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ipcc INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

Options for mitigation: IPCC 5th Assessment Report

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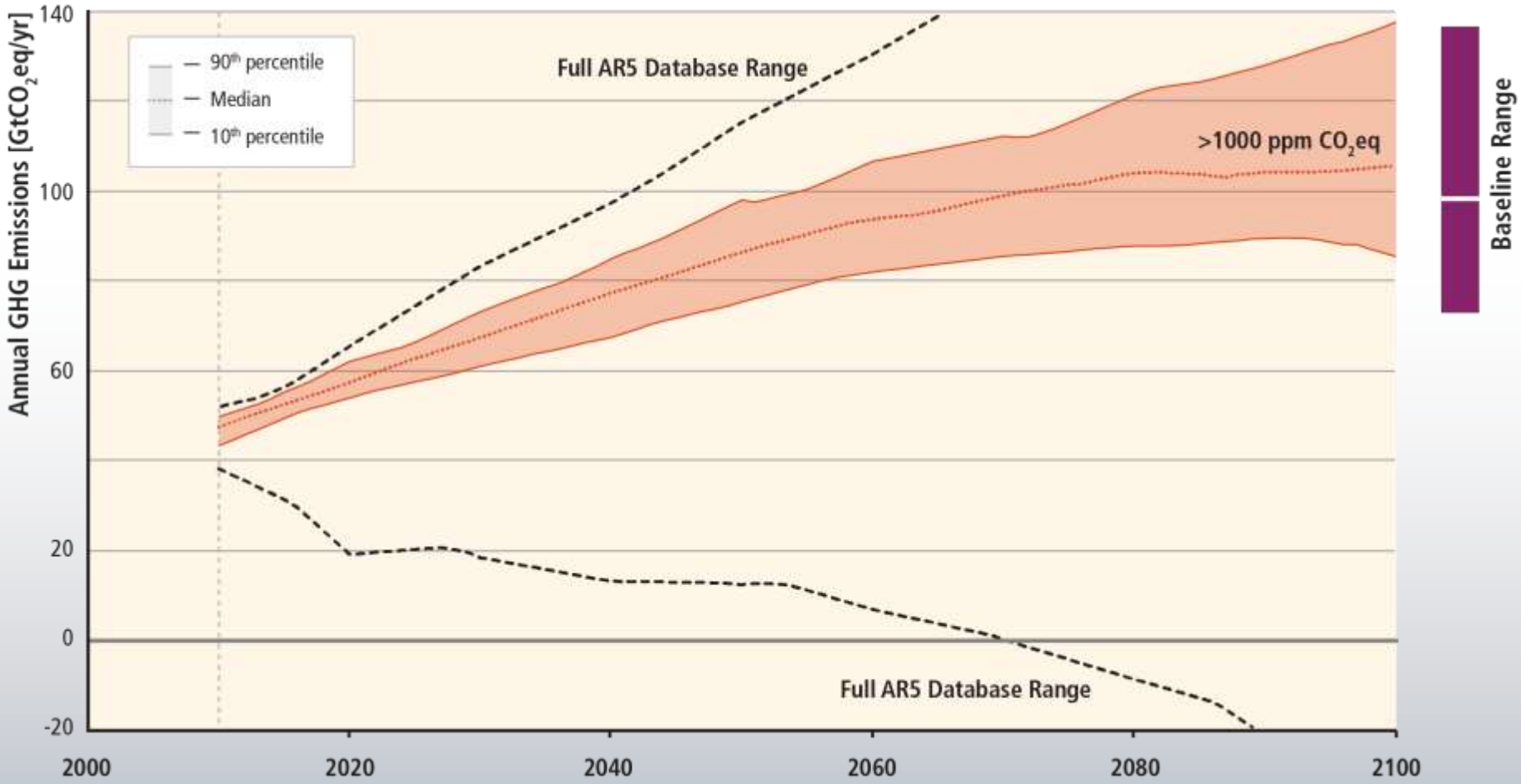
Summary of AR5 mitigation report

- GHG emission growth have accelerated in last decade
- Significant shift has taken place in emission structure in recent decades regionally, along income groups, and sectors
- Climate change mitigation, if unabated, would result into 3.7-4.8^{o}C world (which is undesirable)
- While mitigation challenges exist, the 2^{o}C climate stabilization pathways are possible, **options are there**; delaying of mitigation would entail more costs and limit options; impacts to economy is minimal
- But such pathways needs significant efforts from policies and institutions, investments and international cooperation

