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INTERGOVERNMENTAL PANEL ON climate change

# CLIMATE CHANGE 2014

## *Mitigation of Climate Change*


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Co-Chair, IPCC Working Group III
TEC 9, Bonn, 18 August 2014

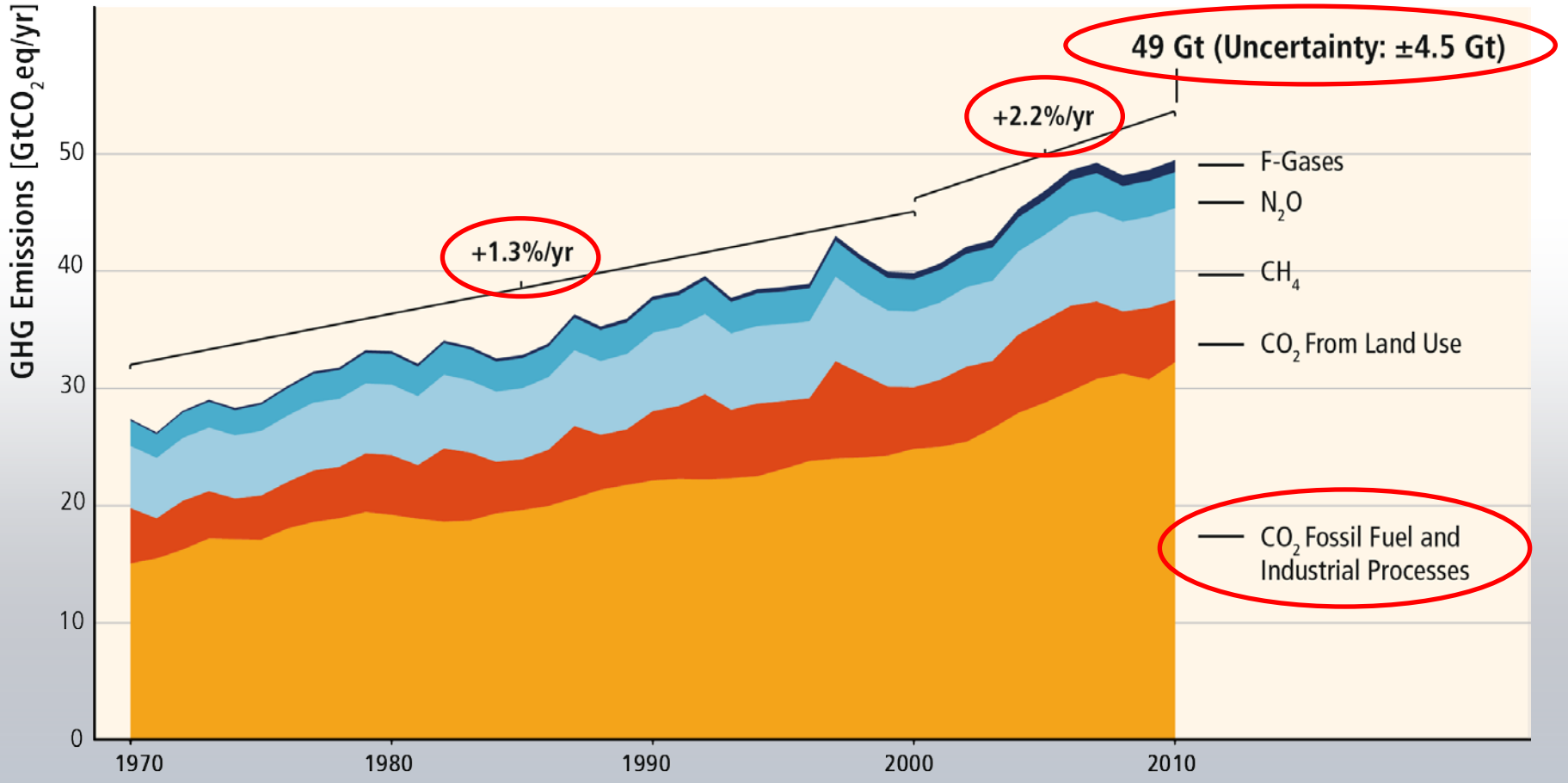
Working Group III contribution to the
IPCC Fifth Assessment Report

WMO UNEP

# Exploring the solution space

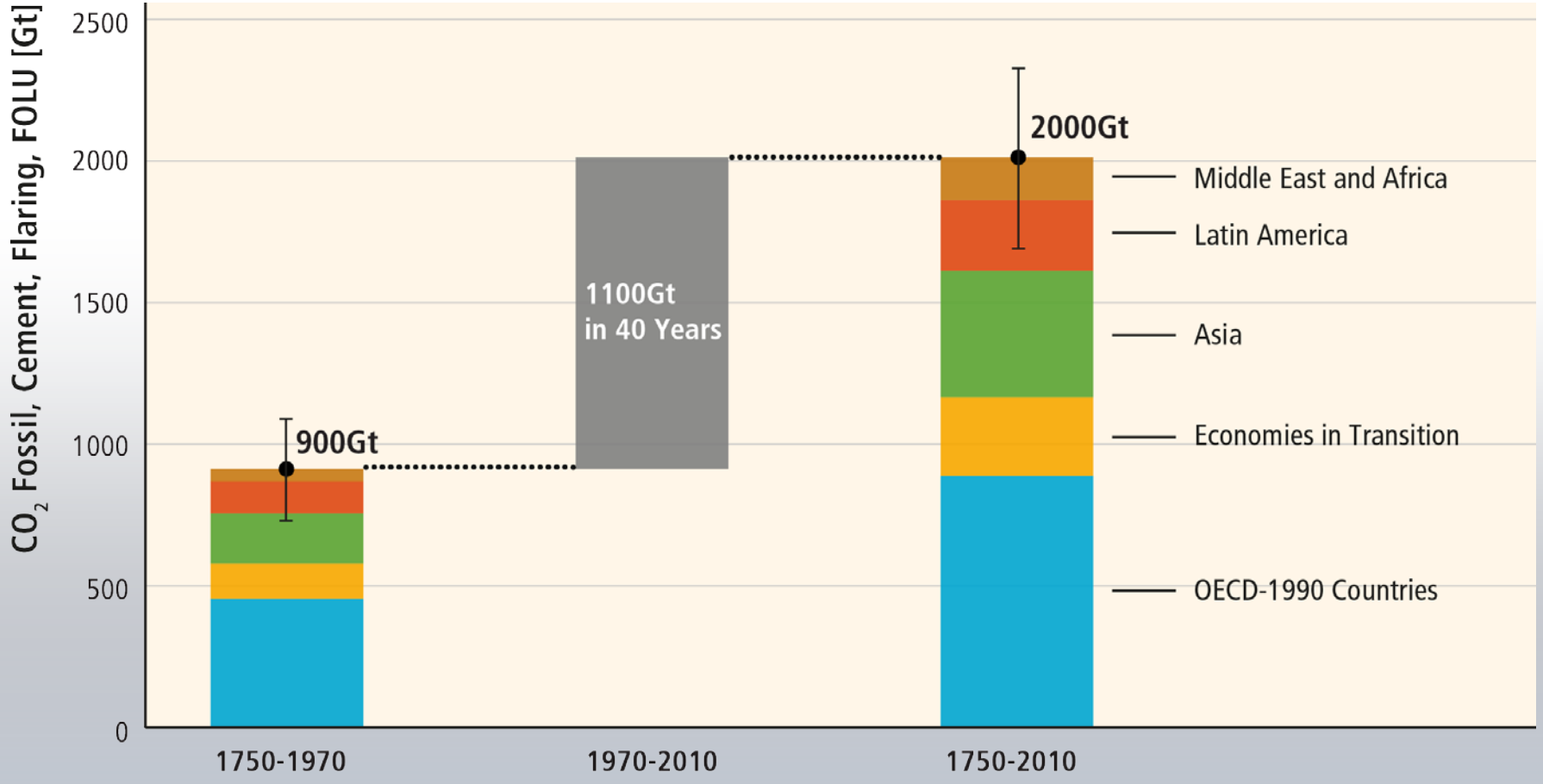

GHG emissions growth has accelerated
despite reduction efforts.

