ipcc
INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2014

Mitigation of Climate Change

Key messages from the Working Group III contribution to the IPCC's AR5

2 June 2014, World Bank, Washington DC, USA

Working Group III contribution to the
IPCC Fifth Assessment Report

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WMO UNEP

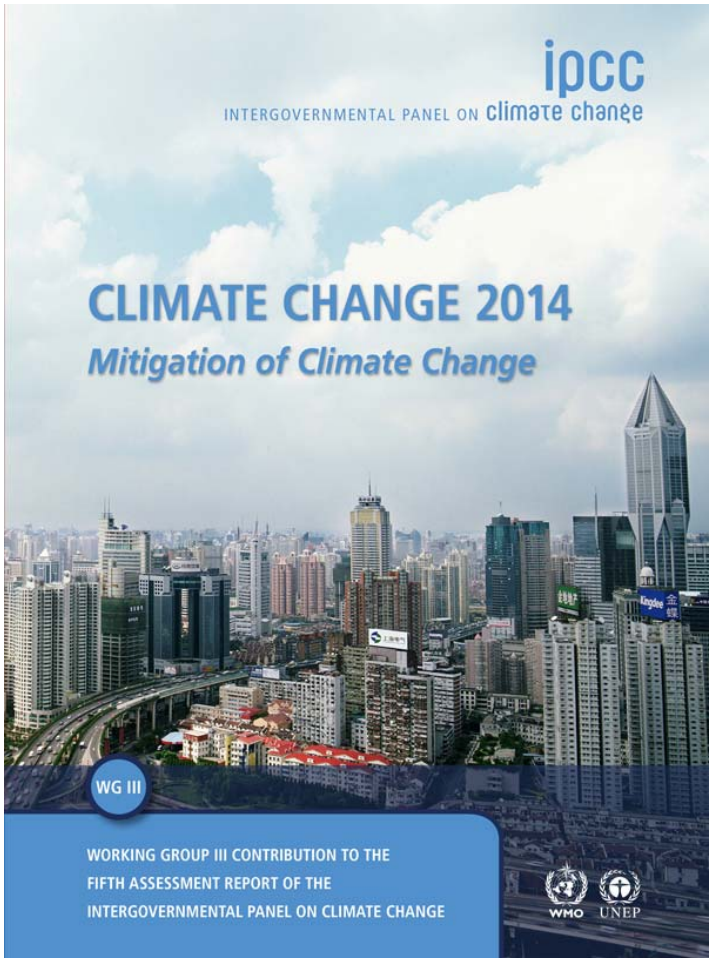
Exploring the solution space

INTERGOVERNMENTAL PANEL ON climate change

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 accelerate despite reduction efforts. Most emission growth is CO_2 from fossil fuel combustion.

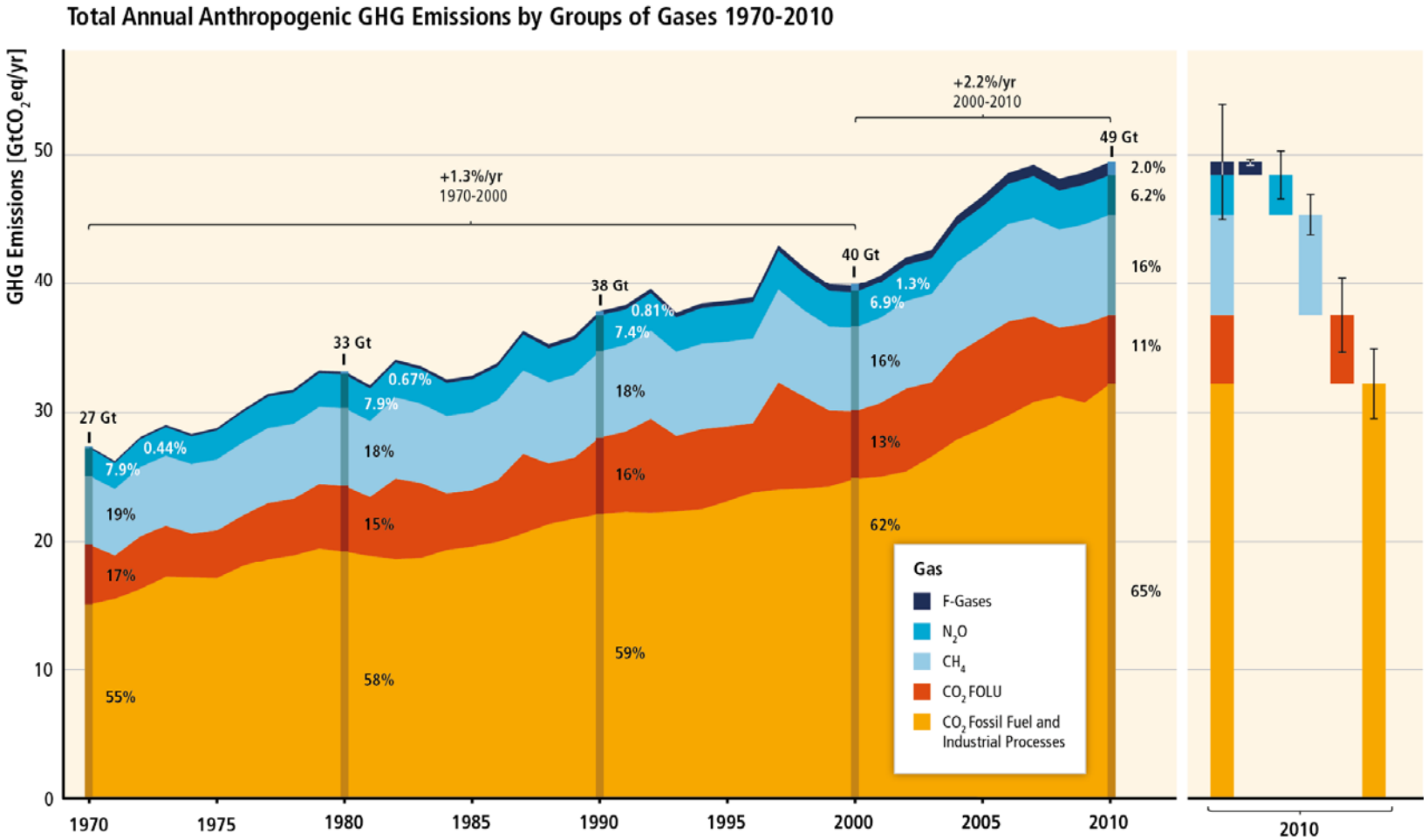


Figure SPM.1

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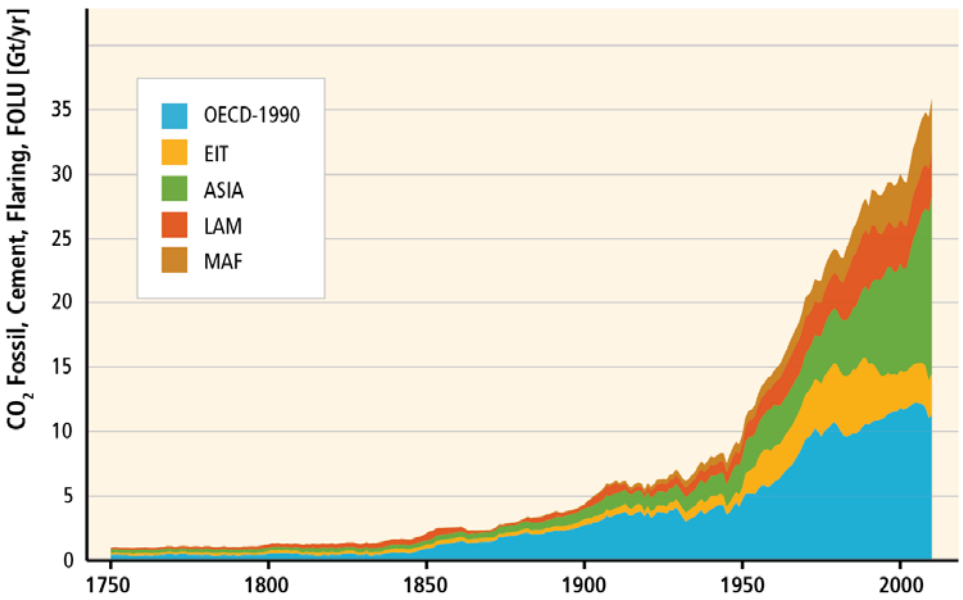
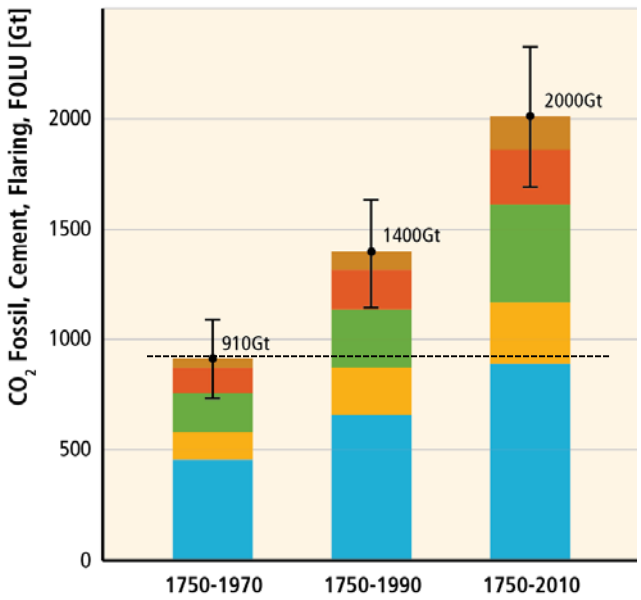
Cumulative CO_2 emissions have more than doubled since 1970.





