ipcc
INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2014

Mitigation of Climate Change

Mitigation in the energy-supply and demand sectors: Policies and measures

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Working Group III side event, SBSTA 40, Bonn

Working Group III contribution to the
IPCC Fifth Assessment Report

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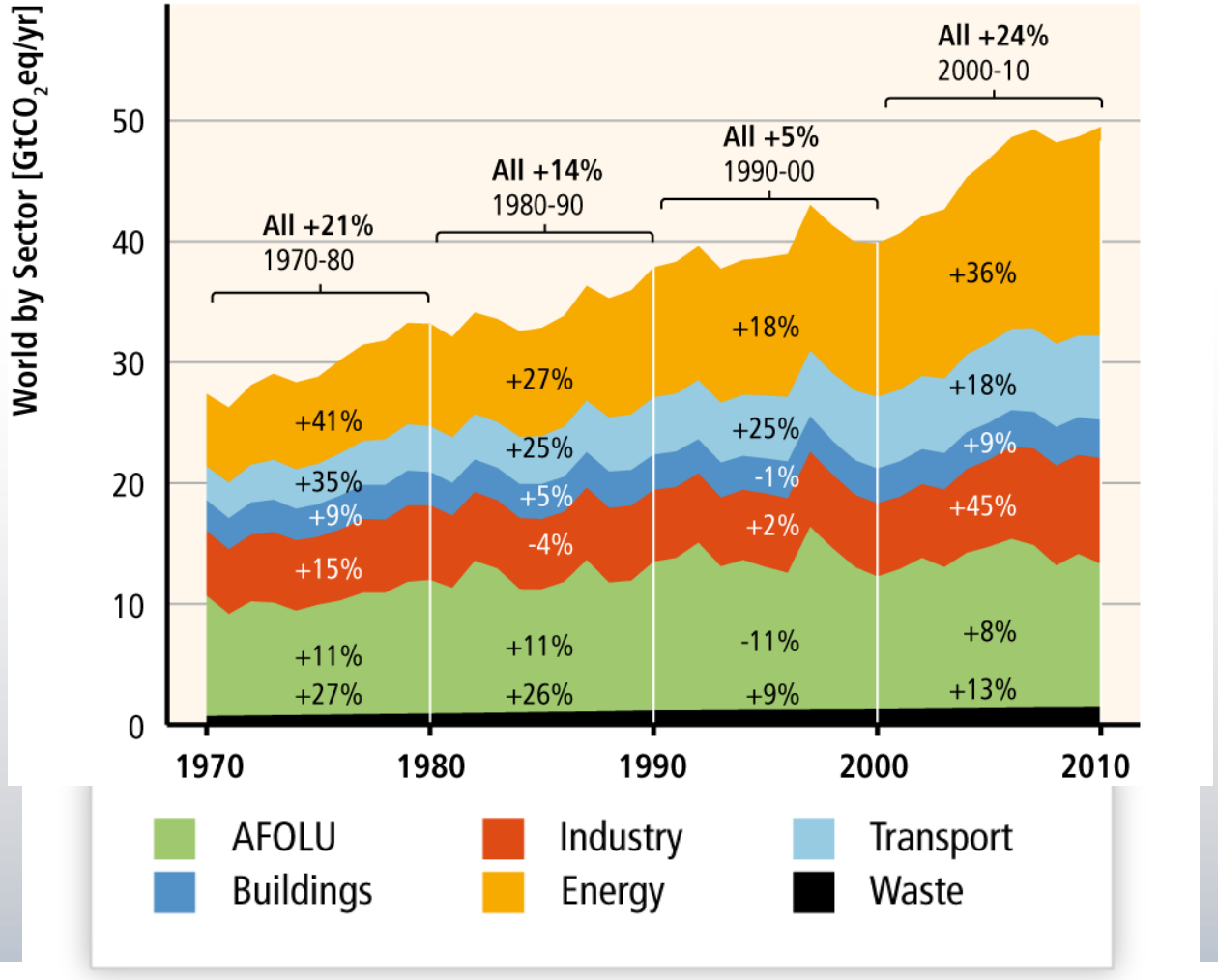
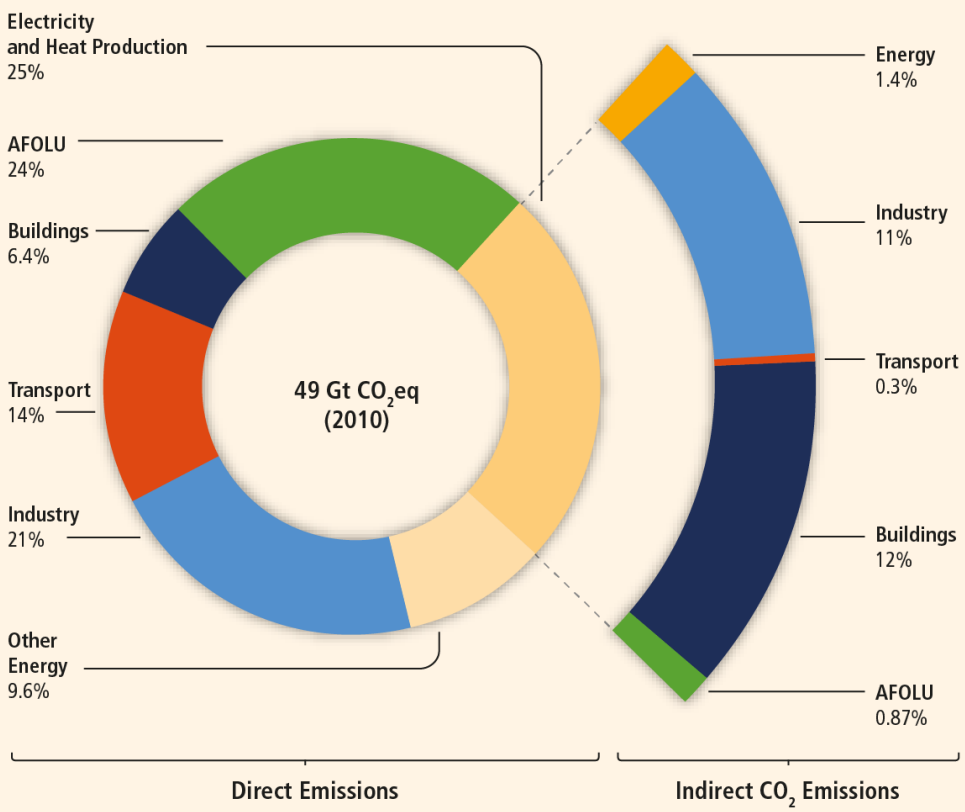
#1
GHG emissions continue to rise in all sectors, except AFOLU.

Almost 80% of the GHG emission growth between 2000 and 2010 comes from the energy supply and industry sectors.