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



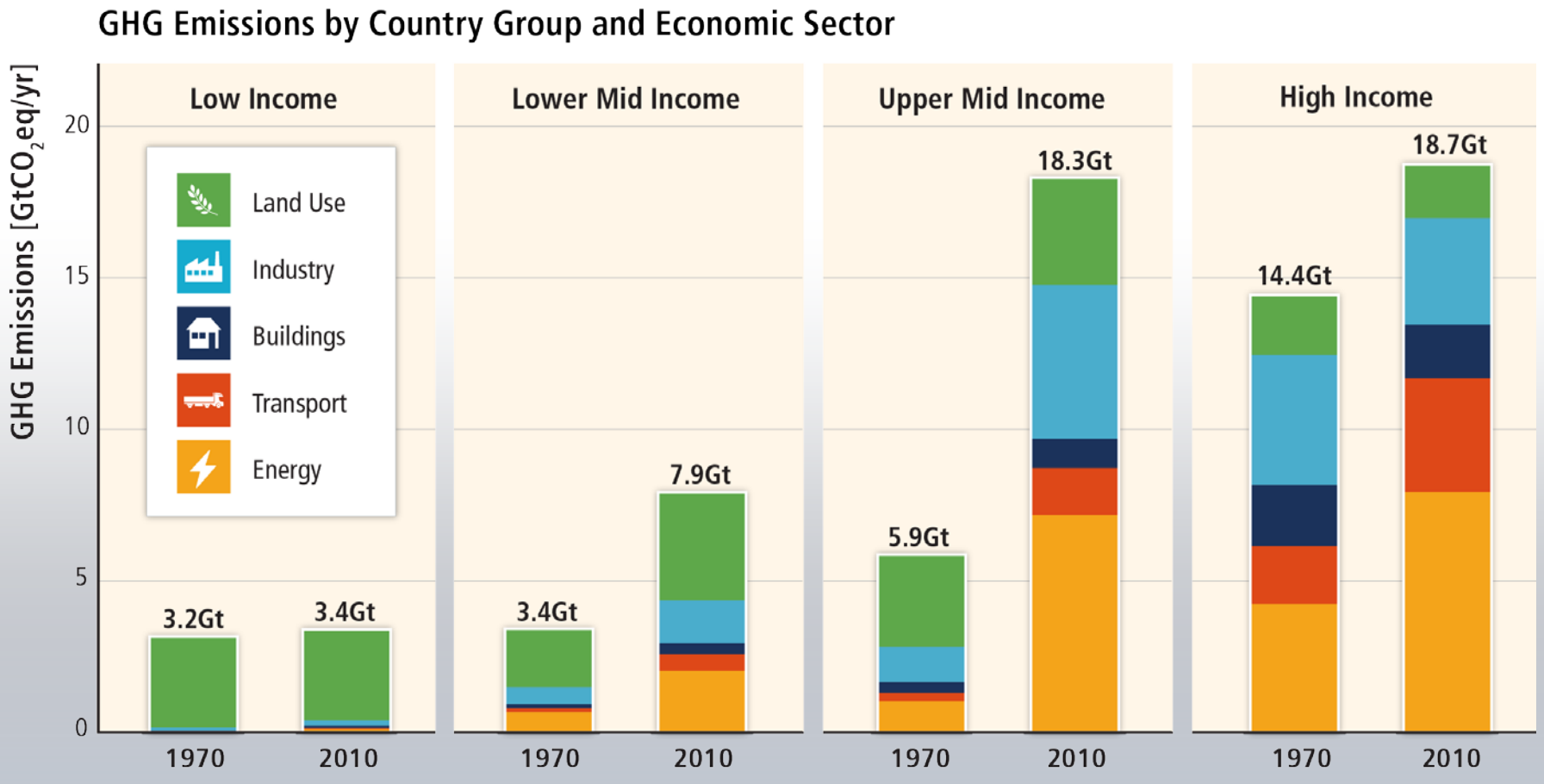

Based on Figure 1.3

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



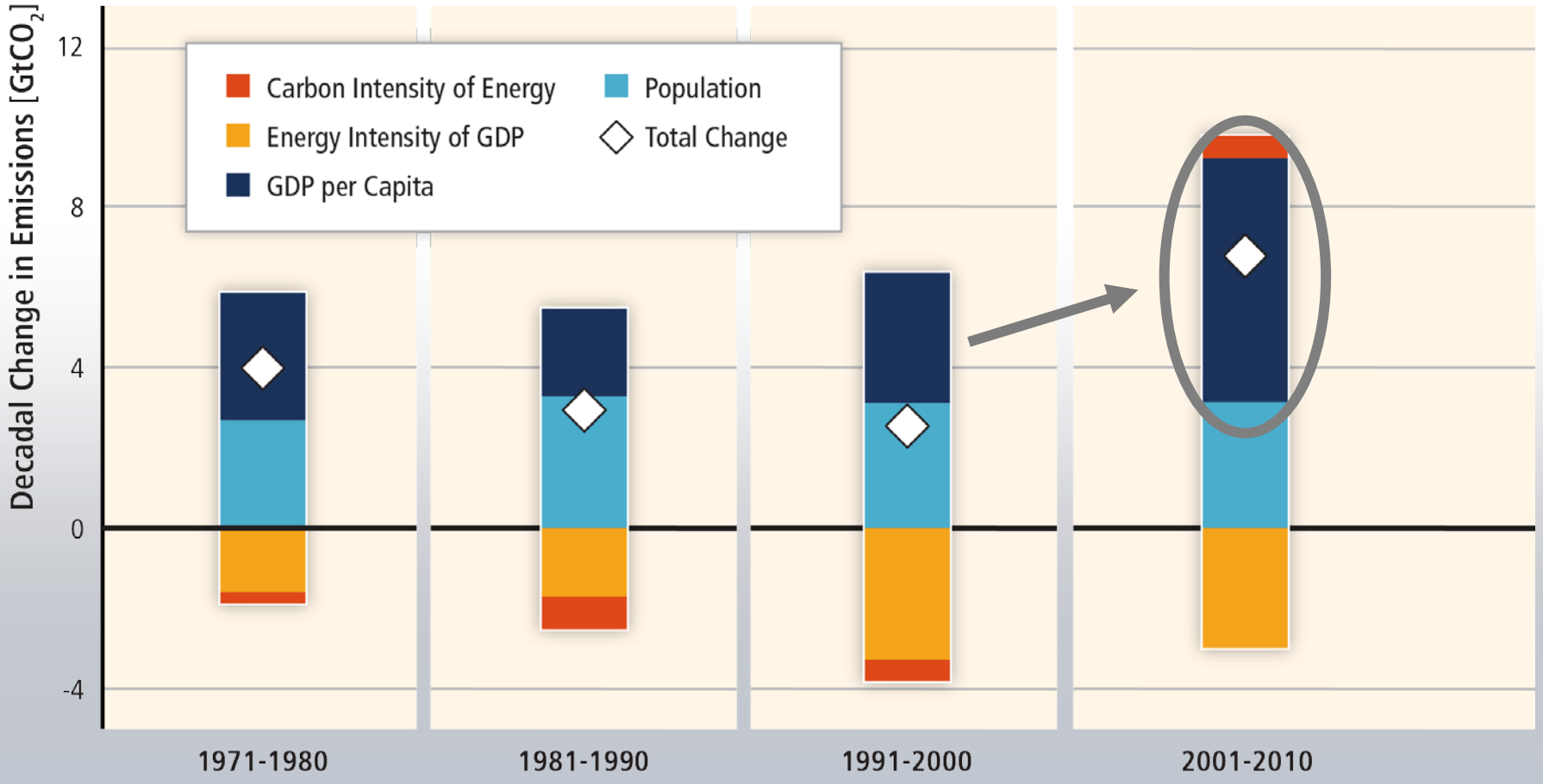

Based on Figure 5.3

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



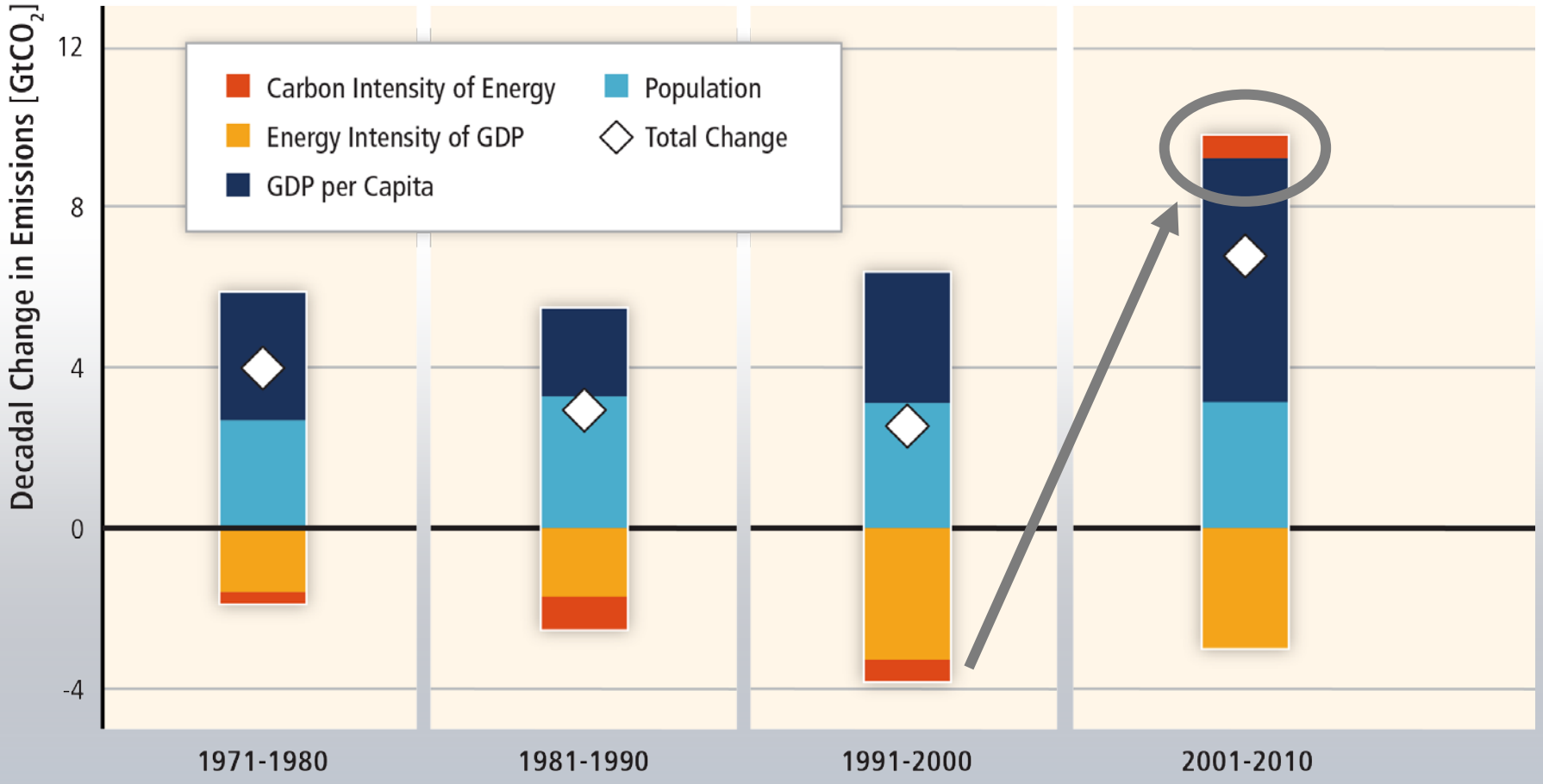

Based on Figure 1.6

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




Based on Figure 1.7

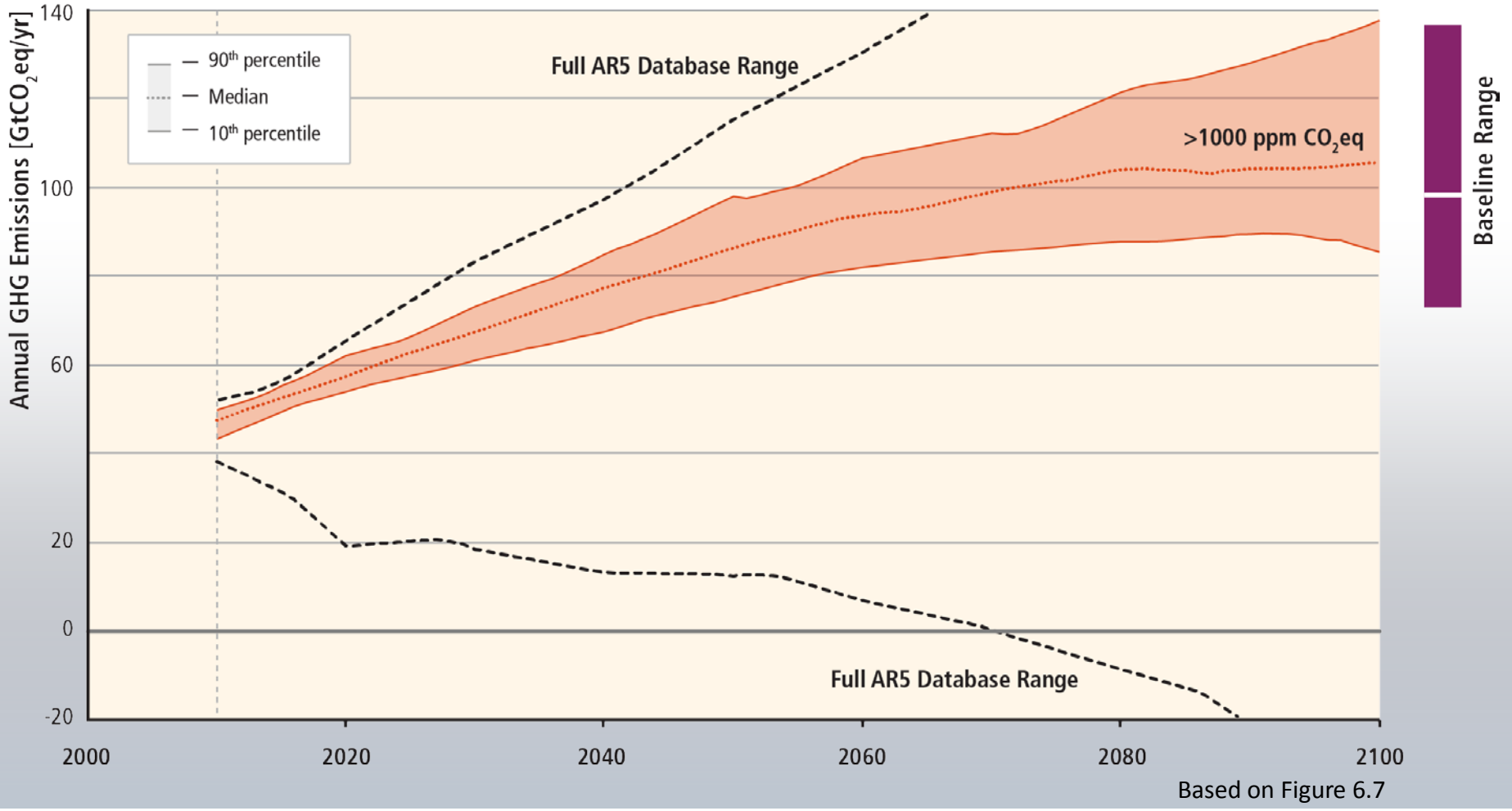
# GHG emissions rise with growth in GDP and population; long-standing trend of decarbonisation of energy reversed.