After 1970: 1100 $GtCO_2$

Before 1970: 910 $GtCO_2$

Figure TS.2

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Regional patterns of GHG emissions are shifting along with changes in the world economy.

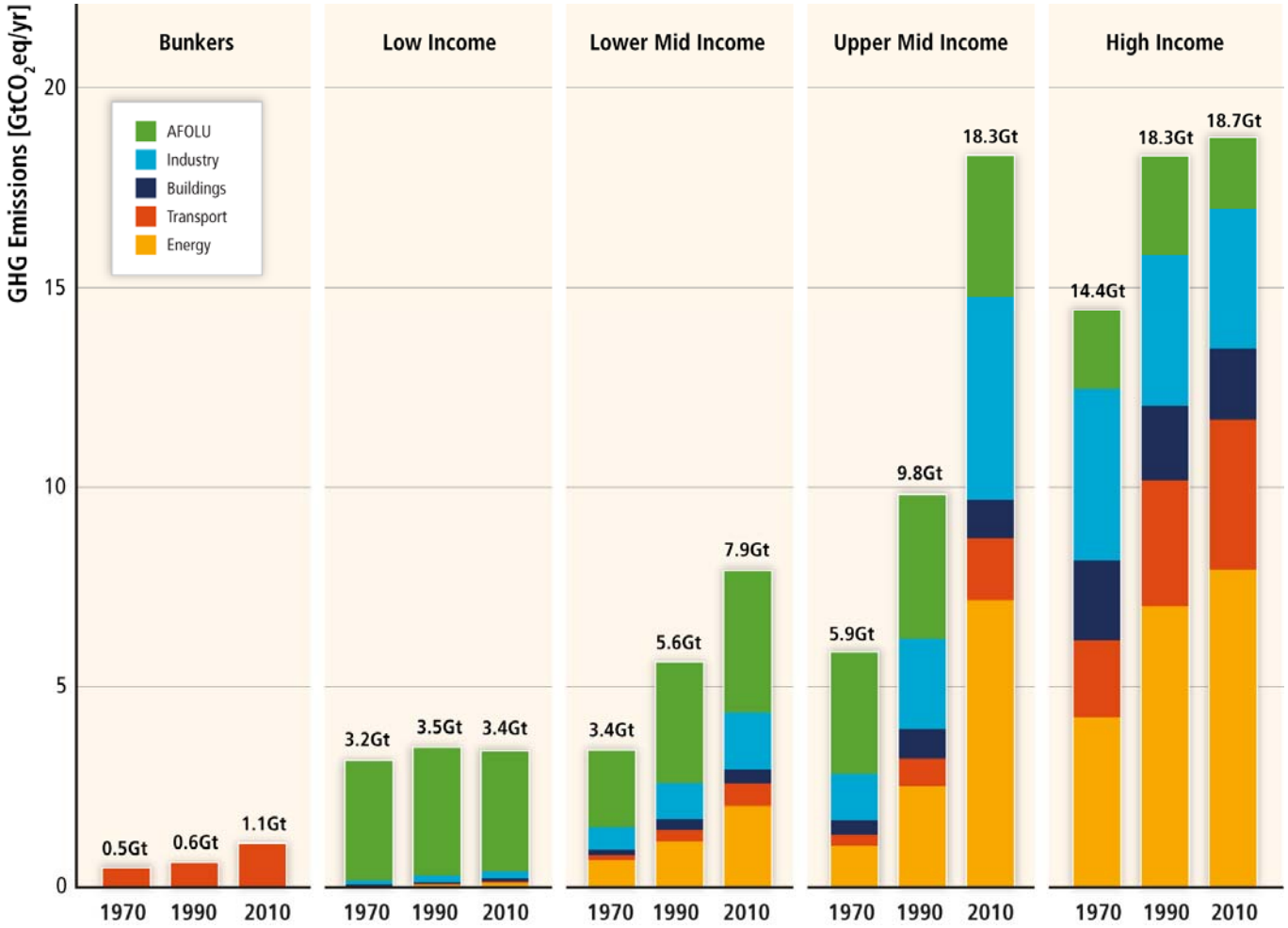

Figure TS.3

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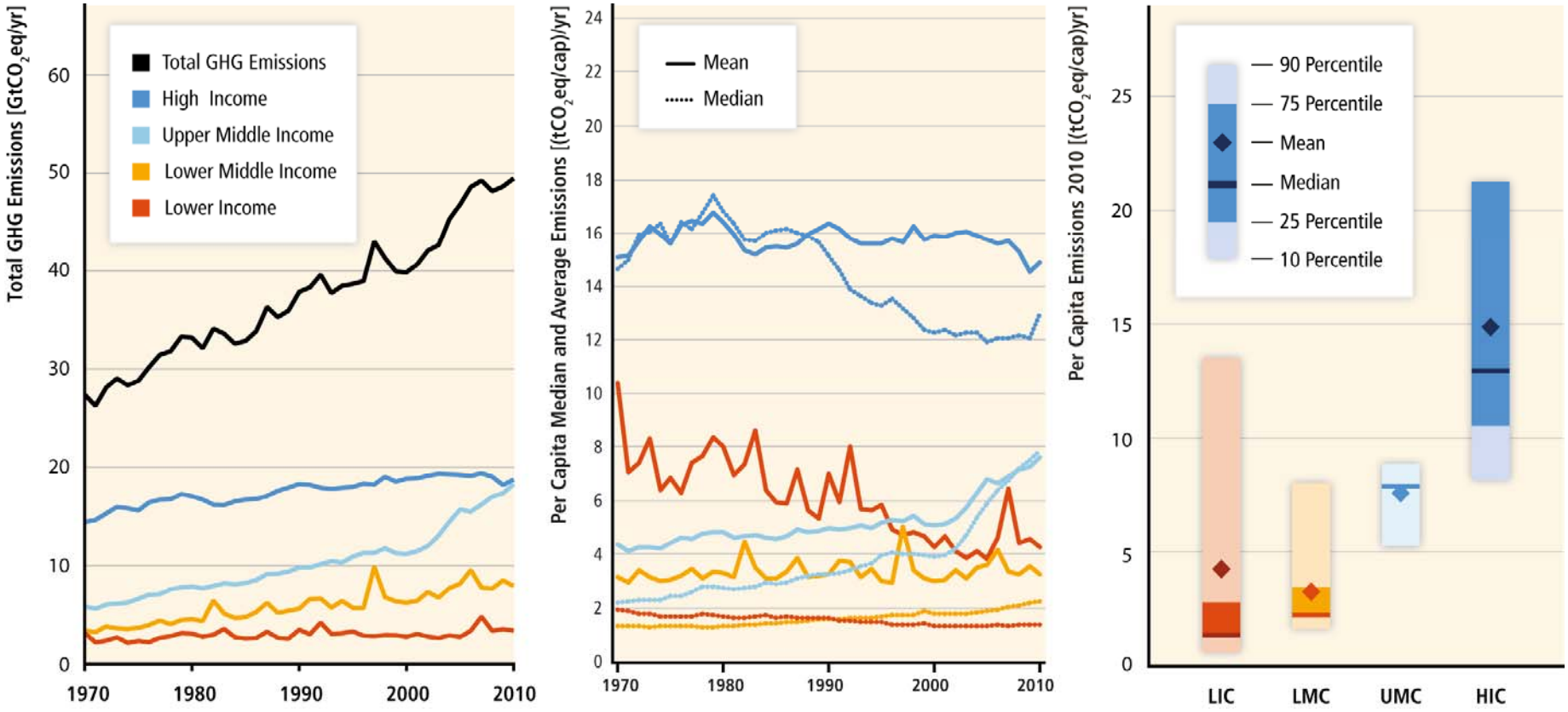
National per-capita GHG emissions are highly variable within and between income groups.