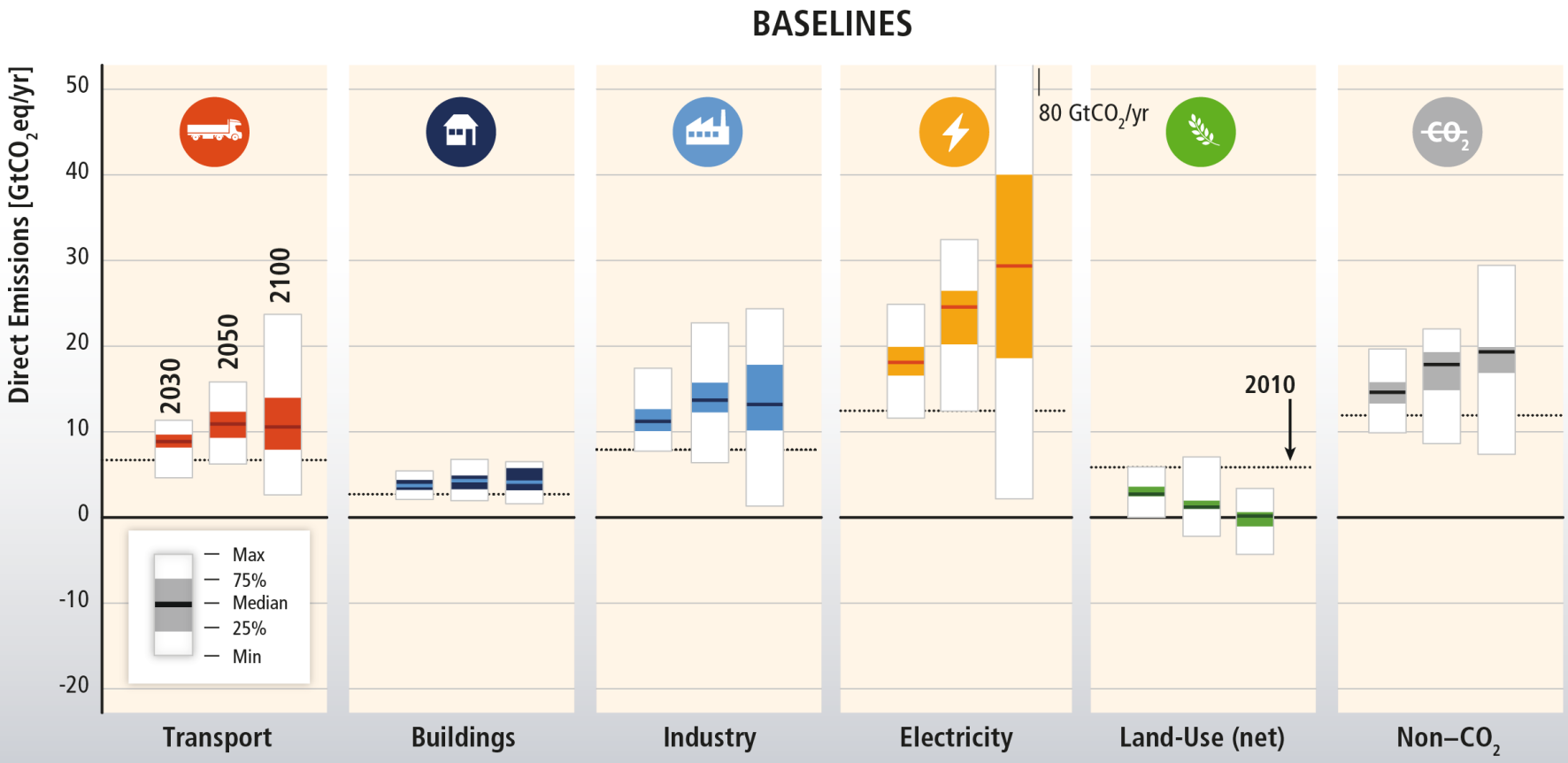
Energy sector was the largest GHG emitter in 2010, but importance of industry and buildings rise as indirect emissions are accounted for.

Greenhouse Gas Emissions by Economic Sectors

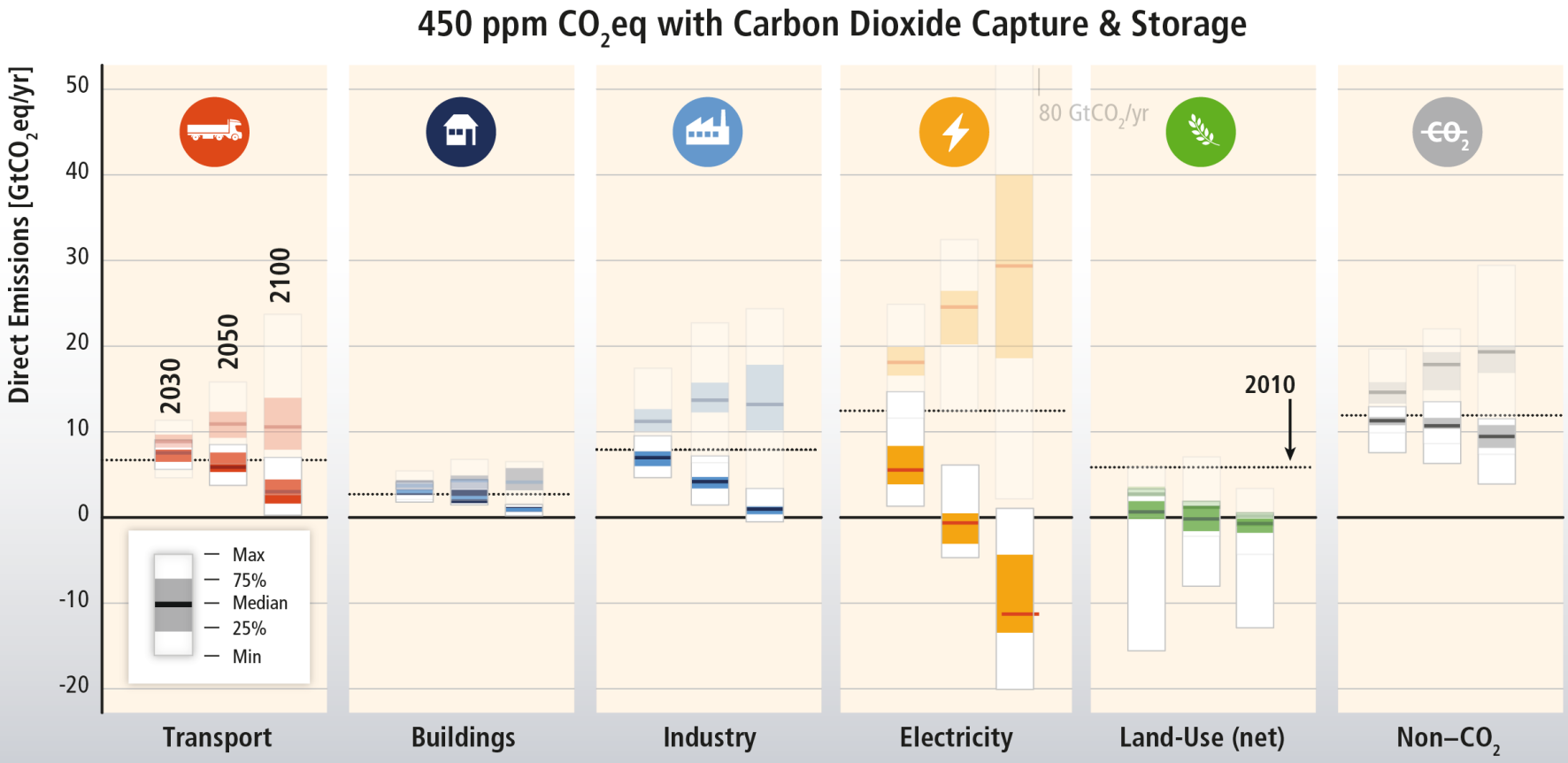



#1
Ambitious mitigation requires GHG emission reductions in all sectors of the economy.

