

# CLIMATE CHANGE 2014

## *Mitigation of Climate Change*

**Ottmar Edenhofer**

Co-Chair, IPCC Working Group III

WG3 Side Event, SBSTA, Bonn

6 June 2014



# 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



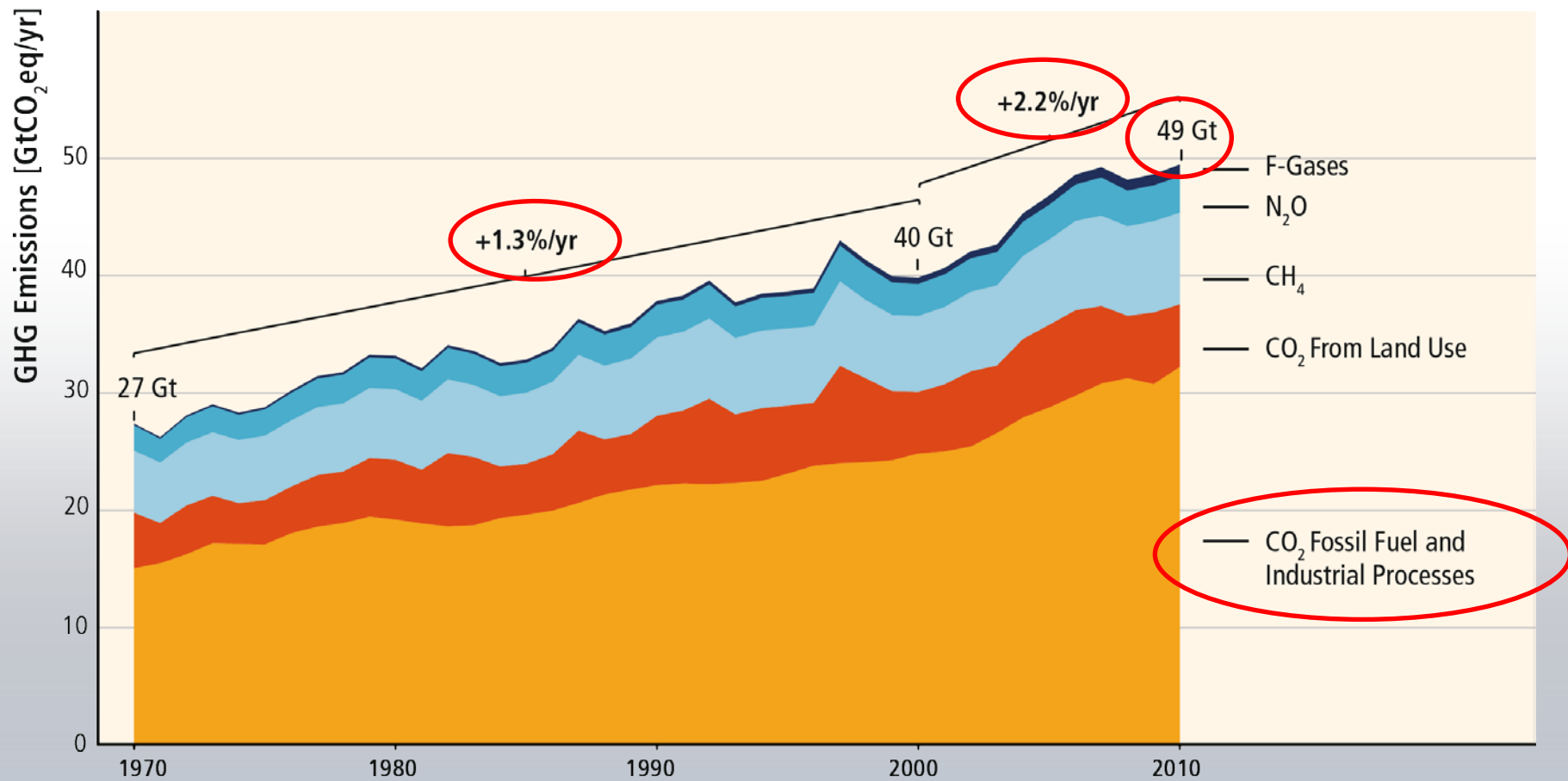


An aerial photograph of a dense urban landscape, likely a major city in Asia, featuring a complex multi-level highway interchange in the foreground and a dense cluster of high-rise buildings in the background. The sky is overcast with grey clouds. The text is overlaid in the center of the image.

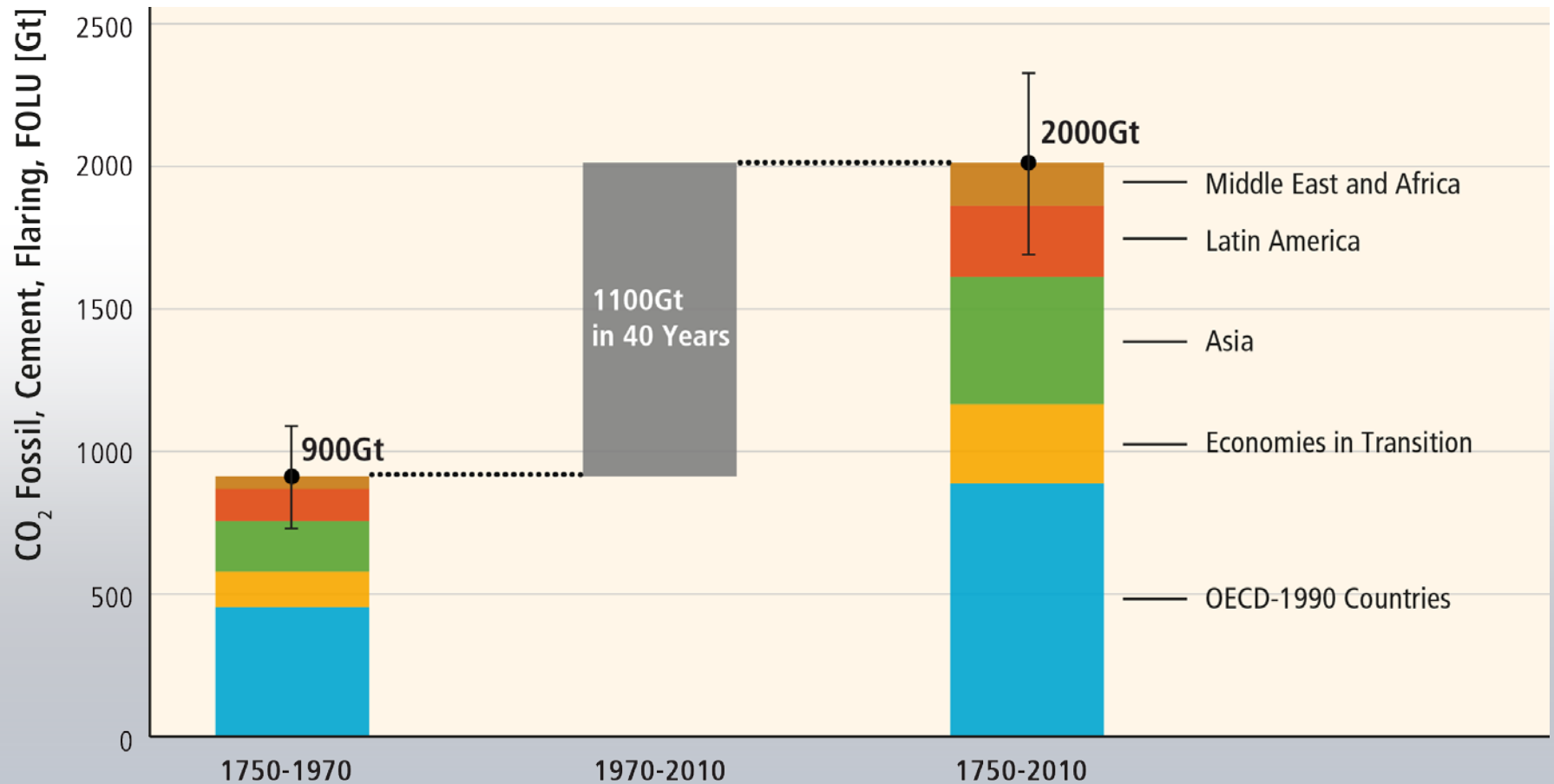
**GHG emissions growth has accelerated despite reduction efforts.**



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



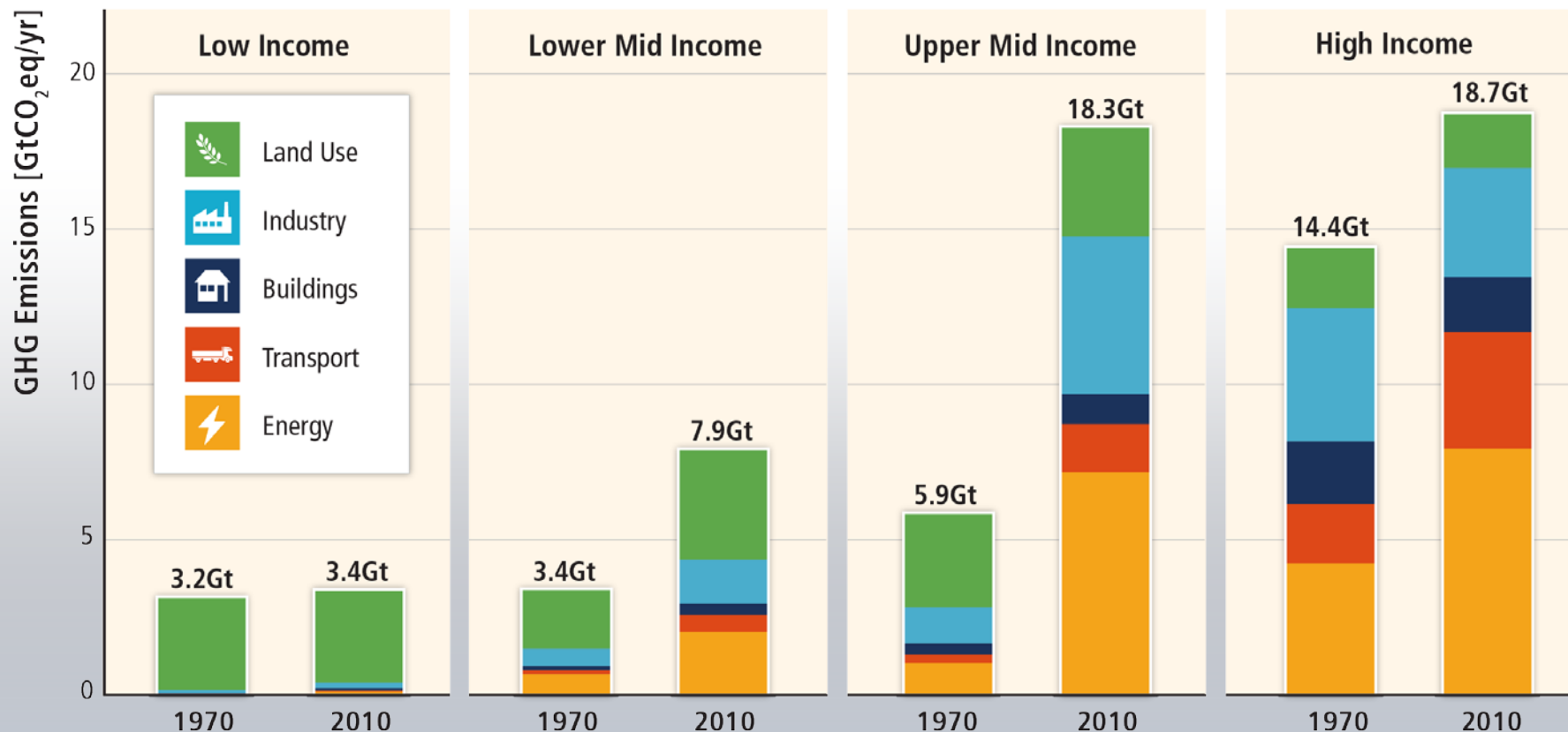
# About half of cumulative anthropogenic CO<sub>2</sub> emissions between 1750 and 2010 have occurred in the last 40 years.