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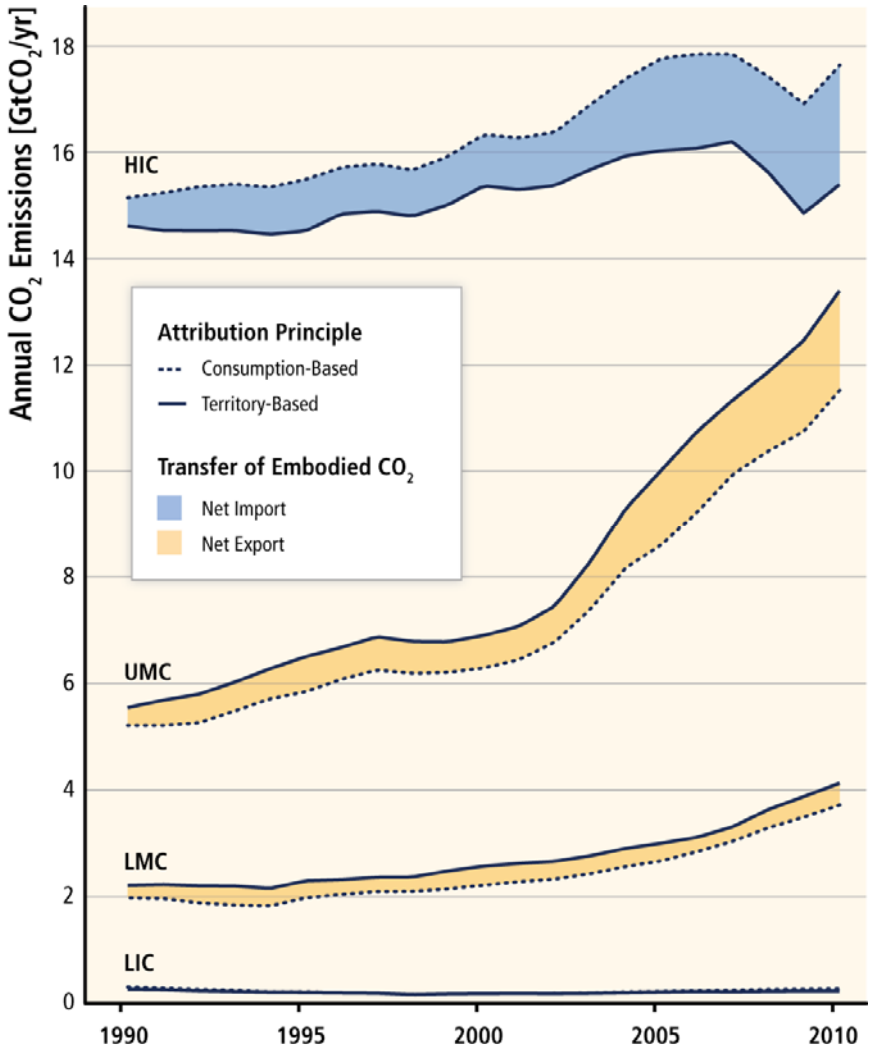

A growing share of CO_2 emissions from fossil fuel combustion and industrial processes in low and middle income countries has been released in the production of goods and services exported, notably from upper-middle income countries to high income countries.

Figure TS.5

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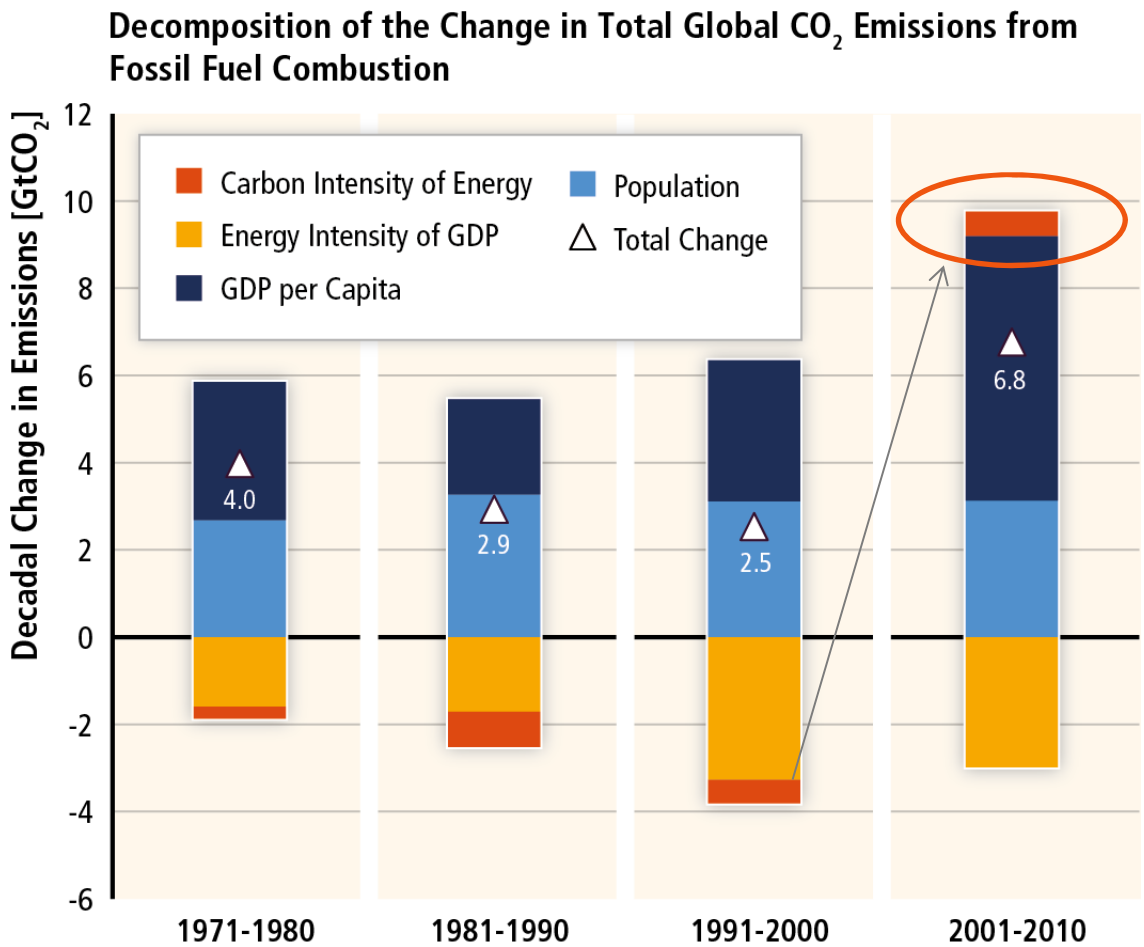
GHG emissions rise with growth in GDP and population; long-standing trend of decarbonisation of energy reversed.