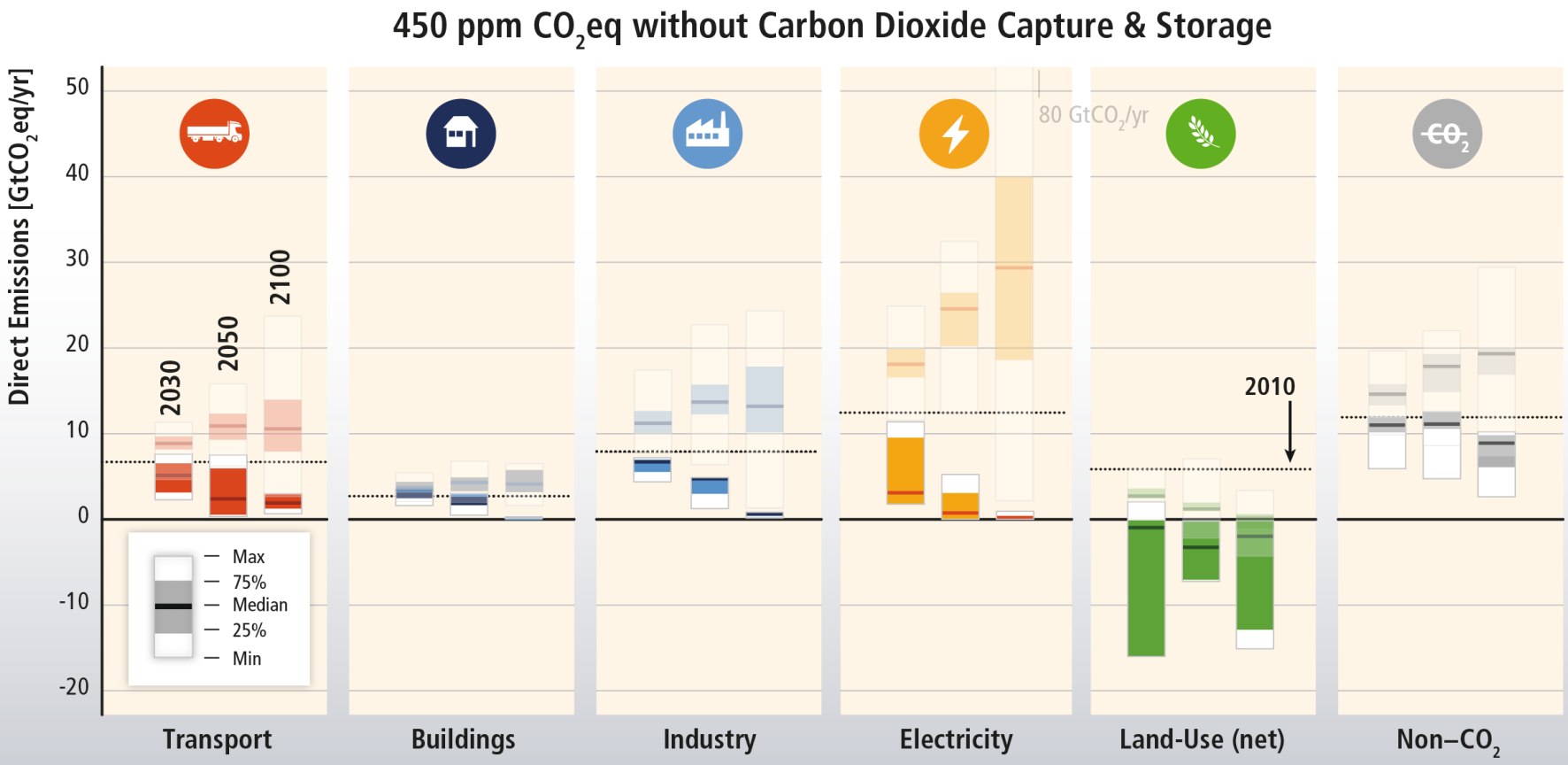
Baseline scenarios suggest rising GHG emissions in all sectors, except for CO2 emissions in the land-use sector



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



Efforts in one sector determine mitigation efforts in others. Importance of negative emission option in ambitious mitigation scenarios.