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



Based on Figure 6.7

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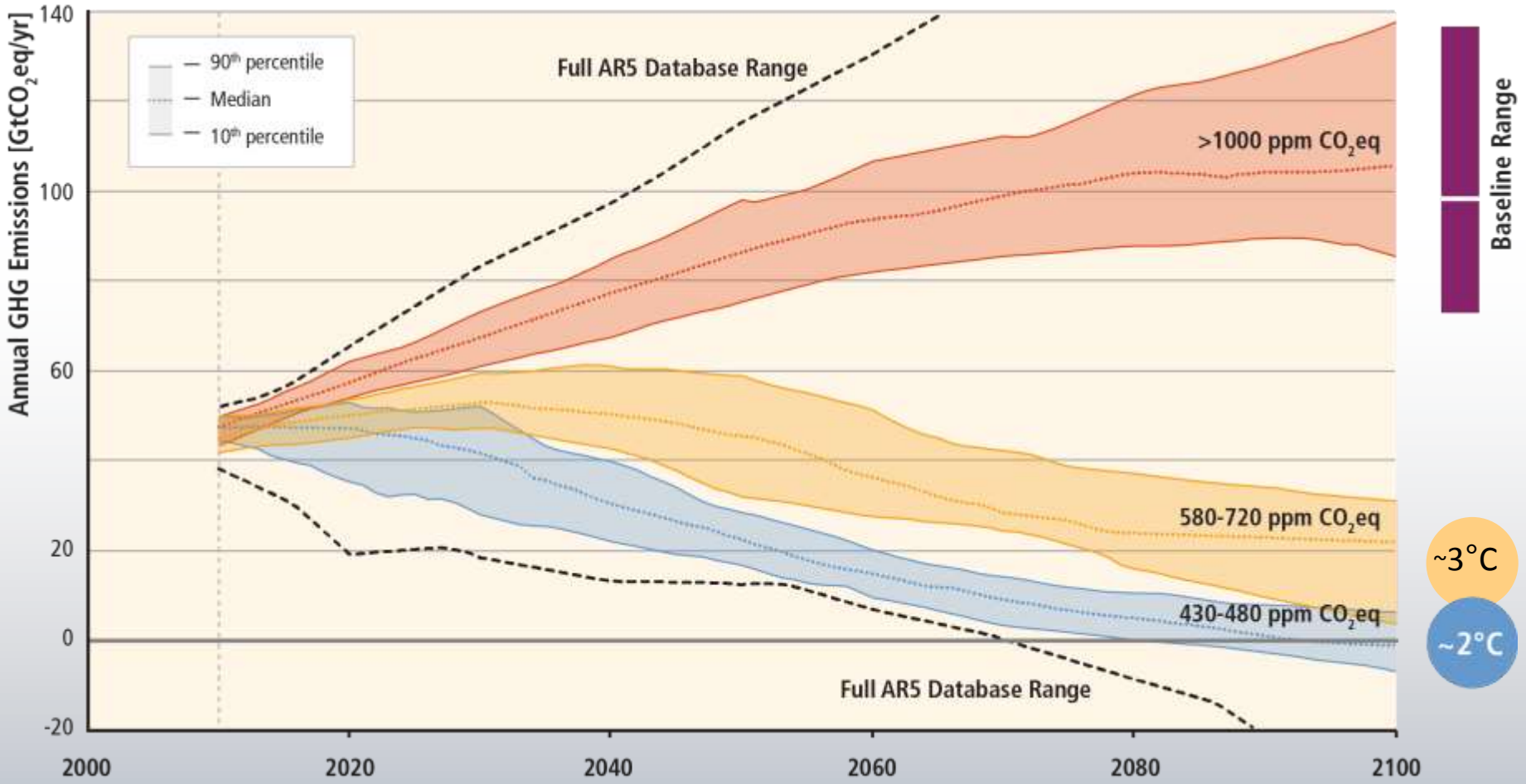
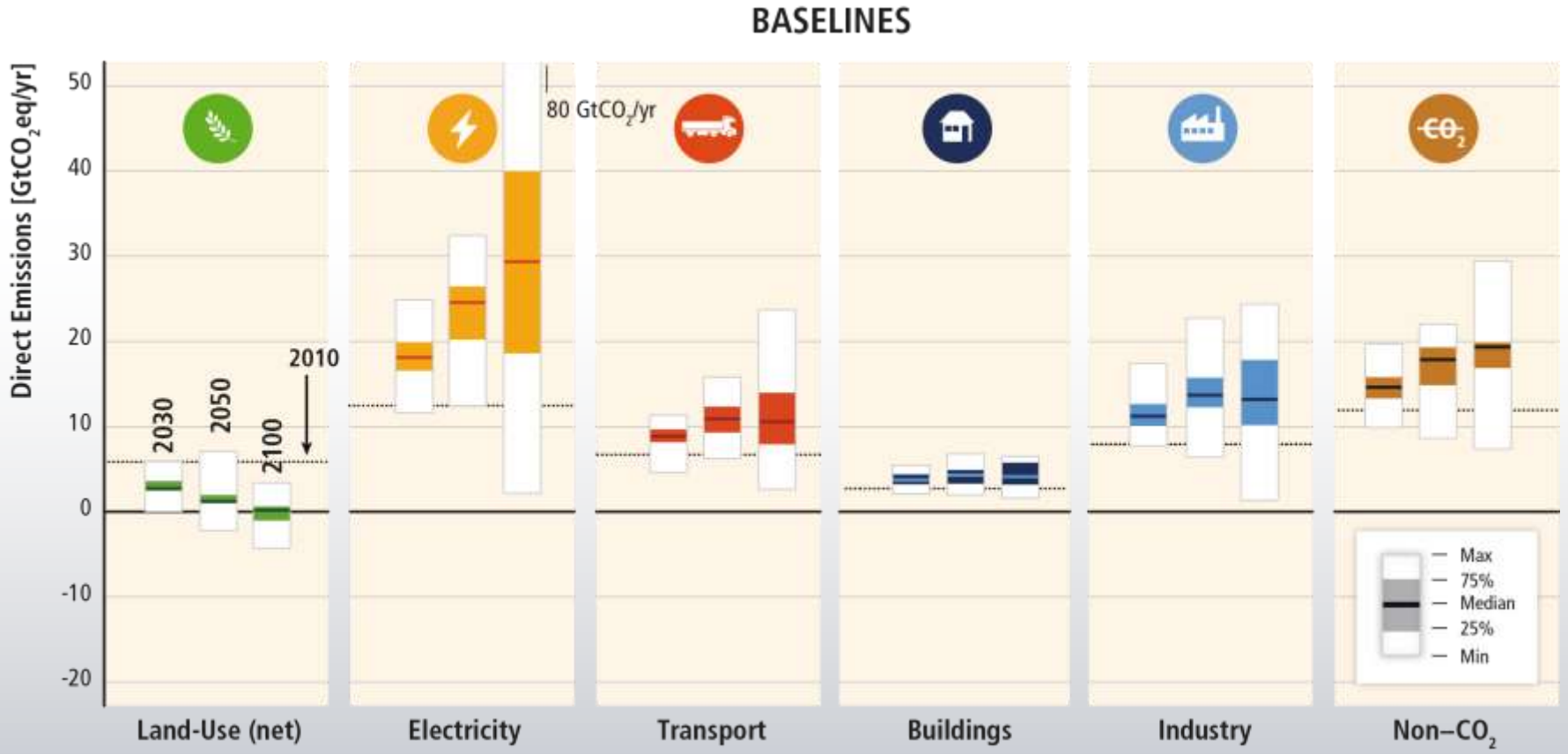


Based on Figure 6.7

Required options for 2°C pathways

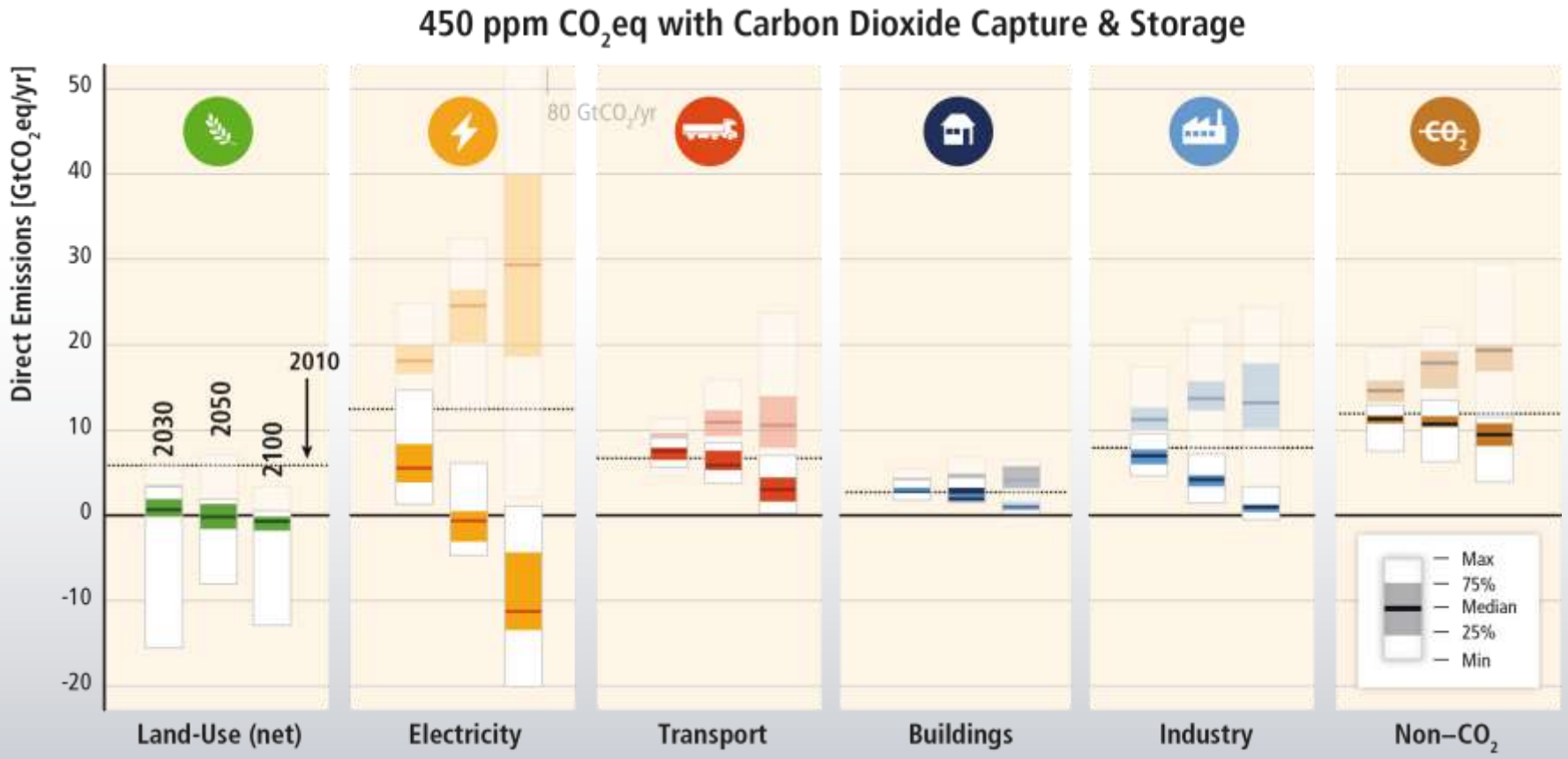
- Full decarbonization of energy supply in the long term
- Rapid deployment of CCS technology combined with bio-energy
- Wide-scale upscaling of best-practice technologies in all sectors
- Efficiency enhancements and behavioral change
- Capitalize on co-benefits rapidly in short-to-medium term
- Systemic approach to entire sectors- choice is one sector affect other sector