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

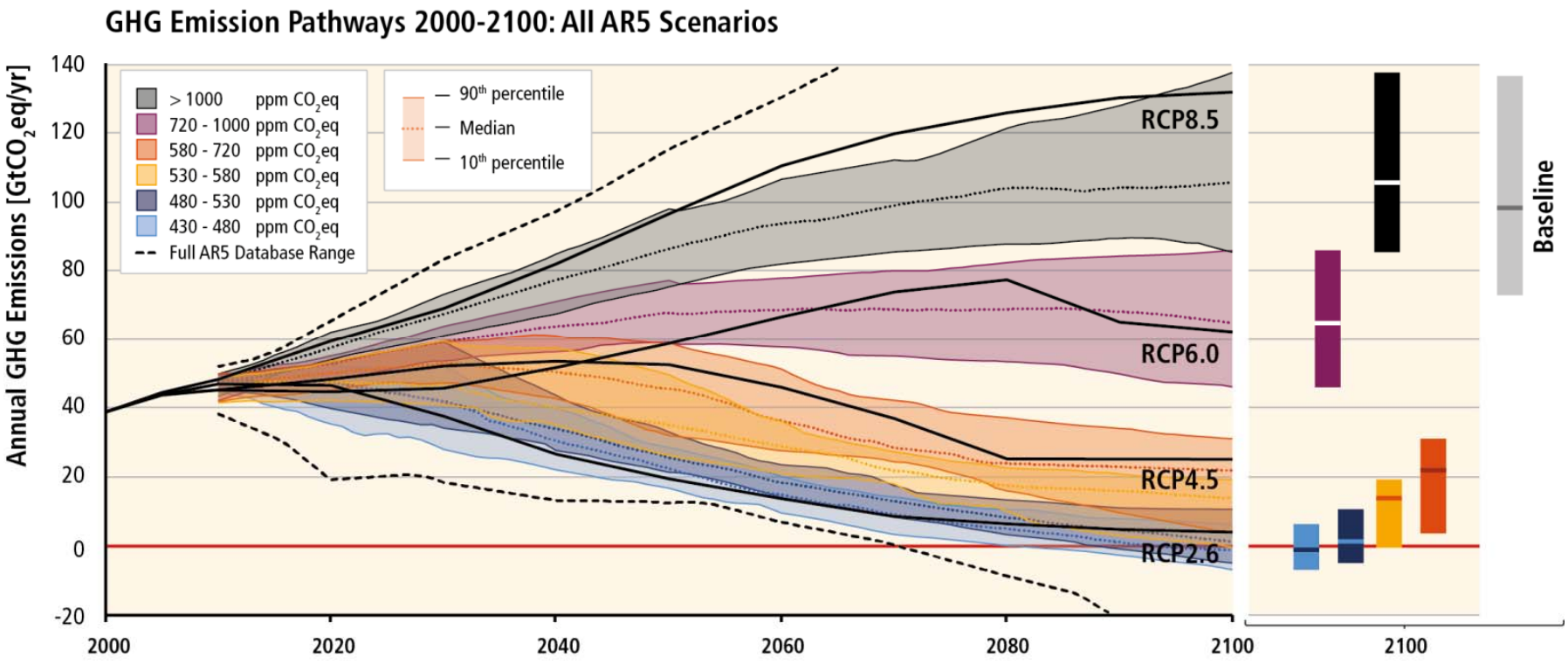

Figure SPM.4

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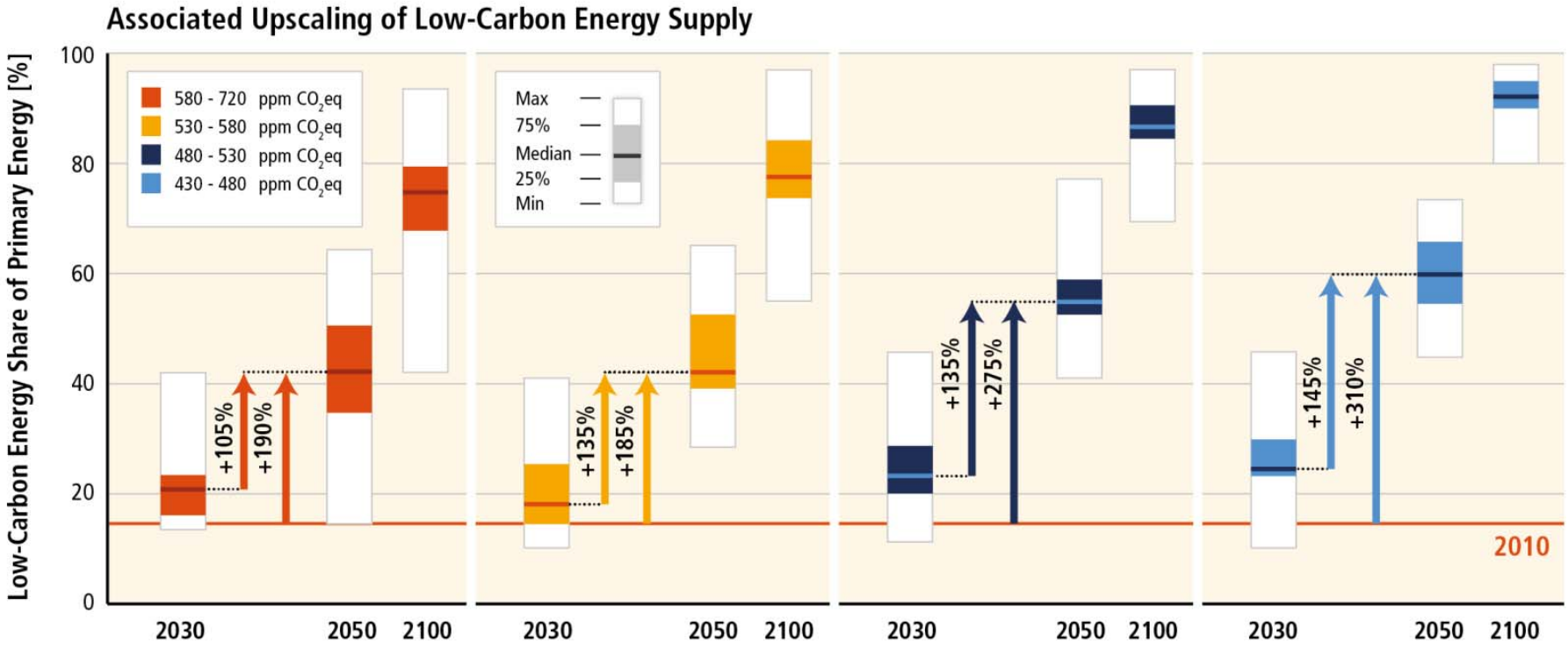
Mitigation requires major technological and institutional changes including the upscaling of low- and zero carbon energy.



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In cost-effective 2°C mitigation strategies, emissions have peaked and emission levels in 2030 tend to be lower than today.