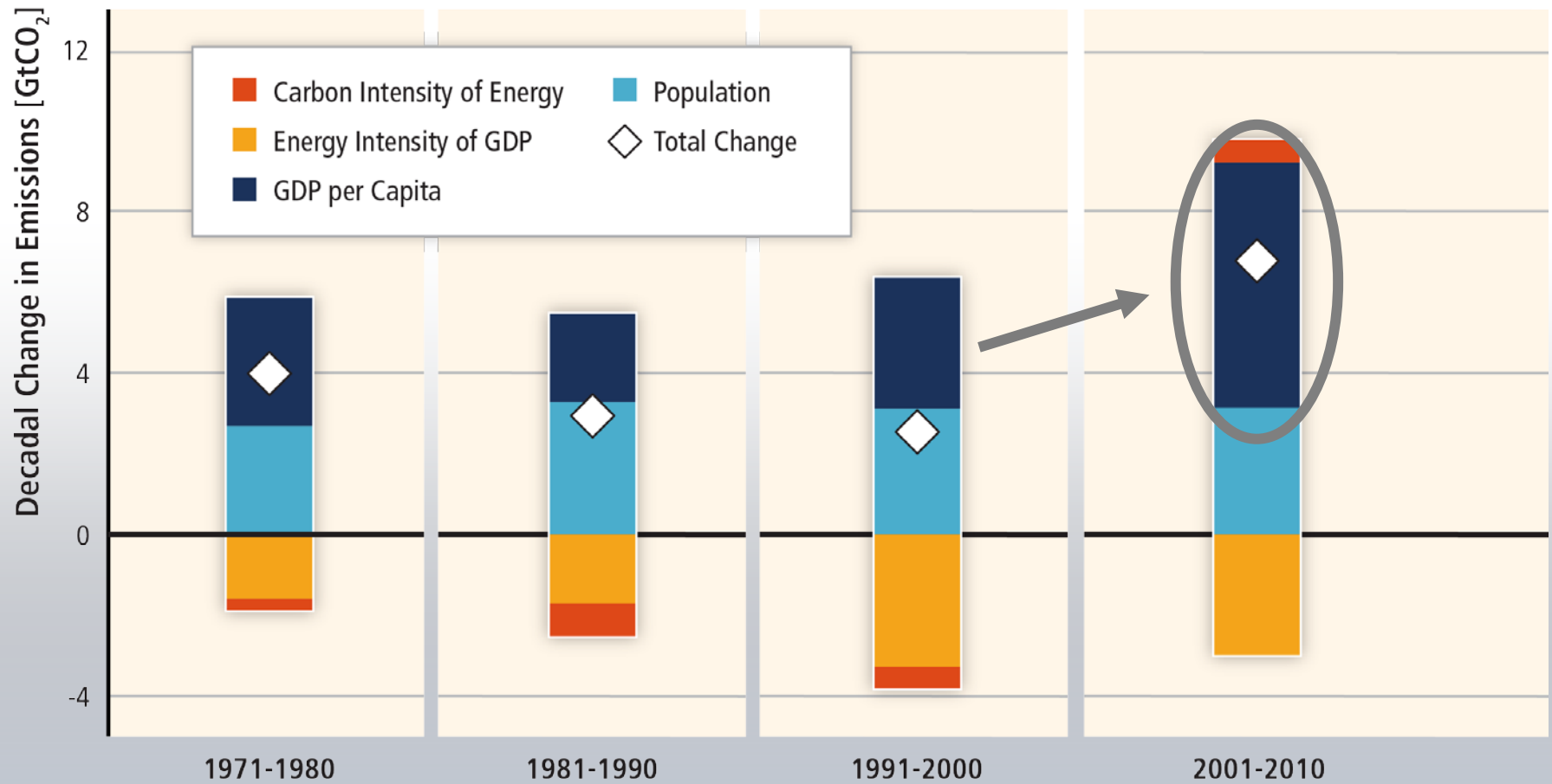


# Regional patterns of GHG emissions are shifting along with changes in the world economy.

## GHG Emissions by Country Group and Economic Sector

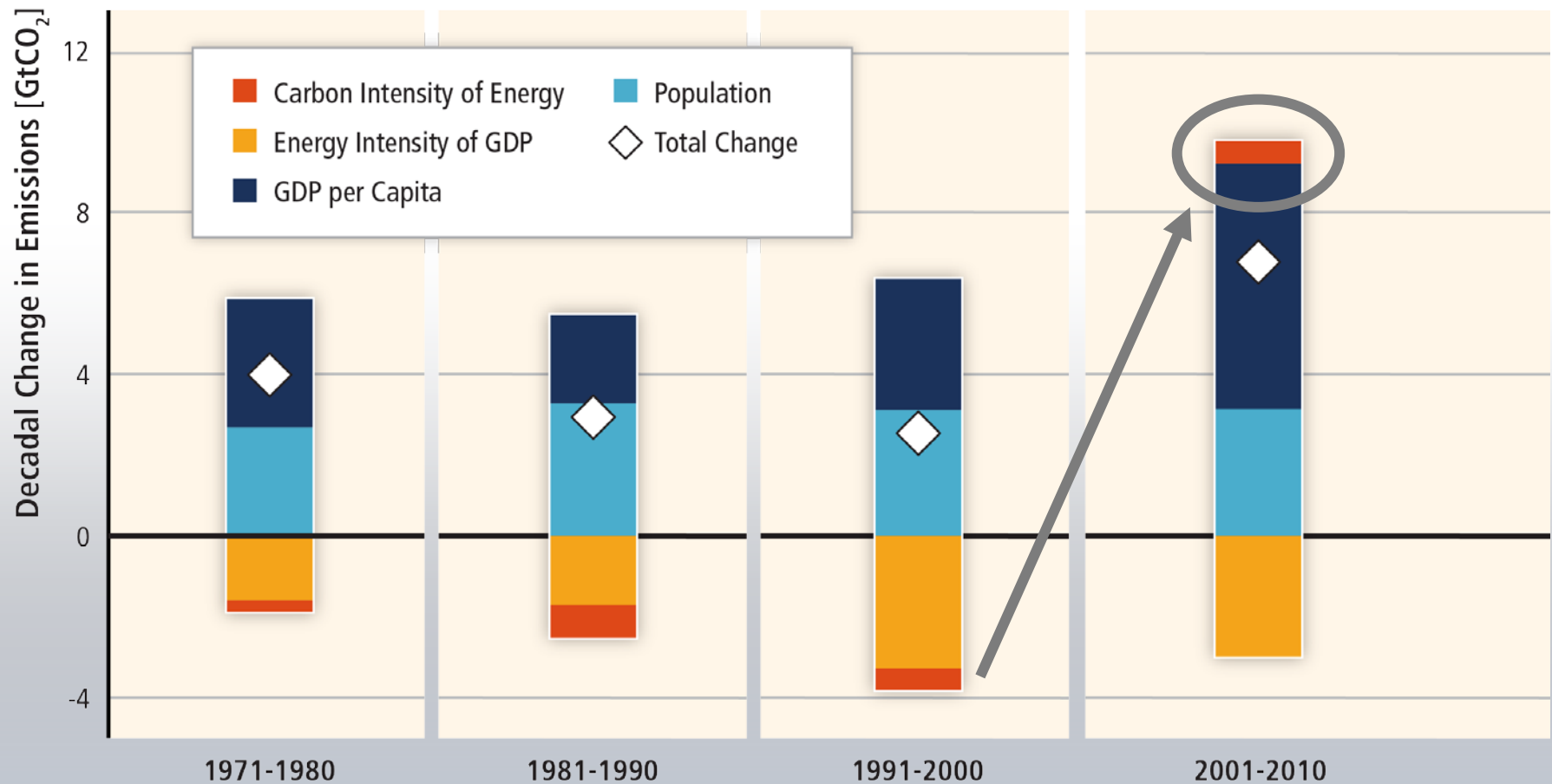


# Most of the recent GHG emission growth has been driven by growth in economic activity.





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

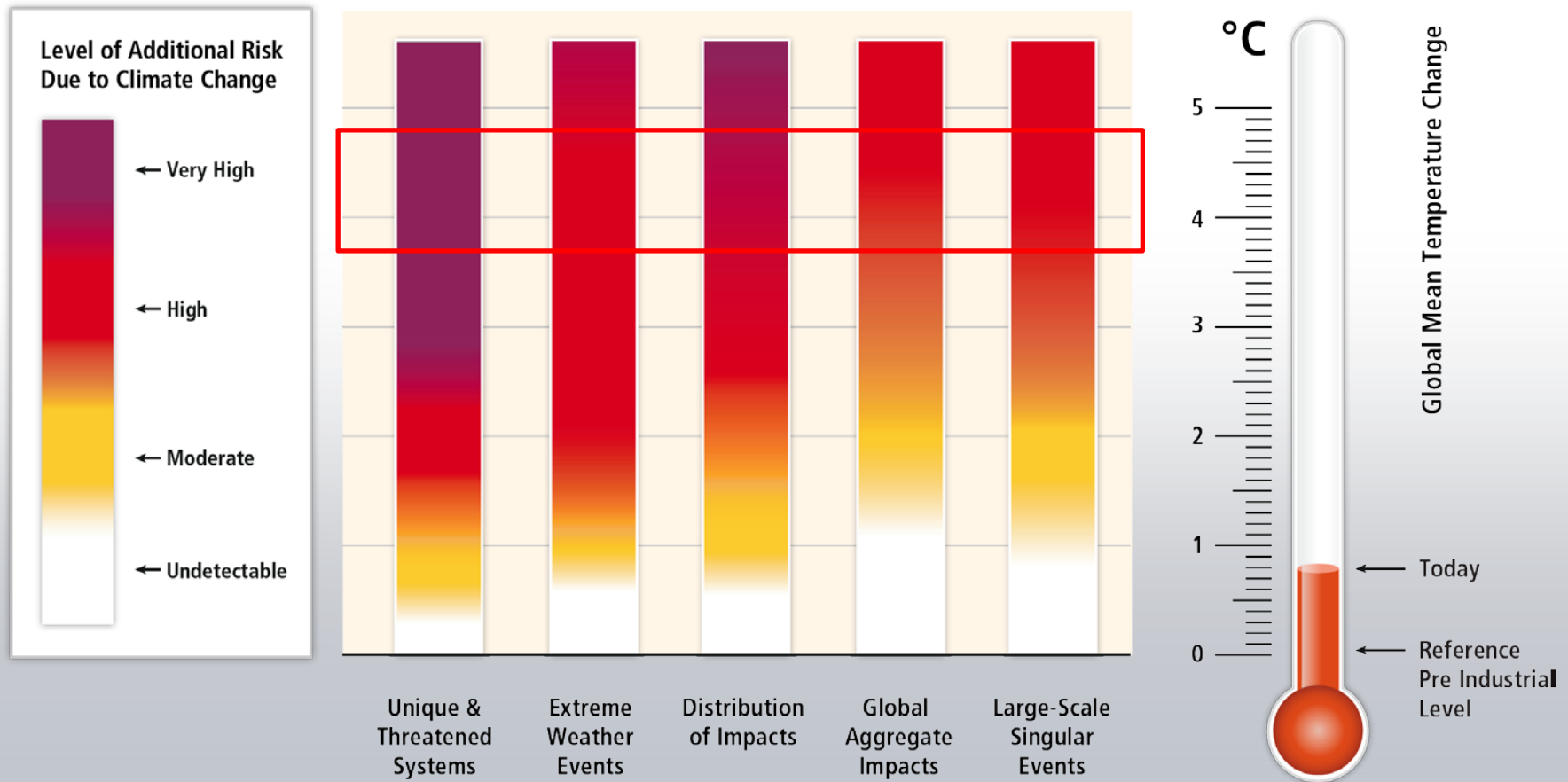


An aerial photograph of a dense urban landscape, likely Hong Kong, featuring a complex multi-level highway interchange in the foreground and numerous high-rise buildings in the background. The sky is a clear, deep blue. The text is overlaid in the center of the image.