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



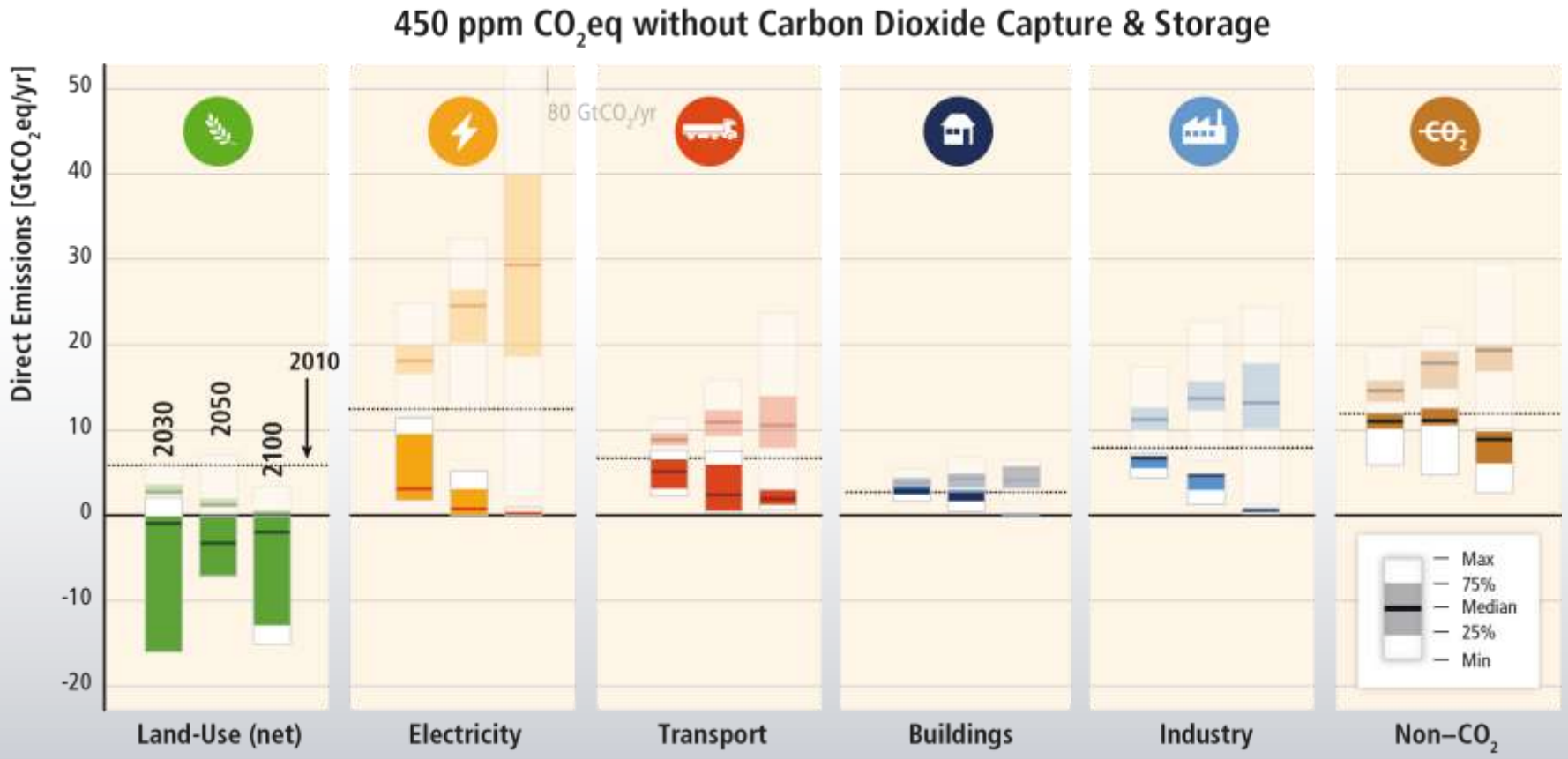
Based on Figure TS.17

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



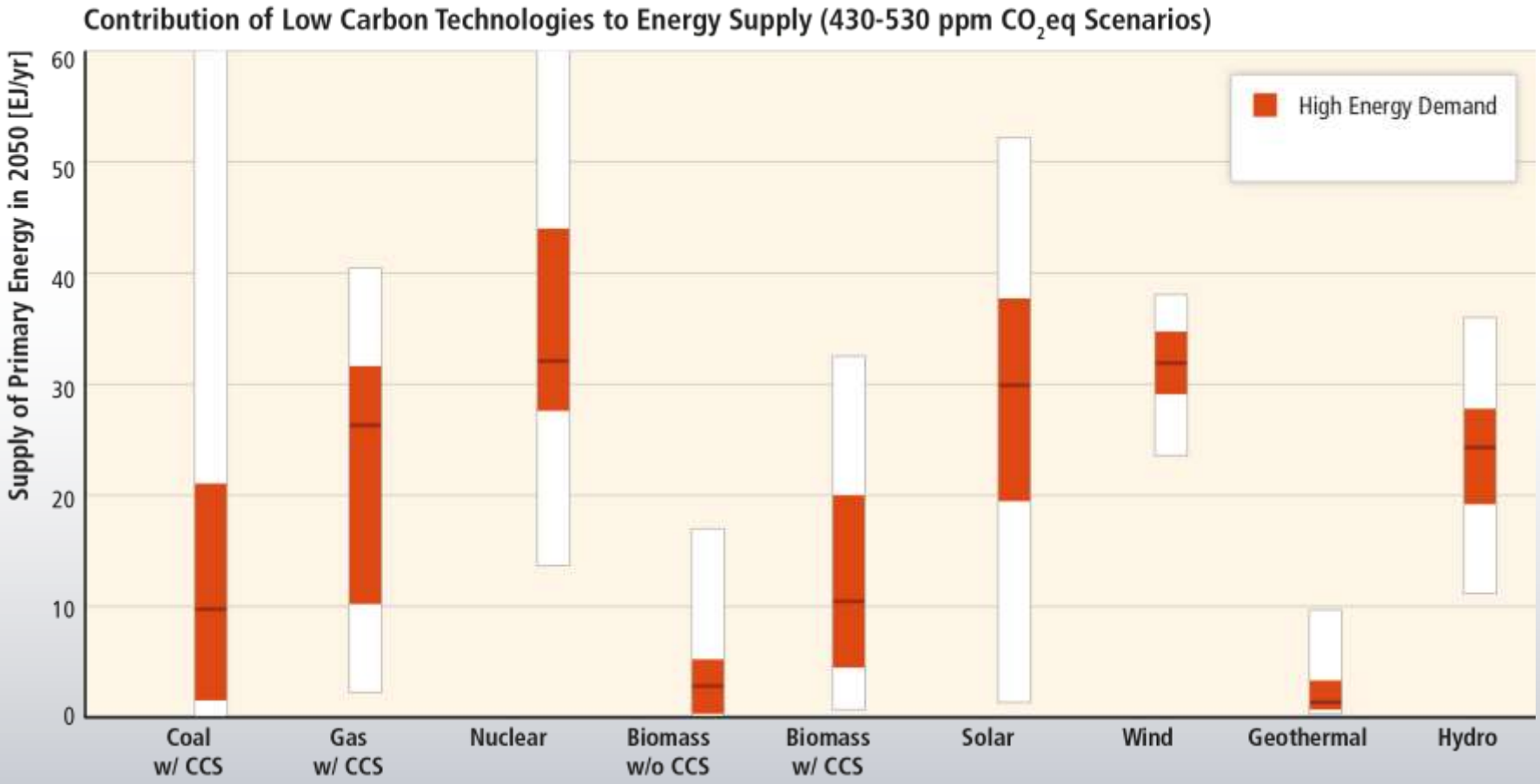
Based on Figure TS.17

Interdependencies: Mitigation efforts in one sector determine efforts in others.



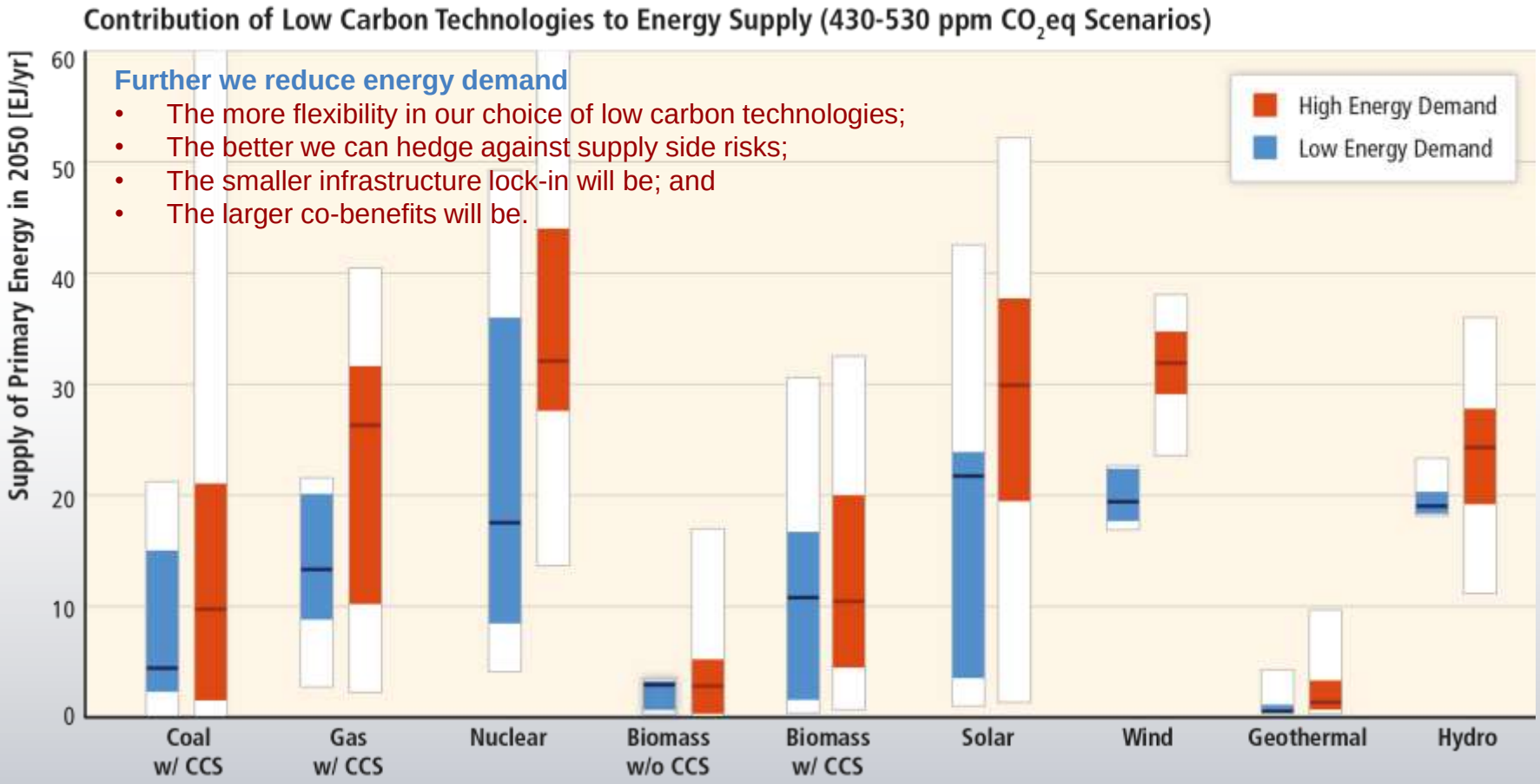
Based on Figure TS.17

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.



