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INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2014

Mitigation of Climate Change

Overarching presentation on findings and new approaches of AR5 WGIII relevant for the review

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Addis Ababa, Ethiopia
18 August 2014

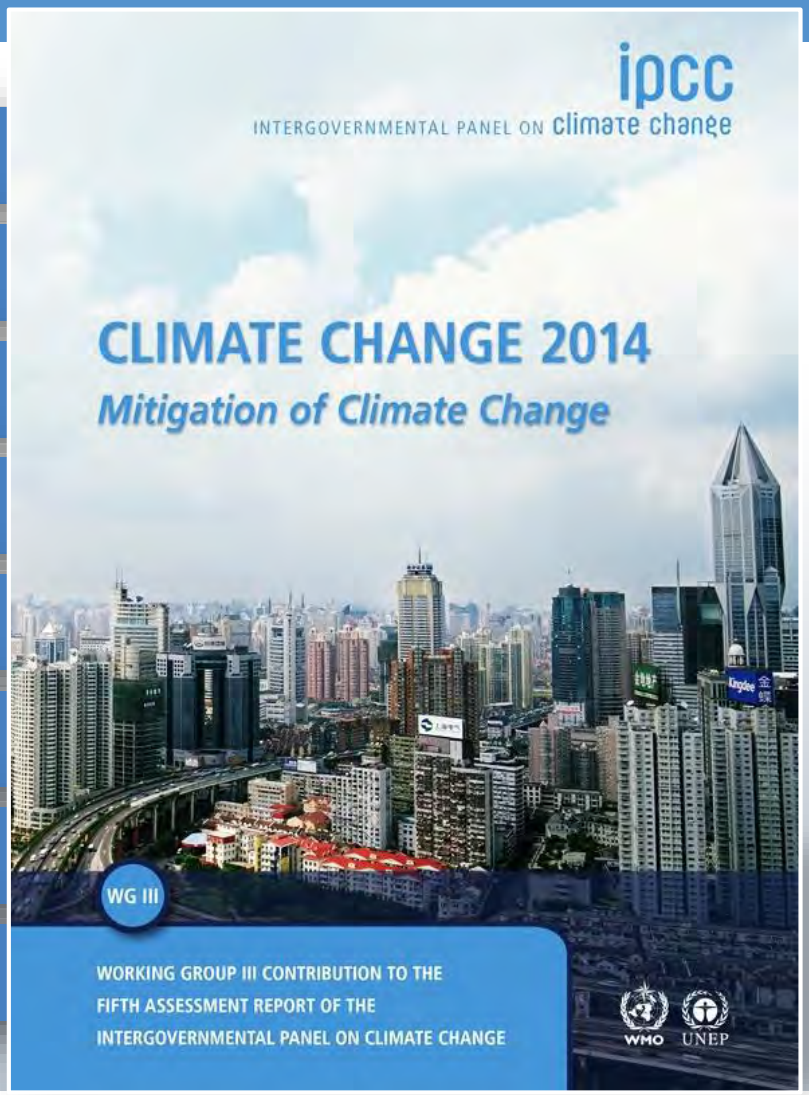
Working Group III contribution to the
IPCC Fifth Assessment Report

WMO UNEP

Exploring the solution space

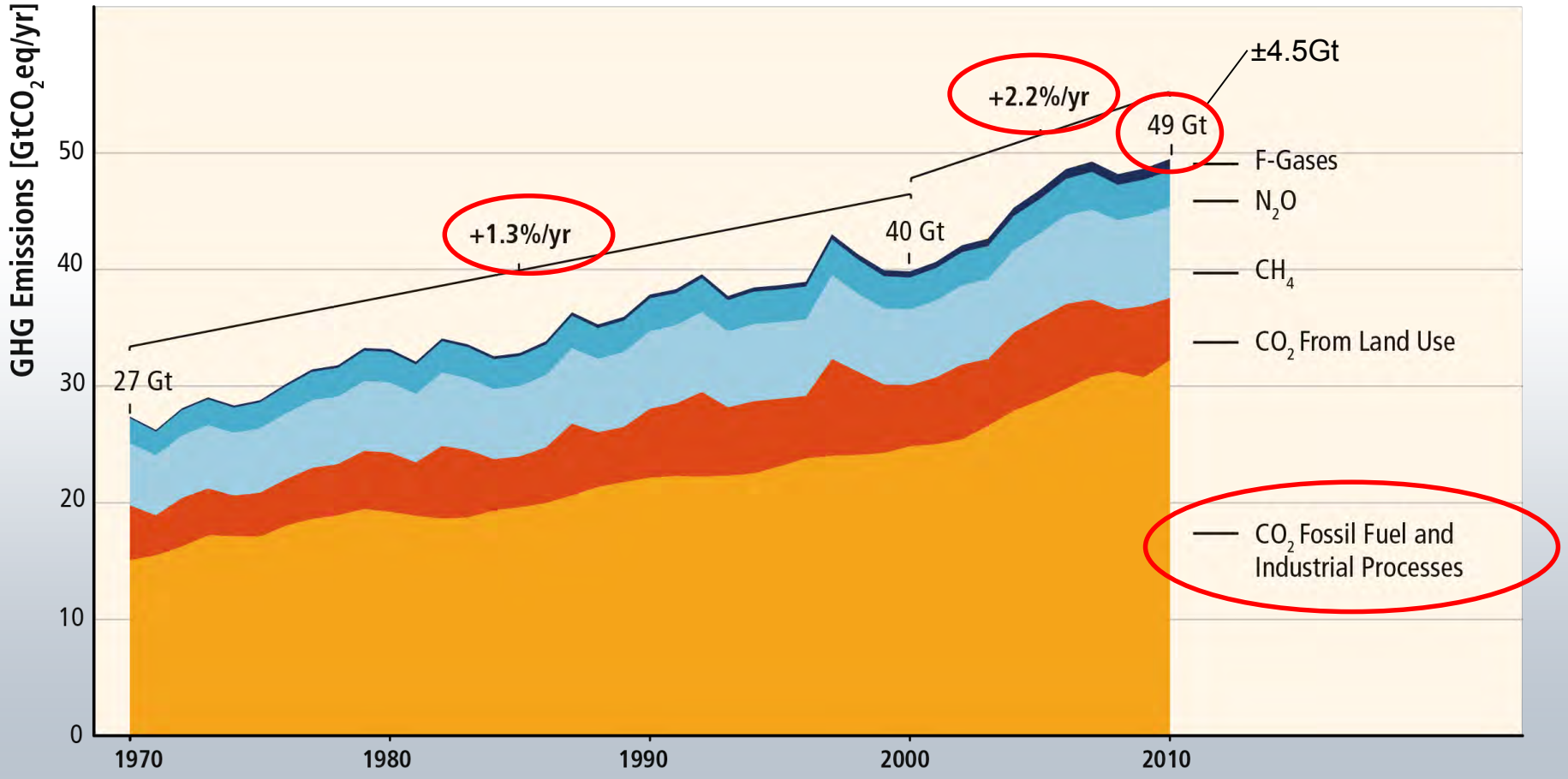
IPCC reports are the result of extensive work of many scientists from around the world.

- 1 Summary for Policymakers
- 1 Technical Summary
- 16 Chapters
- 235 Authors
- 900 Reviewers
- More than 2000 pages
- Close to 10,000 references
- More than 38,000 comments

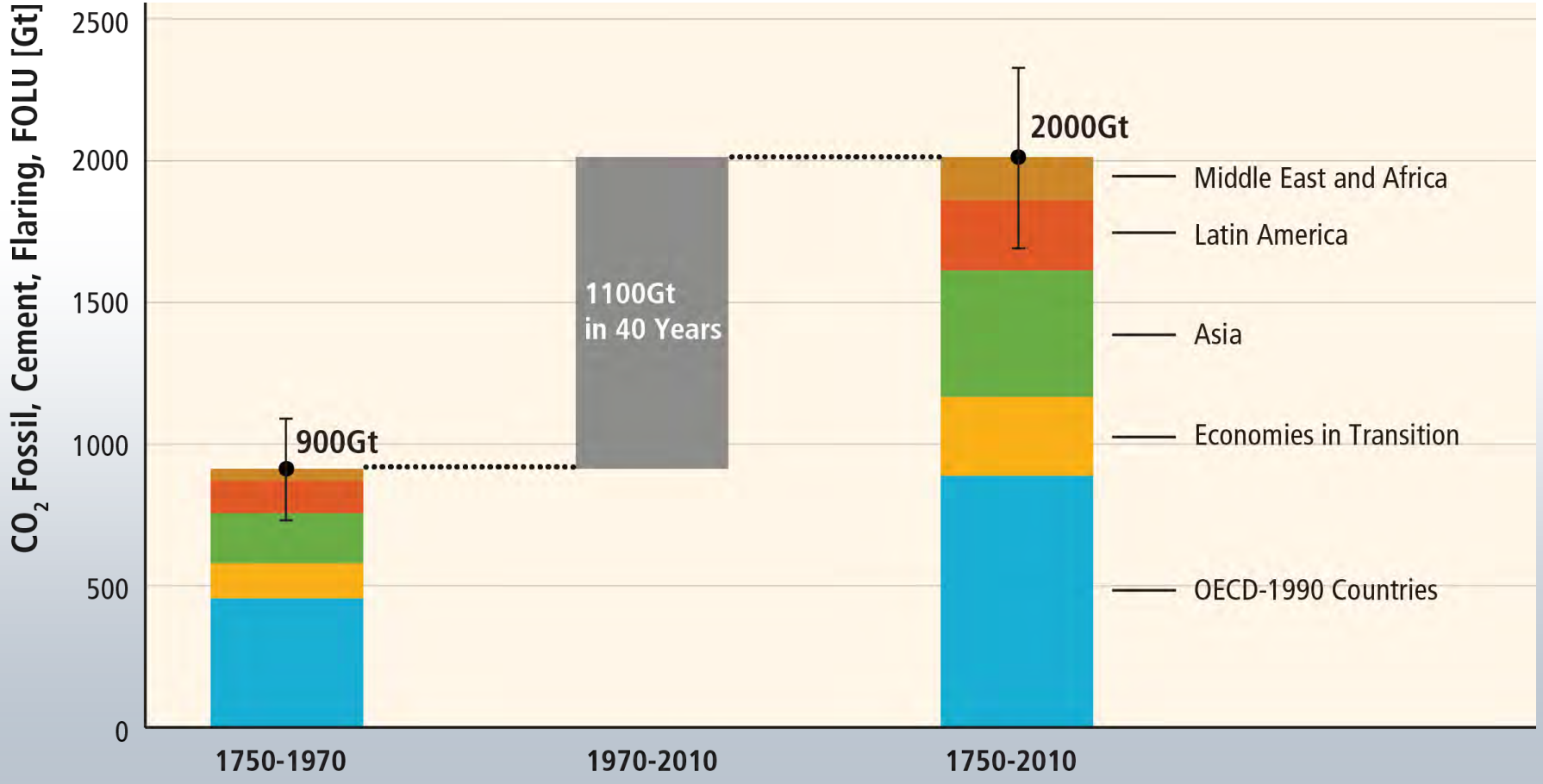


GHG emissions growth has accelerated despite reduction efforts.