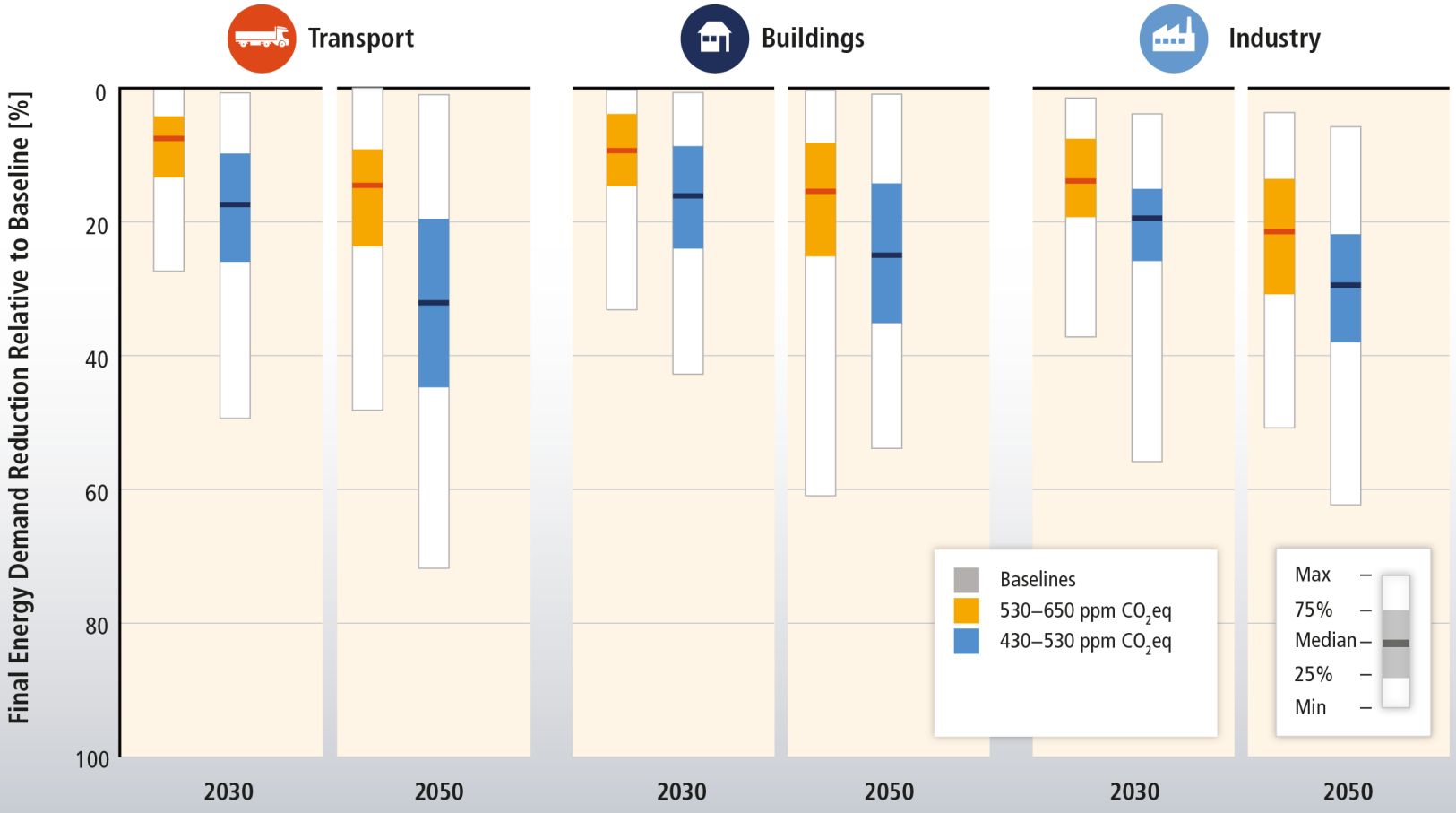


#2

Ambitious mitigation scenarios require a full decarbonisation of energy supply.