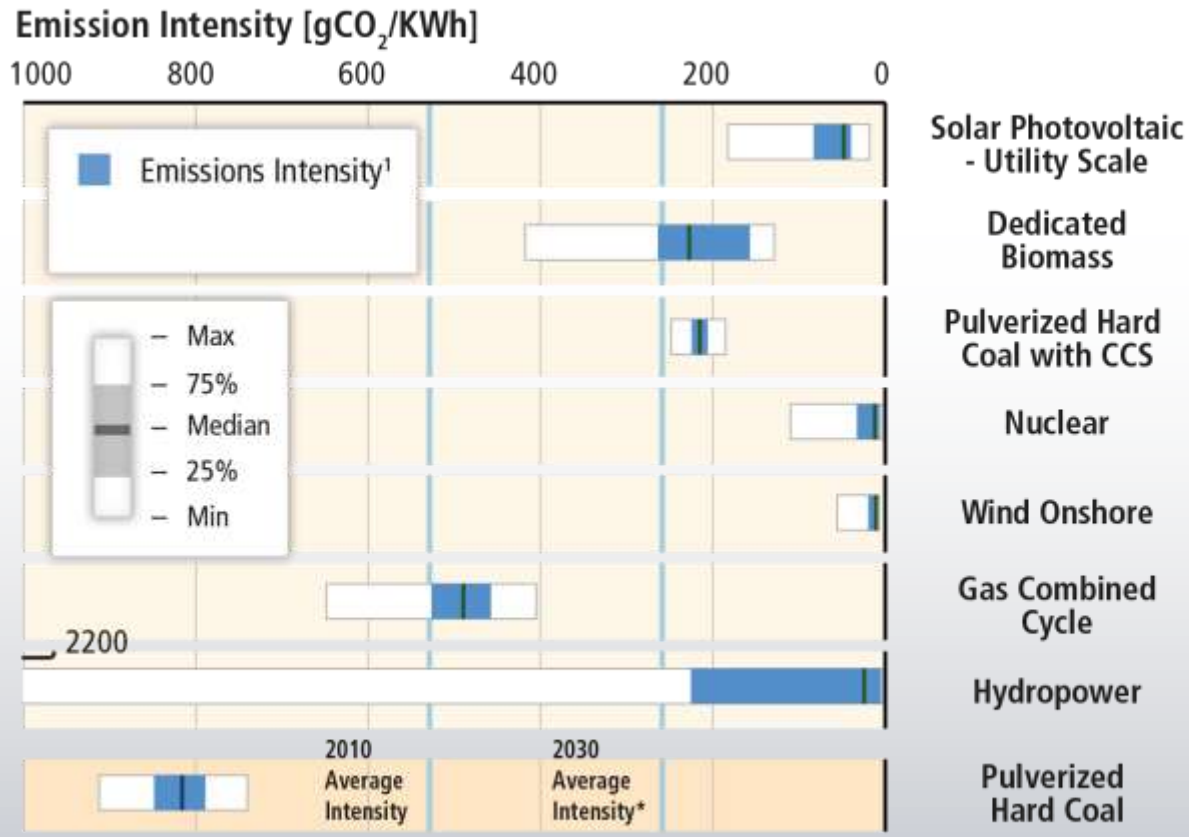
Based on Figure 7.11

Reducing energy demand through efficiency enhancements and behavioural changes are a key mitigation strategy.

Based on Figure 6.37

Best practice technology examples from power supply

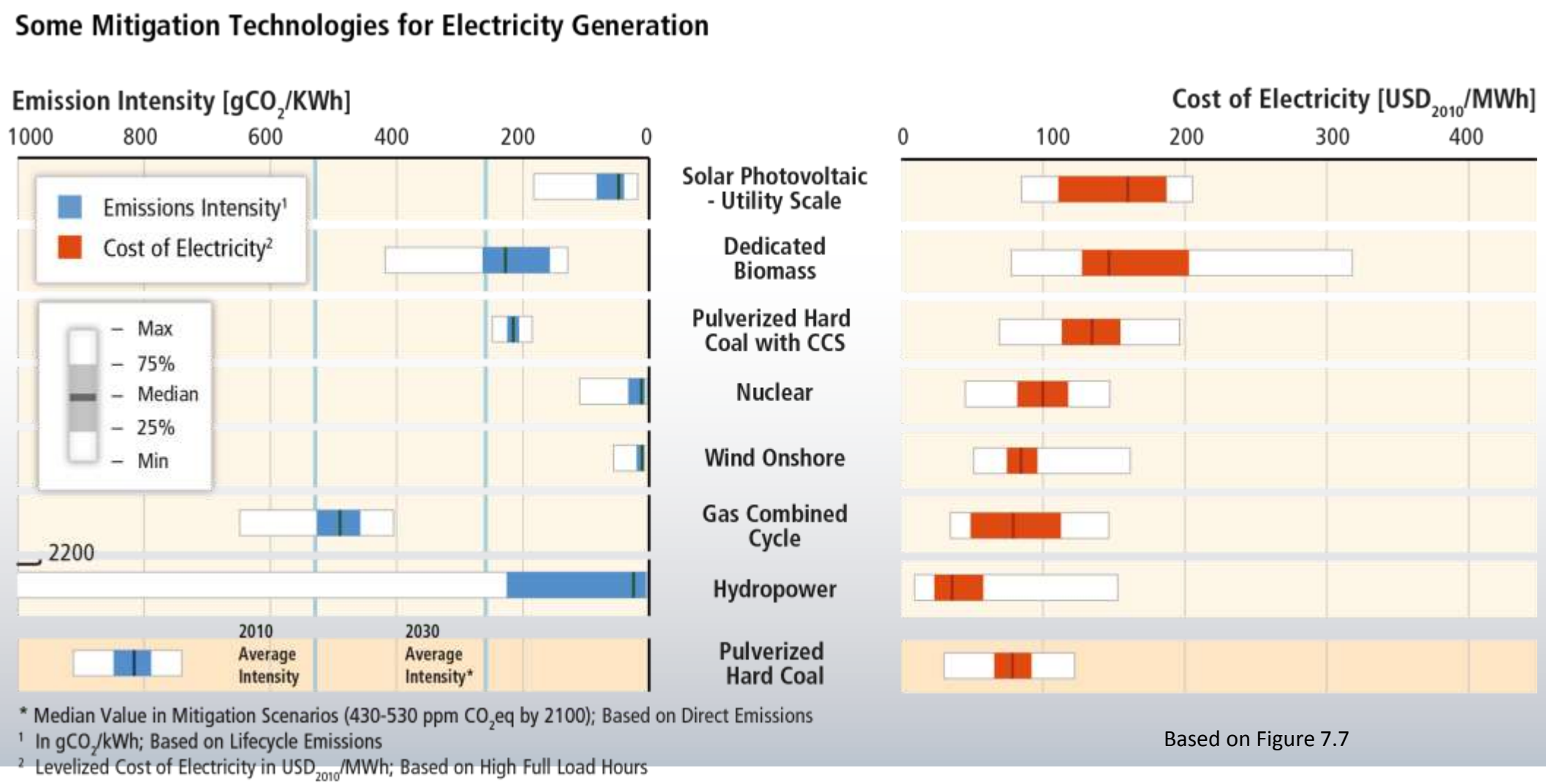
Some Mitigation Technologies for Electricity Generation



* Median Value in Mitigation Scenarios (430-530 ppm CO_2eq by 2100); Based on Direct Emissions

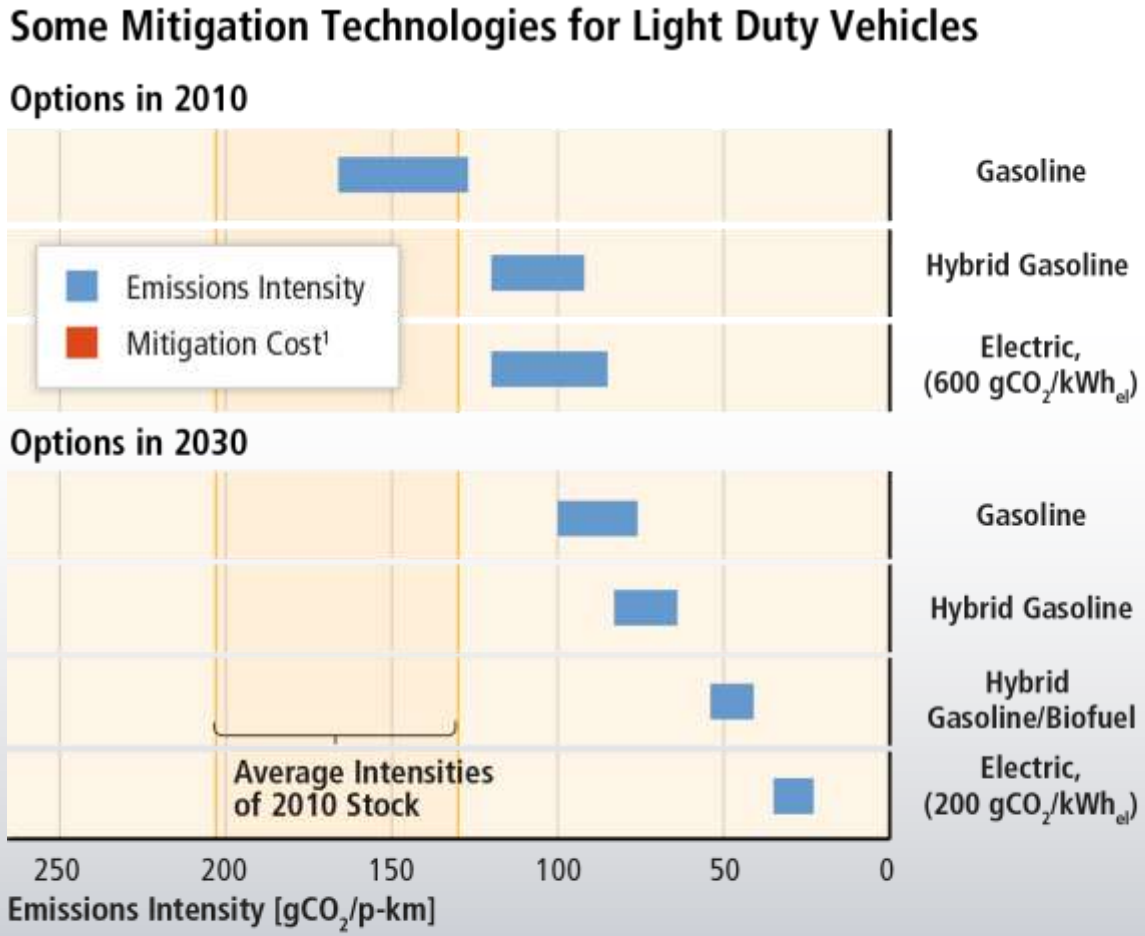
[1] In gCO_2/kWh; Based on Lifecycle Emissions