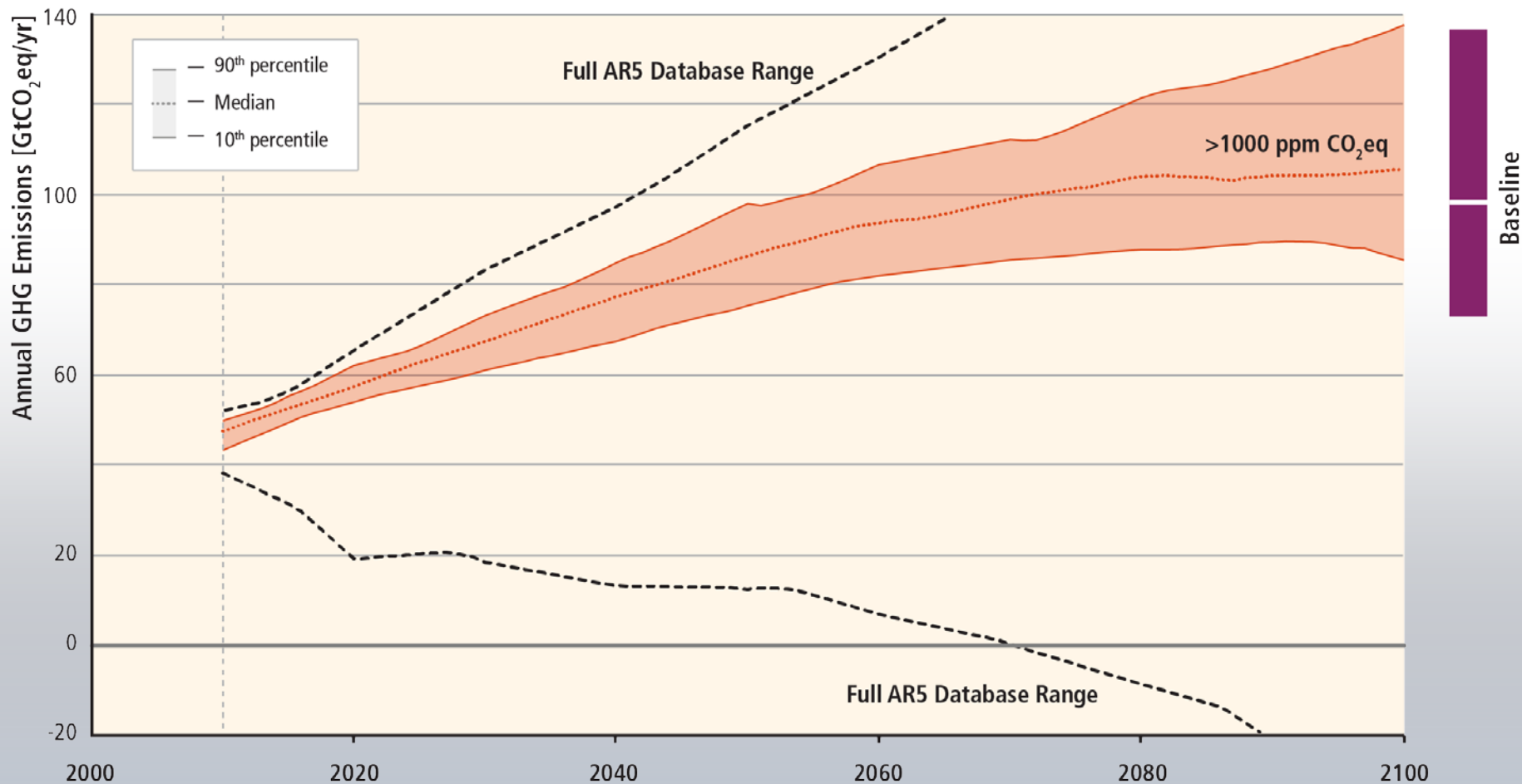
**Limit warming to 2 C relative to pre-industrial levels involves substantial technological, economic and institutional challenges.**



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 21<sup>st</sup> century.

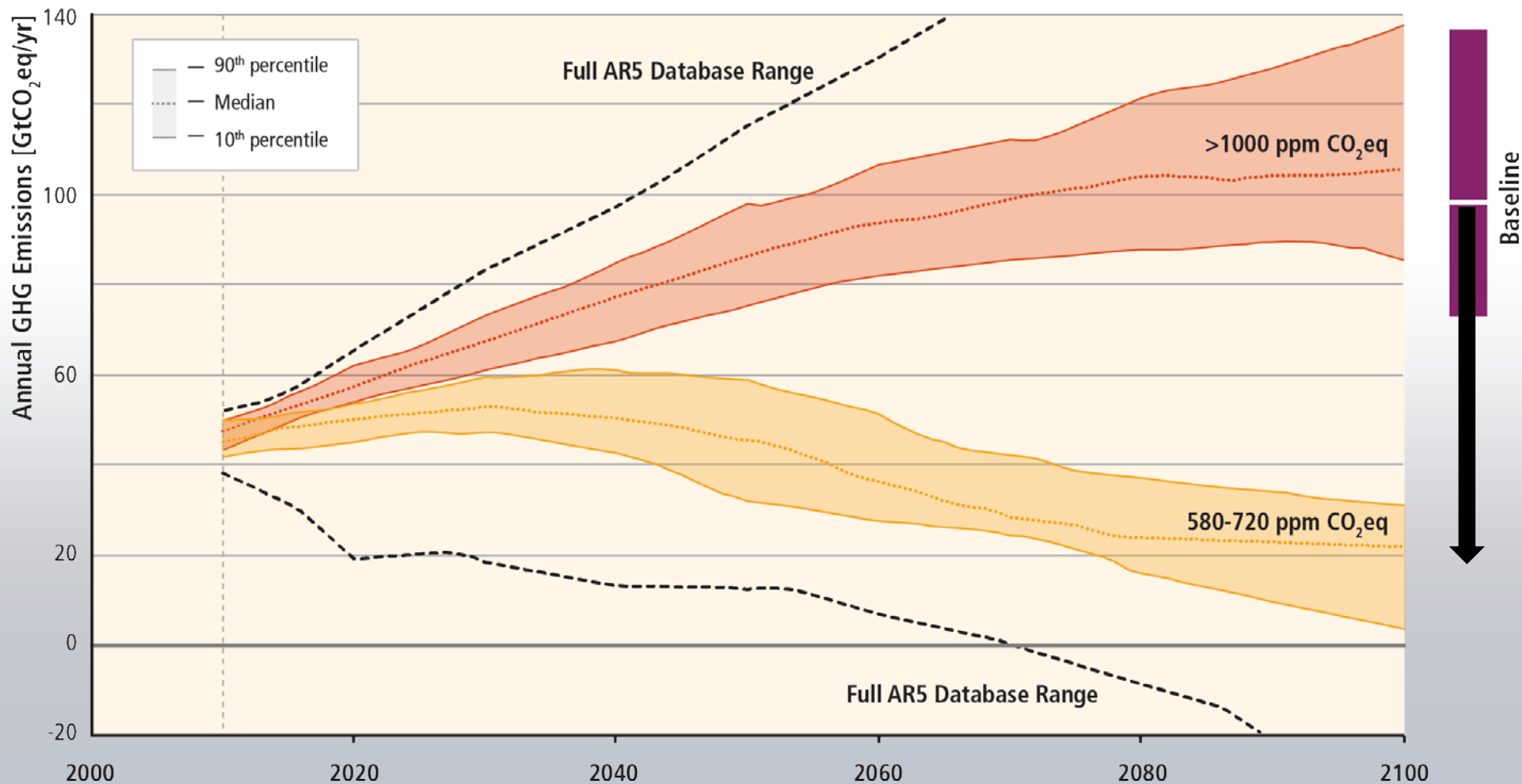


# Stabilization of atmospheric concentrations requires moving away from the baseline – regardless of the mitigation goal.