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

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



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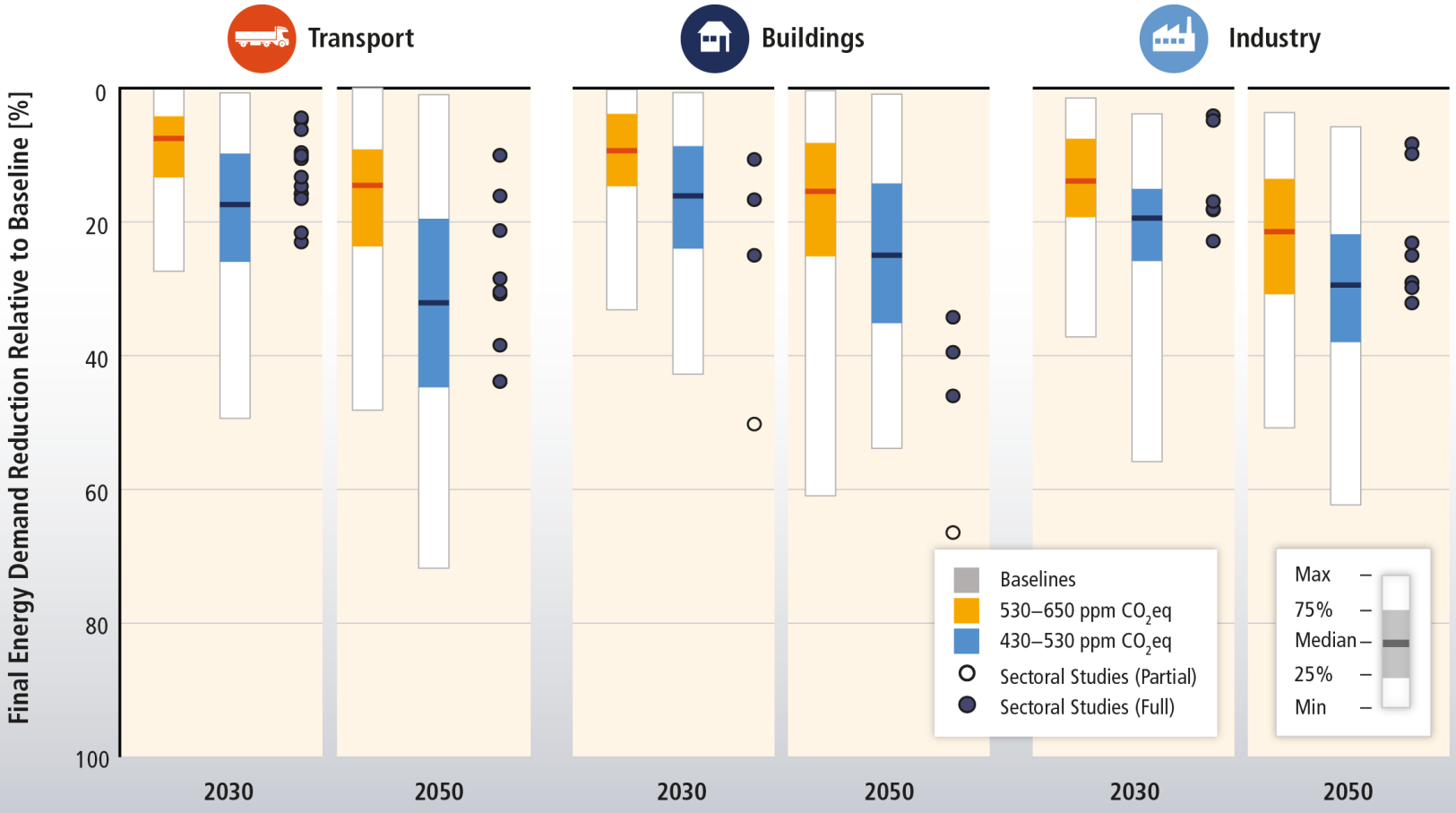
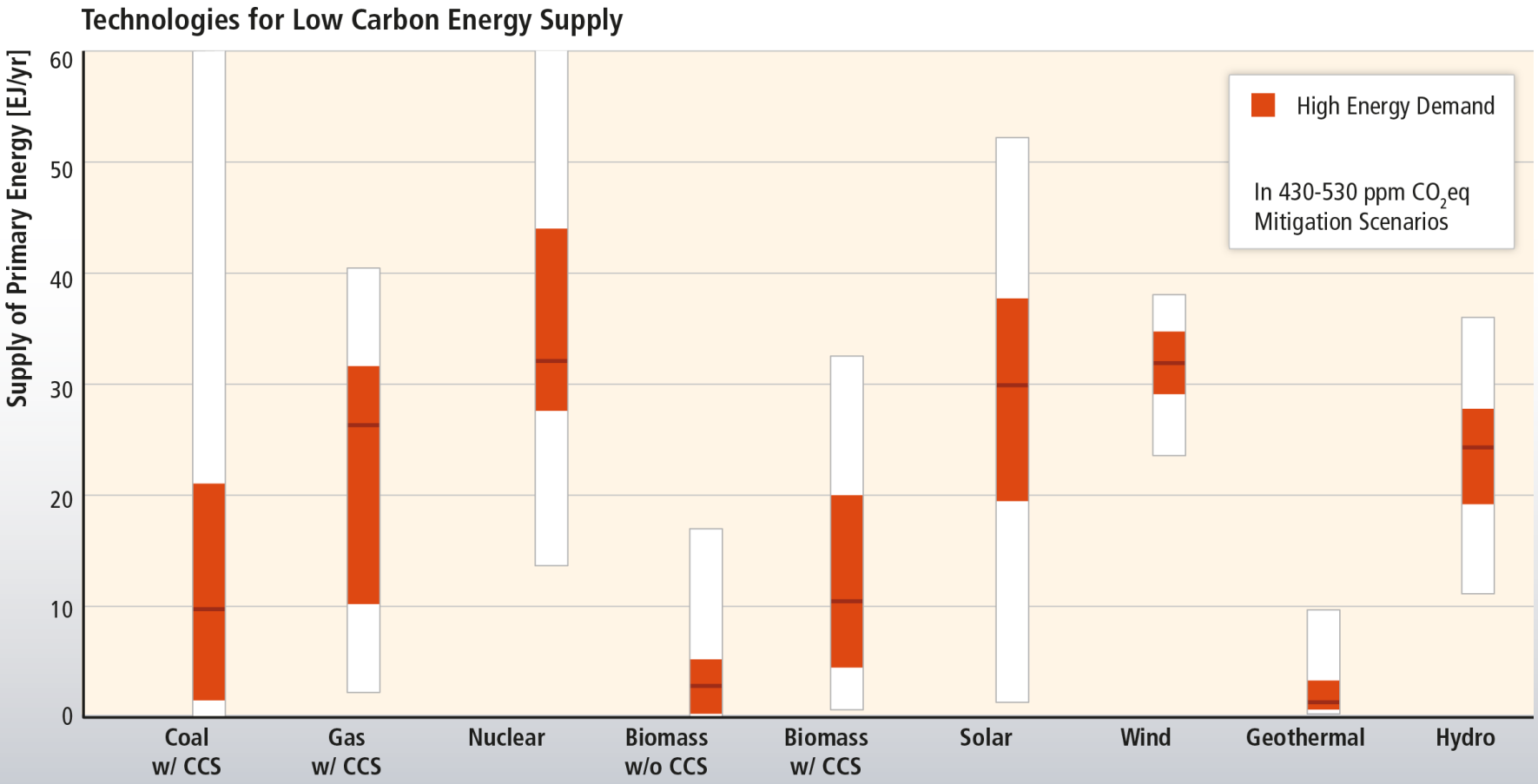
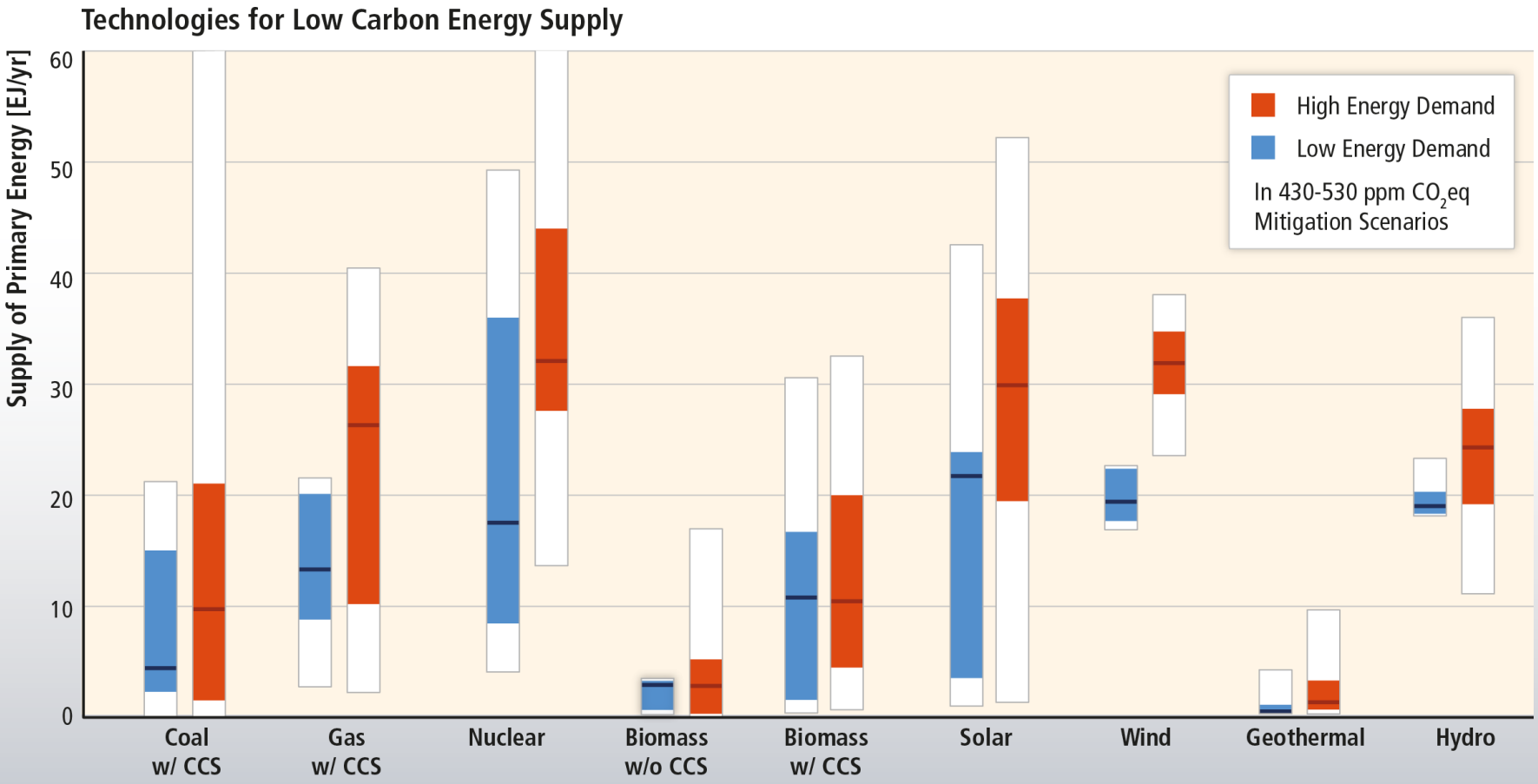


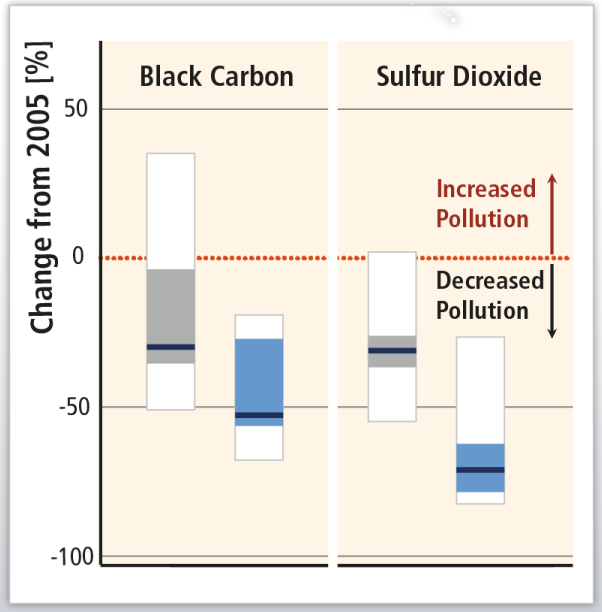
Mitigation scenarios show there is a lot of flexibility in how to decarbonize energy supply.