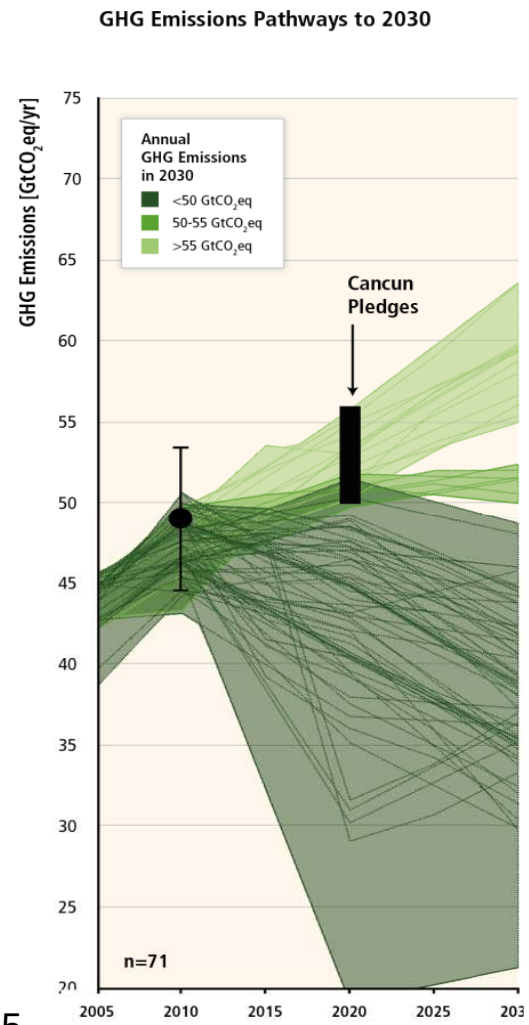

Figure SPM.5

Delayed mitigation

50 $GtCO_2e$

Cost-effective mitigation

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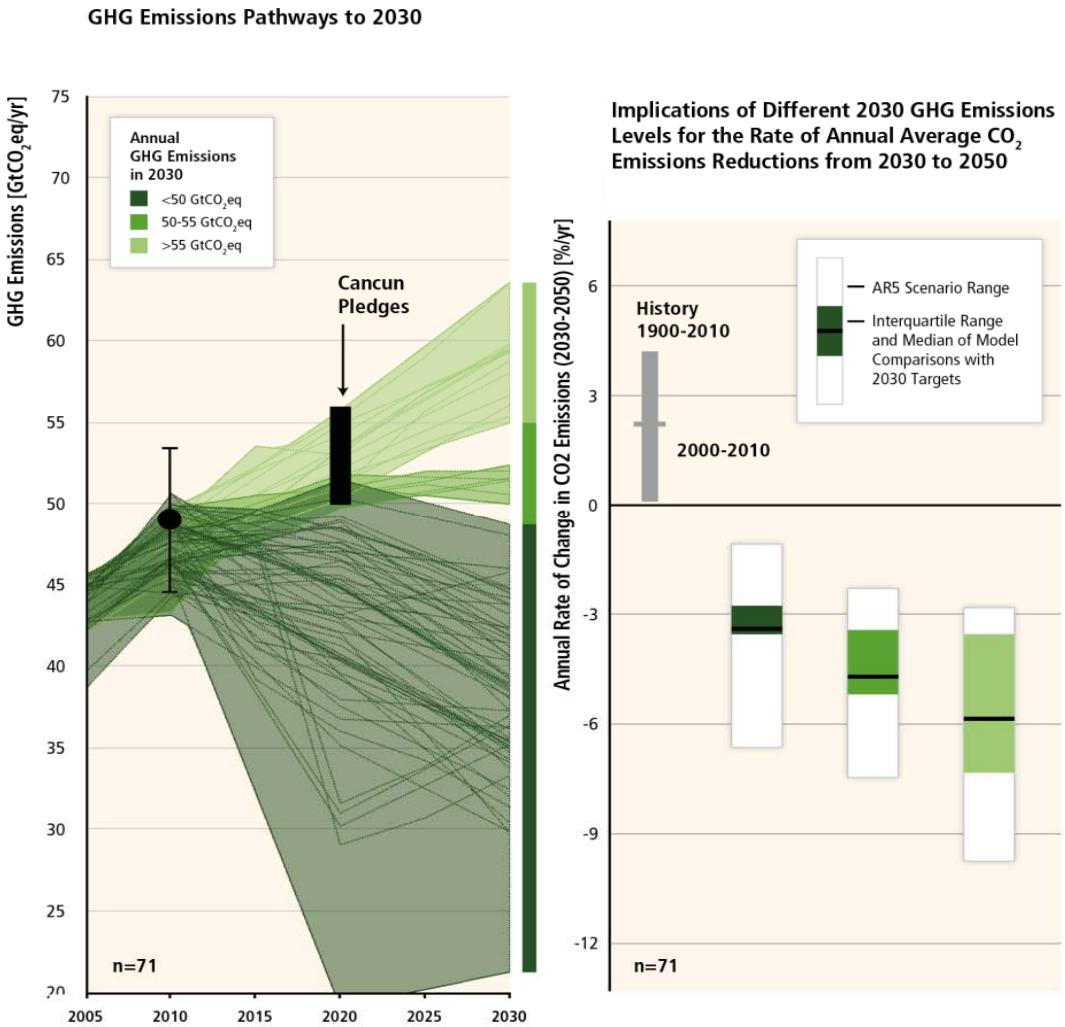
Delayed mitigation significantly increases the challenge to reach low concentration targets.



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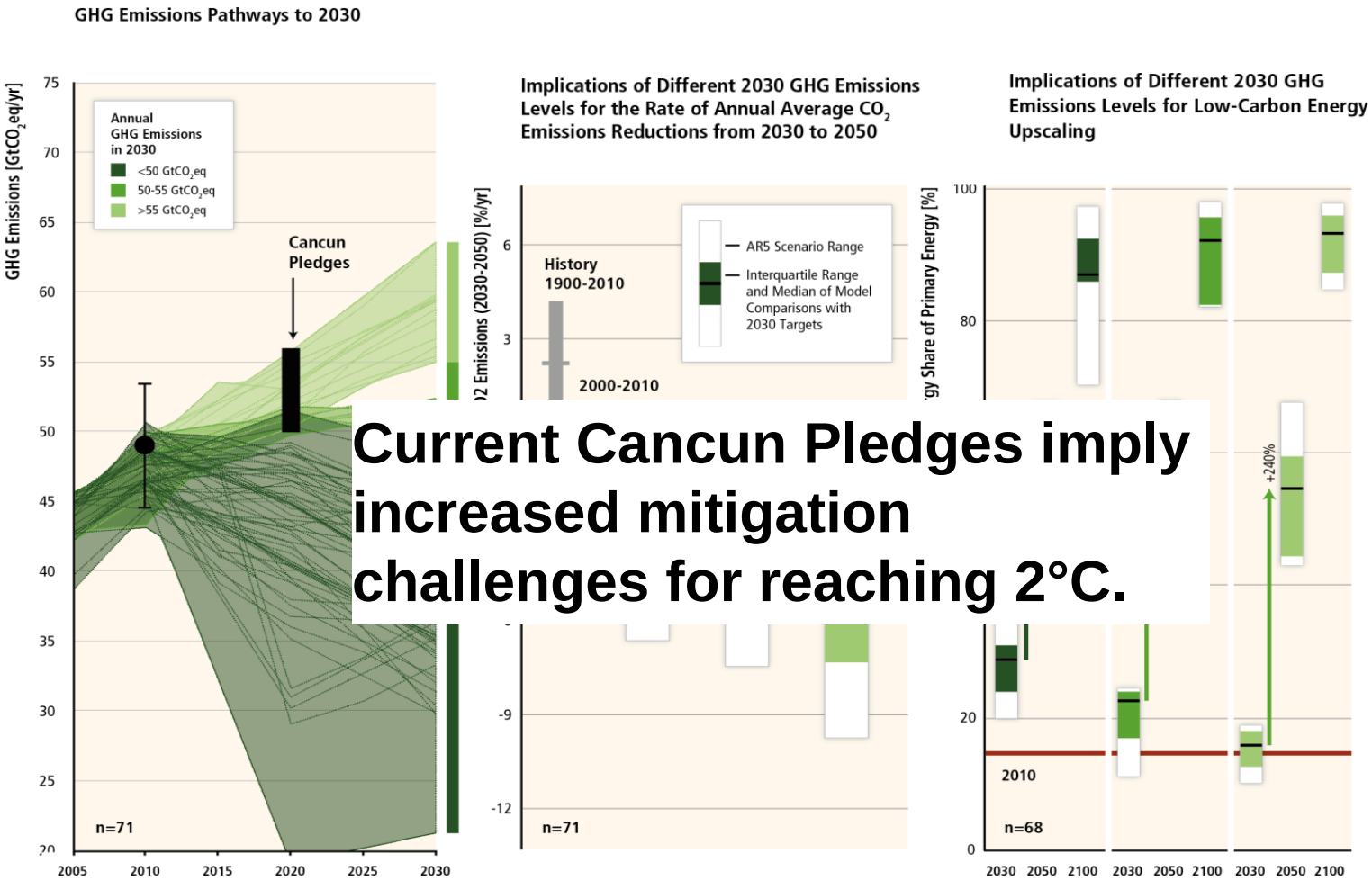
Delayed mitigation significantly increases the challenge to reach low concentration targets.



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

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Estimates for mitigation costs vary widely.

- Reaching 450ppm CO_2eq 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 exlude 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.

Limited availability of technologies increases costs.