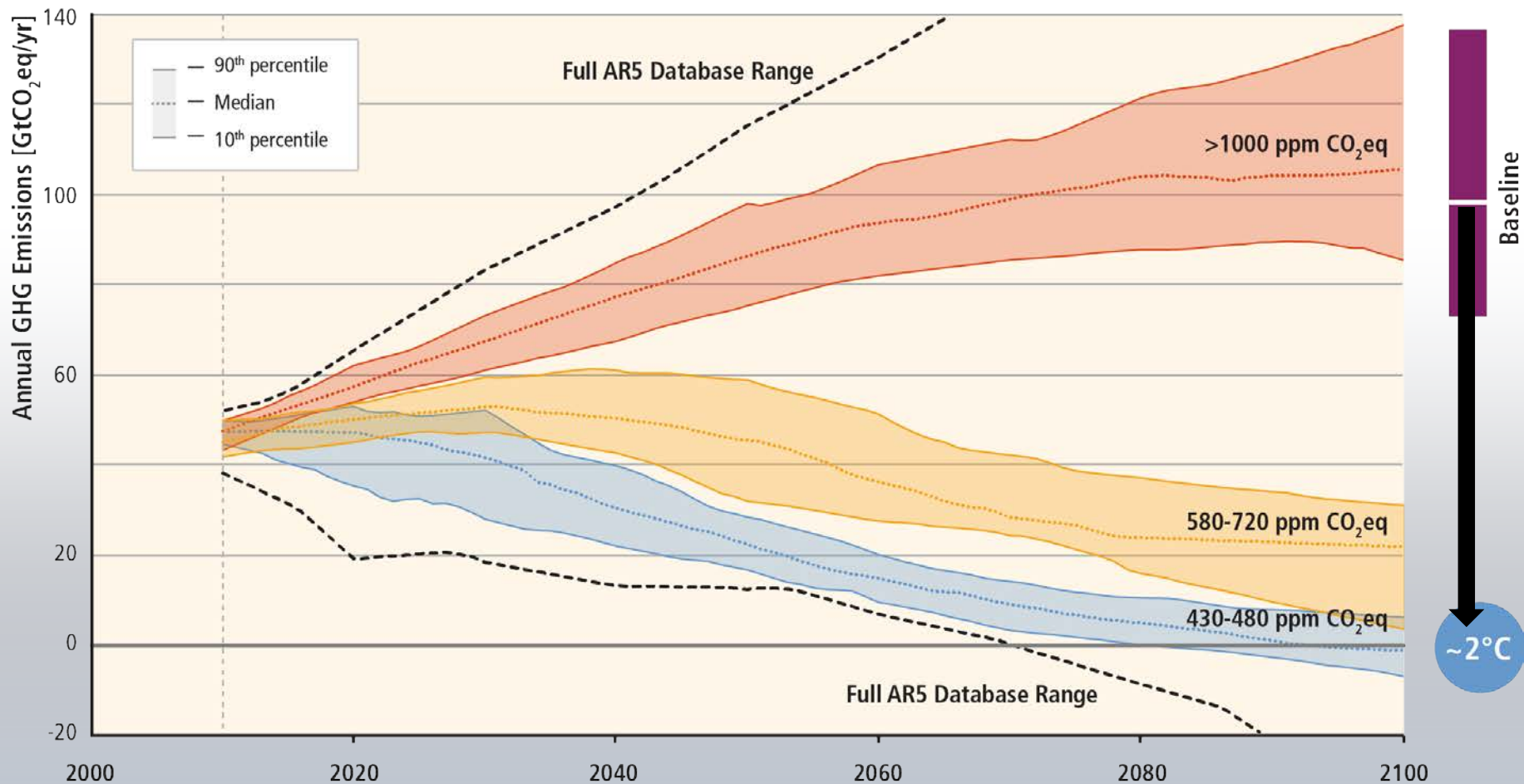




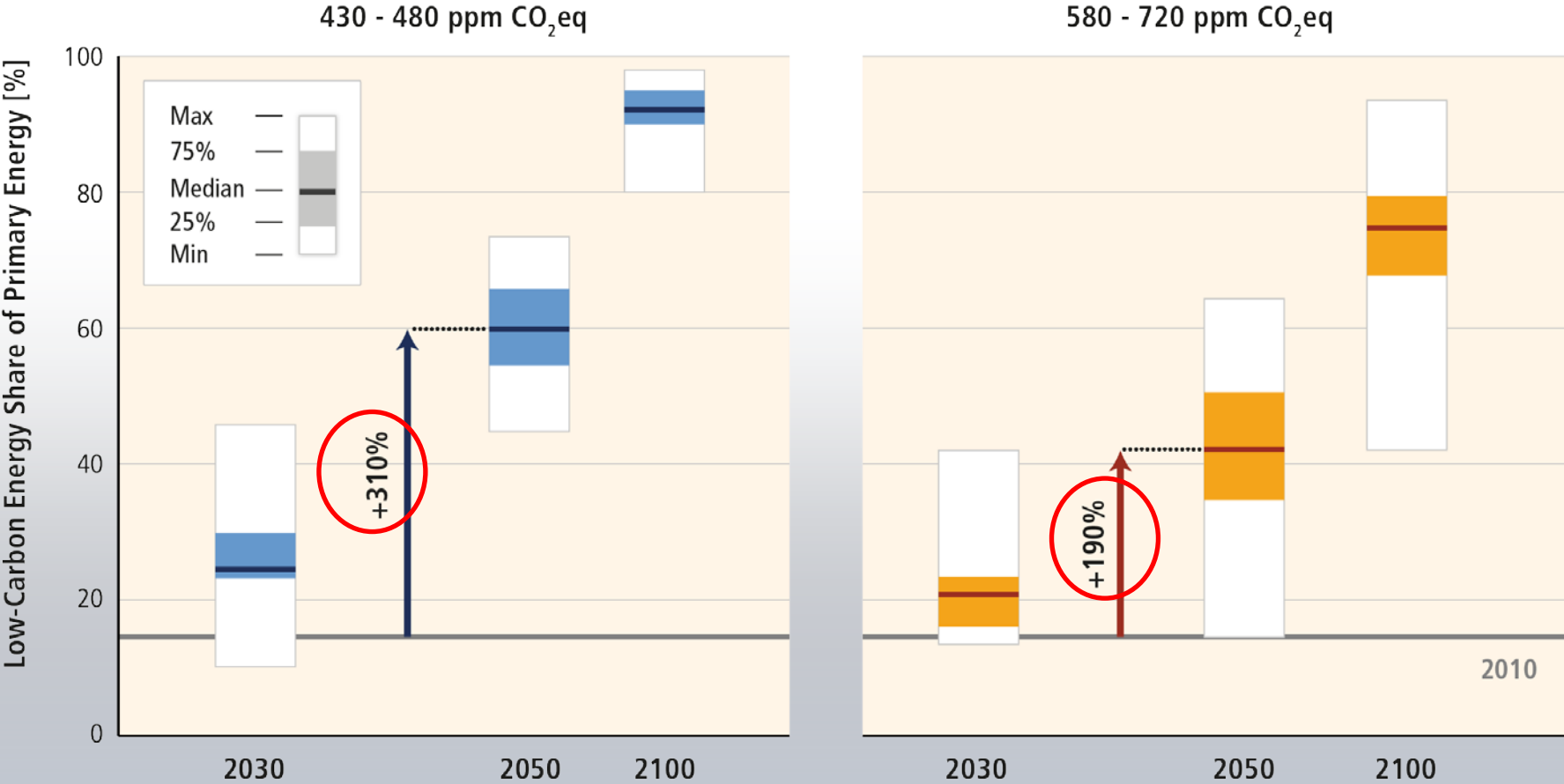
# Stabilization of atmospheric concentrations requires moving away from the baseline – regardless of the mitigation goal.



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



# Mitigation involves substantial upscaling of low carbon energy.

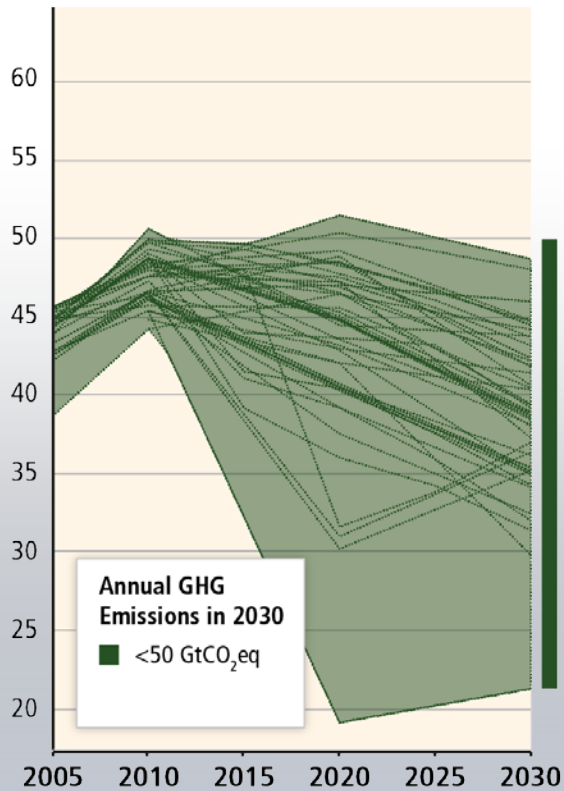




# Delaying mitigation increases the difficulty and narrows the options for limiting warming to 2°C.

Before 2030

GHG Emissions Pathways [GtCO<sub>2</sub>eq/yr]

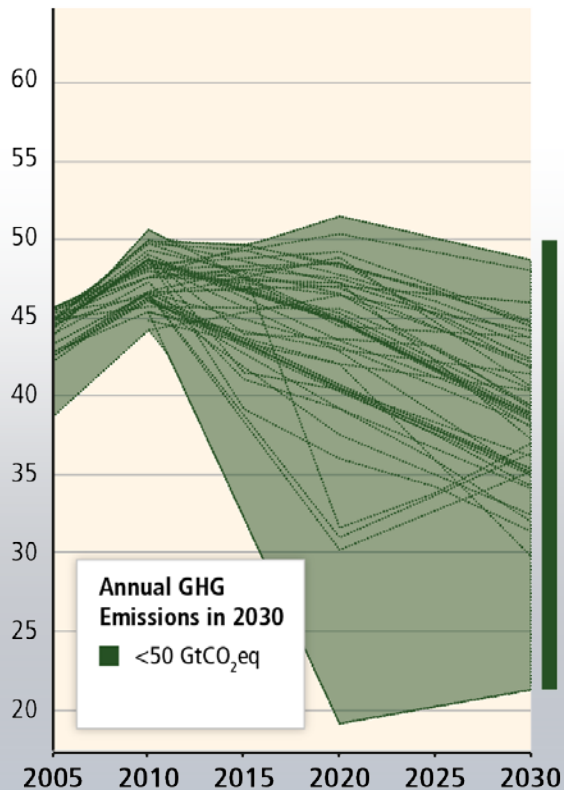


„immediate action“

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

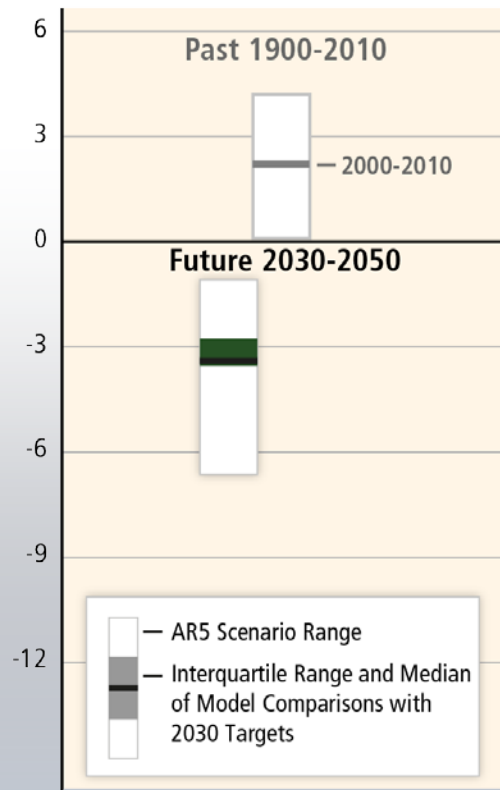
## Before 2030

GHG Emissions Pathways [GtCO<sub>2</sub>eq/yr]



## After 2030

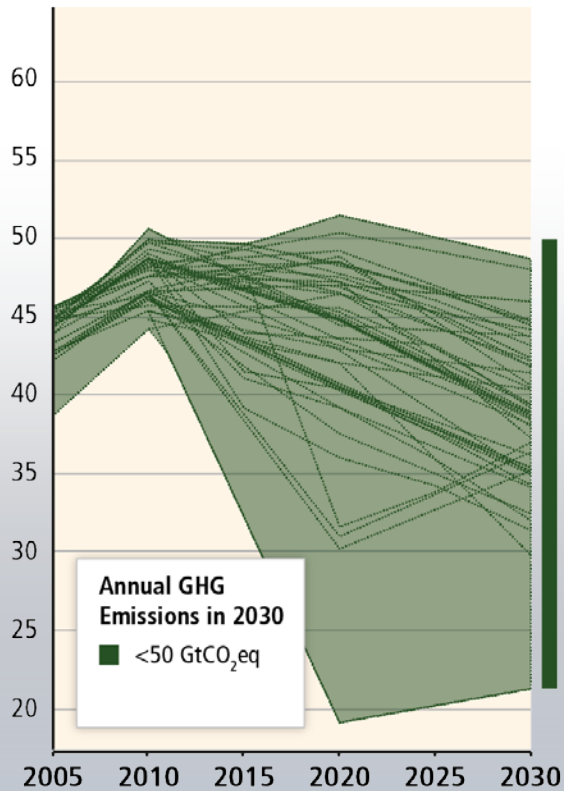
Rate of CO<sub>2</sub> Emission Change [%/yr]



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

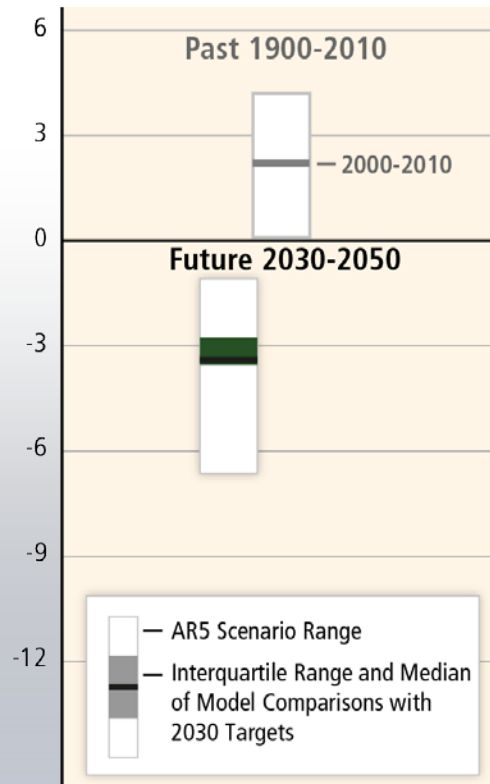
## Before 2030

GHG Emissions Pathways [GtCO<sub>2</sub>eq/yr]

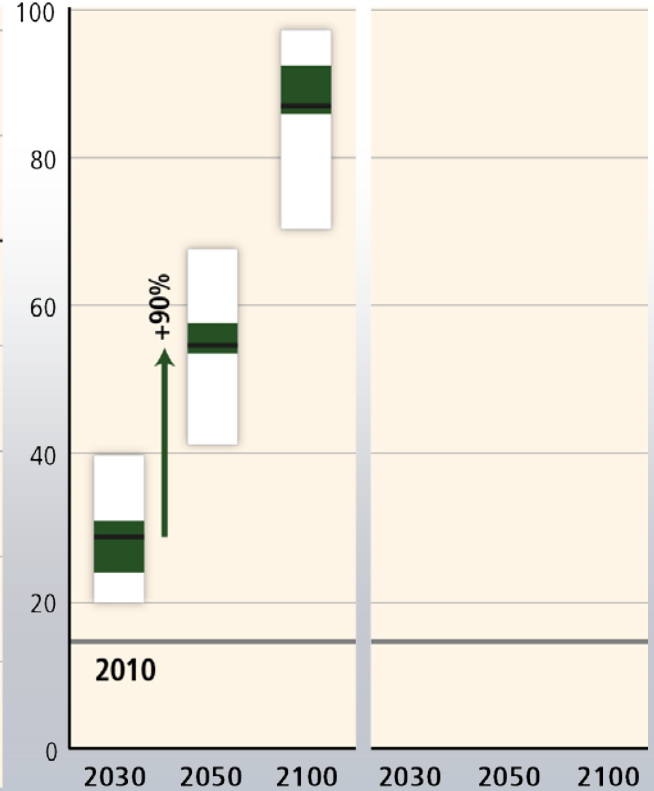


## After 2030

Rate of CO<sub>2</sub> Emission Change [%/yr]



Share of Low Carbon Energy [%]