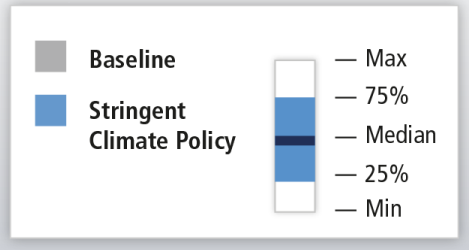


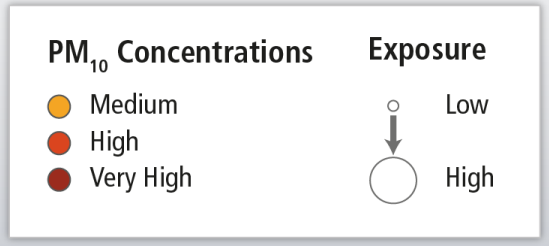
Scale of energy demand reductions determine 1) flexibility in decarbonizing energy; 2) hedge against supply side-risks; 3) avoid infrastructure lock-in; 4) co-benefits of mitigation.

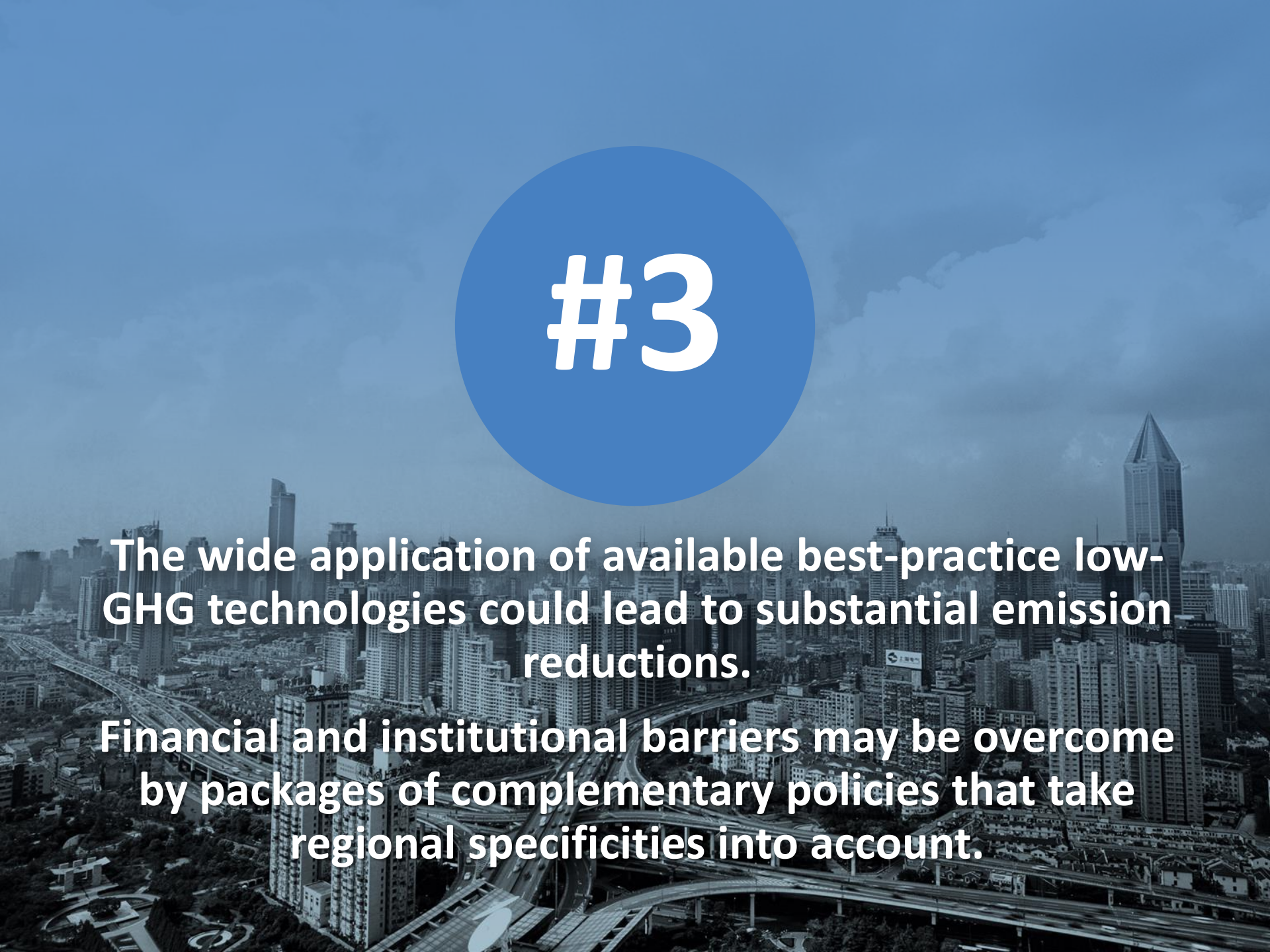


Mitigation can result in large co-benefits for human health and other societal goals. Important differences across technologies.