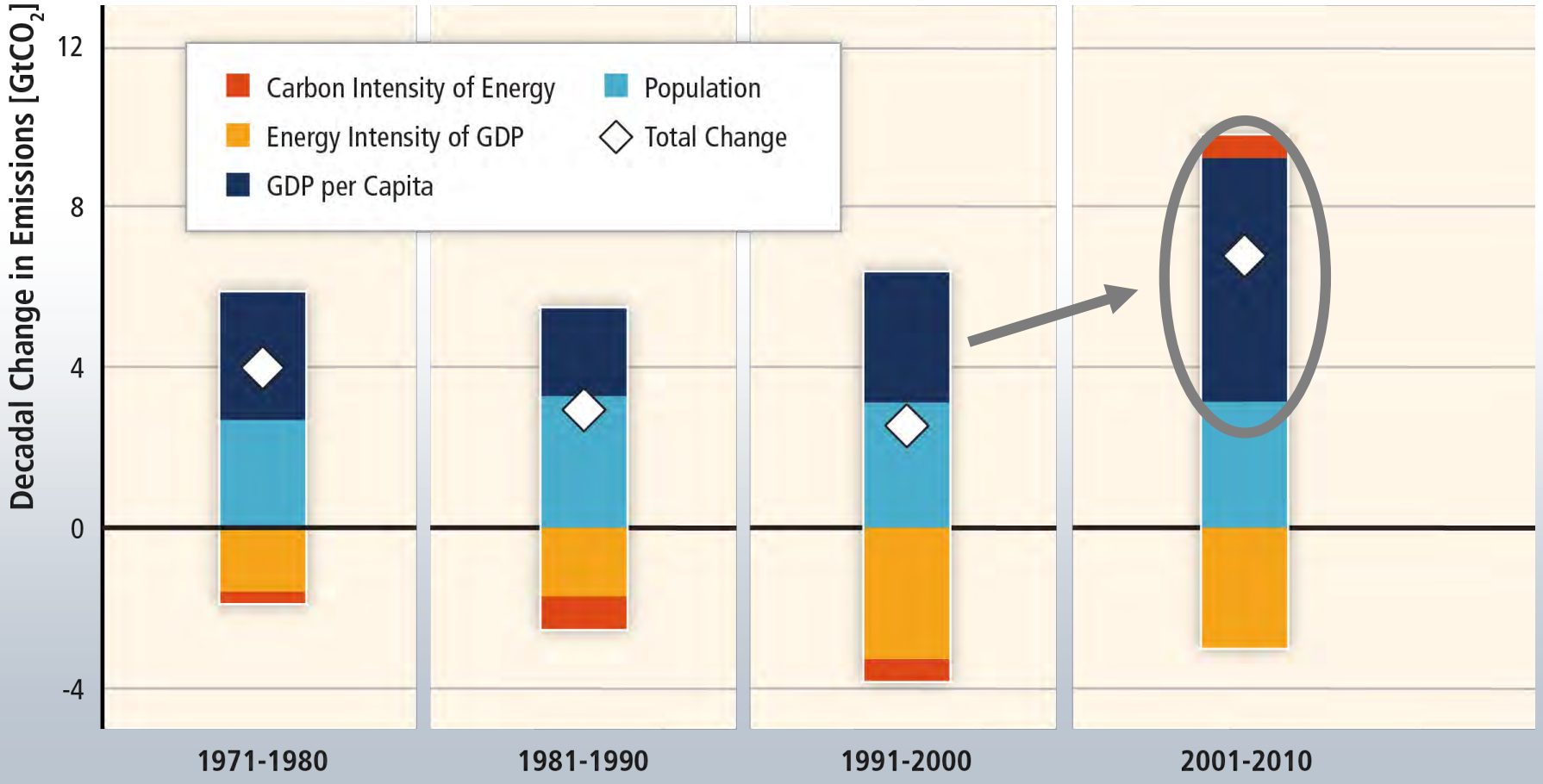
GHG emissions growth between 2000 and 2010 has been larger than in the previous three decades.



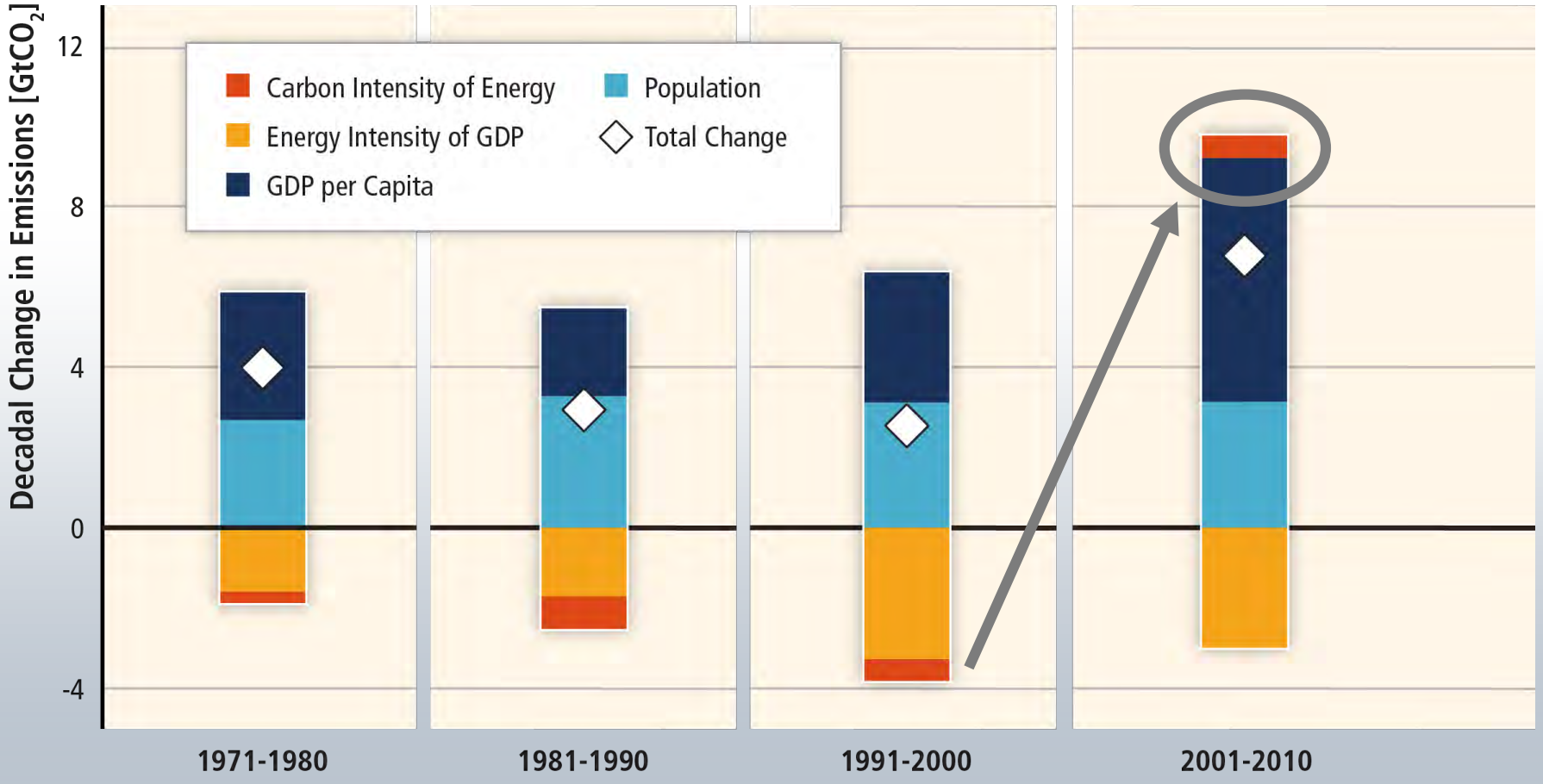
About half of cumulative anthropogenic CO_2 emissions between 1750 and 2010 have occurred in the last 40 years.



Most of the recent GHG emission growth has been driven by growth in economic activitiy.