Costs of many power supply technologies decreased substantially, some can already compete with conventional technologies.

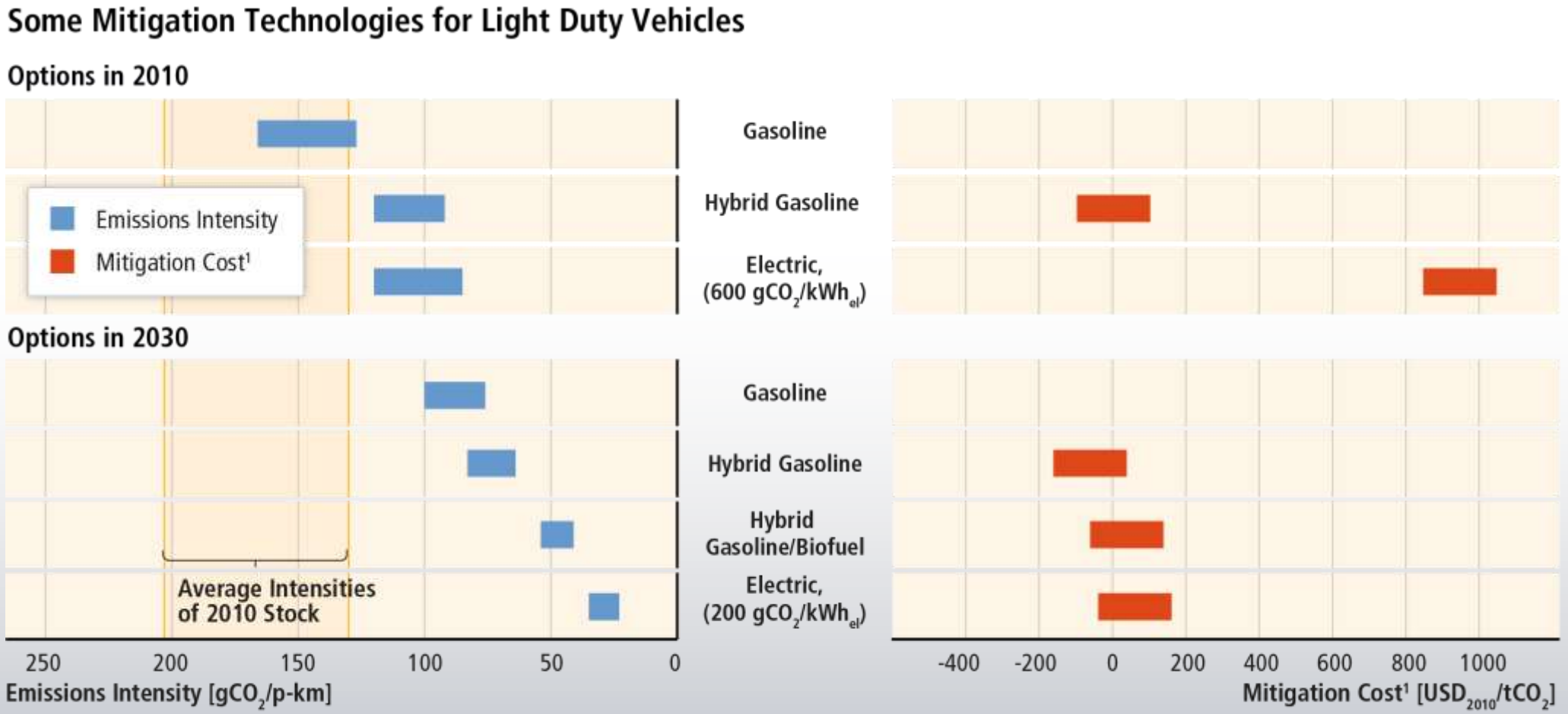


Based on Figure 7.7

Example transport: several strategies exist to reduce emissions from transportation.



Private costs of reducing emissions in transport vary widely. Societal costs remain uncertain.