Based on Figure 1.7


Limiting warming to 2 C involves substantial technological, economic and institutional challenges.

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




Based on Figure 6.7

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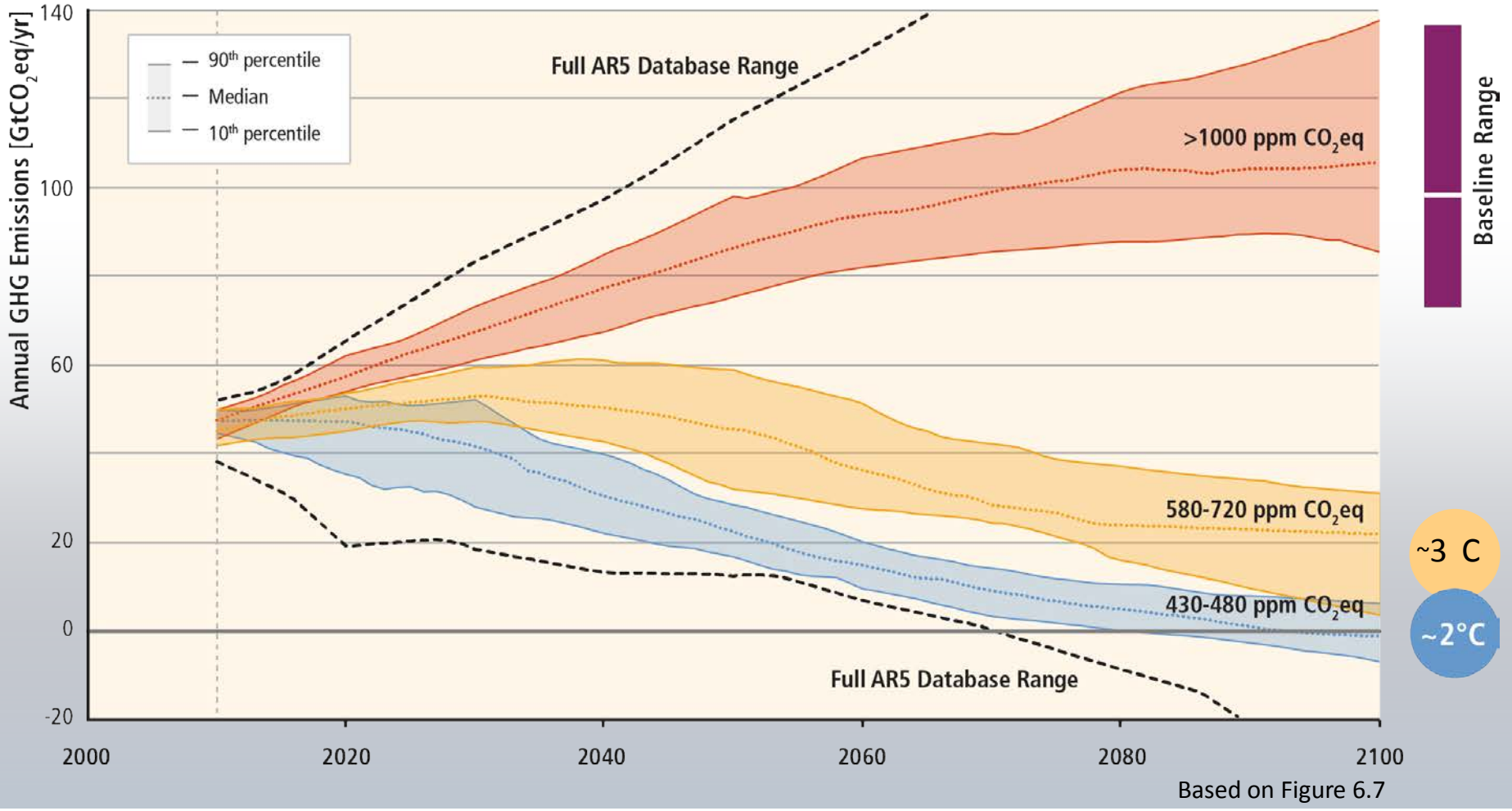
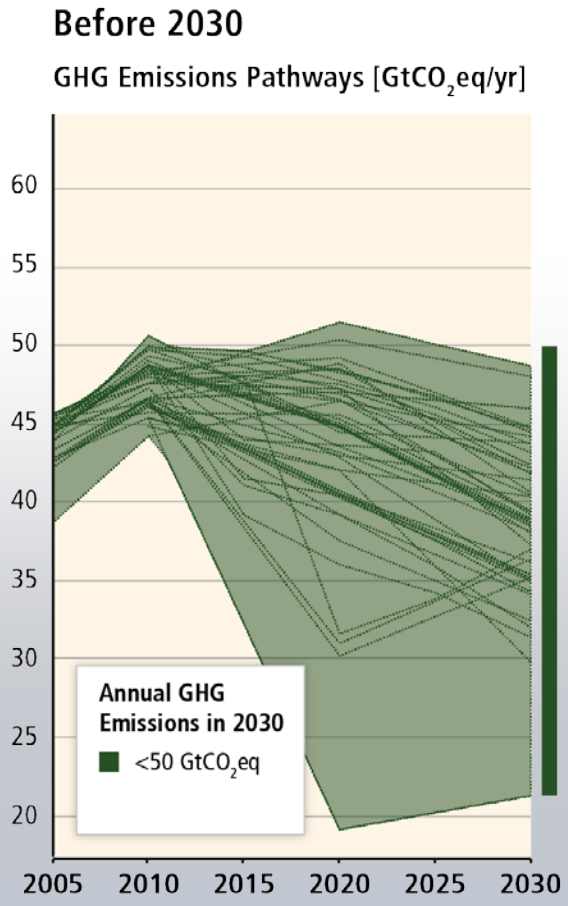



Based on Figure 6.7

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

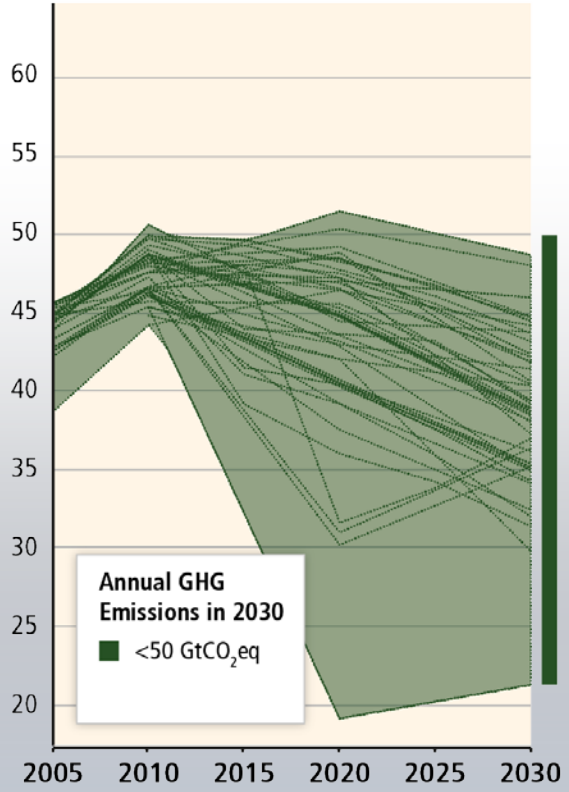



„immediate action“

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

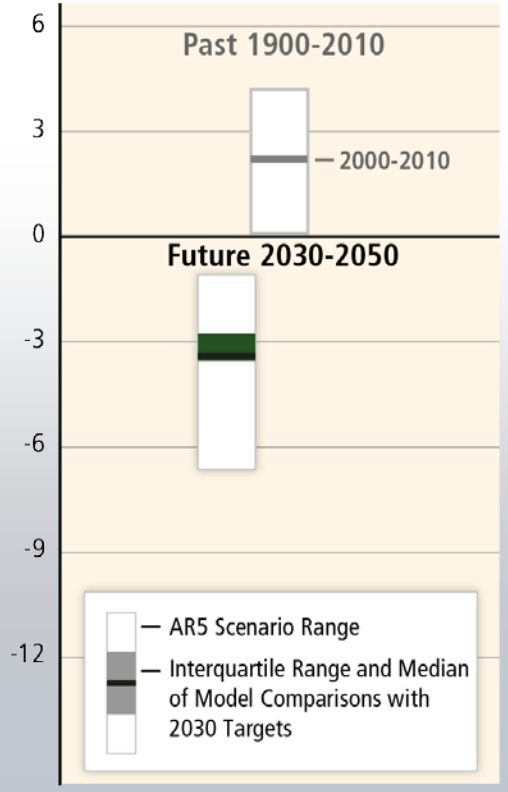
## Before 2030

GHG Emissions Pathways [$GtCO_2eq/yr$]




## After 2030

Rate of $CO_2$ Emission Change [%/yr]