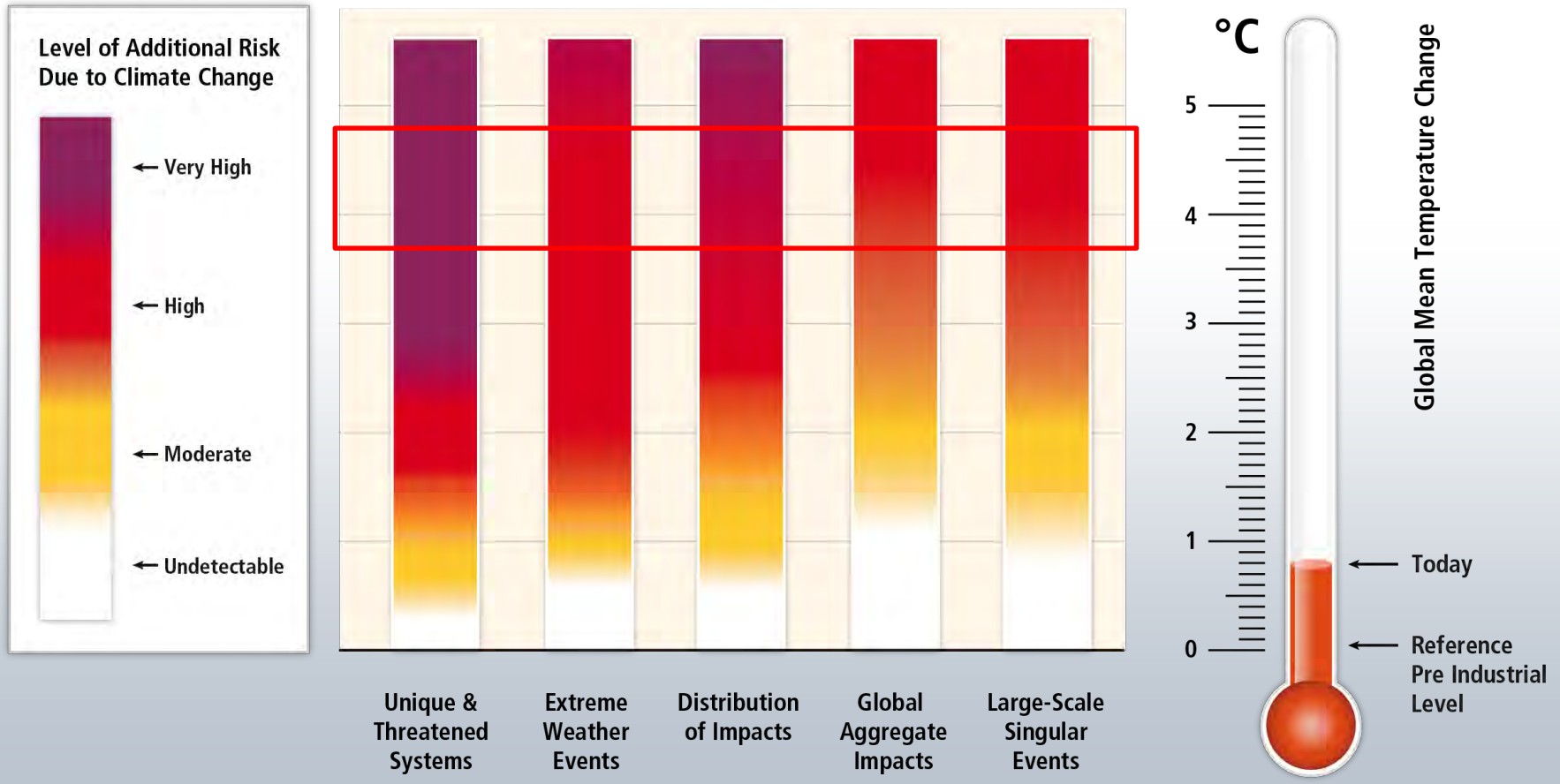


The long-standing trend of gradual decarbonisation of energy has reversed recently.

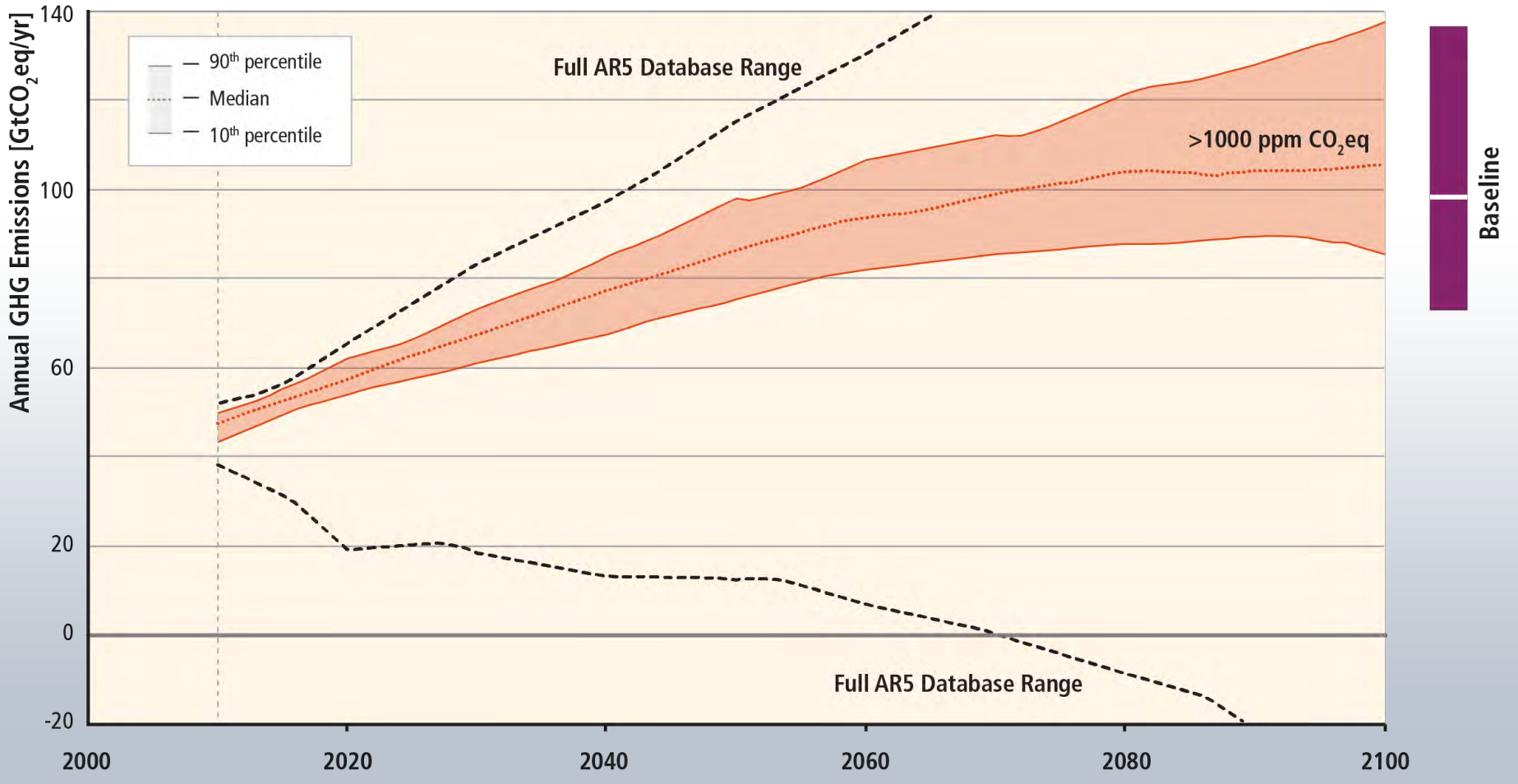



Limit warming to 2°C relative to pre-industrial levels involves substantial technological, economic and institutional challenges.

Without additional mitigation, global mean surface temperature is projected to increase by 3.7 to 4.8°C (2.5 - 7.8 °C) over the 21st century.



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



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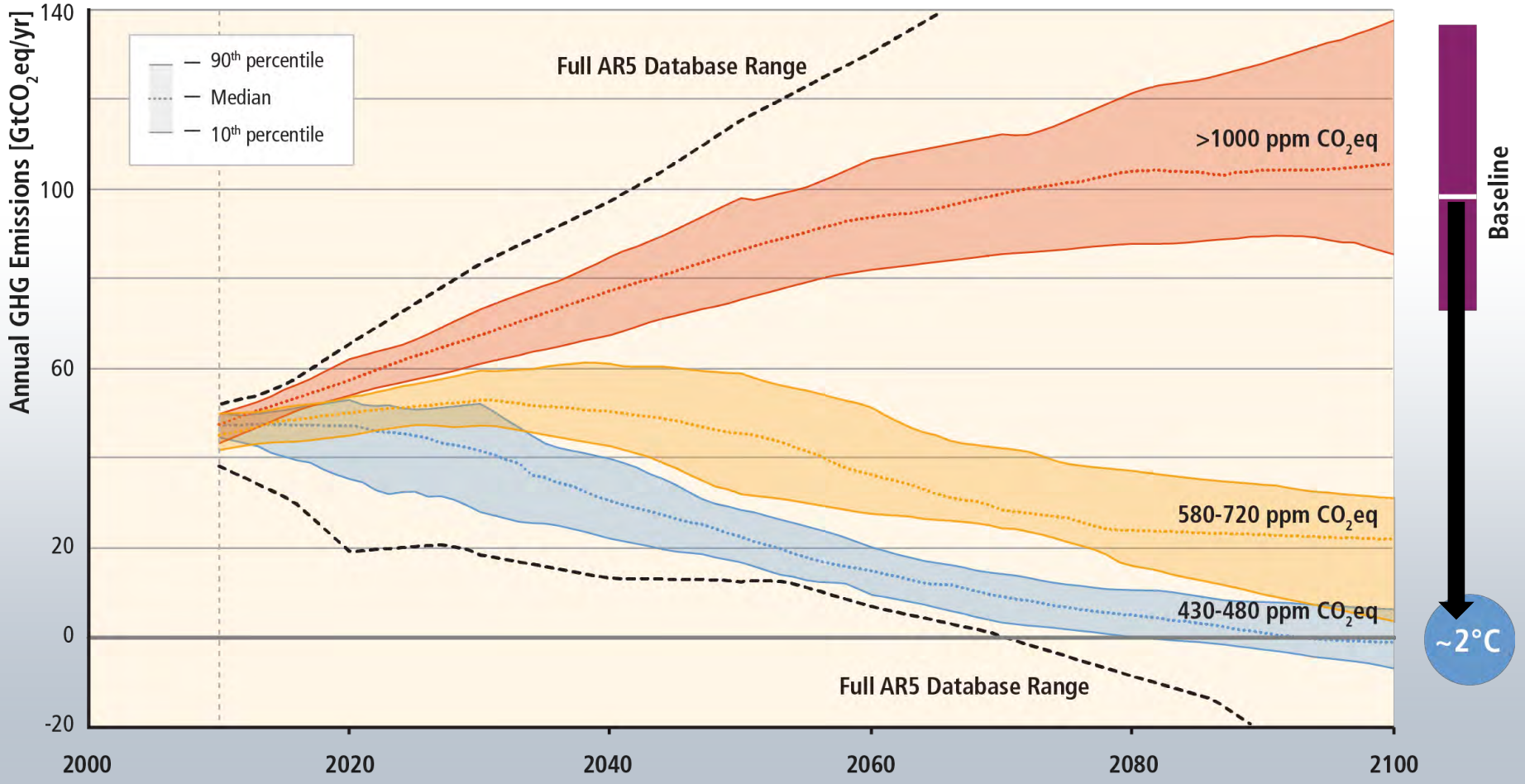

