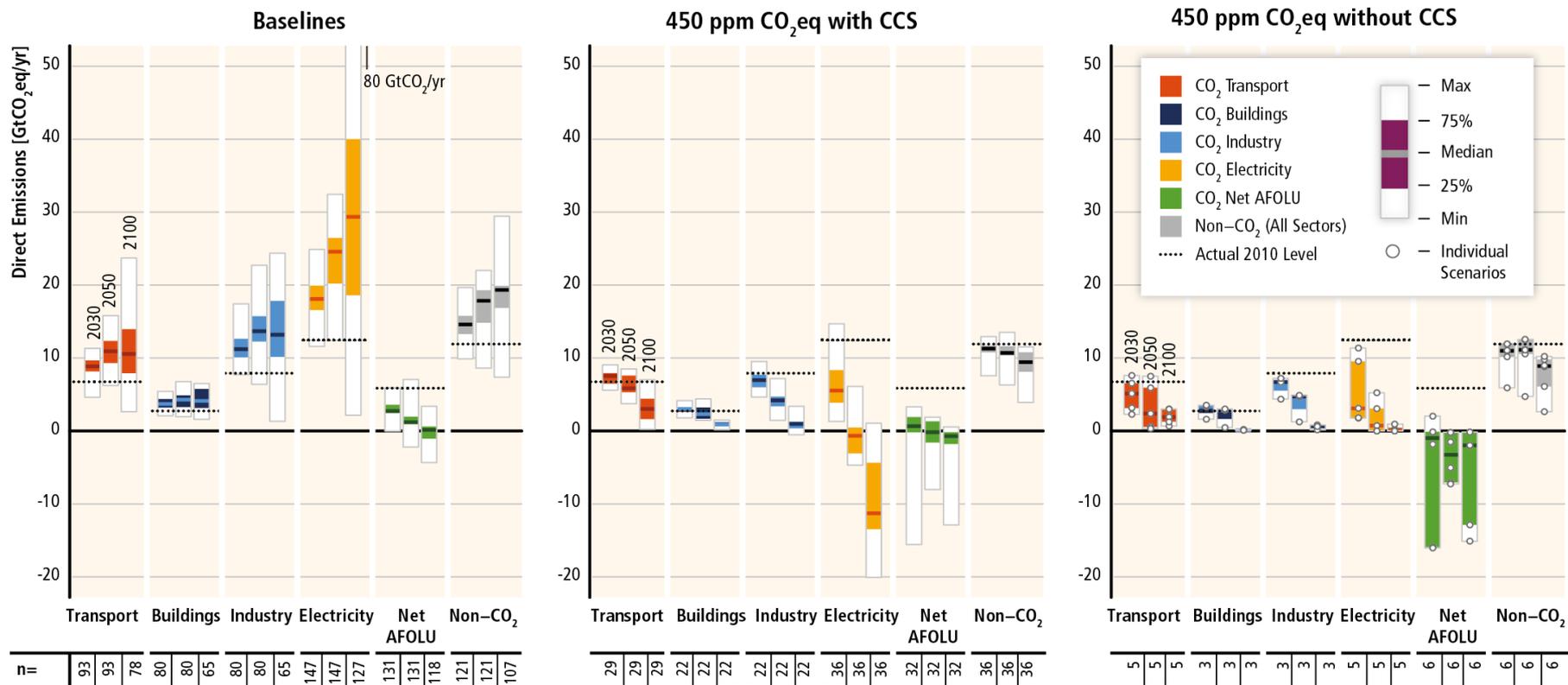
- Reaching 450ppm CO₂eq entails consumption losses of 1.7% (1%-4%) by 2030, 3.4% (2% to 6%) by 2050 and 4.8% (3%-11%) by 2100 relative to baseline (which grows between 300% to 900% over the course of the century).
- This is equivalent to a reduction in consumption growth over the 21st century by about 0.06 (0.04-0.14) percentage points a year (relative to annualized consumption growth that is between 1.6% and 3% per year).
- Cost estimates exclude benefits of mitigation (reduced impacts from climate change). They also exclude other benefits (e.g. improvements for local air quality).
- Cost estimates are based on a series of assumptions.