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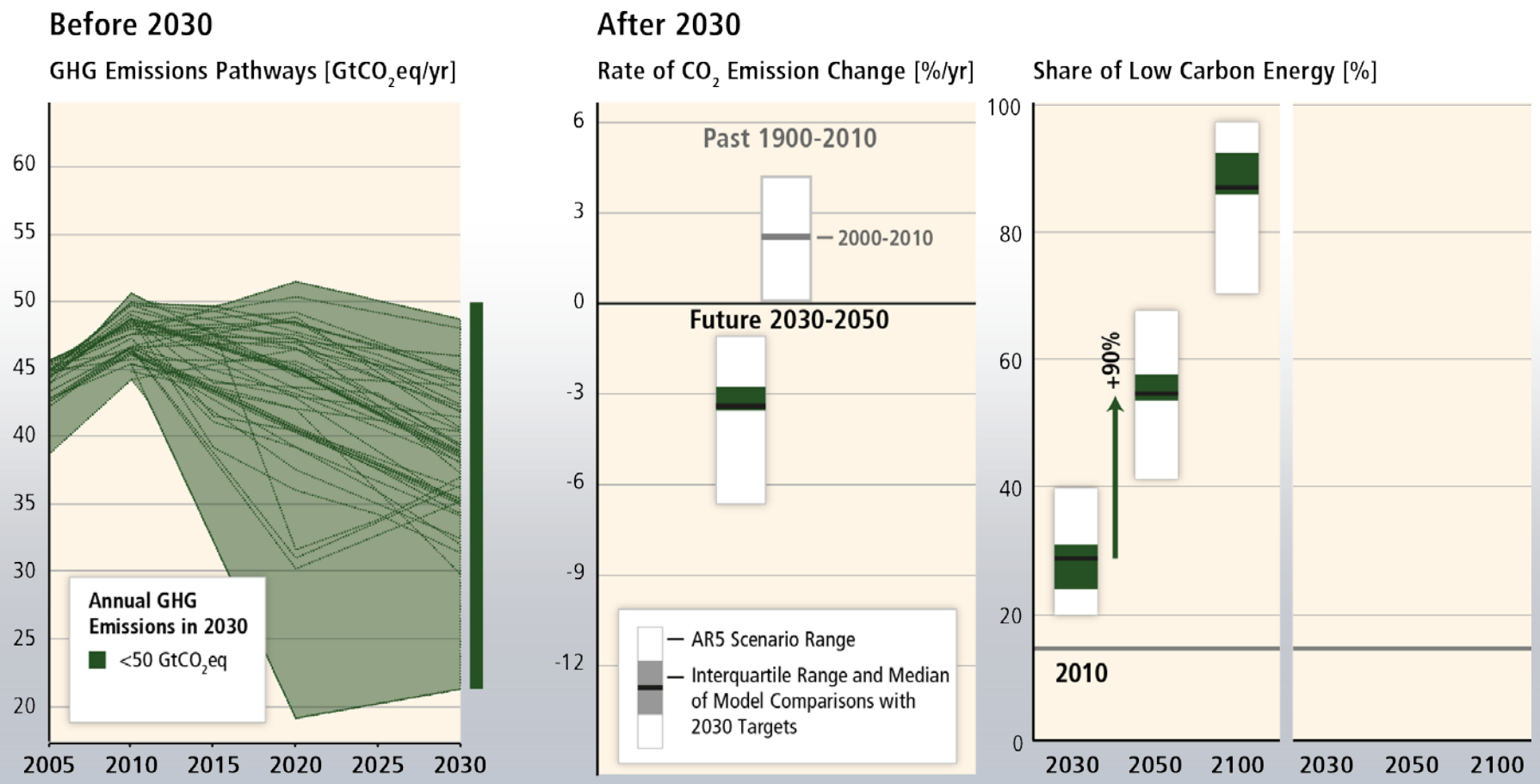
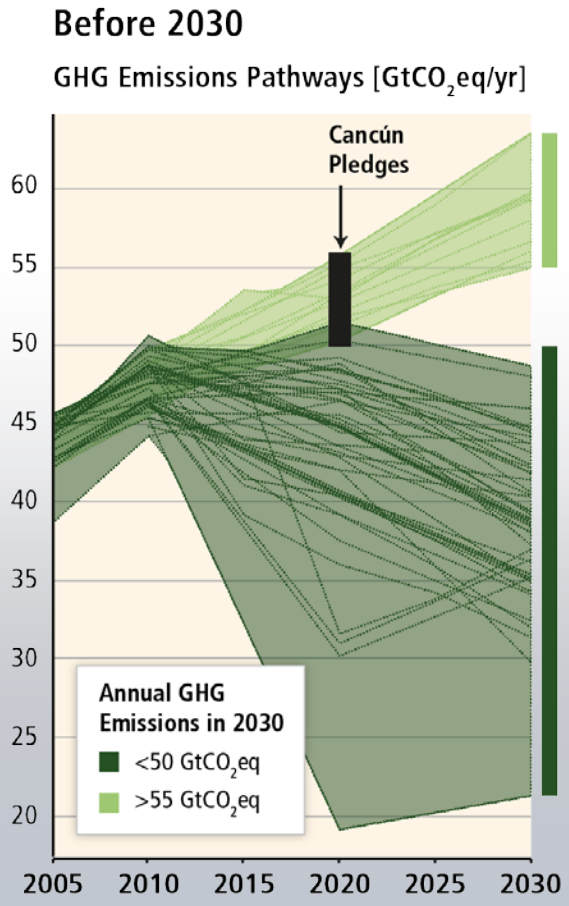


# Delaying mitigation is estimated to increase the difficulty and narrow the options for limiting warming to 2°C.

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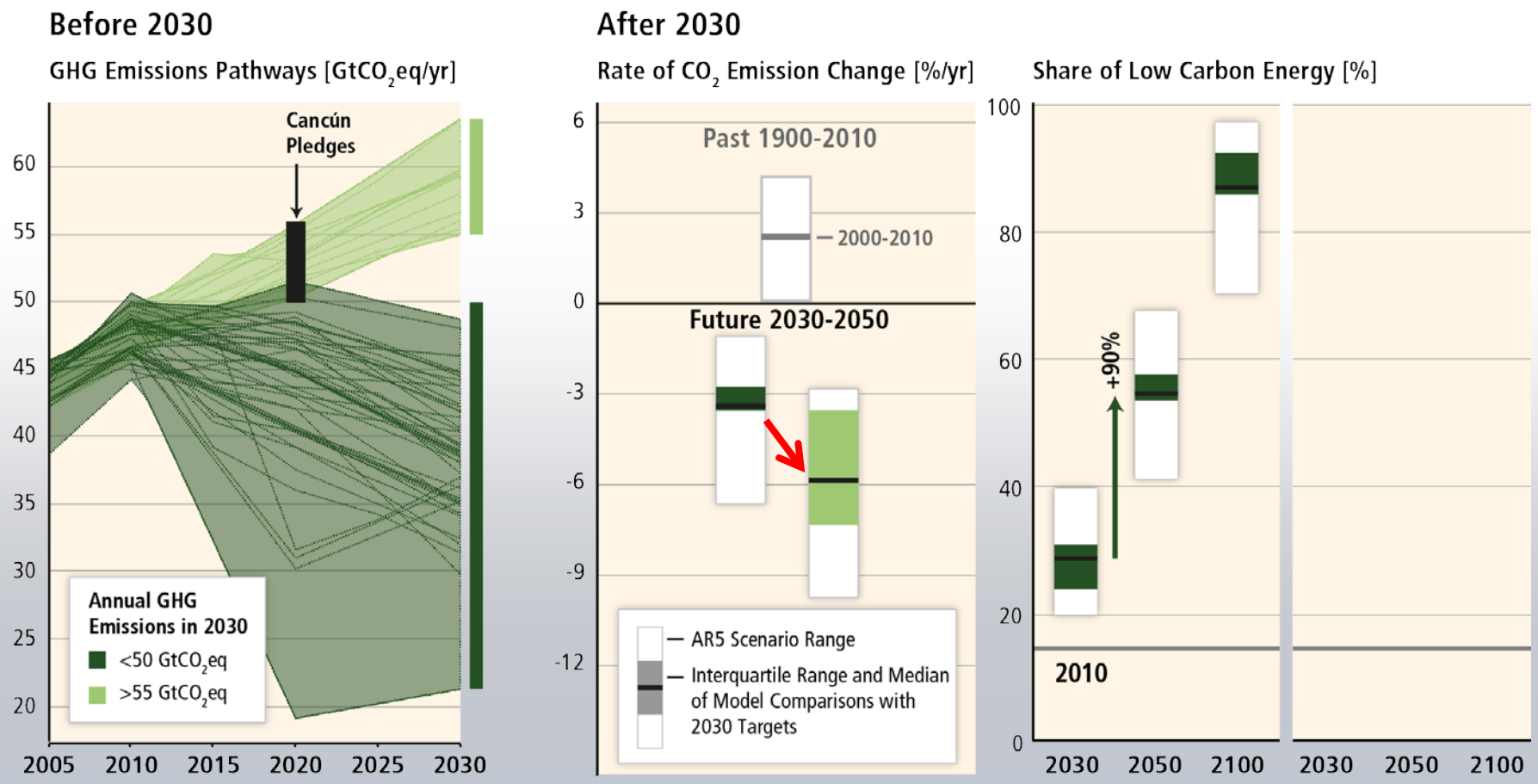

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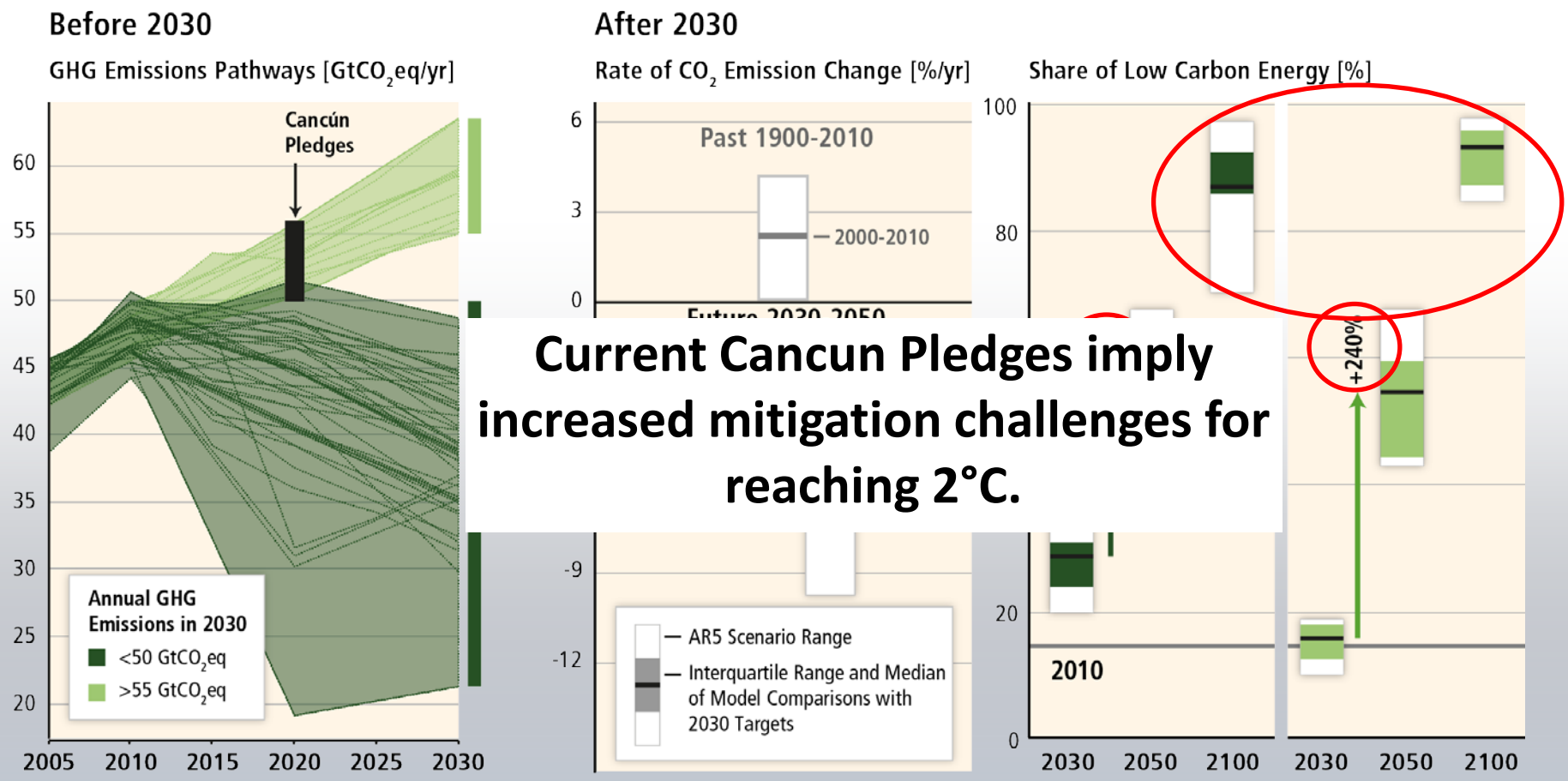