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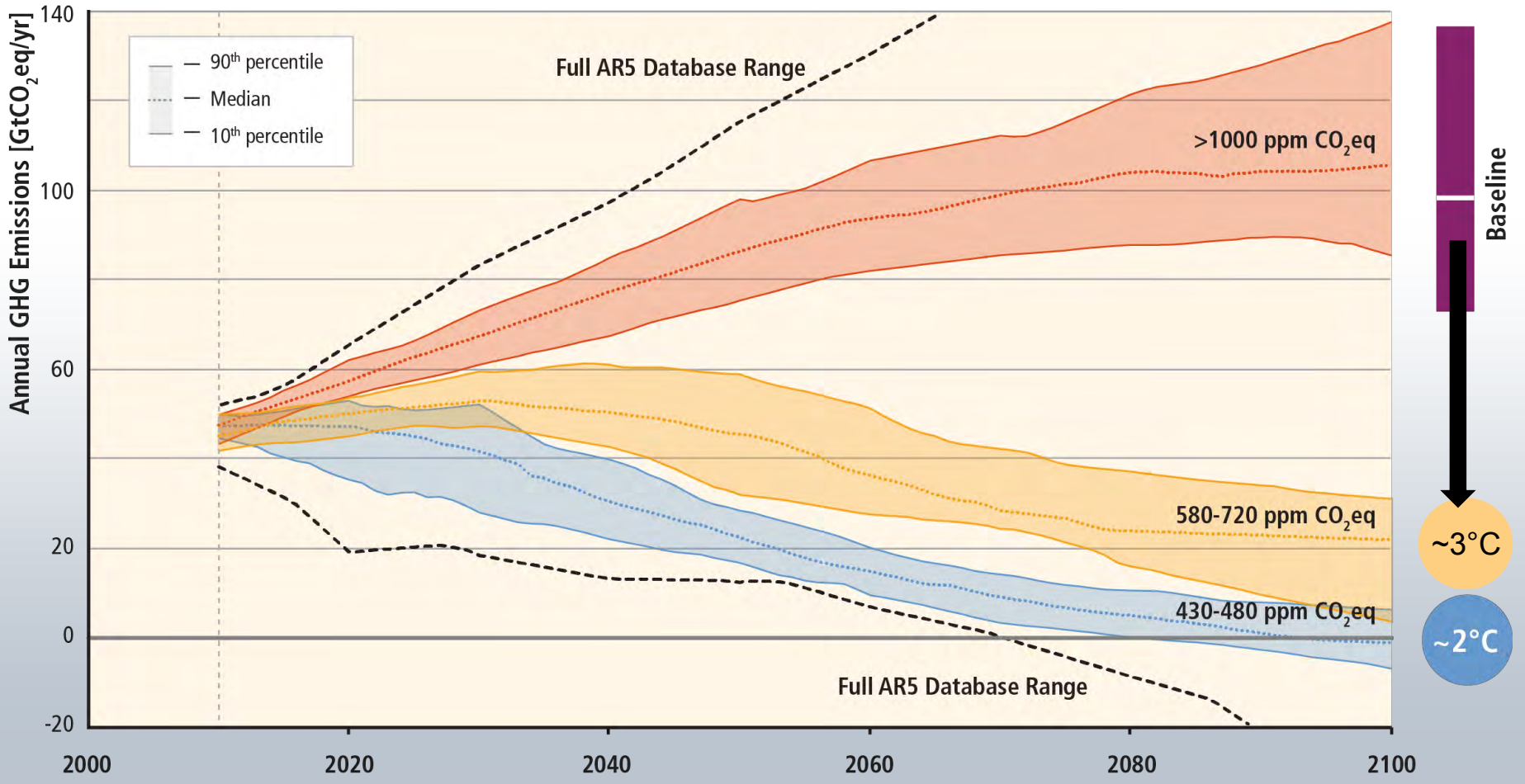
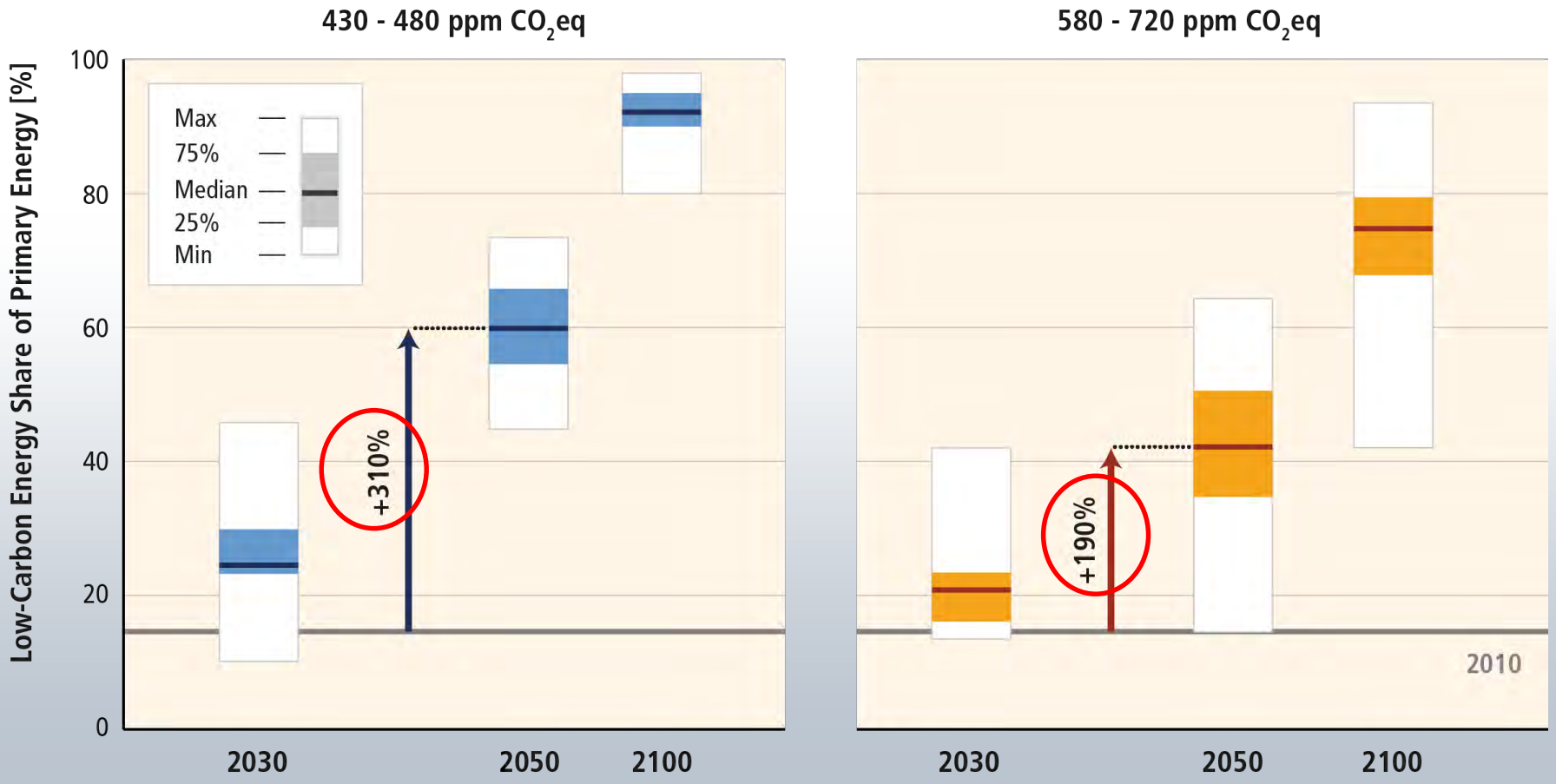
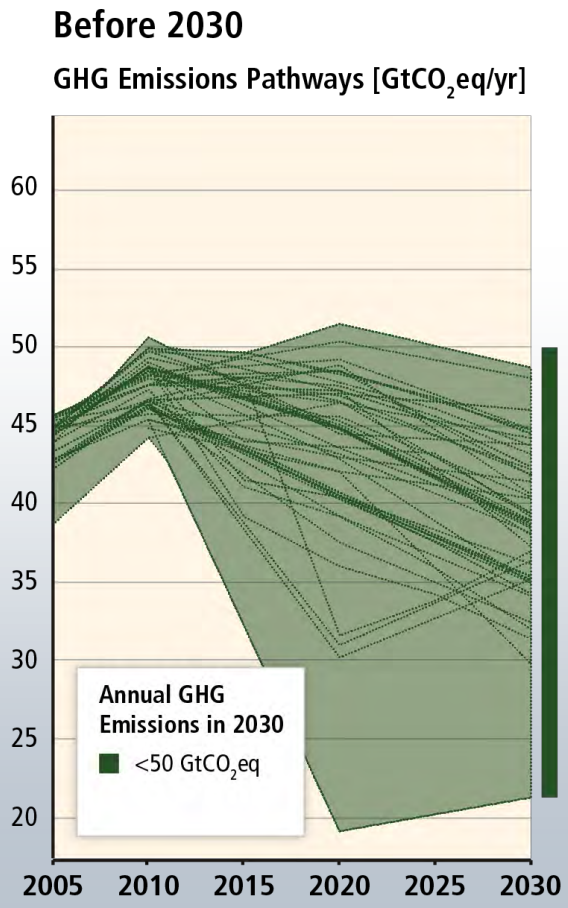


Mitigation involves substantial upscaling of low carbon energy.