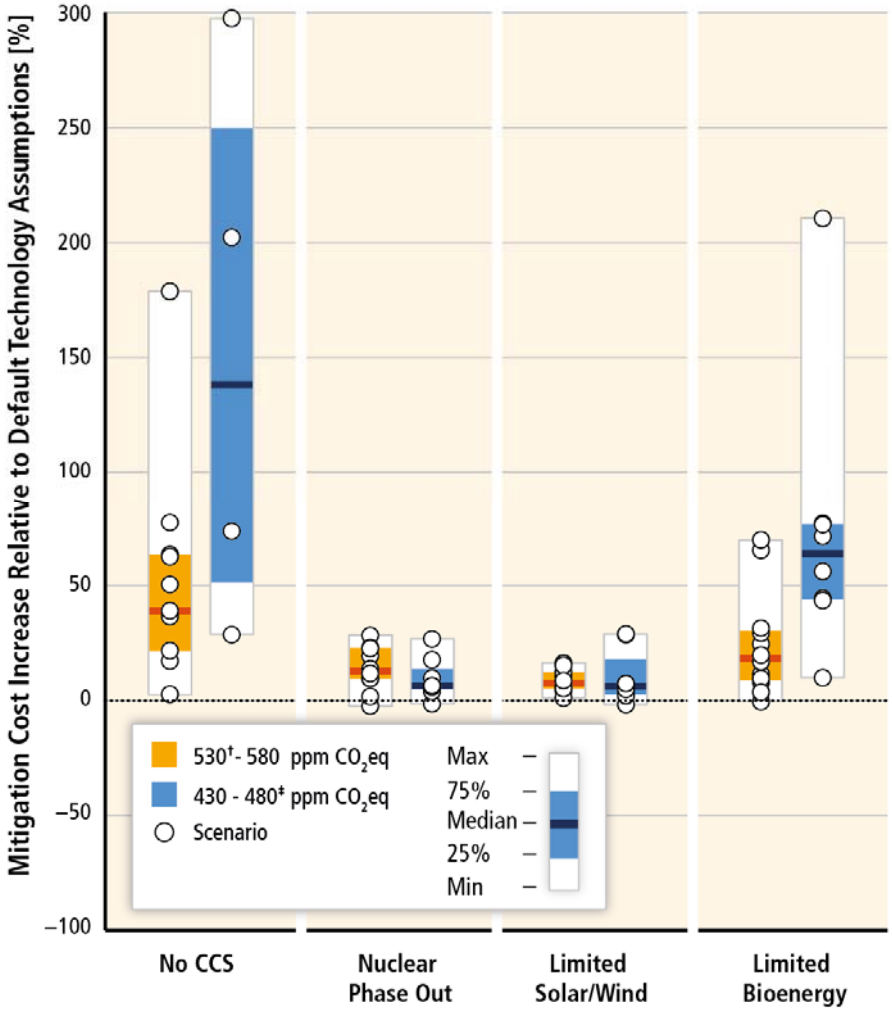
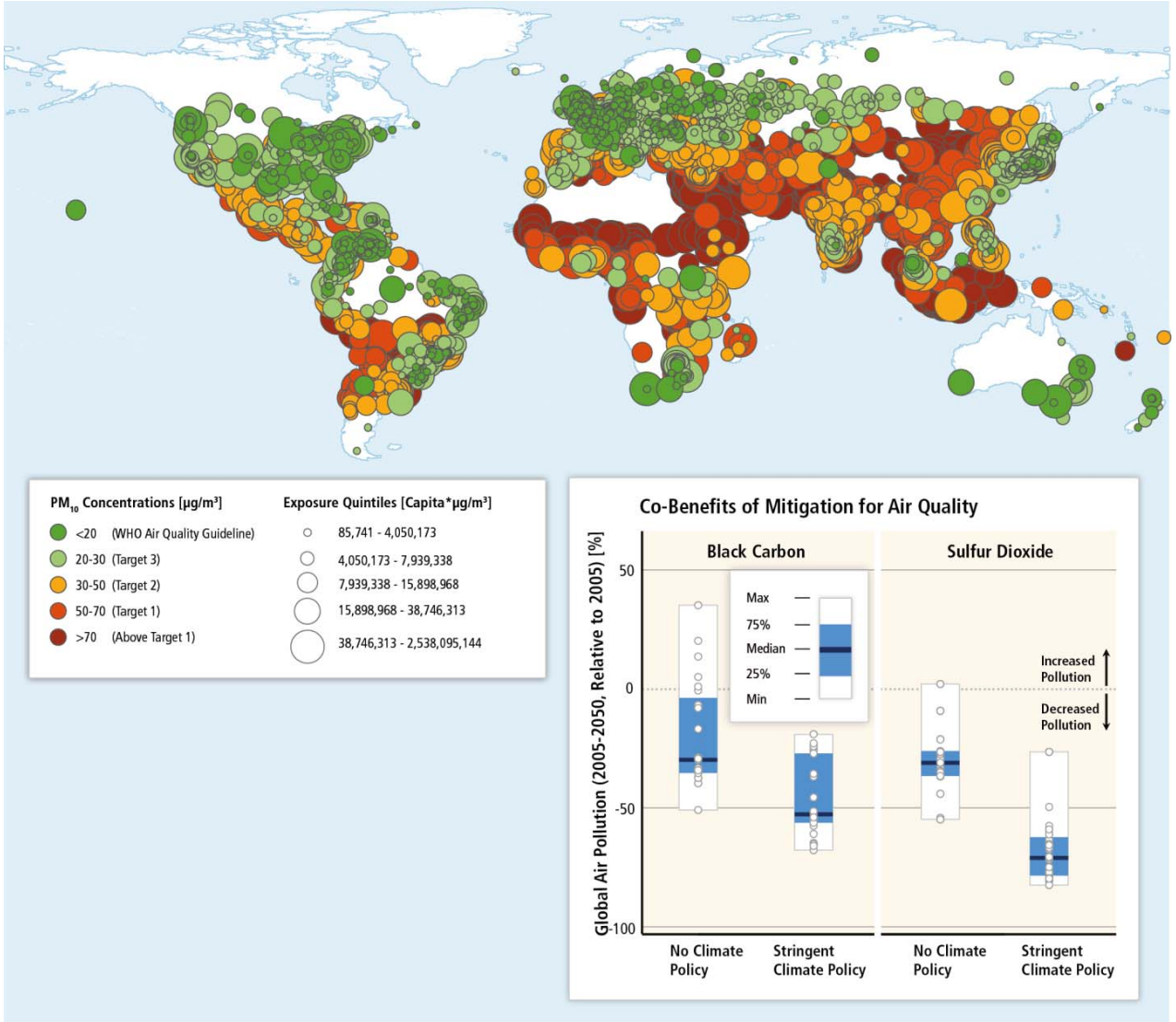


Figure TS.13



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

Figure TS.14
Figure 12.23

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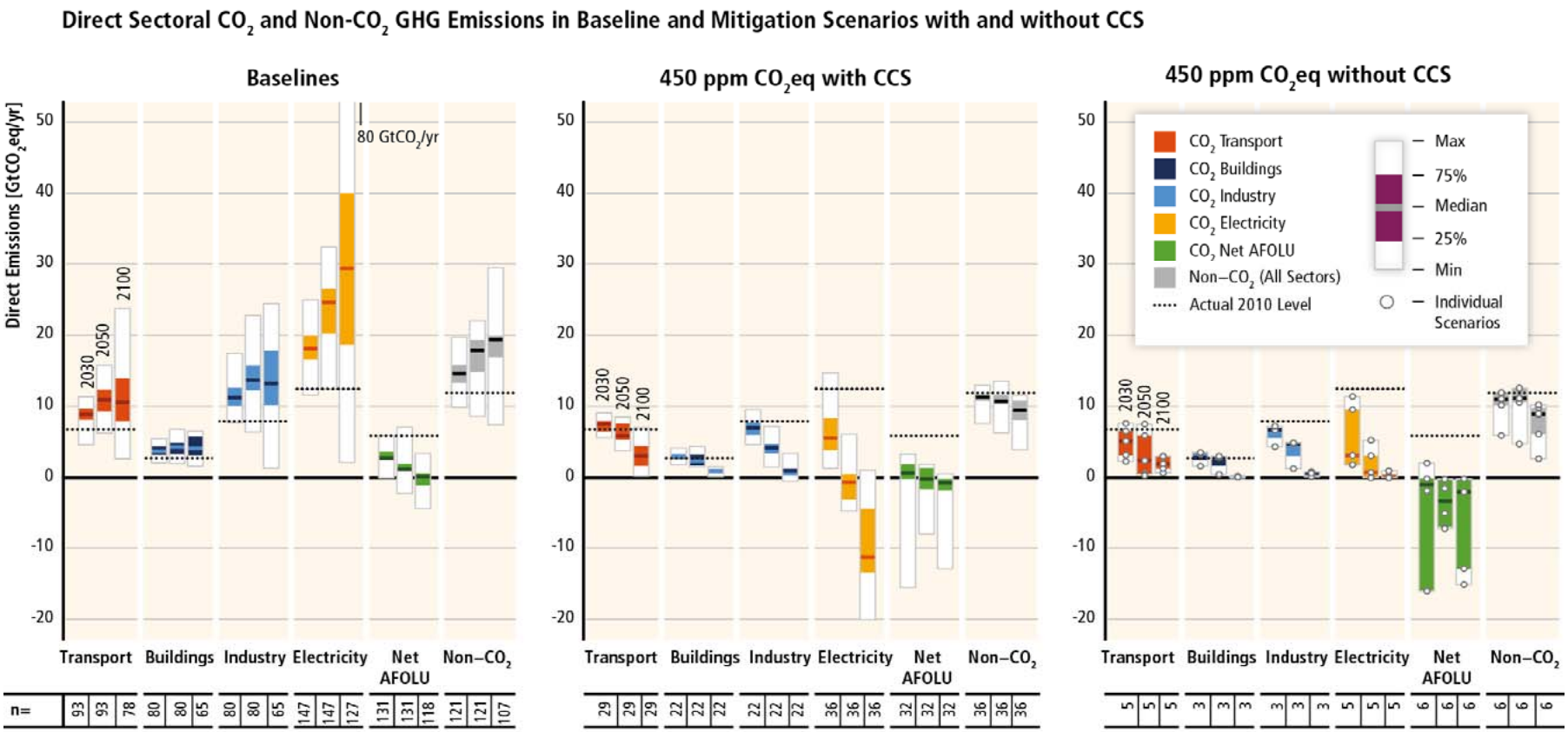
Mitigation requires changes throughout the economy. Efforts in one sector determine mitigation efforts in others.