**Current Cancun Pledges imply increased mitigation challenges for reaching 2°C.**

Based on Figures 6.32 and 7.16

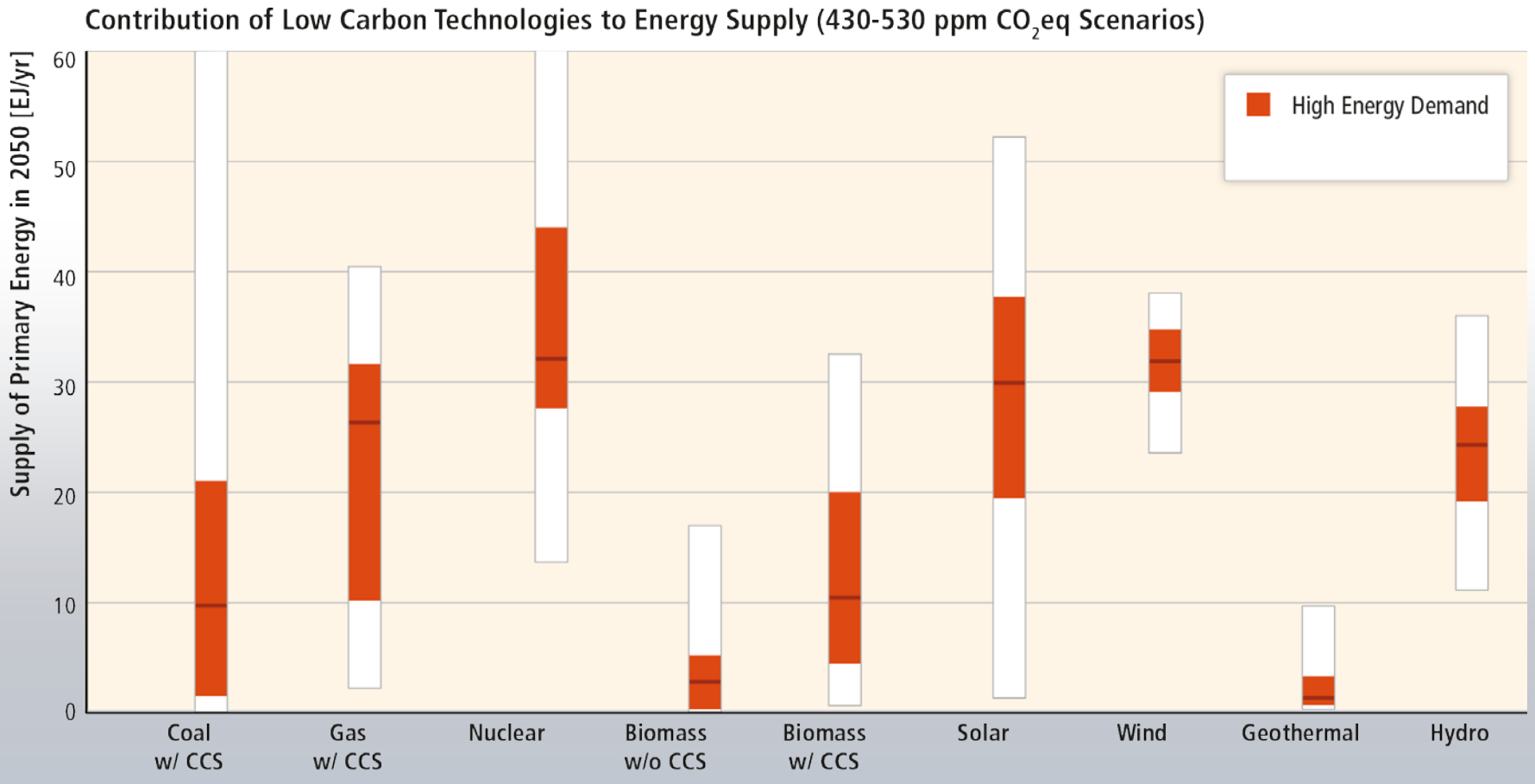
# Scientific evidence on the 1.5°C goal remains limited.

A comprehensive assessment is difficult in the absence of multi-model comparison studies and the limited number of studies focusing on the 1.5°C goal. Existing studies indicate:

- Temperature overshoot and large scale application of carbon dioxide removal technologies
- Immediate mitigation action
- Rapid upscaling of the *full* set of technologies
- Development along a low energy demand pathway

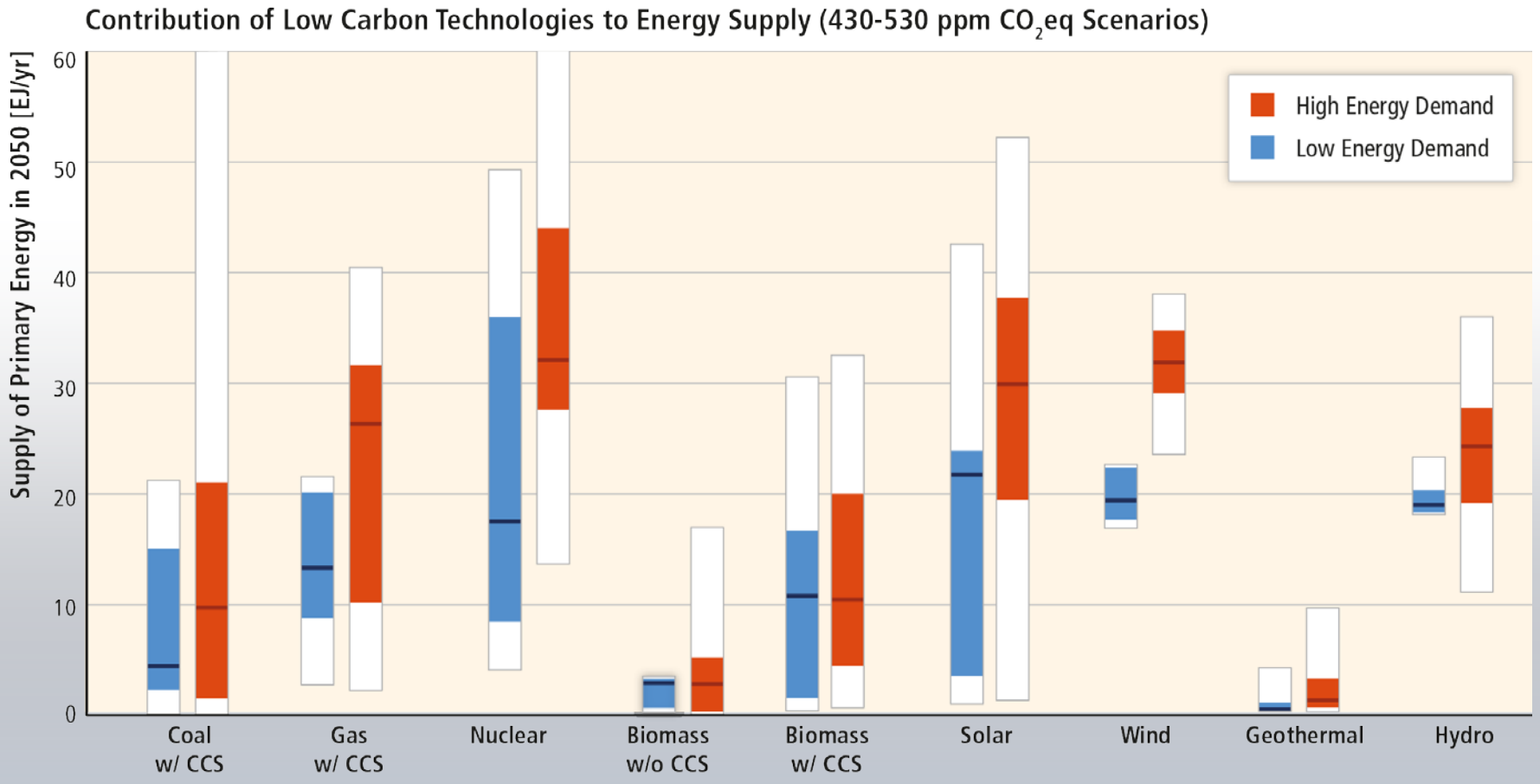

Low stabilization scenarios are dependent upon a full decarbonization of energy supply in the long term.