Delaying mitigation increases the difficulty and narrows the options for limiting warming to 2°C.

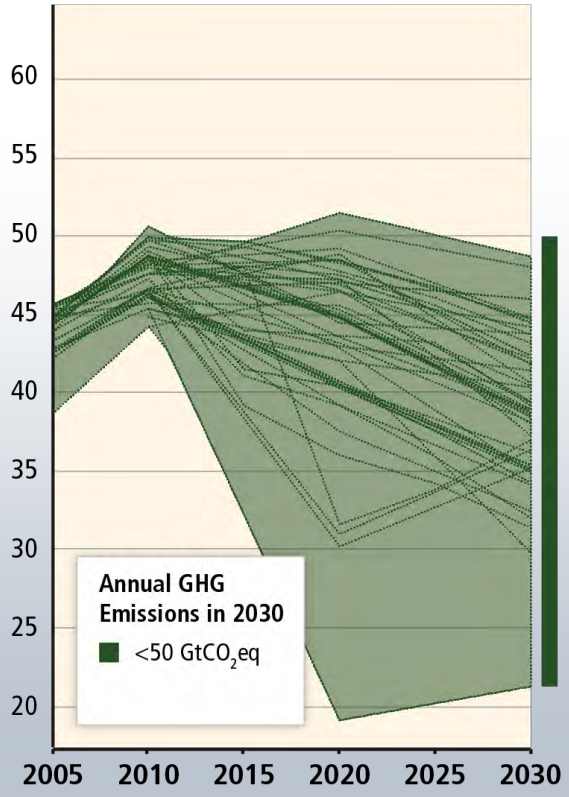


„immediate action“

Delaying mitigation increases the difficulty and narrows the options for limiting warming to 2°C.

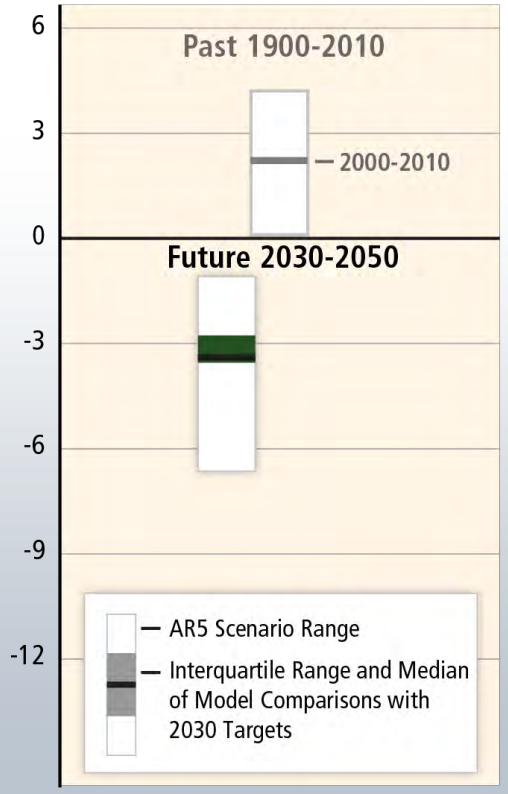
Before 2030

GHG Emissions Pathways [$GtCO_2eq/yr$]



After 2030

Rate of CO_2 Emission Change [%/yr]



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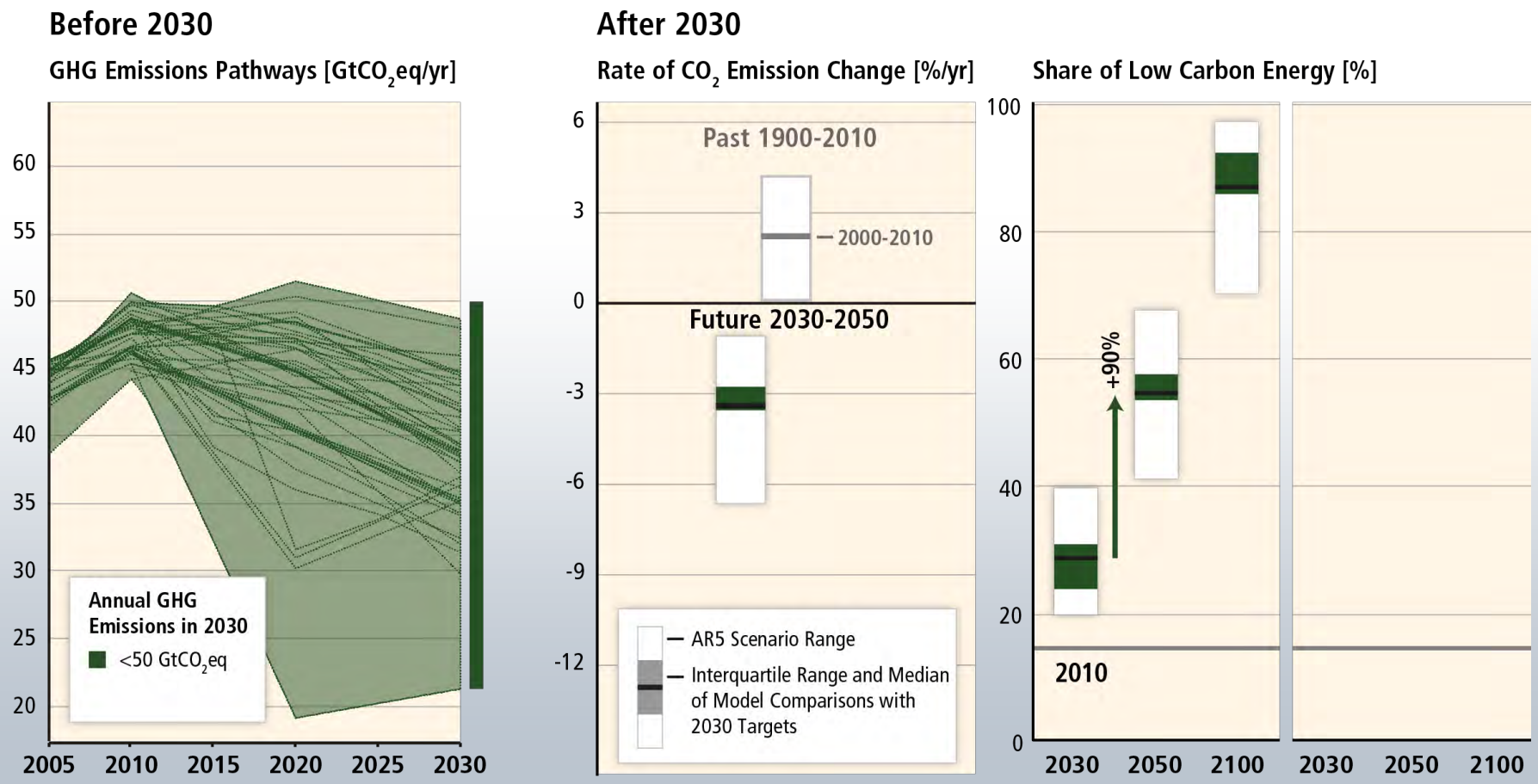
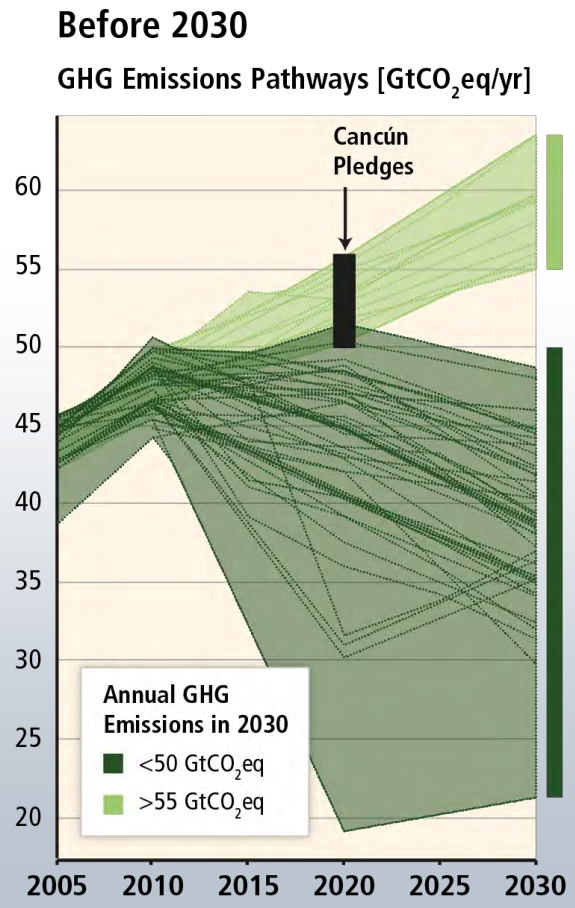


Delaying mitigation is estimated to increase the difficulty and narrow the options for limiting warming to 2°C.