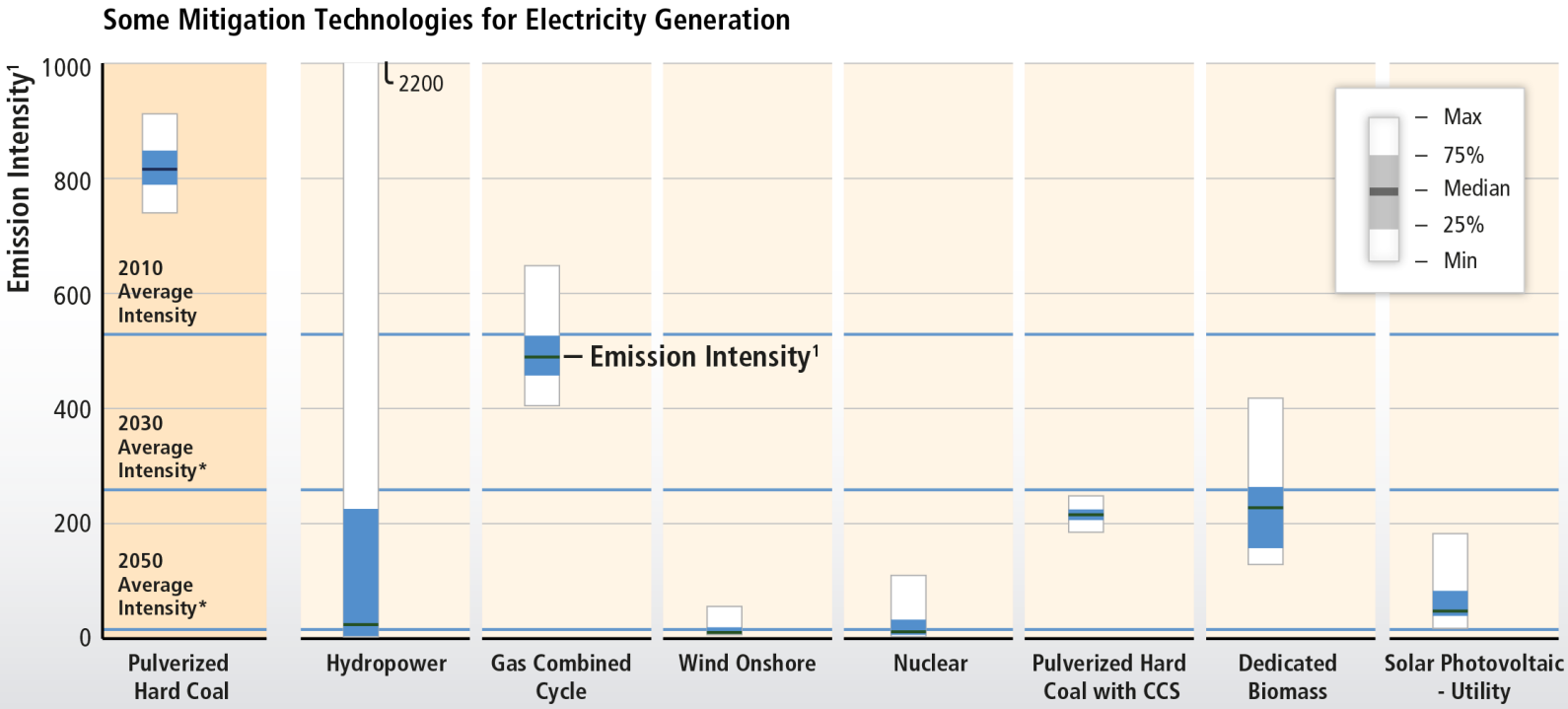







#3
The wide application of available best-practice low-GHG technologies could lead to substantial emission reductions.
Financial and institutional barriers may be overcome by packages of complementary policies that take regional specificities into account.

Many low carbon technologies are available that can reduce GHG emissions in the production of electricity towards zero.



* Median Value in Mitigation Scenarios (430-530 ppm CO_2eq by 2100)
[1] in gCO_2/kWh; Based on Lifecycle Emissions
[2] Levelized Cost in USD_{2010}/MWh; Based on High Full Load Hours

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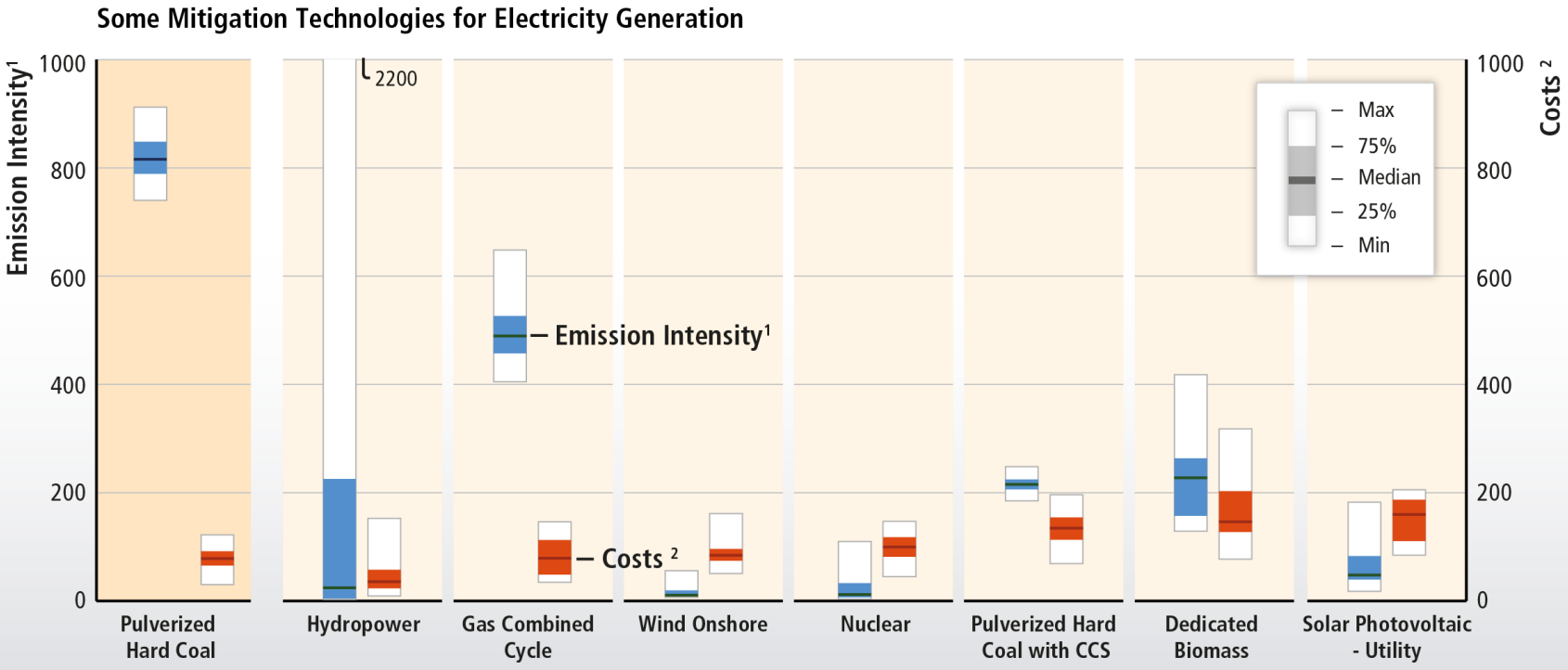
Some already cost-competitive with conventional fossil technologies.