# Decarbonization of energy supply is a key requirement for limiting warming to 2°C.



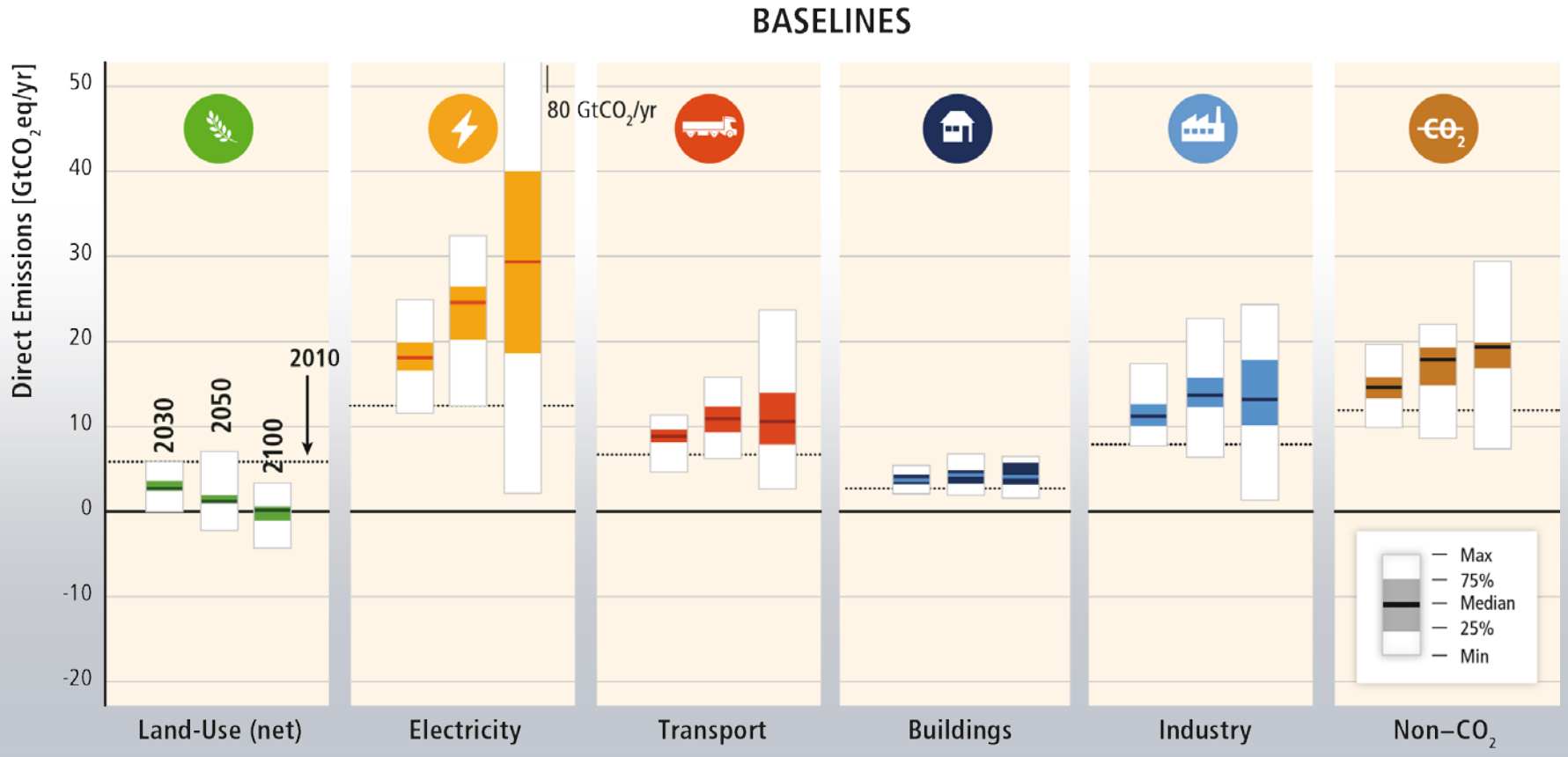

Based on Figure 7.11

# Energy demand reductions can provide flexibility, hedge against risks, avoid lock-in and provide co-benefits.



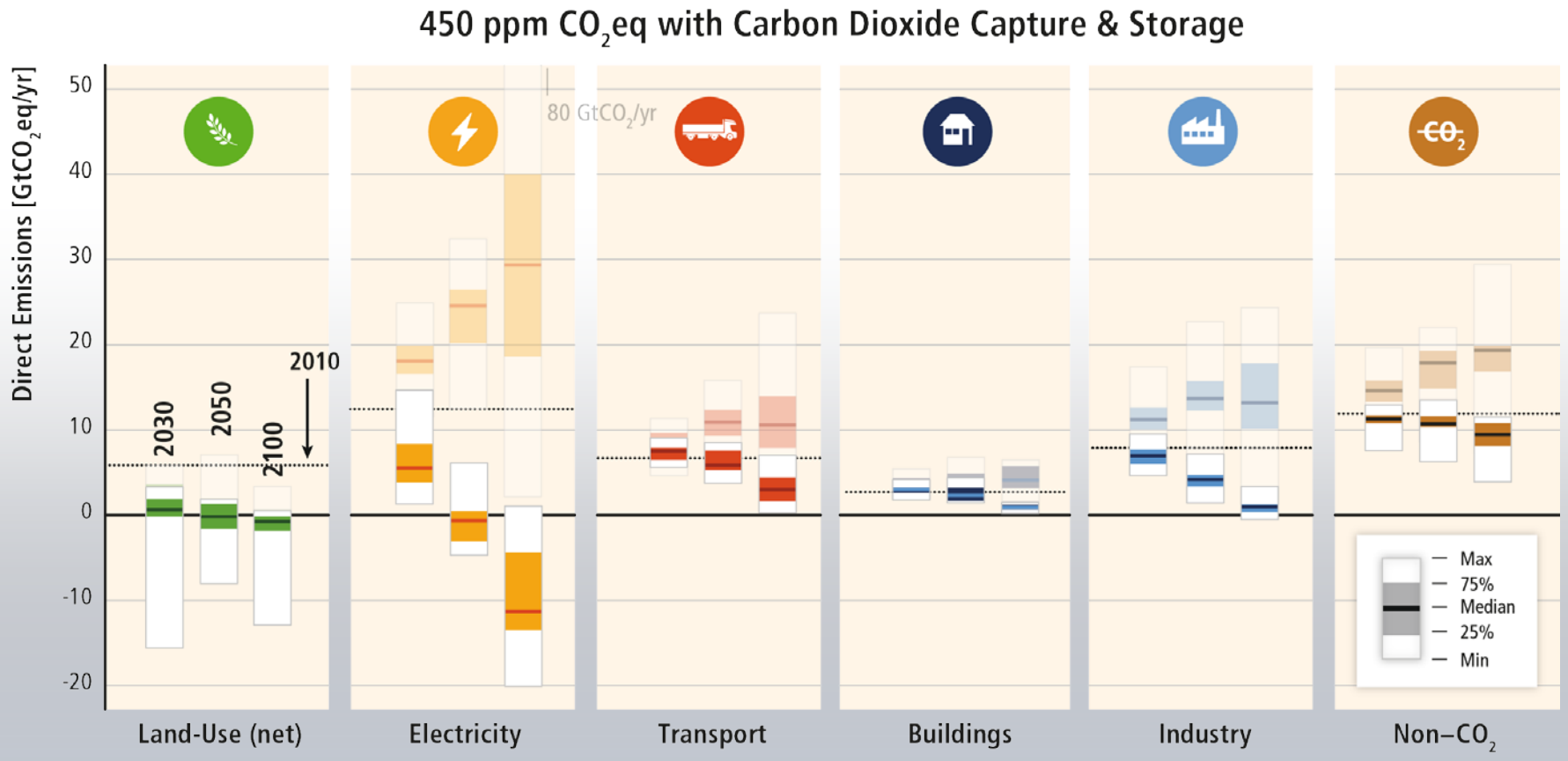

Based on Figure 7.11

# Baseline scenarios suggest rising GHG emissions in all sectors, except for $CO_2$ emissions in the land-use sector.



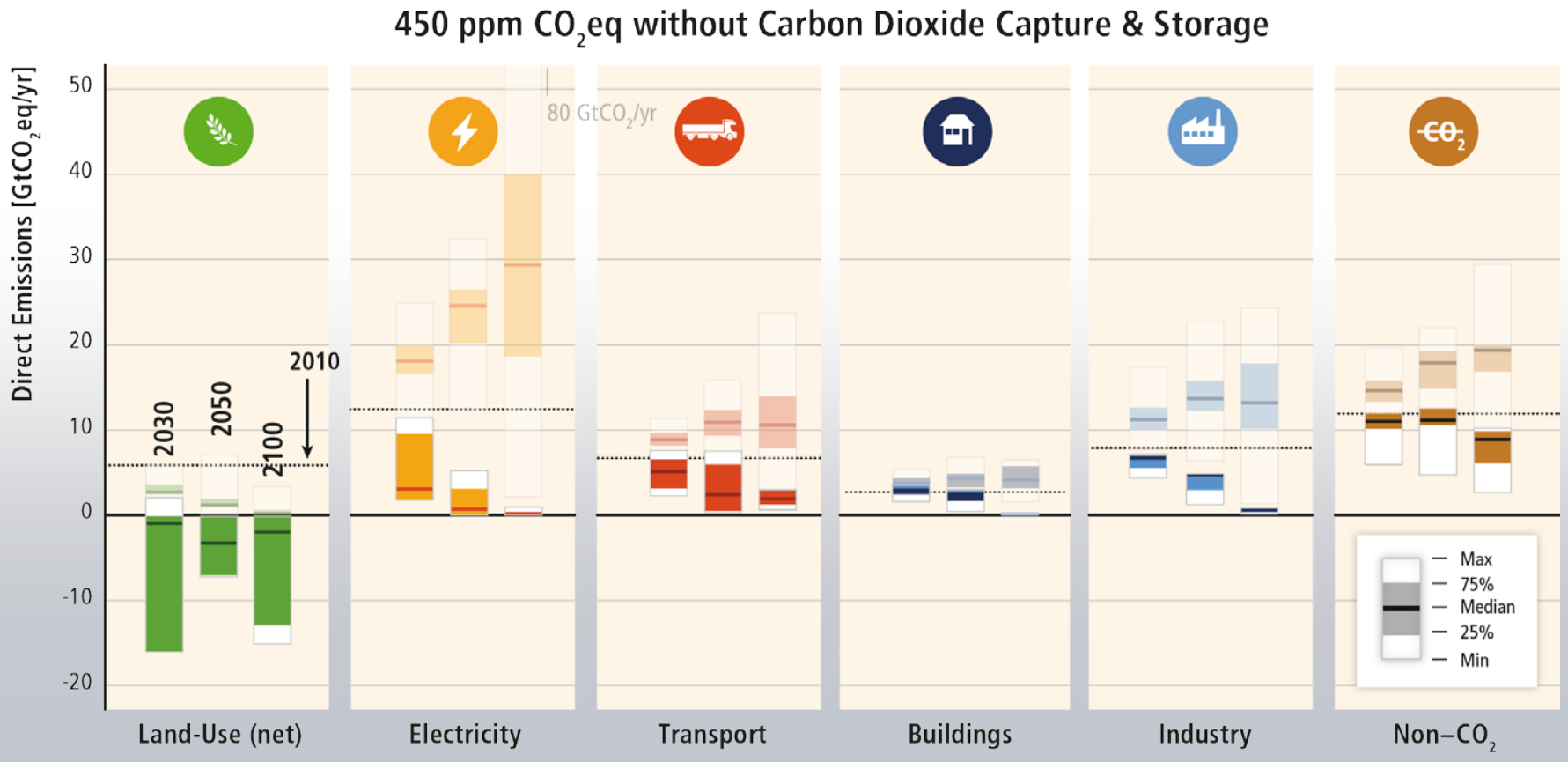

Based on Figure TS.17