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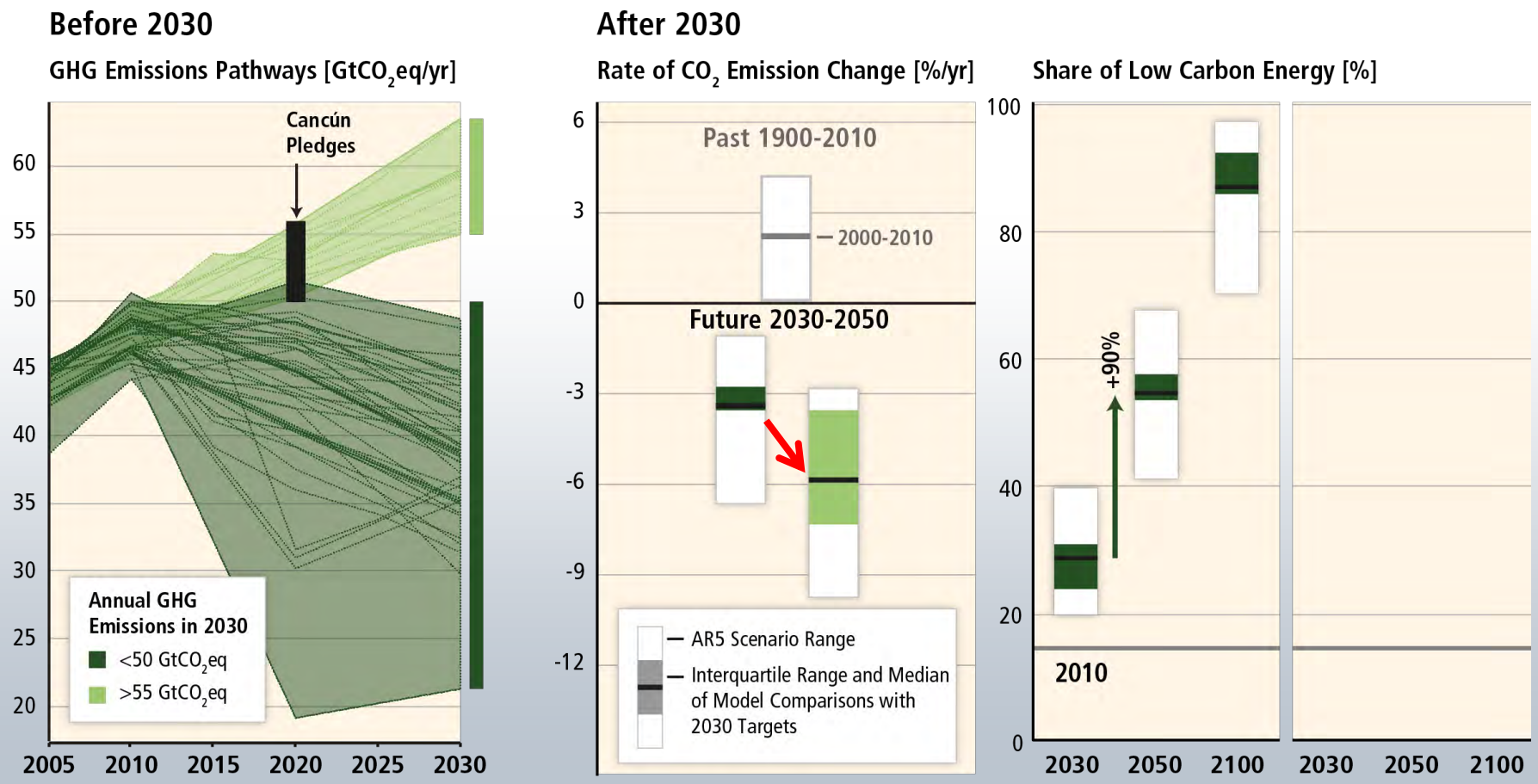

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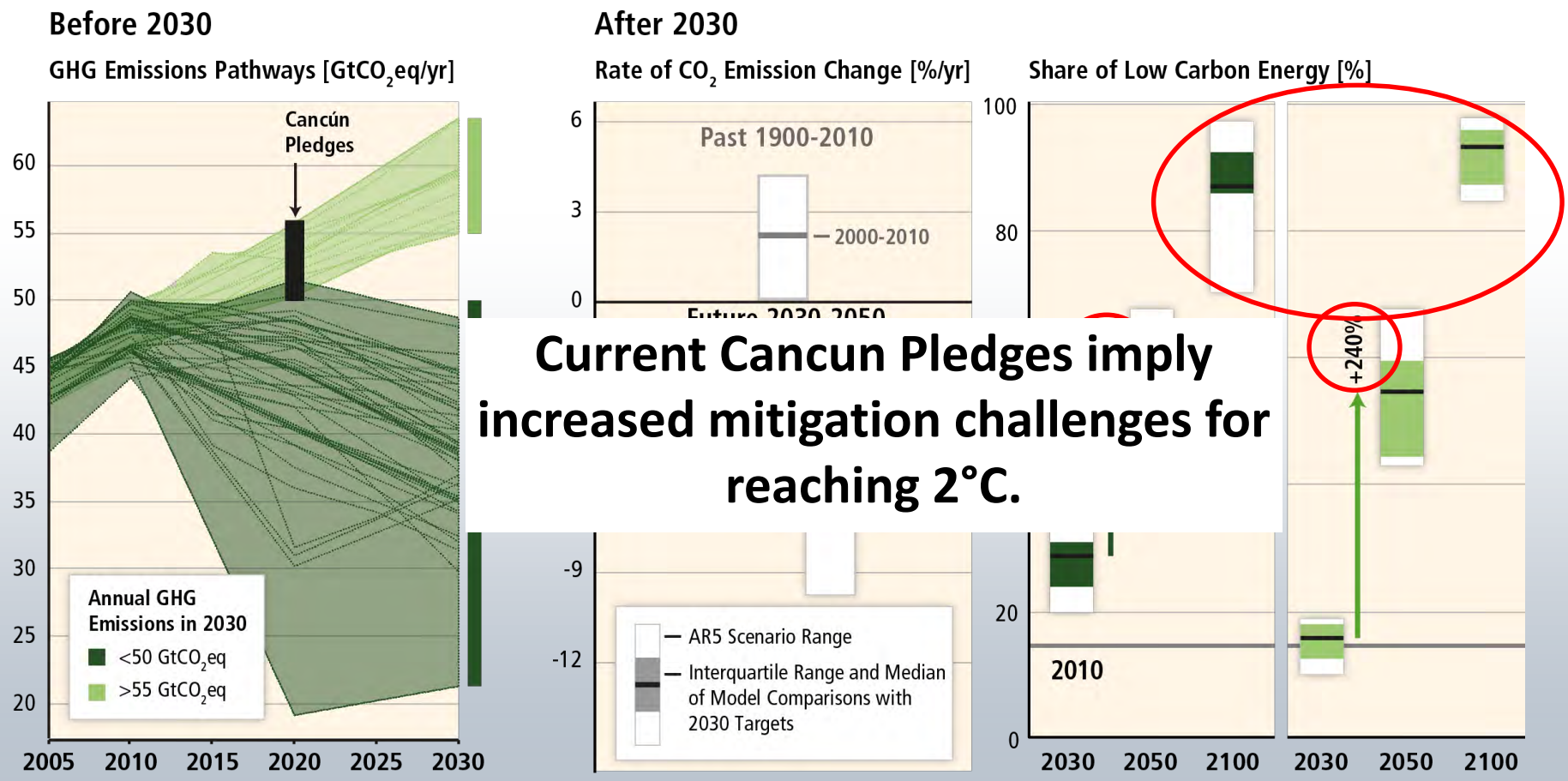
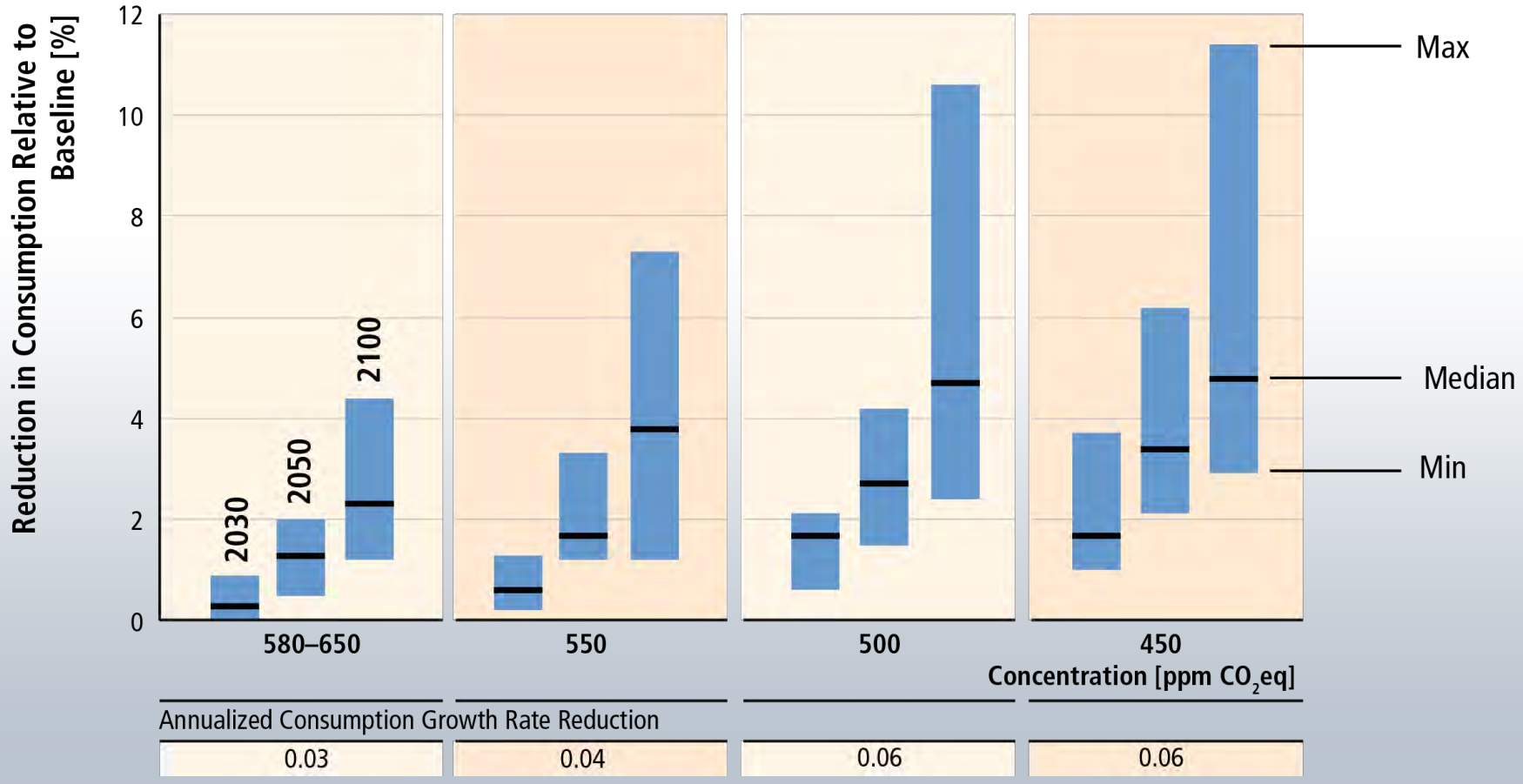