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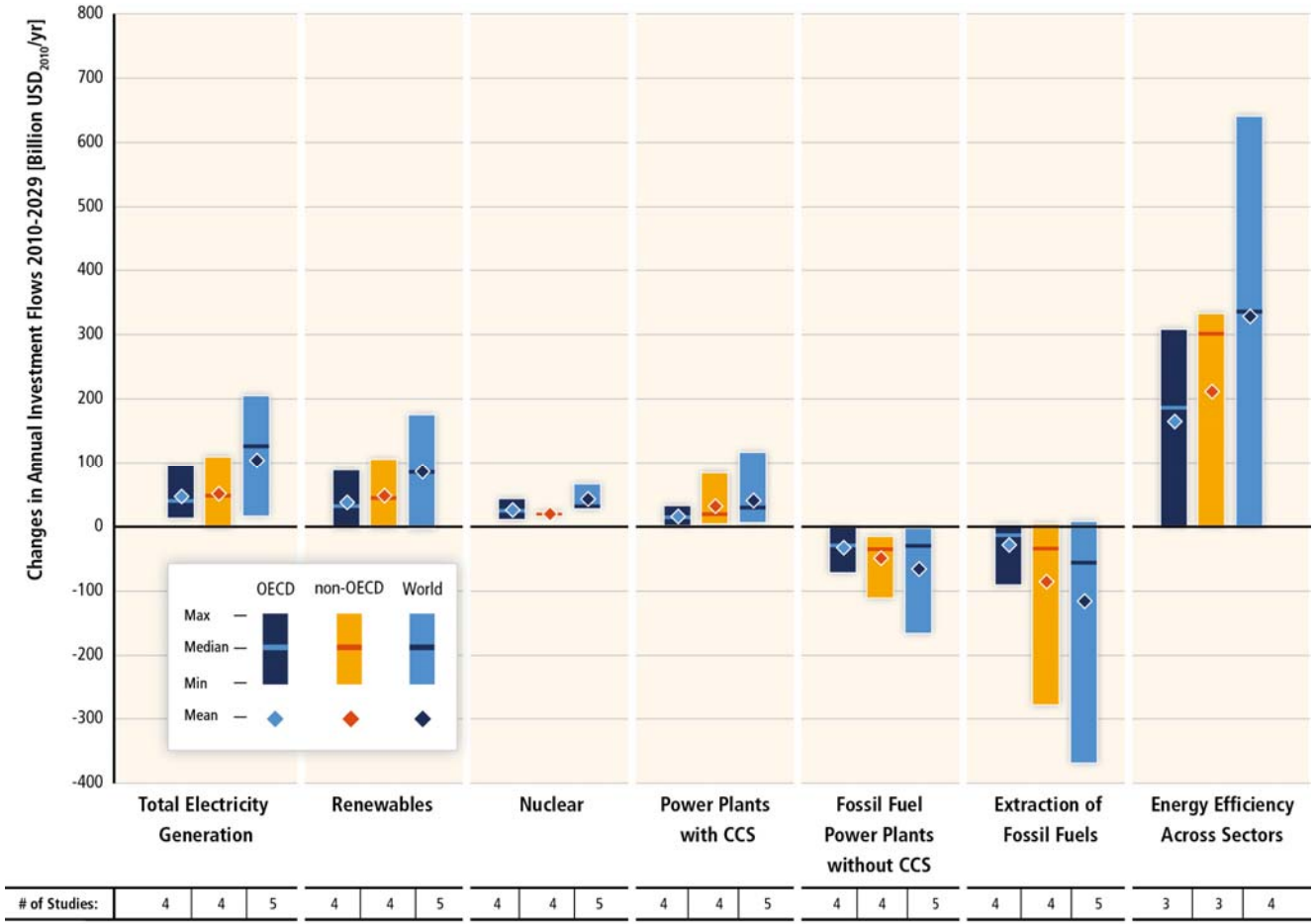
Substantial reductions in emissions would require large changes in investment patterns.



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Current investment in the energy system totals about USD 1200 billion per year.

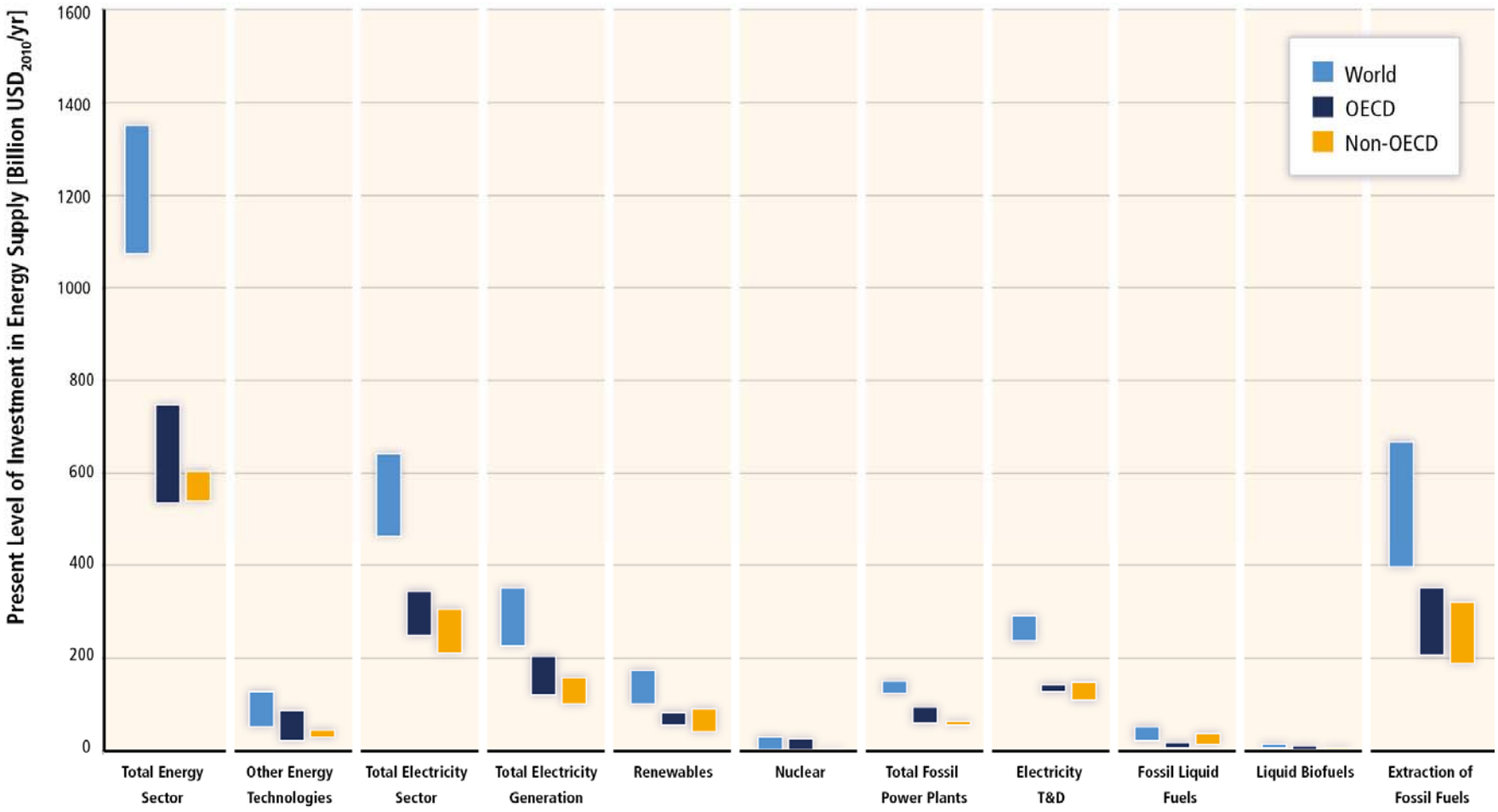

Figure 16.2

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There is no widely agreed definition of what constitutes ‚climate finance‘.