# Mitigation requires changes throughout the economy. Systemic approaches are expected to be most effective.



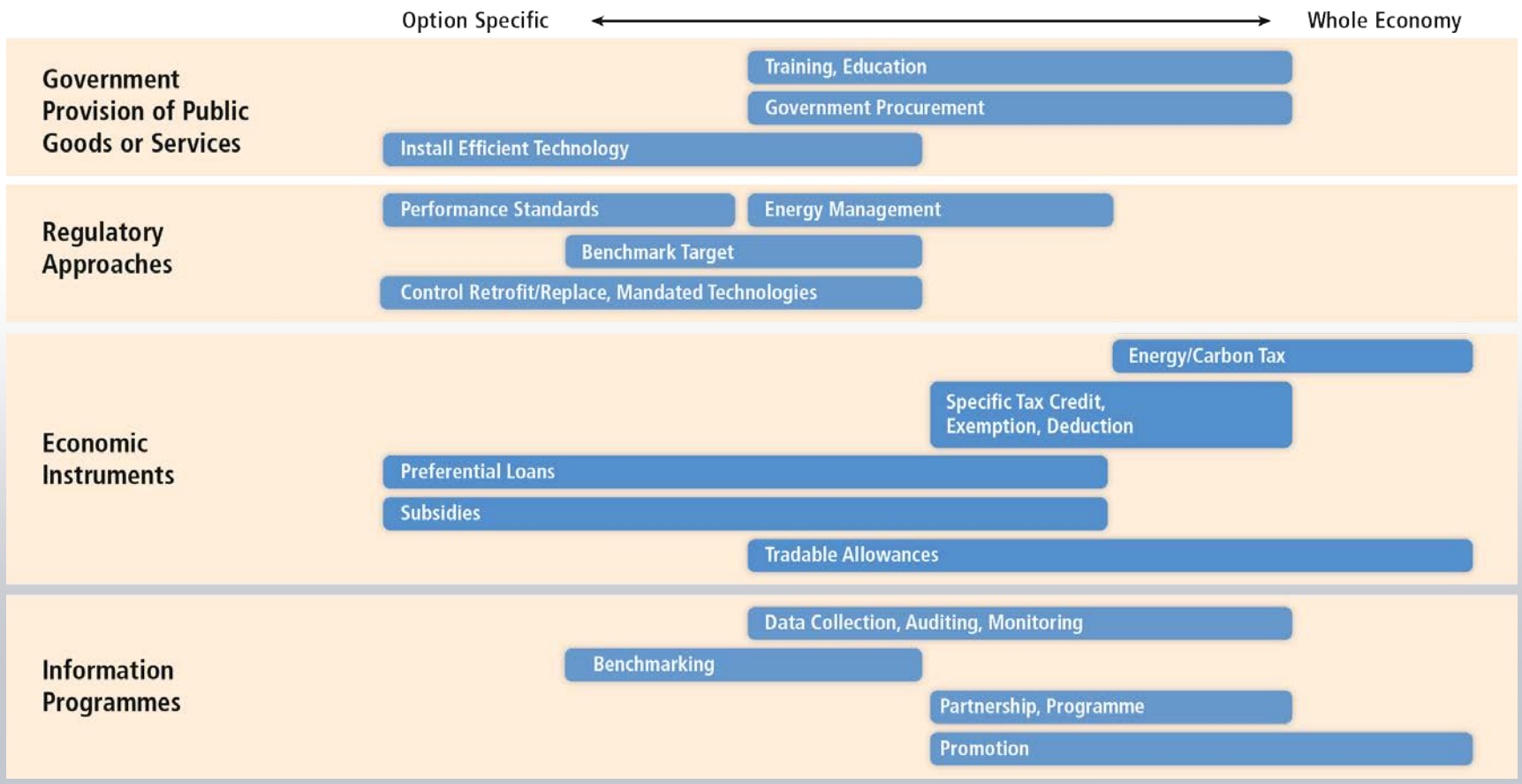

Based on Figure TS.17

# Mitigation efforts in one sector determine efforts in others.




Based on Figure TS.17

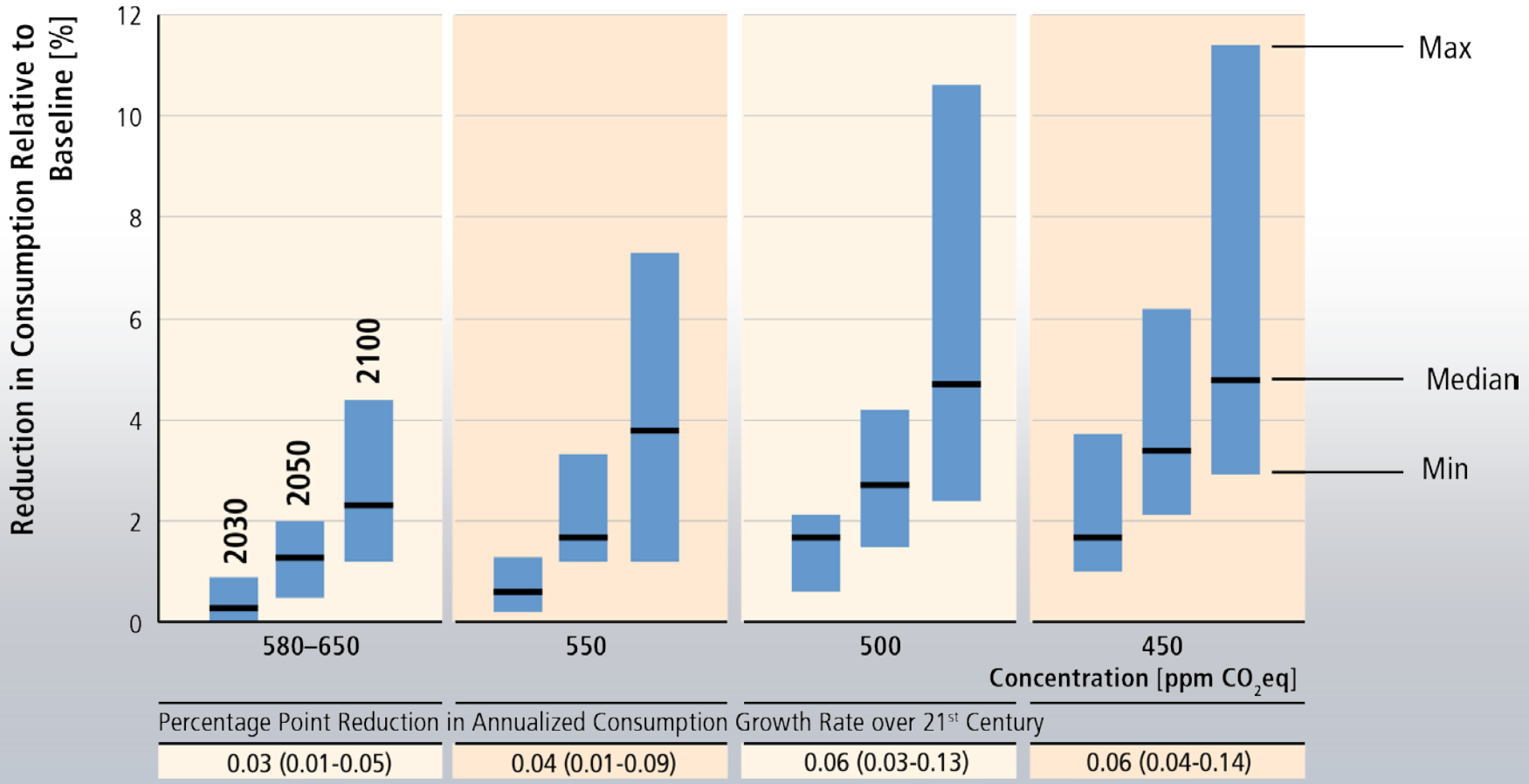
# Sector-specific policies have been more widely used than economy-wide policies.




Based on Figure 10.15

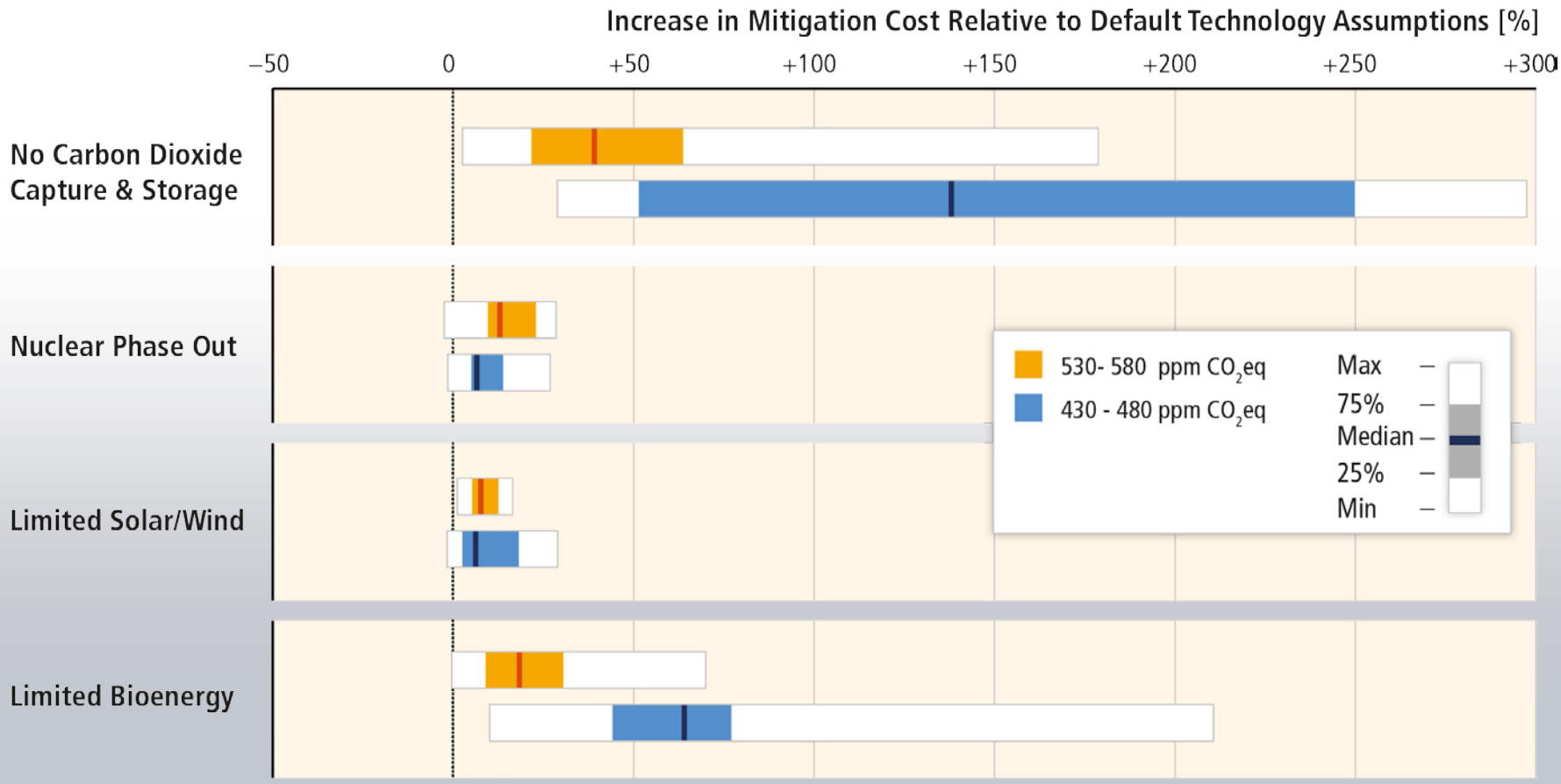

Mitigation cost estimates vary, but do not strongly affect global GDP growth.