Current Cancun Pledges imply increased mitigation challenges for reaching 2°C.

Mitigation cost estimates vary, but do not strongly affect global GDP growth.

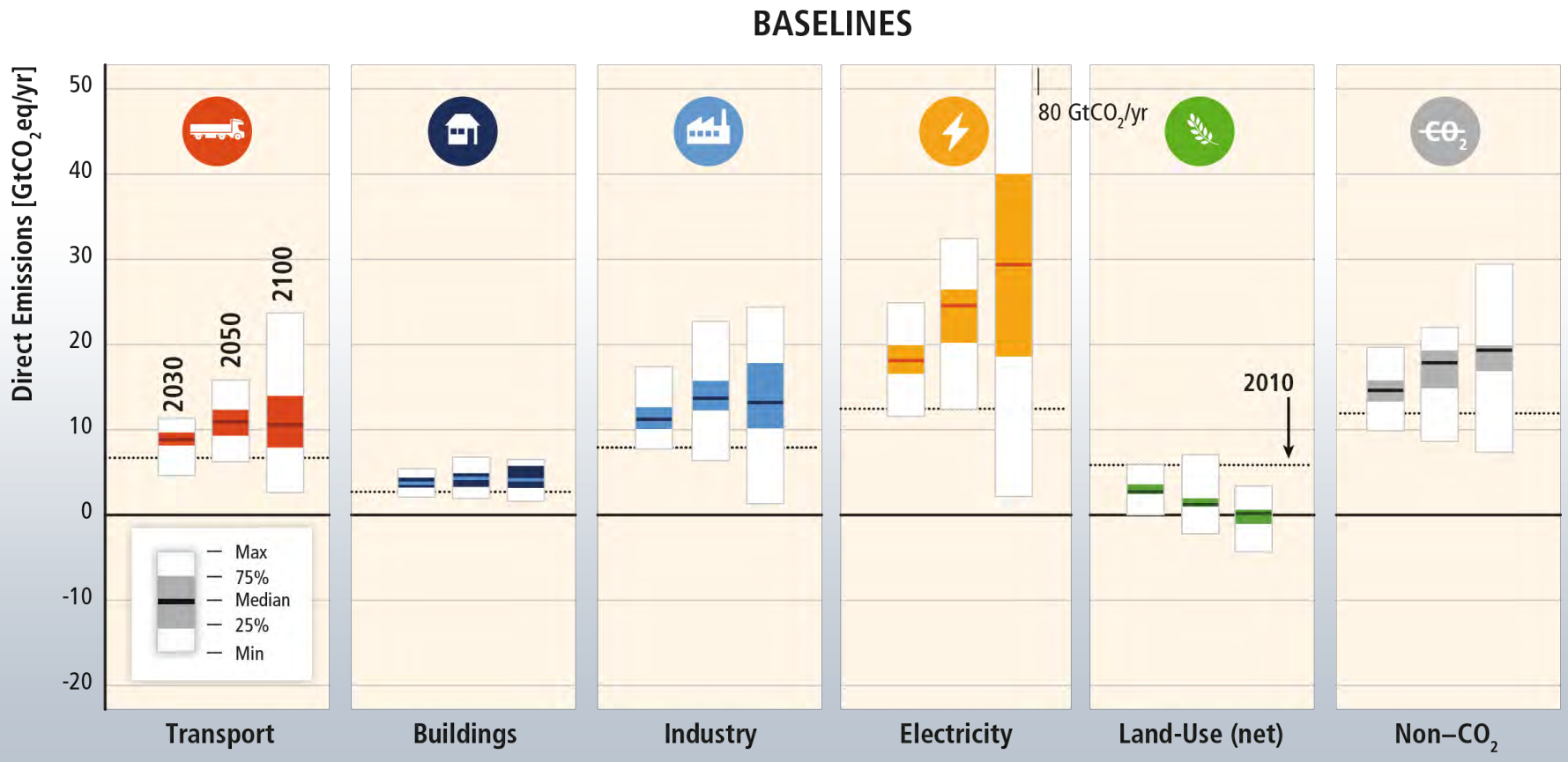
Global costs rise with ambition of mitigation goal



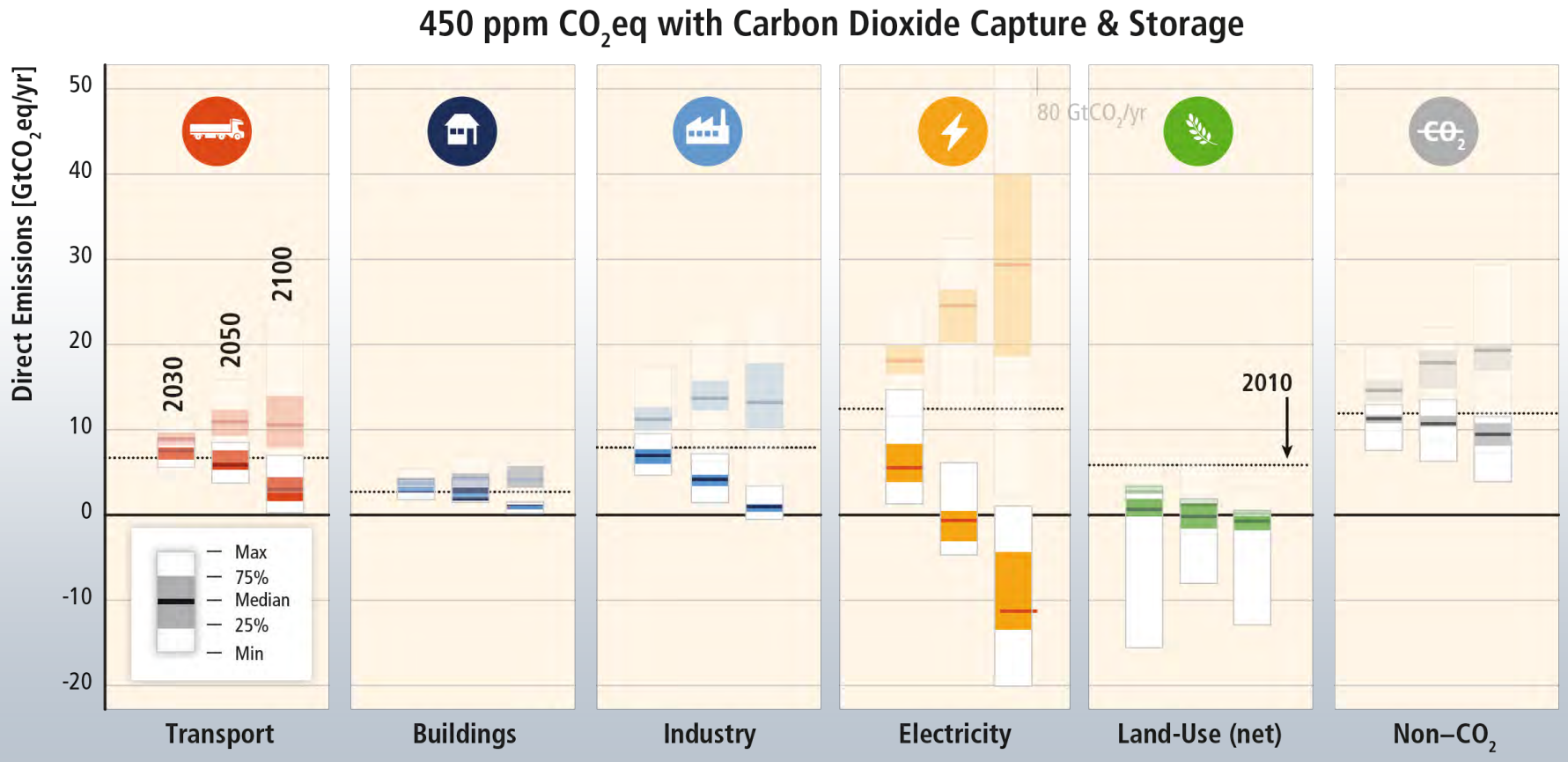
Ambitious mitigation scenarios require a full decarbonisation of energy supply.