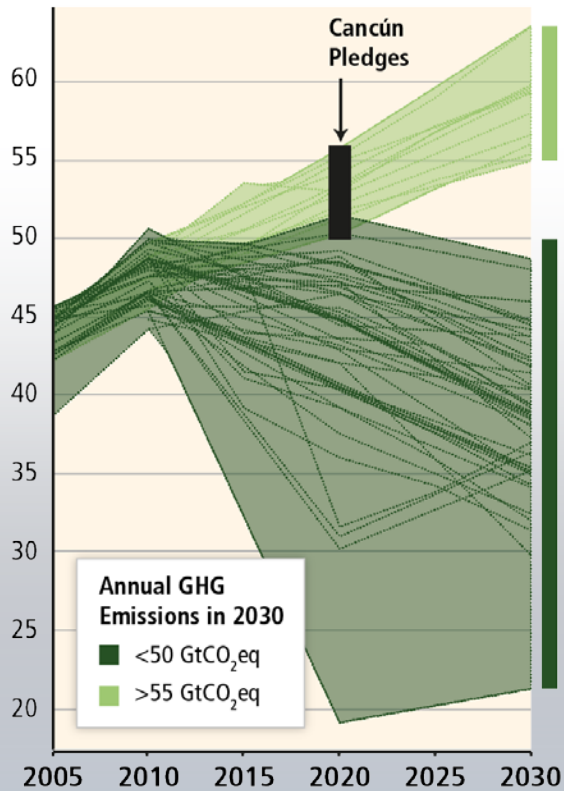




# Delaying mitigation is estimated to increase the difficulty and narrow the options for limiting warming to 2°C.

Before 2030

GHG Emissions Pathways [GtCO<sub>2</sub>eq/yr]



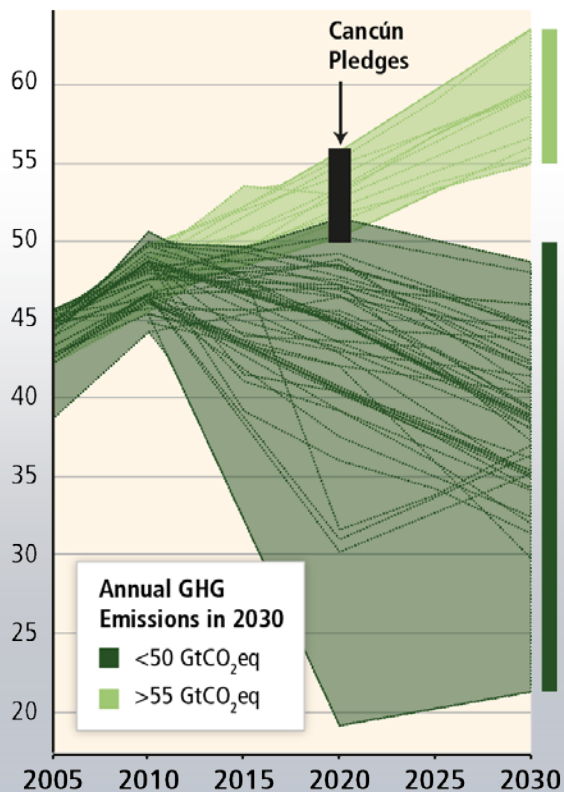
„delayed mitigation“

„immediate action“

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

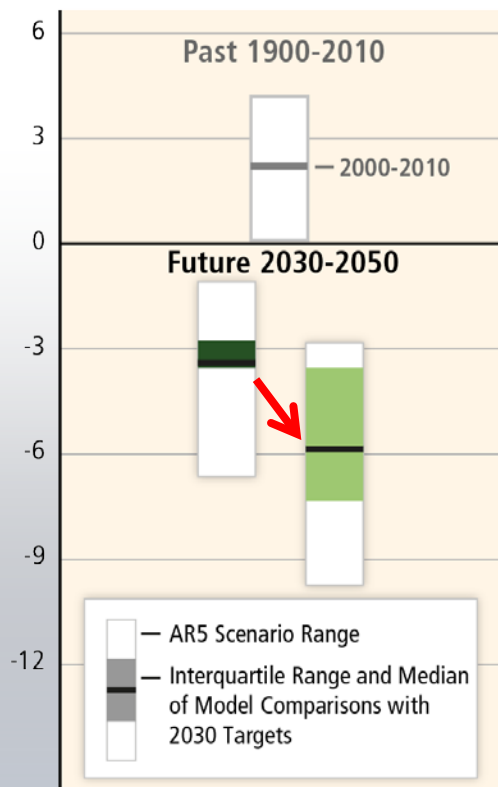
## Before 2030

GHG Emissions Pathways [GtCO<sub>2</sub>eq/yr]

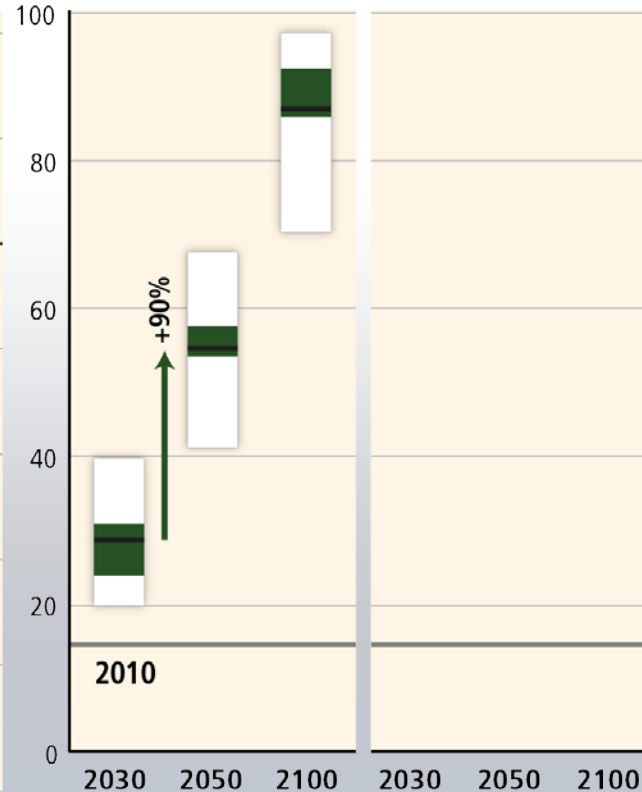


## After 2030

Rate of CO<sub>2</sub> Emission Change [%/yr]



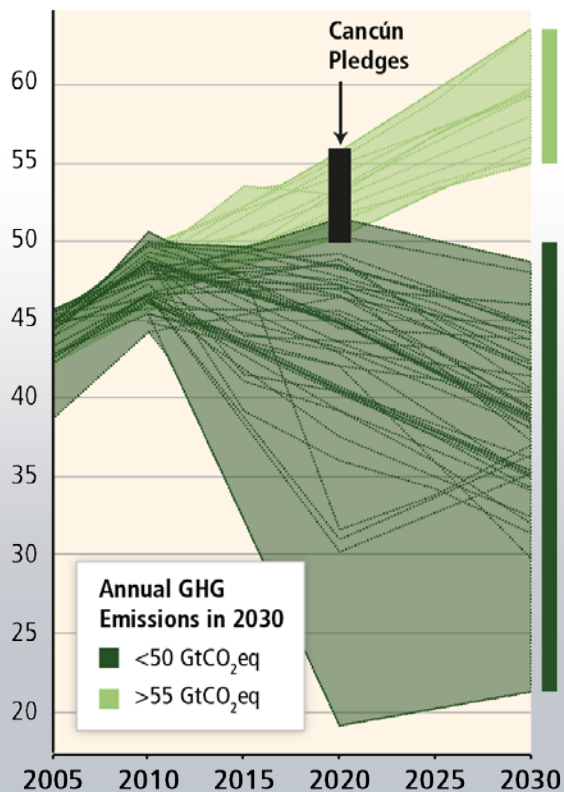
Share of Low Carbon Energy [%]



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

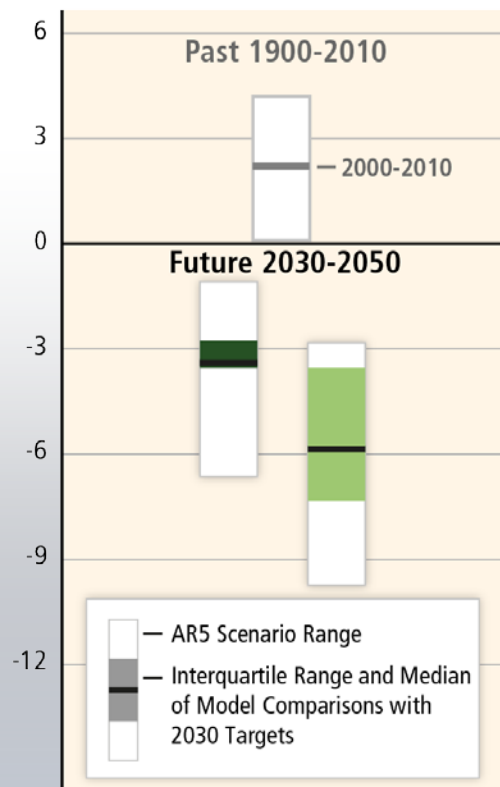
## Before 2030

GHG Emissions Pathways [GtCO<sub>2</sub>eq/yr]

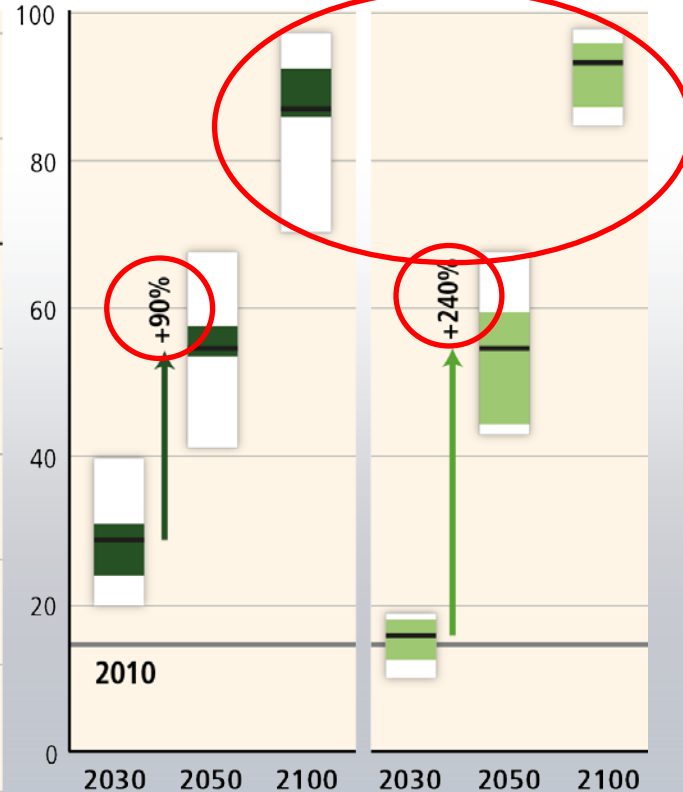


## After 2030

Rate of CO<sub>2</sub> Emission Change [%/yr]



Share of Low Carbon Energy [%]