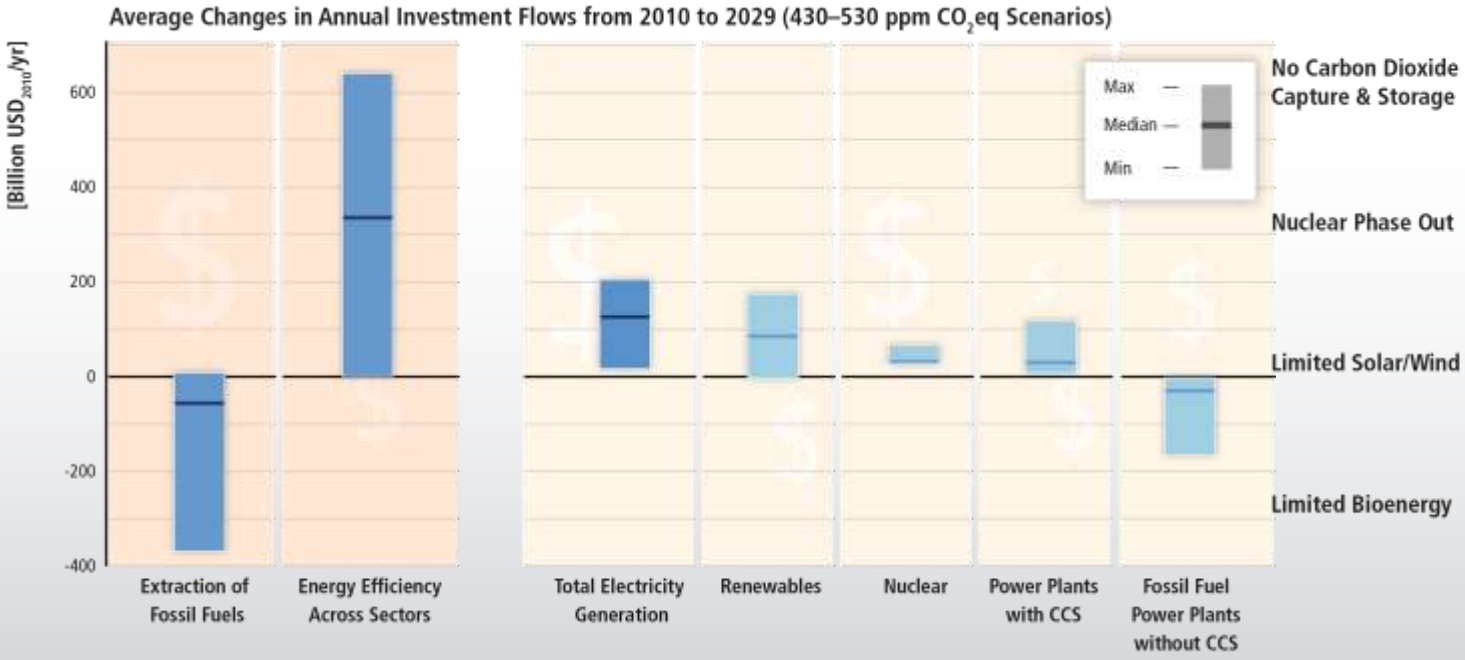


¹ Levelized cost of conserved carbon; calculated against 2010 new gasoline (2030 optimized gasoline) for 2010 (2030) options. Mitigation cost are based on point estimates ±100 USD_{2010}/tCO2 and are highly sensitive to assumptions.

Based on Figure TS.21

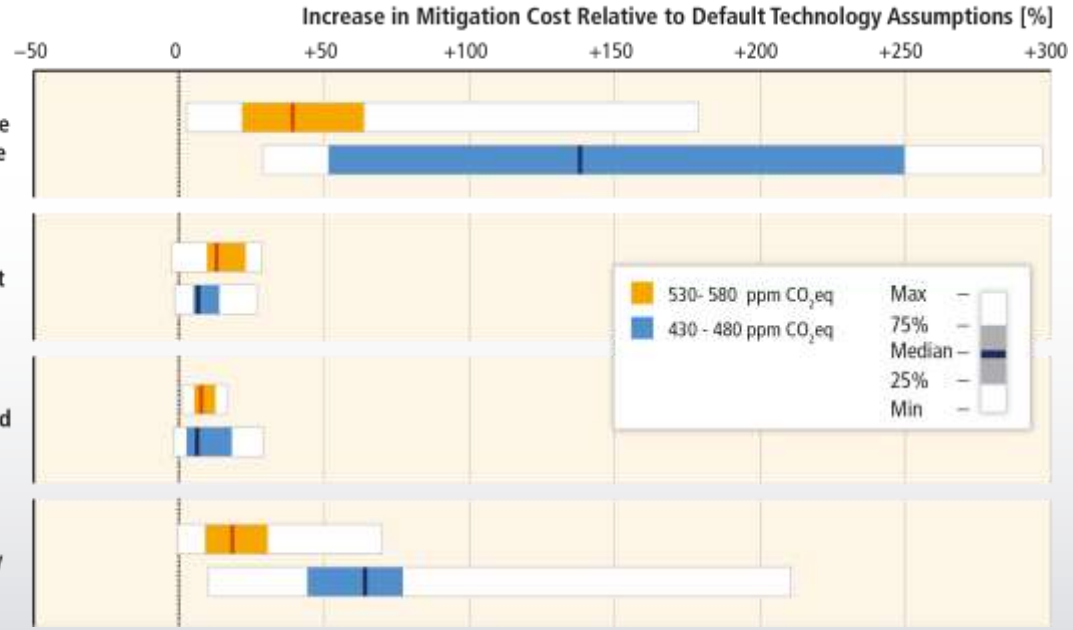
What are required for these options?

Substantial shifts in annual investment flows during the period 2010–2029 compared to baseline scenarios



- For comparison, global total annual investment in the energy system is presently about USD 1200 billion

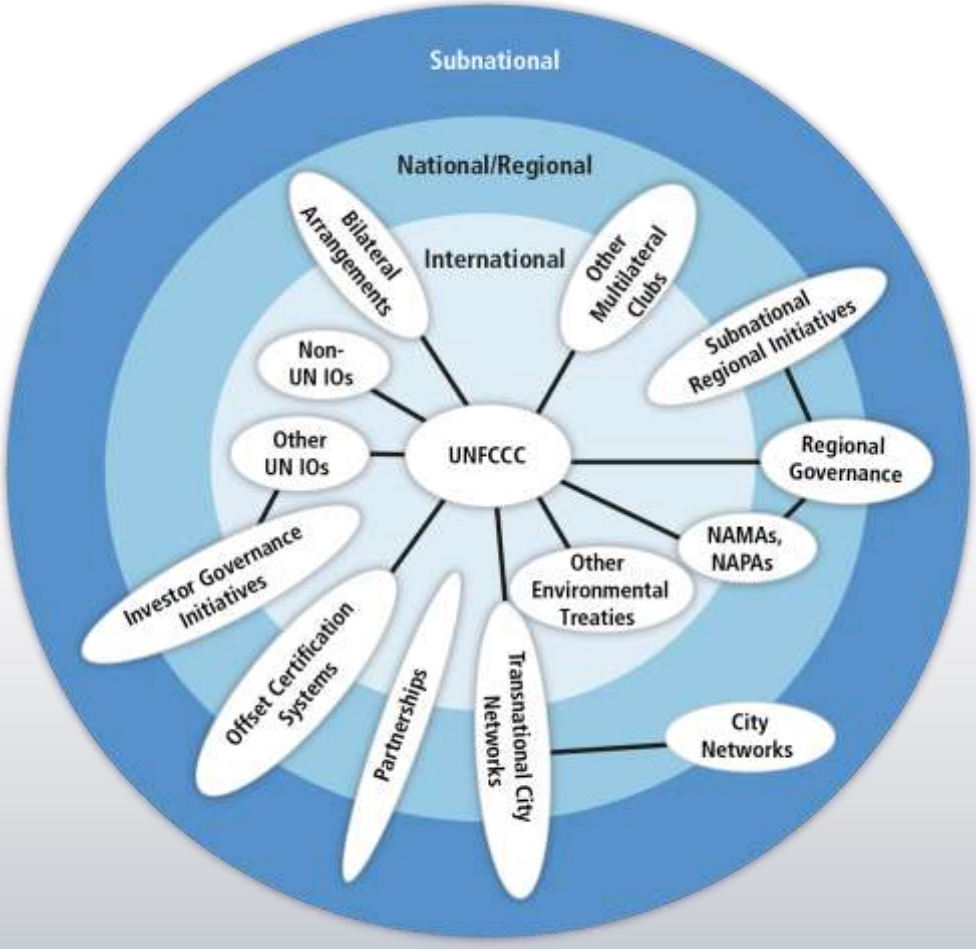
Availability of technologies



- Limits on nuclear, solar and wind influence mitigation costs much less
- Carbon capture and storage as well as bioenergy particularly influence mitigation costs

Climate change mitigation requires international cooperation across scales.