# Global costs rise with the ambition of the mitigation goal.



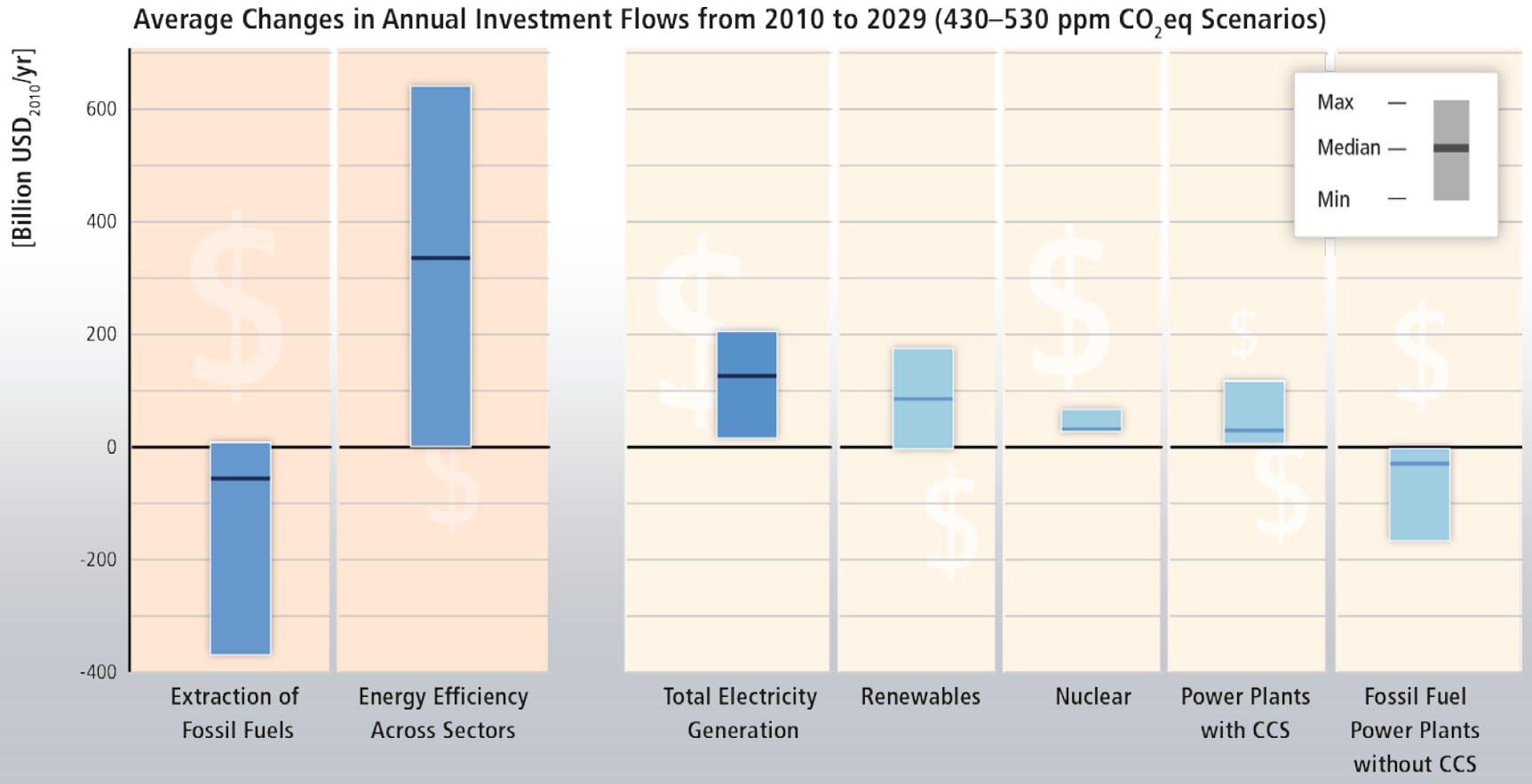

Based on Table SPM.2

# Availability of technology can greatly influence mitigation costs.



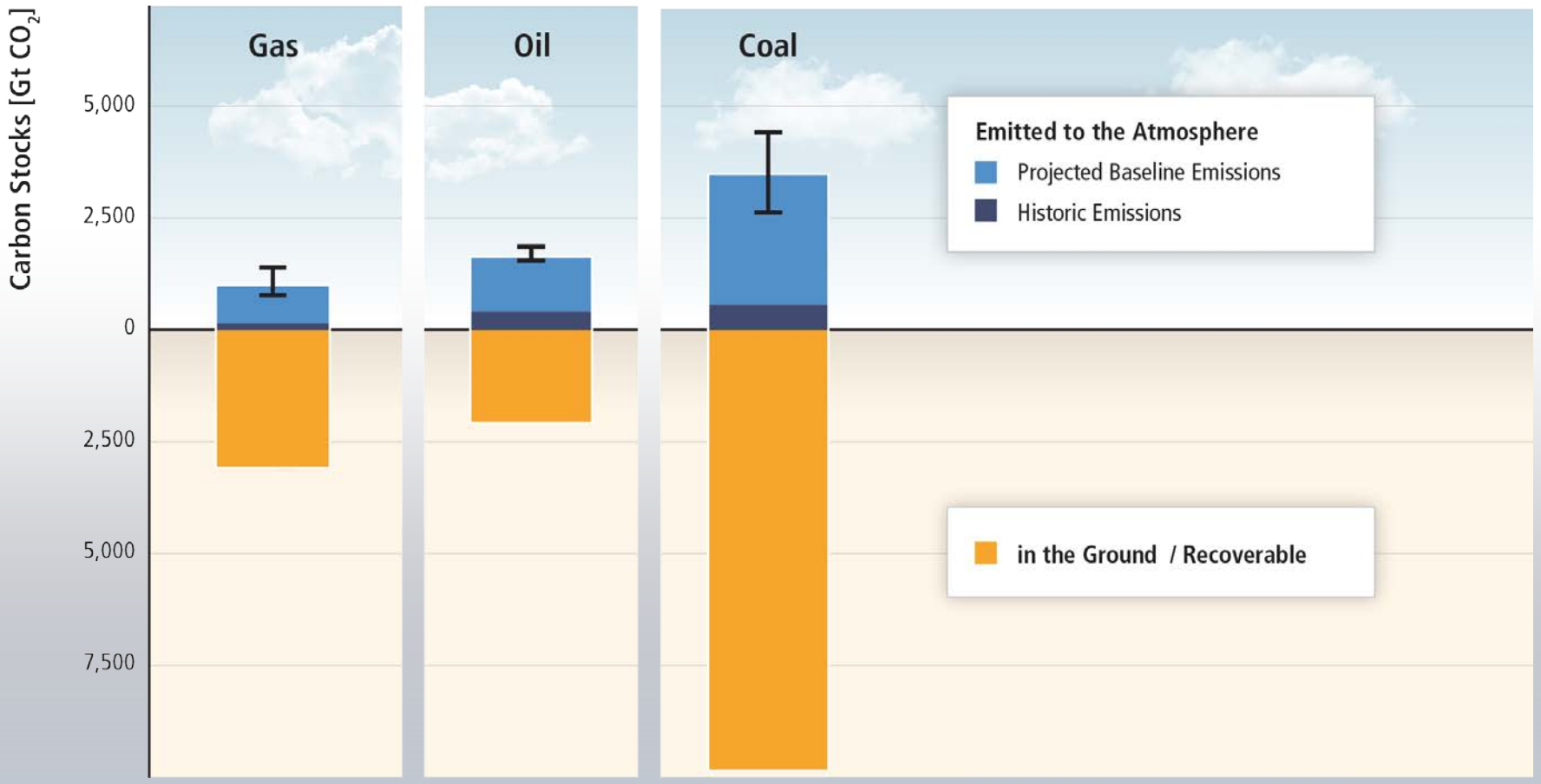

Based on Figure 6.24

# Substantial reductions in emissions would require large changes in investment patterns and appropriate policies.



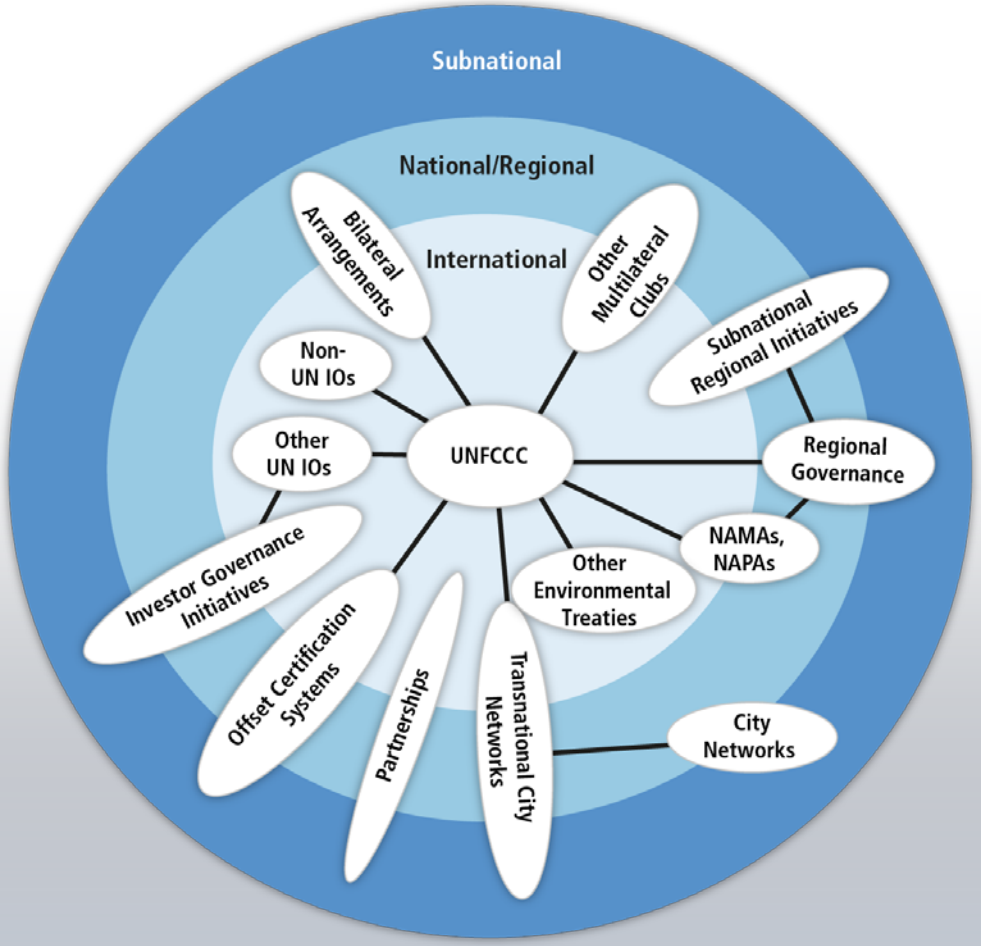

Based on Figure 16.3

# There is far more carbon in the ground than emitted in any baseline scenario.




Based on SRREN Figure 1.7

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




Based on Figure 13.1

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