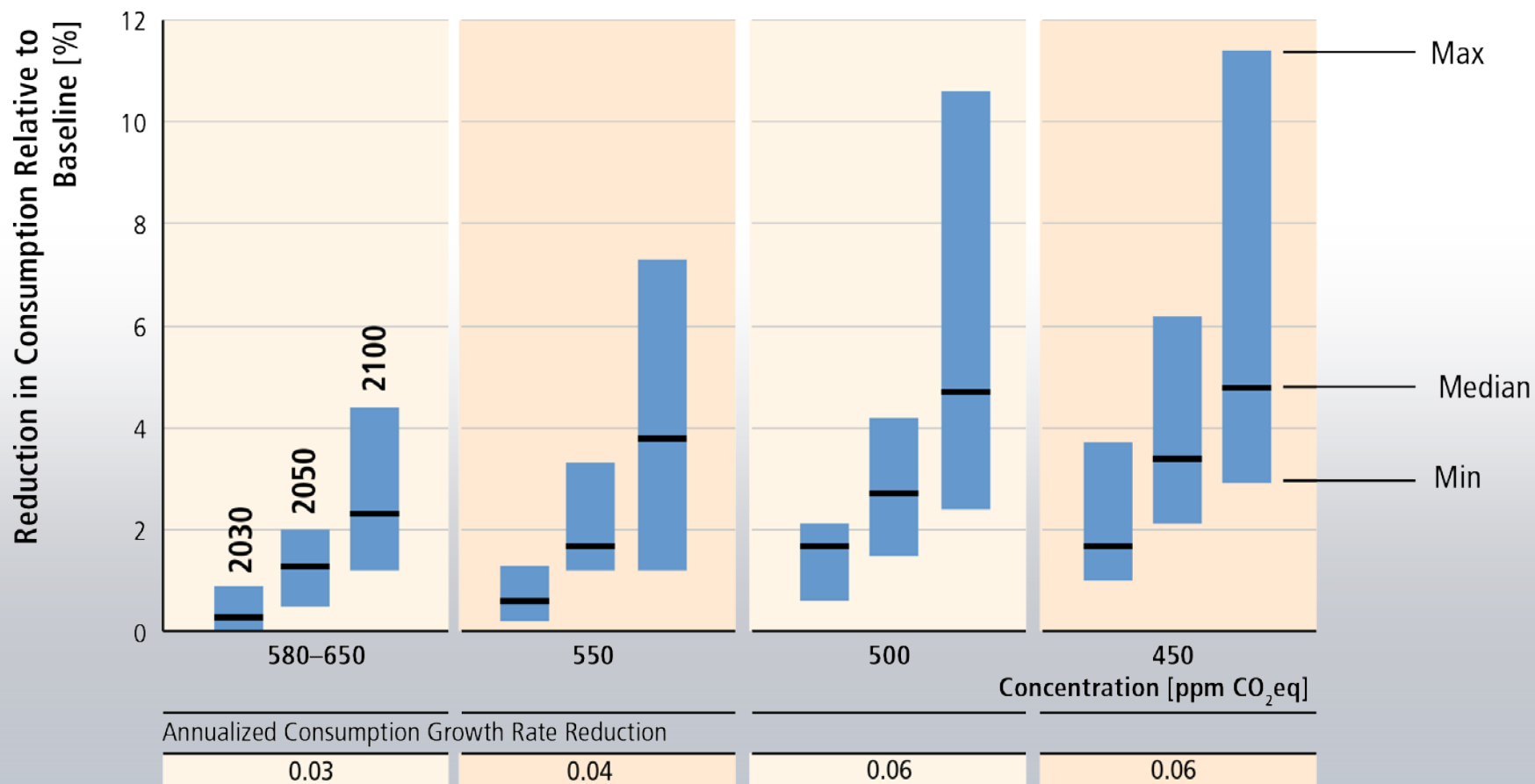


**Mitigation cost estimates vary, but do not strongly affect global GDP growth.**

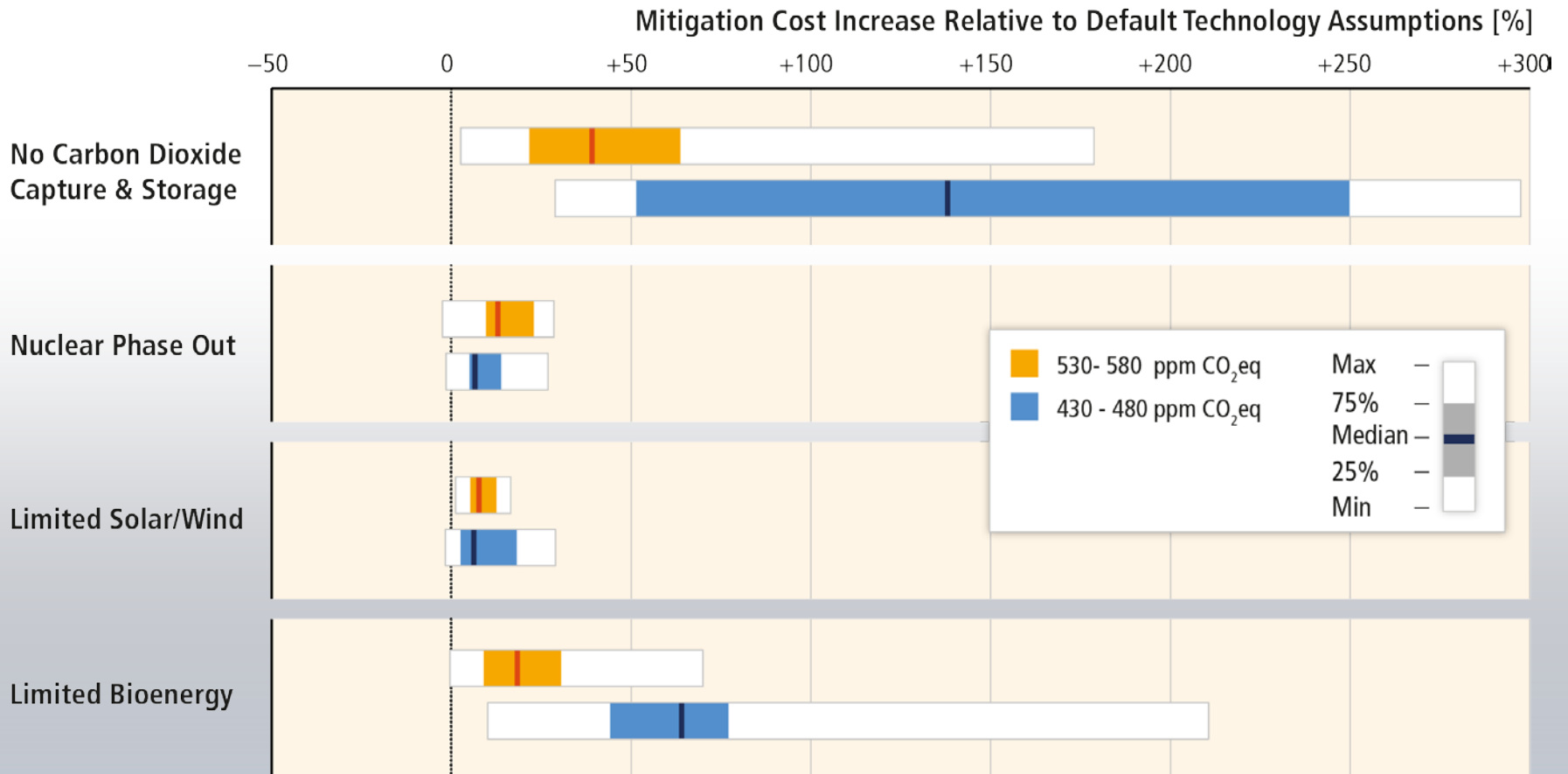




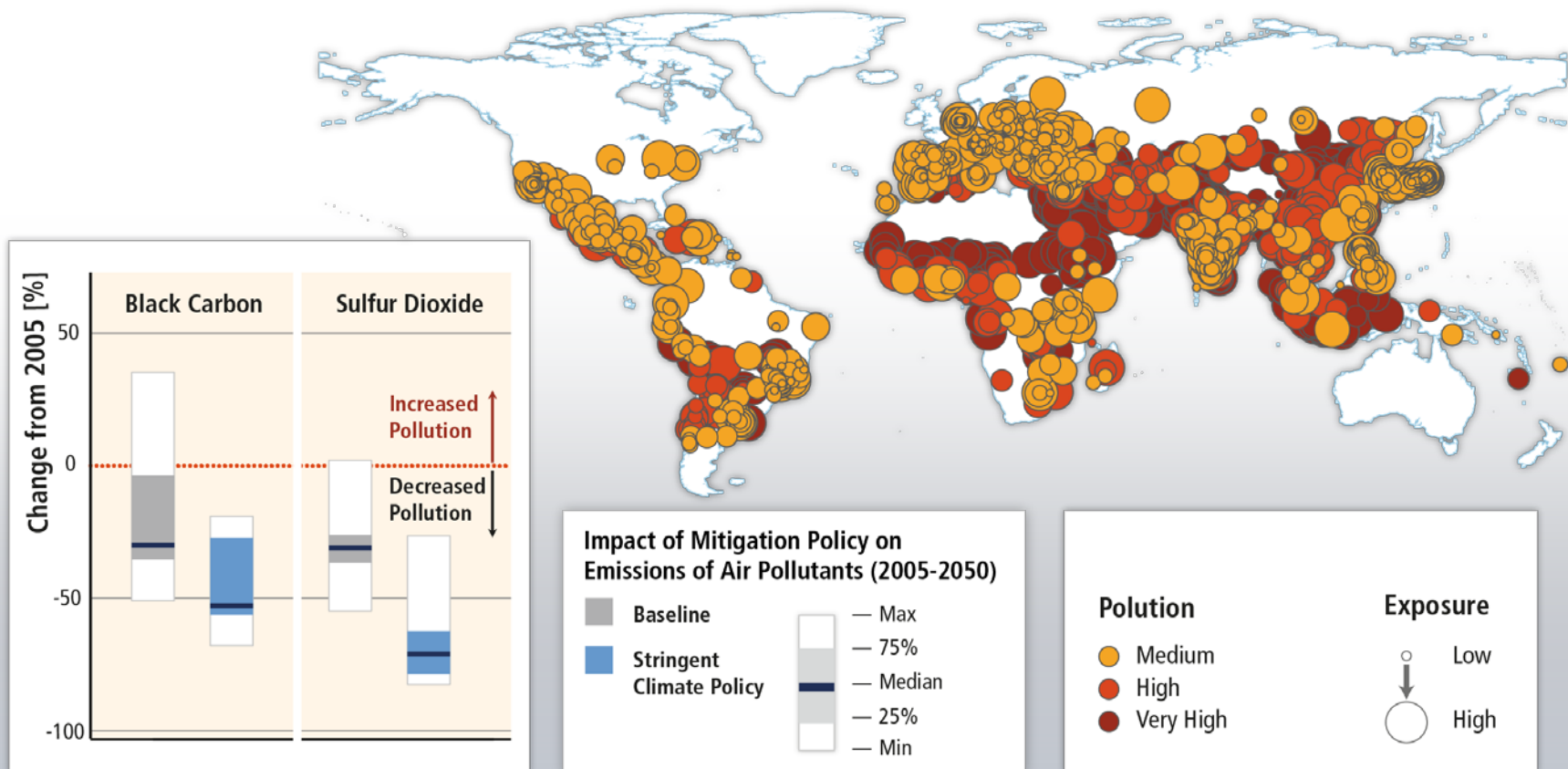
# Global costs rise with ambition of mitigation goal



# Limited availability of technologies can greatly increase mitigation costs.



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





An aerial photograph of a dense urban landscape, likely a major city in Asia, featuring a complex multi-level highway interchange in the foreground. The city is filled with numerous high-rise buildings and residential blocks. The sky is a deep, clear blue, and the overall image has a blue-tinted aesthetic. Overlaid on the center of the image is white text.