- International cooperation on climate change has become more institutionally diverse over the past decade



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

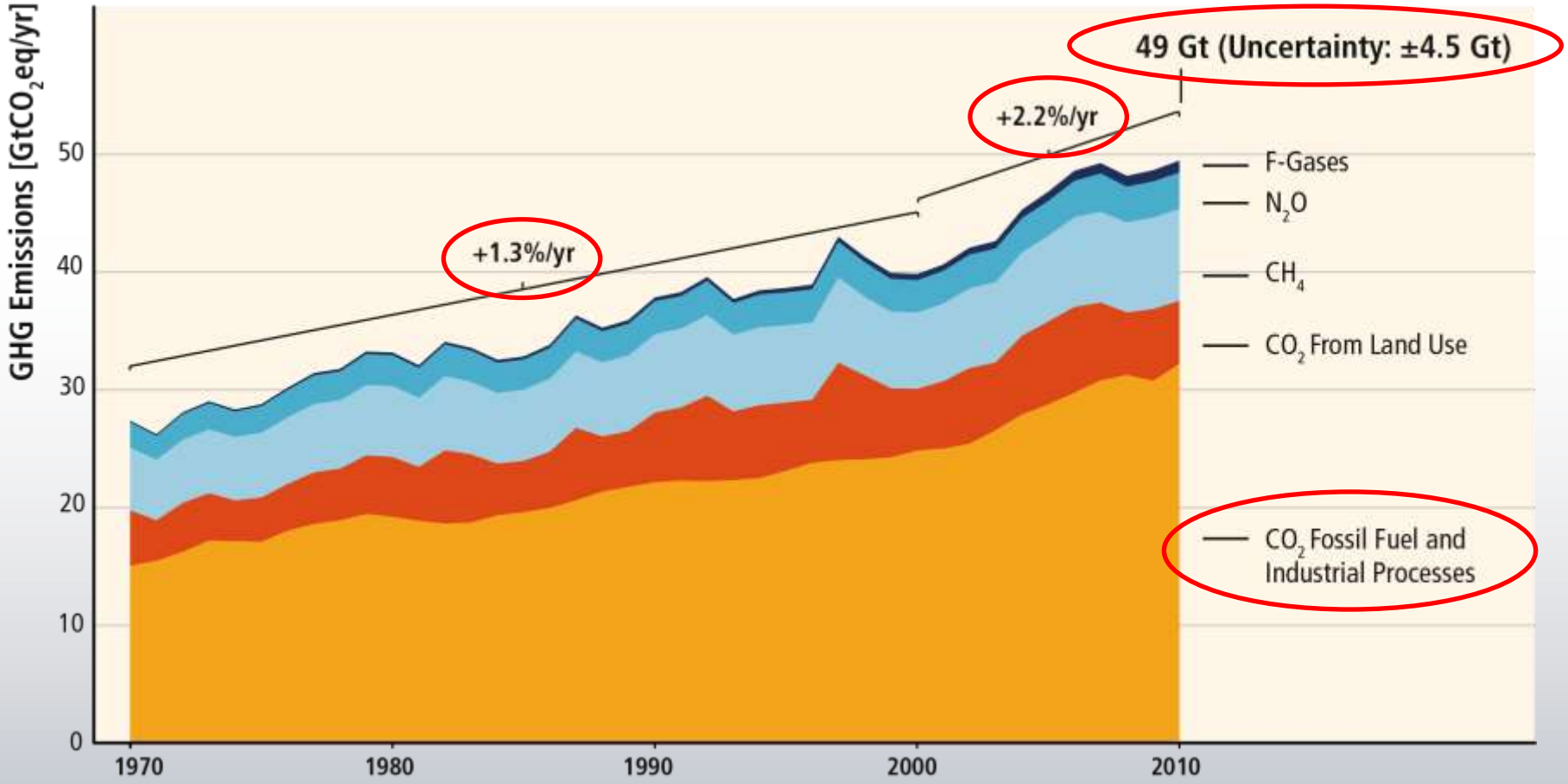
Based on Figure 13.1

Innovative and far reaching policies

- Removing financial and institutional barriers for best practice low carbon technologies
- Packages of complementary policies that take the regional context into account

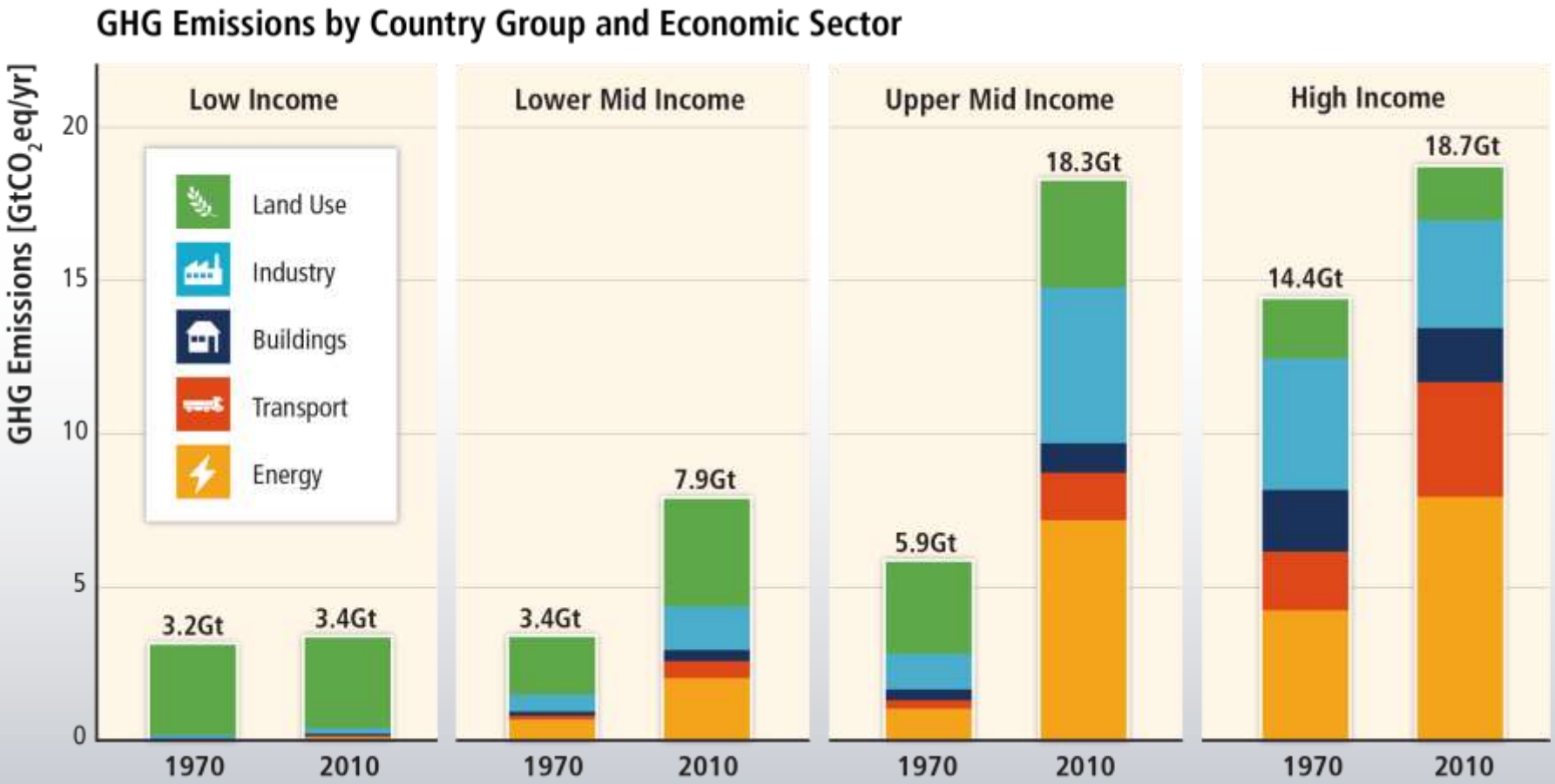
Thank you.

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



Based on Figure 1.3

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



Based on Figure 1.6

Impacts of 2°C mitigation on GDP growth is minimal