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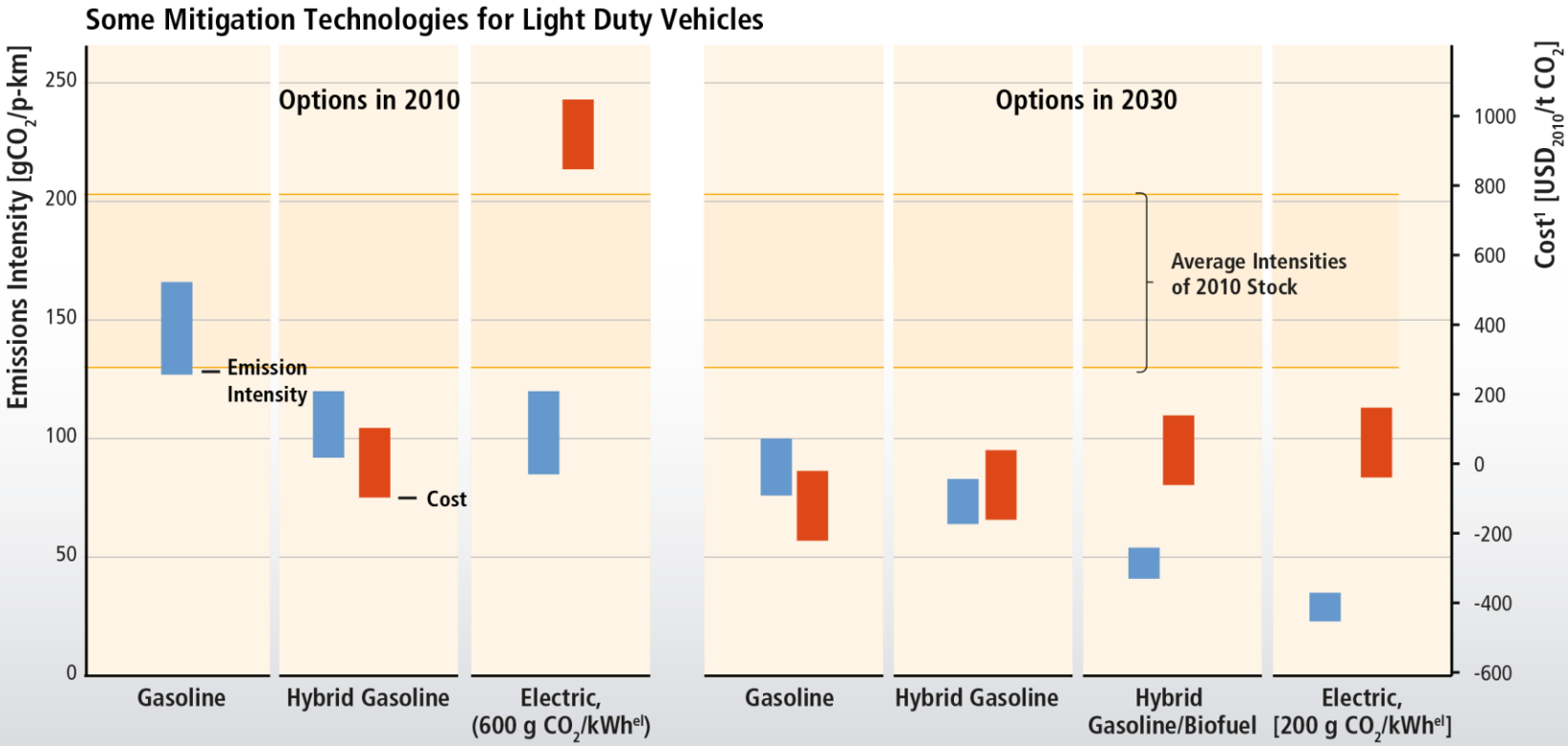
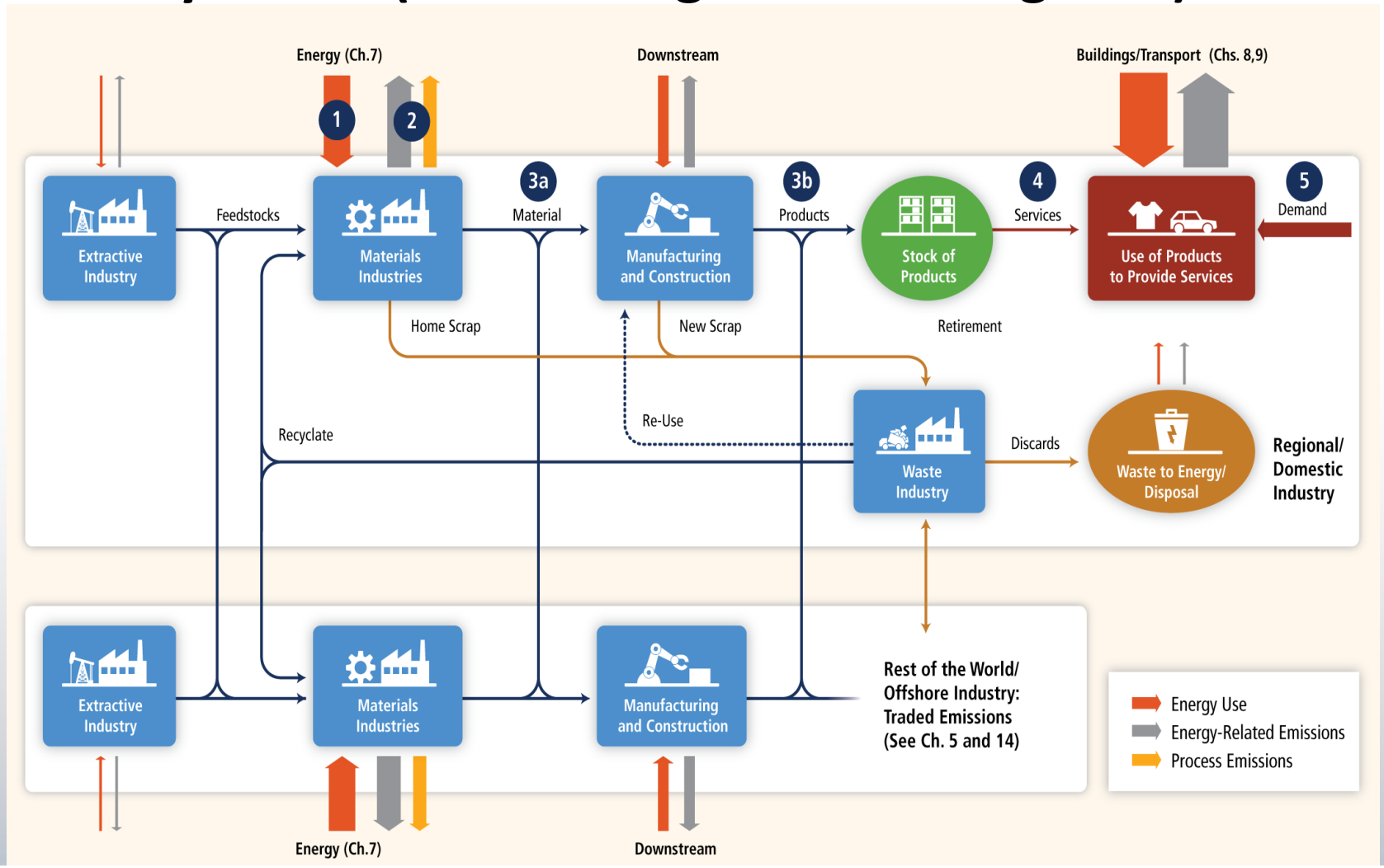
But some of the more efficient technologies have higher levelized costs of conserved carbon.



[1] Levelized cost of conserved carbon at 5% weighted average cost of capital; calculated against 2010 new gasoline (2030 optimized gasoline) for 2010 (2030) options

Five main options for reducing GHG emissions in the industry sector (considering also traded goods)



Advances in technologies, lifestyle change can reduce building sector emission by mid century

- Low energy building codes to avoid lock in
- Retrofit with 50-90% reduction potential for existing building stocks.
- Lifestyle change, traditional architecture, practices can reduce 20-50% from short to mid century

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