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

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

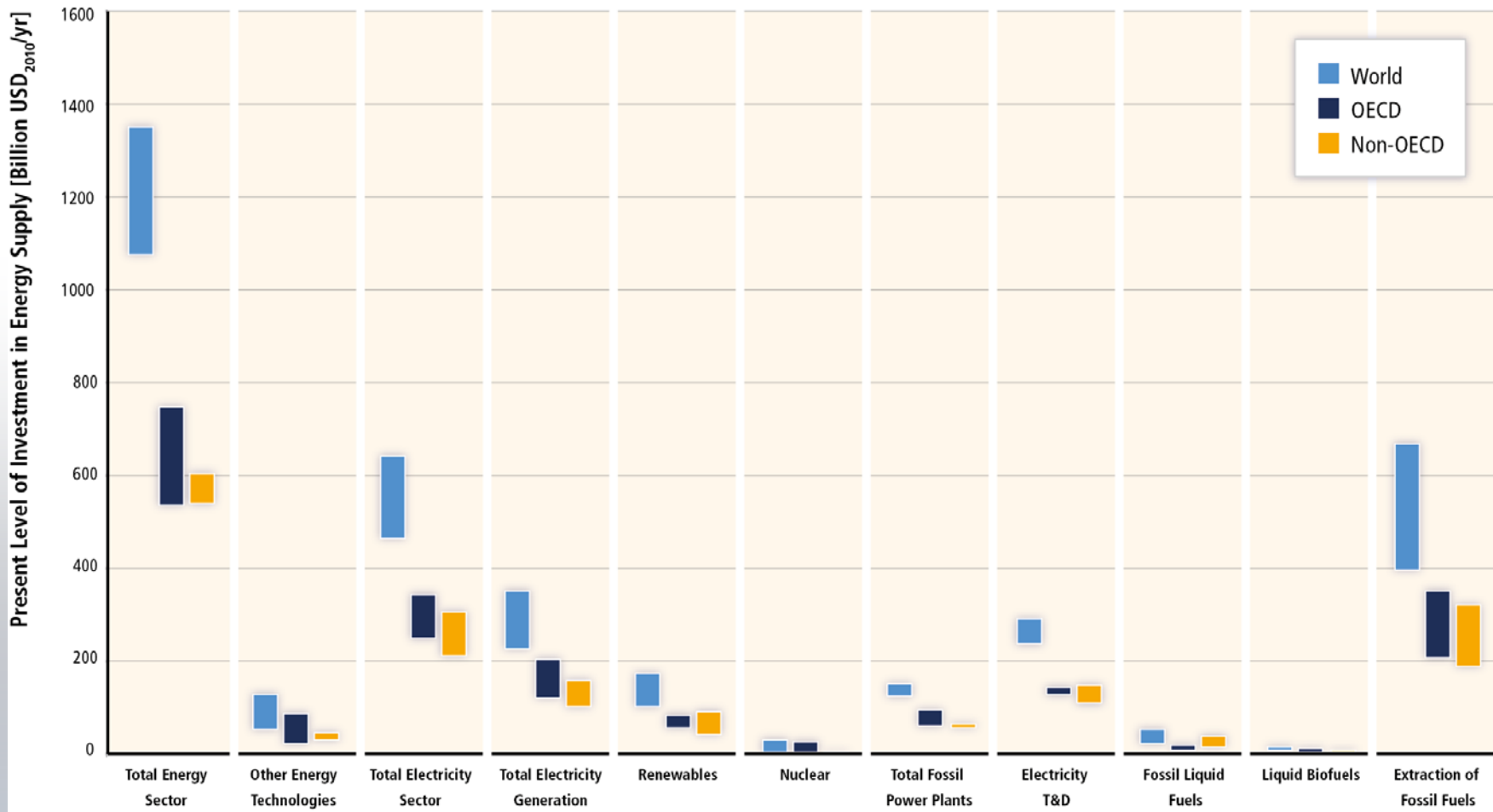
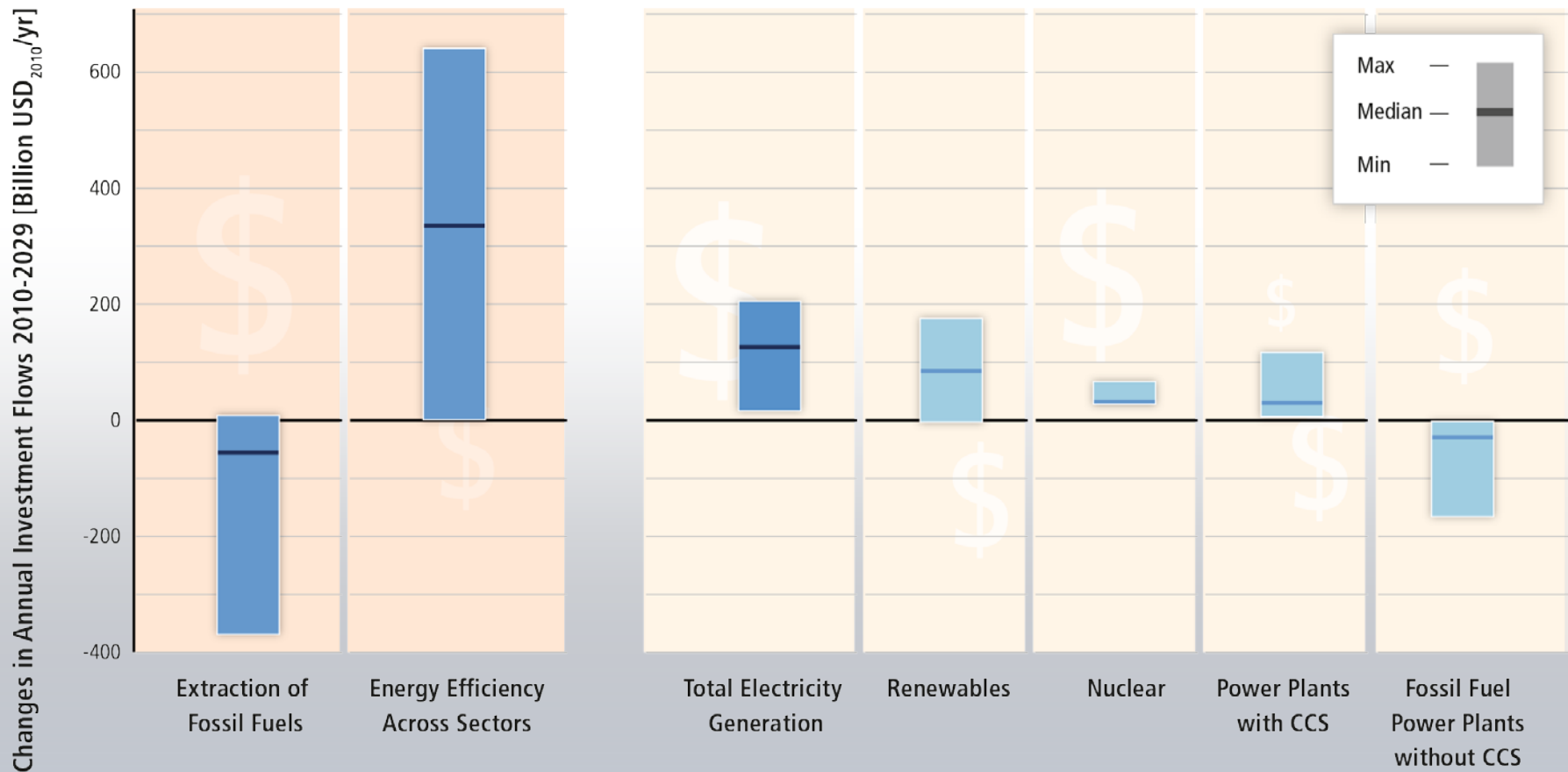


Figure 16.2

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

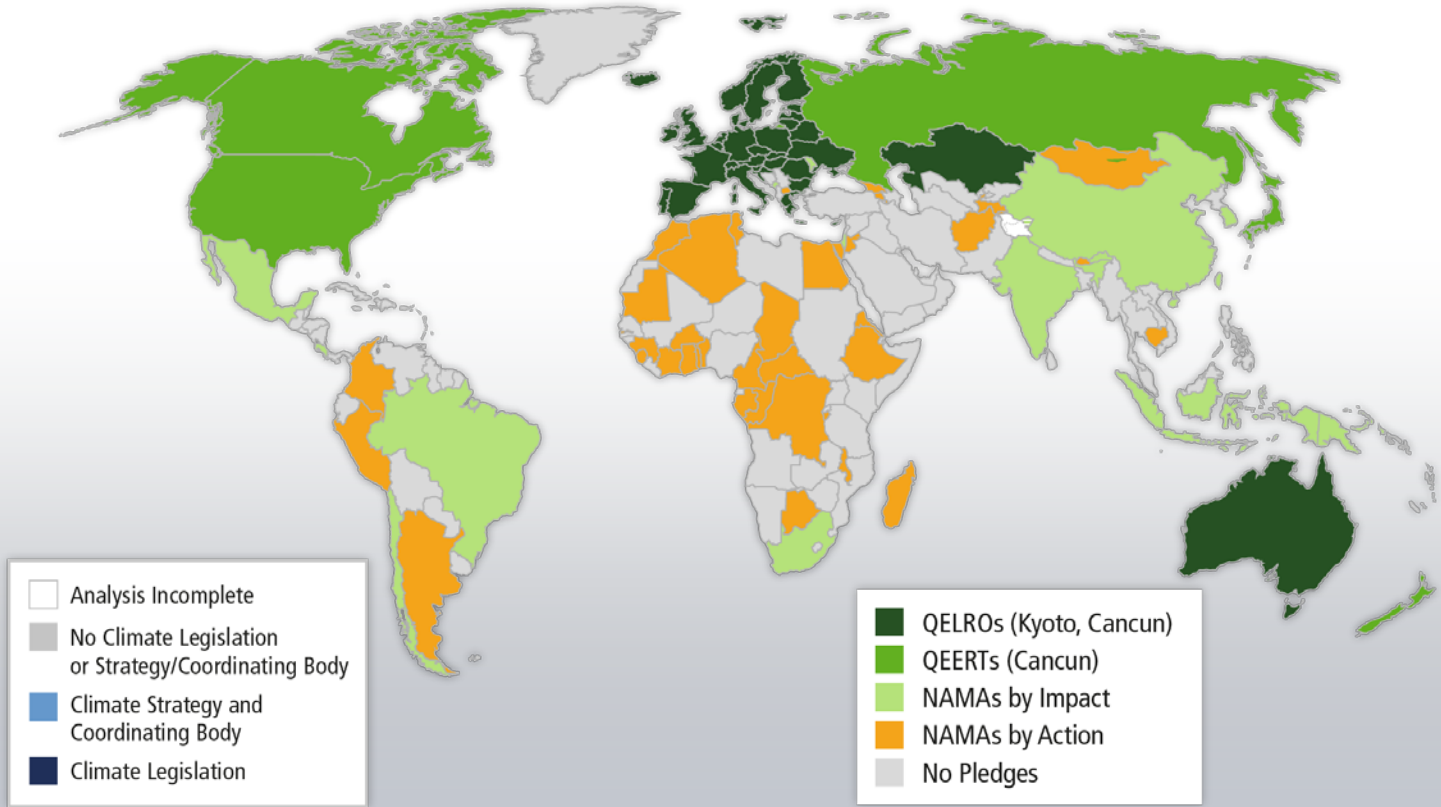
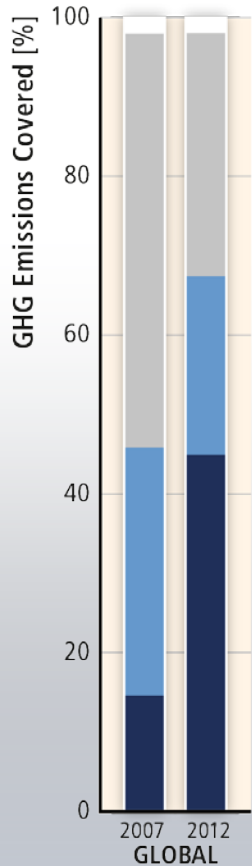


# Within an appropriate enabling environment, the private sector can help to mitigate climate change.

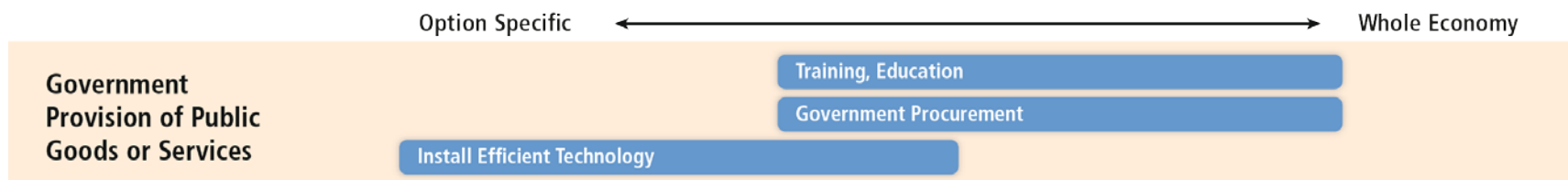




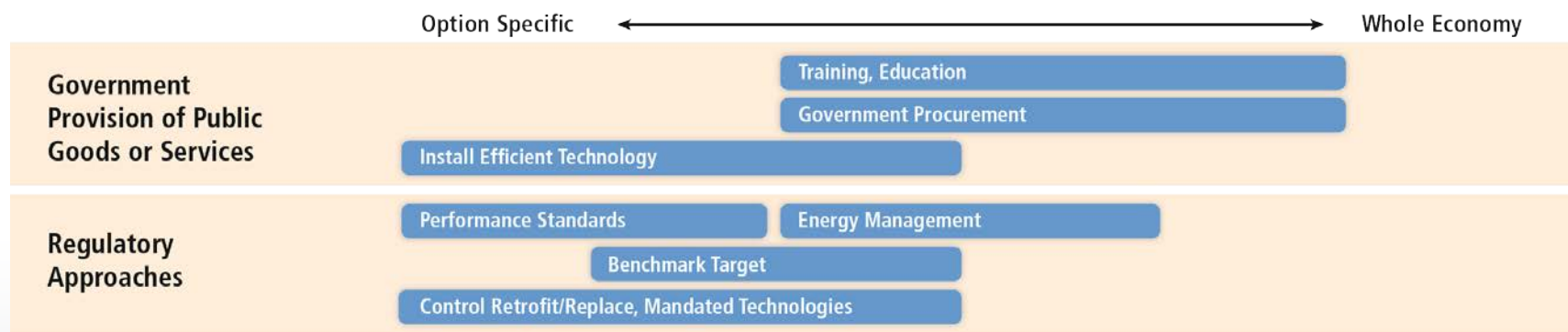
# A growing number of climate change policies at the national and international level