- Total climate finance: about USD 343 to 385 billion per year.
- Around 95% goes to mitigation.
- Public climate finance to developing countries: USD 35 to 49 billion per year.
- Private climate finance flowing to developing countries: USD 10 to 72 billion per year, including foreign direct investment as equity and loans in the range of USD 10 to 37 billion.

Within an appropriate enabling environment, the private sector can help to mitigate climate change.

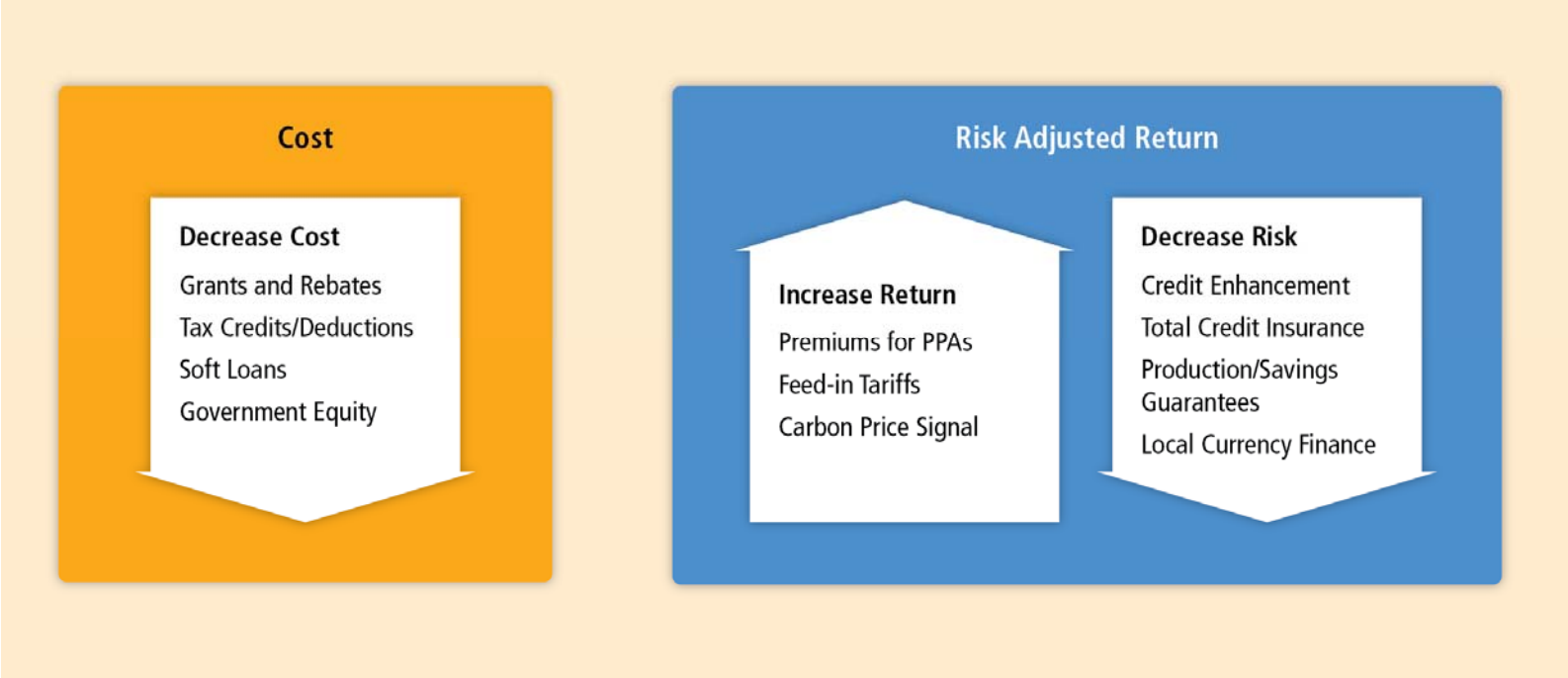

Figure 16.5

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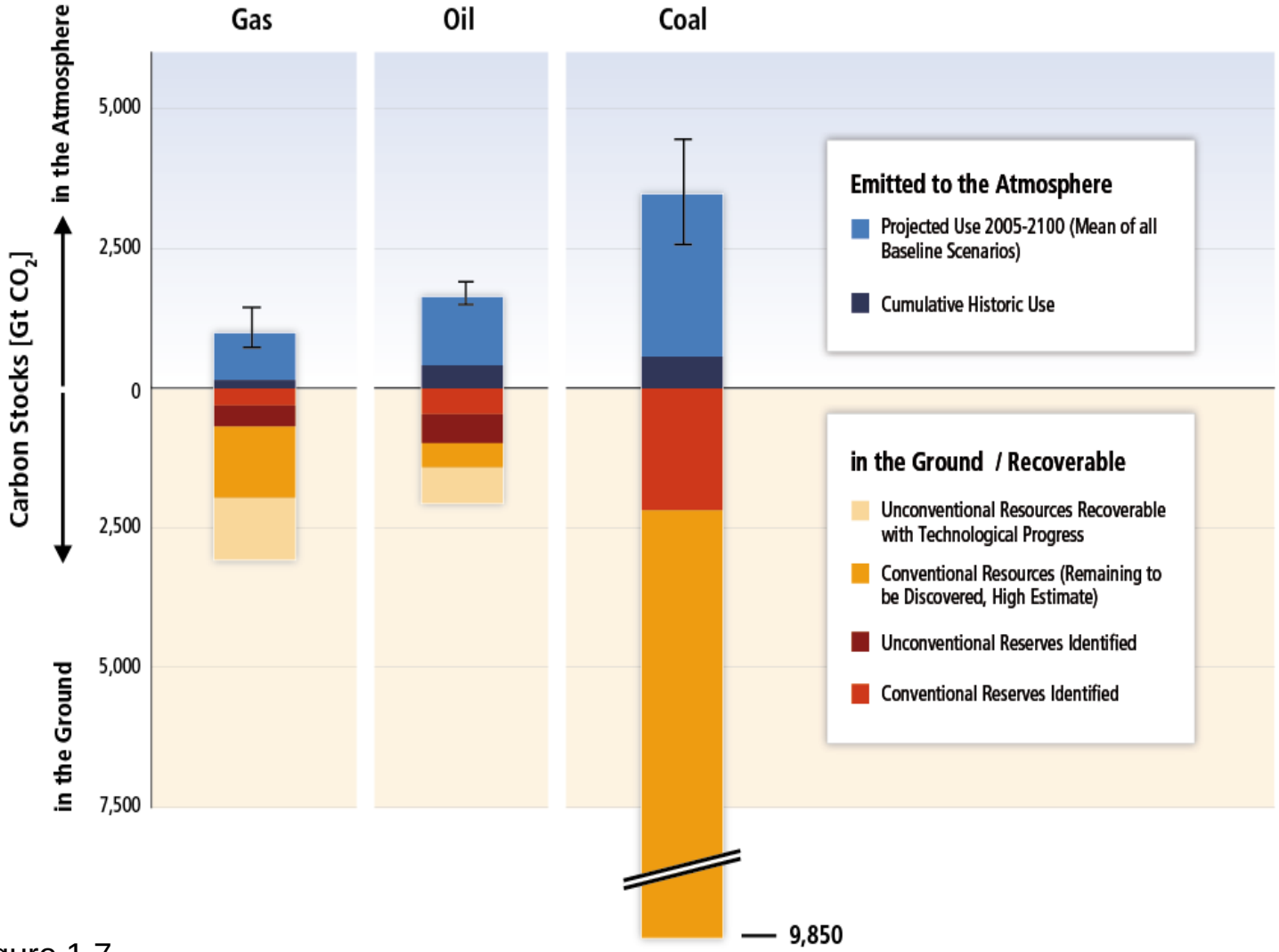
Since AR4, there has been an increased focus on policies designed to integrate multiple objectives, increase co-benefits and reduce adverse side-effects.

- 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.

Climate change is a global commons problem that implies the need for international cooperation.



SRREN, Figure 1.7

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.

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