Energy demand reductions can help to reduce emissions in the medium term and are key for hedging supply side risks in the long-run.

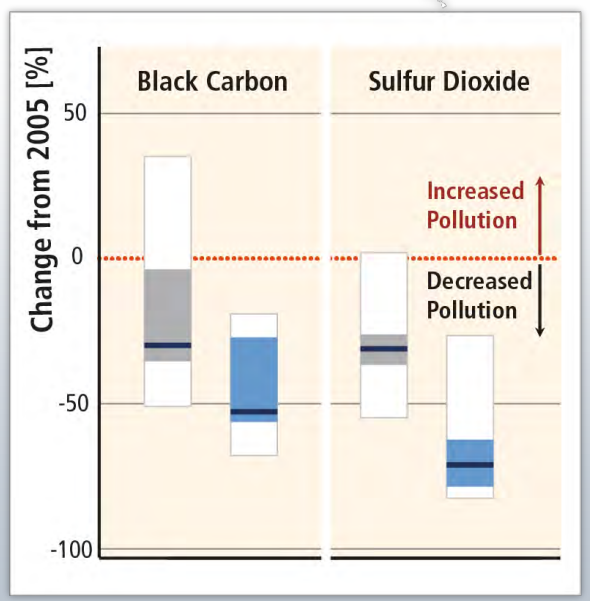
Baseline scenarios suggest rising GHG emissions in all sectors, except for CO2 emissions in the land-use sector

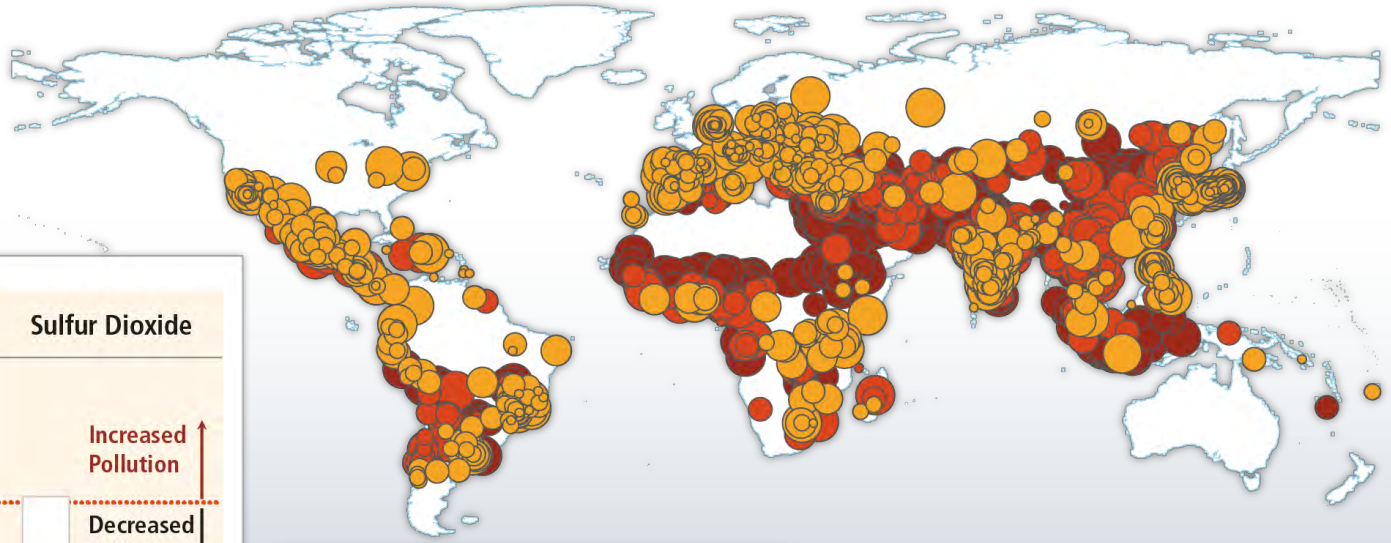


Systemic approaches to mitigation across the economy are expected to be most environmentally and cost effective.



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





Impact of Mitigation Policy on Emissions of Air Pollutants (2005-2050)

- Baseline
- Stringent Climate Policy
- Max
- 75%
- Median
- 25%
- Min

Polution

- Medium
- High
- Very High

Exposure

- Low
- High

Key points about co-benefits and adverse side effects

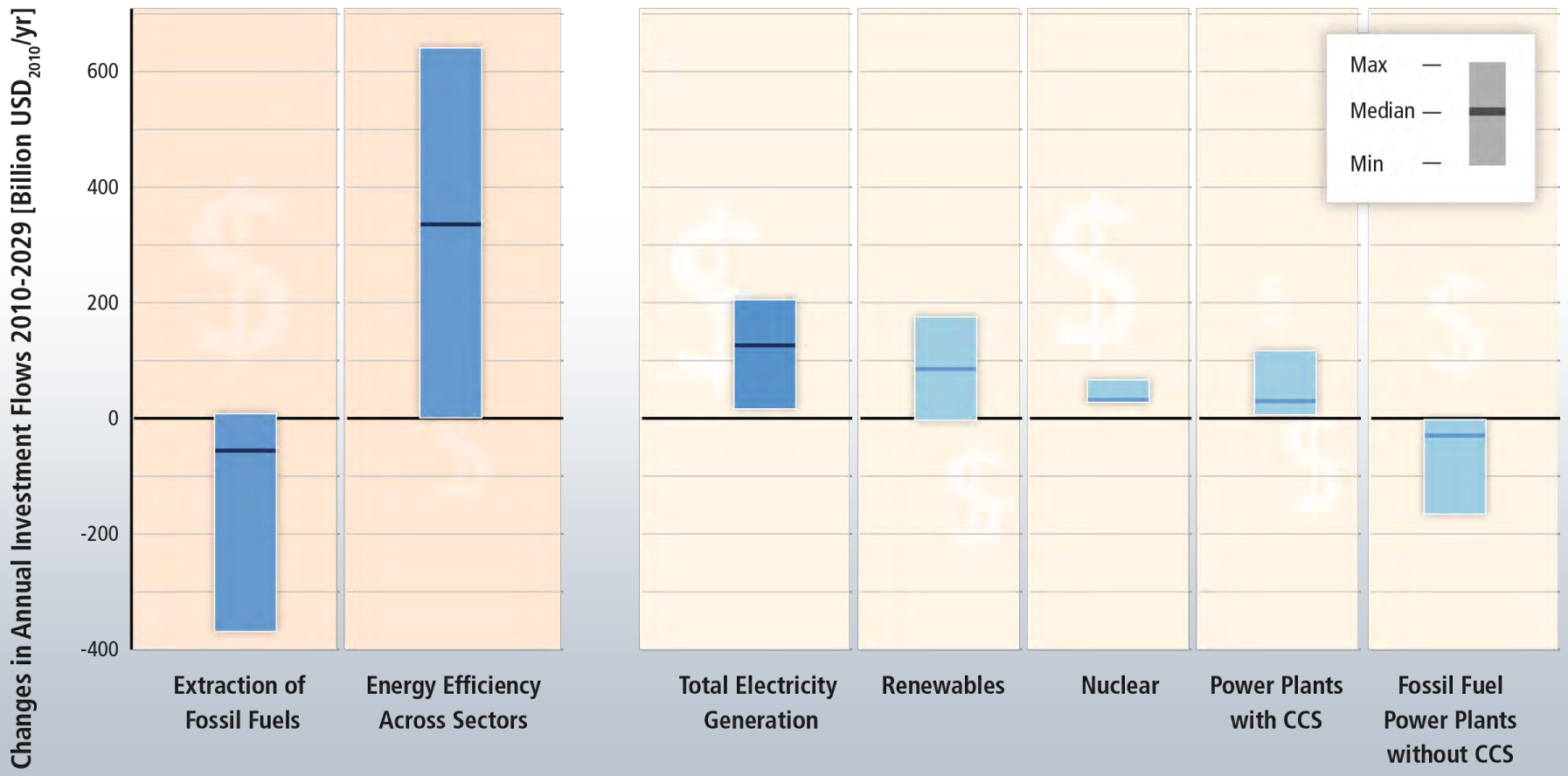
- These influences can be substantial, although often difficult to quantify, and have not yet been thoroughly assessed in the literature.
- Co-benefits and adverse side-effects depend on local circumstances as well as on the implementation practice, pace and scale.
- Behavior, lifestyle and culture have a considerable influence on emissions, with high mitigation potential in some sectors, in particular when complementing technological and structural change.
- Enhancing co-benefits and avoiding adverse side-effects: good governance, transparency, stakeholder participation, cross-sectoral analysis and design, etc.


Climate change mitigation is a global commons problem that requires international cooperation and coordination across scales.

Climate change as a global commons problem. Equitable outcomes can lead to more effective cooperation.

- No single country can protect “its own” climate by reducing its own emissions.
- Countries must persuade other countries to help it solve its climate problem
- A country thus reduces its own emissions – and cooperates in other ways – for the sake of inducing reciprocal effort, i.e., getting other countries to do likewise.
- A country is more likely to be successful if it is perceived as doing its fair share of the effort.
- Thus, a cooperative agreement with equitable effort-sharing is more likely to be agreed and successfully implemented.

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



Climate change mitigation is a necessary, but not a sufficient conditions for sustainable development

- Effort-sharing is fundamental to international cooperation in a global commons problem.
- There is a small set of broadly invoked ethical principles relating to equitable effort-sharing.
- Mitigation measures interact broadly (and sometimes strongly) with other sustainable development objectives, creating co-benefits or adverse side-effects.
- Highly context specific, difficult to quantify yet nonetheless significant both in welfare and political terms. Managing these interactions implies mainstreaming mitigation.

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