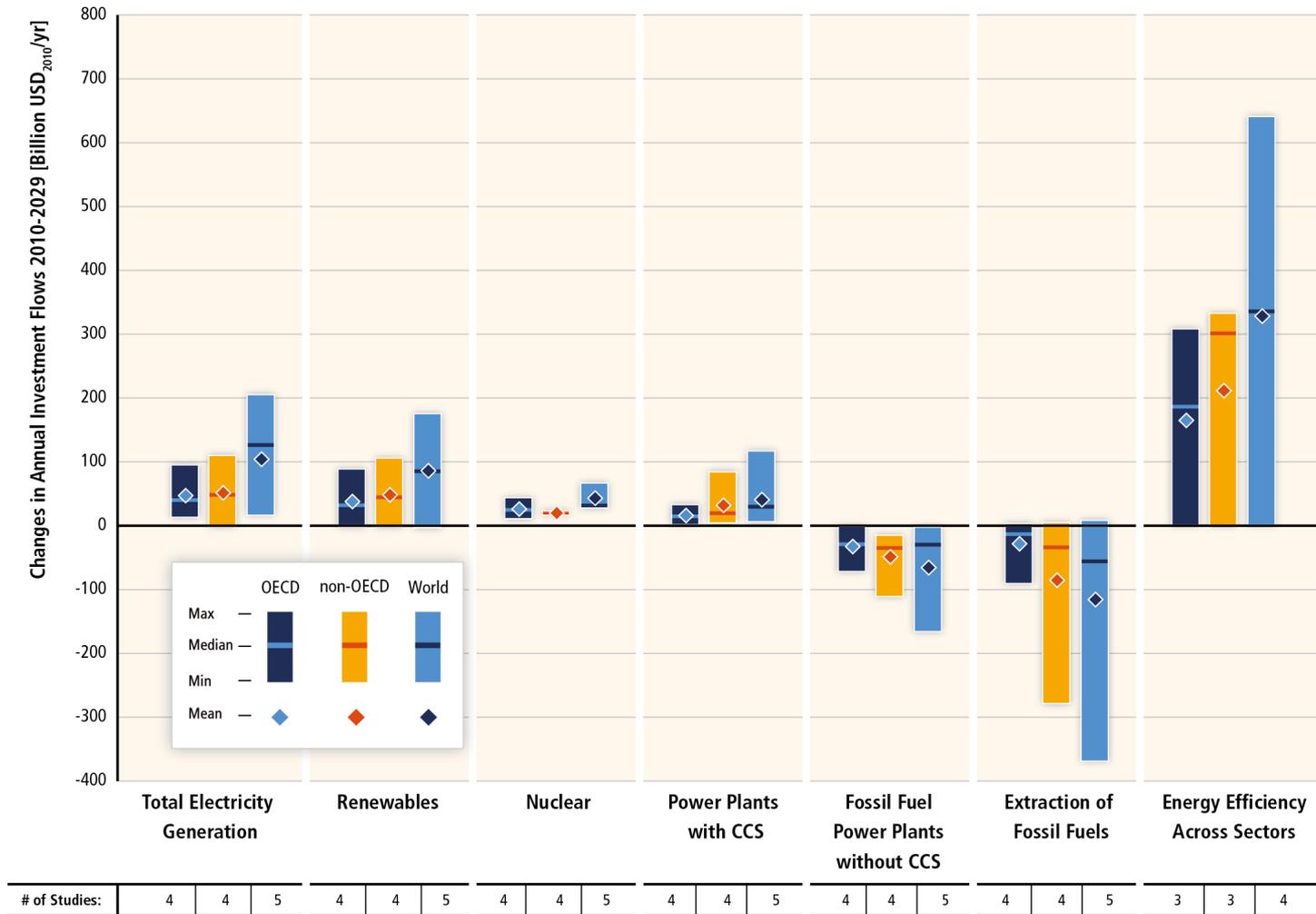
Mitigation can result in large co-benefits for human health and other societal goals.

Mitigation requires changes throughout the economy. Efforts in one sector determine mitigation efforts in others.

Direct Sectoral CO₂ and Non-CO₂ GHG Emissions in Baseline and Mitigation Scenarios with and without CCS



Substantial reductions in emissions would require large changes in investment patterns.



Since AR4, there has been an increased focus on policies designed to integrate multiple objectives, increase co-benefits and reduce adverse side-effects.

- Sector-specific policies have been more widely used than economy-wide policies.
- Regulatory approaches and information measures are widely used, and are often environmentally effective.
- Since AR4, cap and trade systems for GHGs have been established in a number of countries and regions.
- In some countries, tax-based policies specifically aimed at reducing GHG emissions—alongside technology and other policies—have helped to weaken the link between GHG emissions and GDP
- The reduction of subsidies for GHG-related activities in various sectors can achieve emission reductions, depending on the social and economic context.

Effective mitigation will not be achieved if individual agents advance their own interests independently.

- Existing and proposed international climate change cooperation arrangements vary in their focus and degree of centralization and coordination.
- Issues of equity, justice, and fairness arise with respect to mitigation and adaptation.
- Climate policy may be informed by a consideration of a diverse array of risks and uncertainties, some of which are difficult to measure, notably events that are of low probability but which would have a significant impact if they occur.

An aerial photograph of a dense urban area, likely Shanghai, featuring a complex multi-level highway interchange with many cars. The city is filled with various buildings, including several prominent skyscrapers. The sky is filled with white and grey clouds.

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www.mitigation2014.org