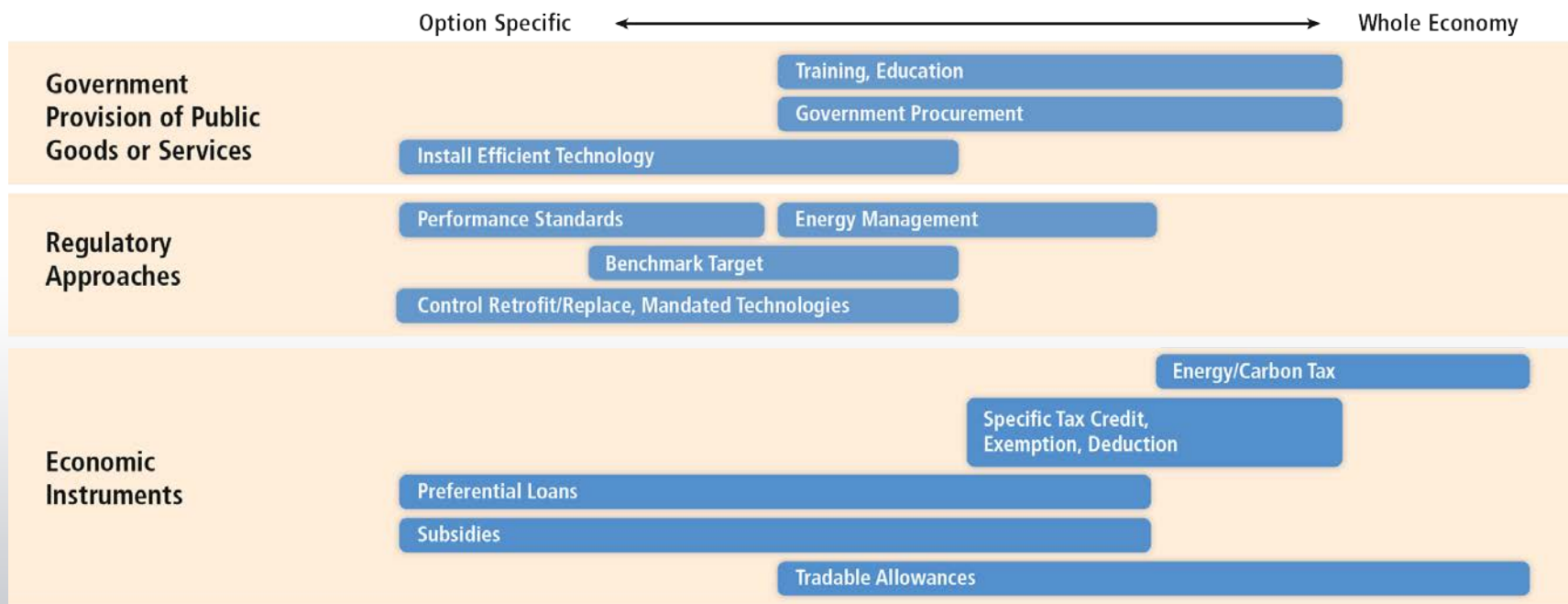
# Since AR4, there has been an increased focus on policies designed to integrate multiple objectives, increase co-benefits and reduce adverse side-effects



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

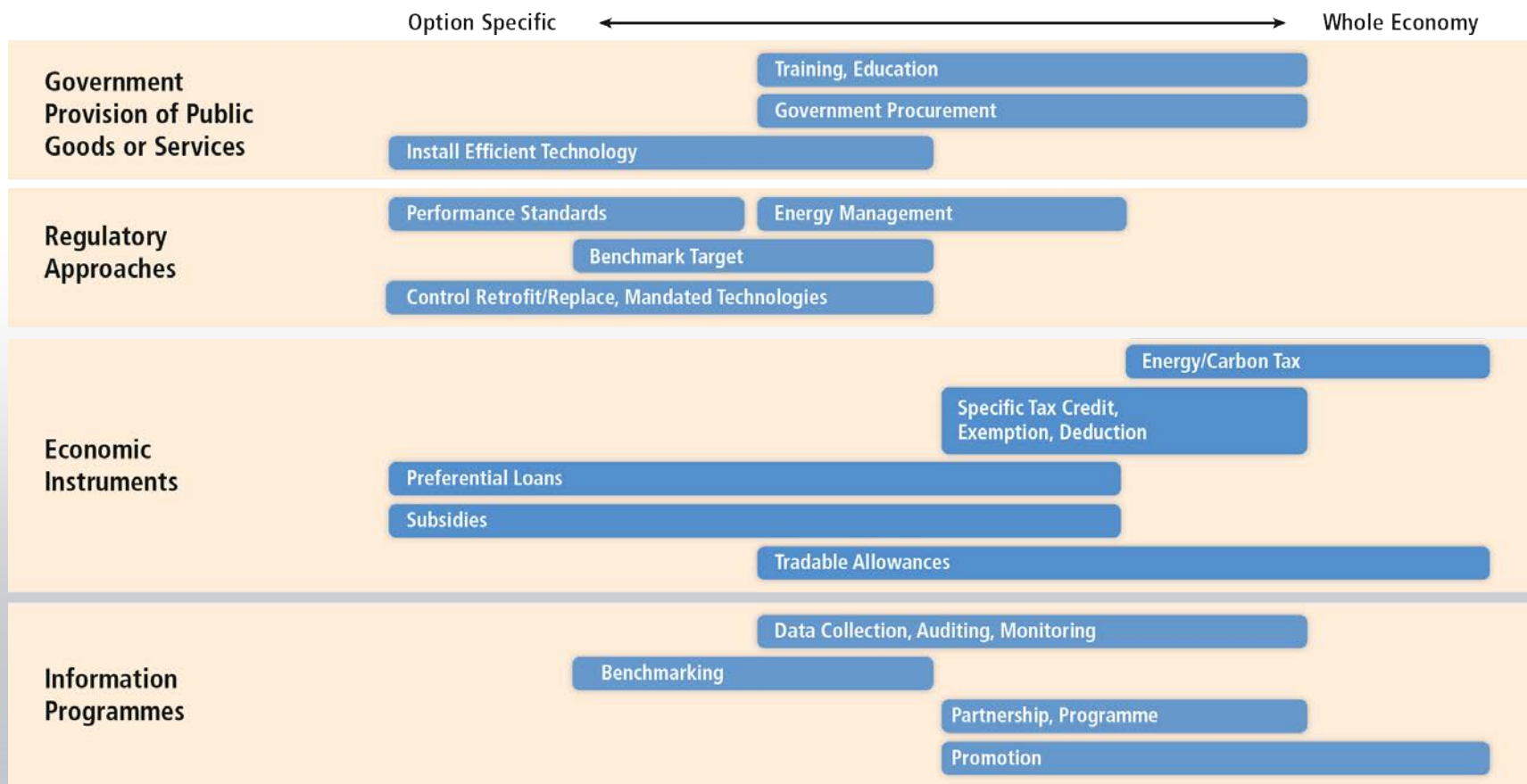


# Since AR4, there has been an increased focus on policies designed to integrate multiple objectives, increase co-benefits and reduce adverse side-effects.

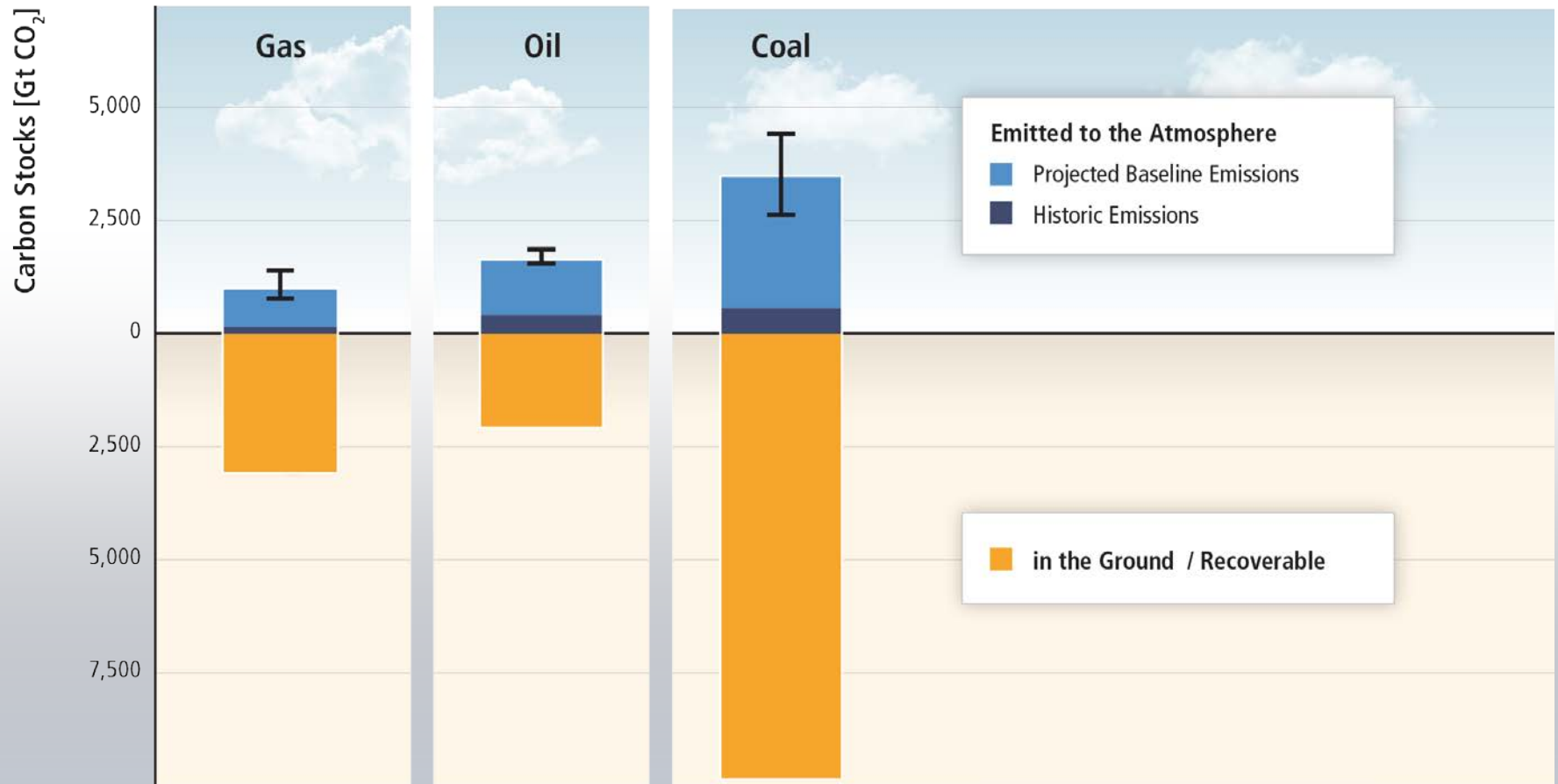




# Since AR4, there has been an increased focus on policies designed to integrate multiple objectives, increase co-benefits and reduce adverse side-effects.



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



# CLIMATE CHANGE 2014

## *Mitigation of Climate Change*

[www.mitigation2014.org](http://www.mitigation2014.org)

# Example for a Bullet List

- First level bulletpoint
- First level bulletpoint
  - Second level bulletpoint
  - Second level bulletpoint
    - Third level bulletpoint
    - Third level bulletpoint
      - Fourth level bulletpoint
      - Fourth level bulletpoint
        - » Fifth level bulletpoint
        - » Fifth level bulletpoint

## Example for a Text Page

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean commodo ligula eget dolor. Aenean massa.

Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem.

Nulla consequat massa quis enim. Donec pede justo, fringilla vel, aliquet nec, vulputate eget, arcu. In enim justo, rhoncus ut, imperdiet a, venenatis vitae, justo. Nullam dictum felis eu pede mollis pretium. Integer tincidunt. Cras dapibus. Vivamus elementum semper nisi.