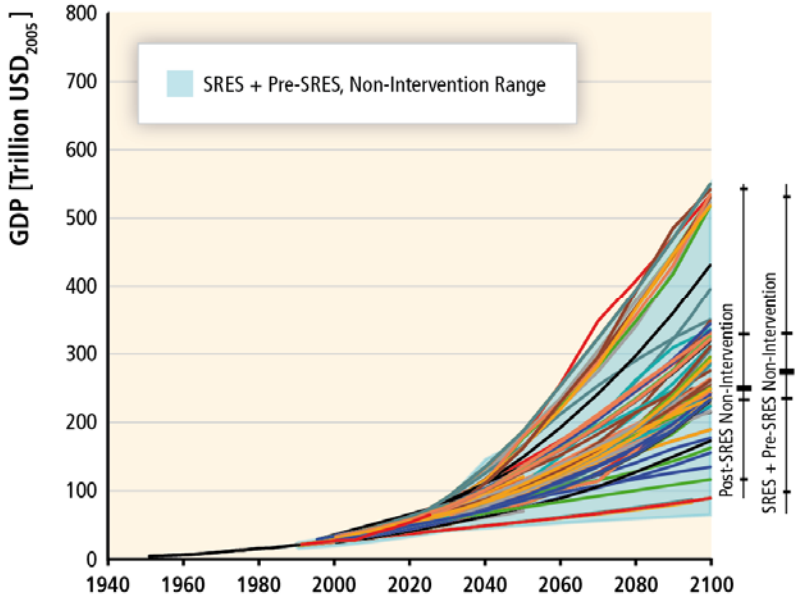

# The IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation

*Renewable Energy and Climate Change*

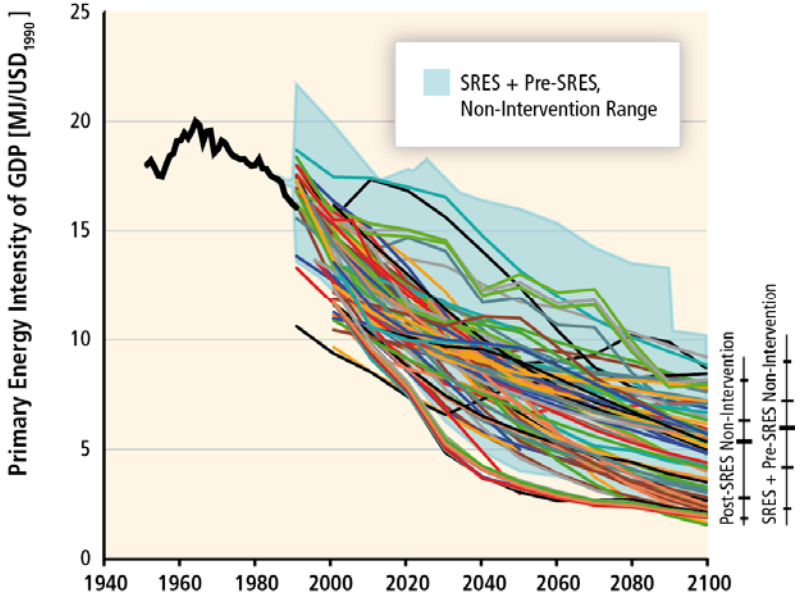
*Youba SOKONA*

WMO UNEP

# Scenarios indicate that economic growth will lead to increase in GDP and primary energy intensity will improve

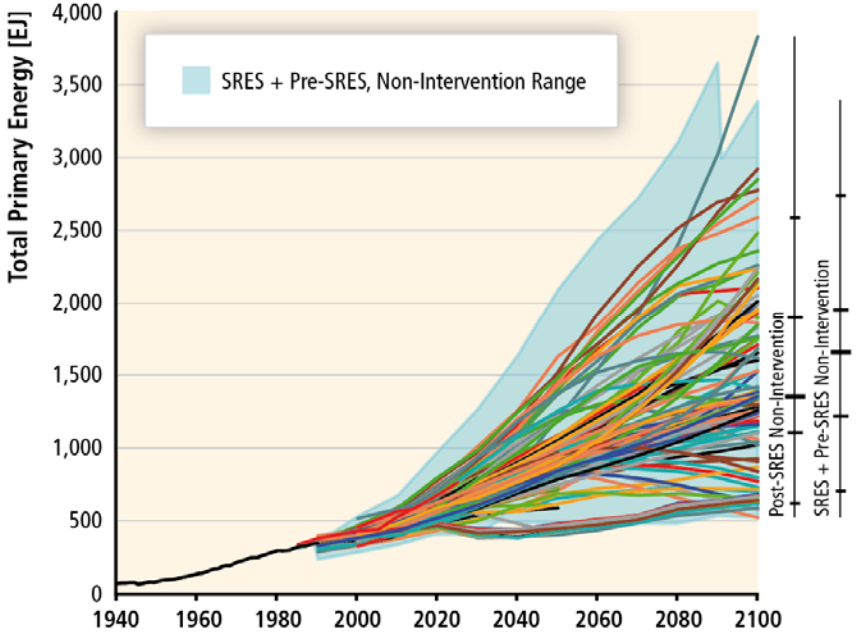



Projected global economic growth

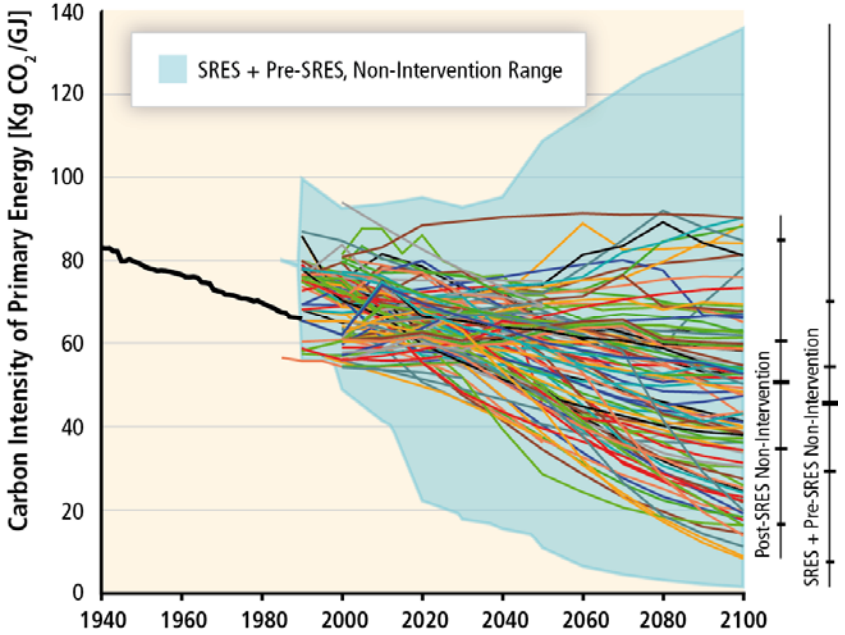



Primary energy intensity

# Demand for global primary energy supply is projected to increase in association of decrease of carbon intensity




Projected primary energy supply




Carbon intensity changes

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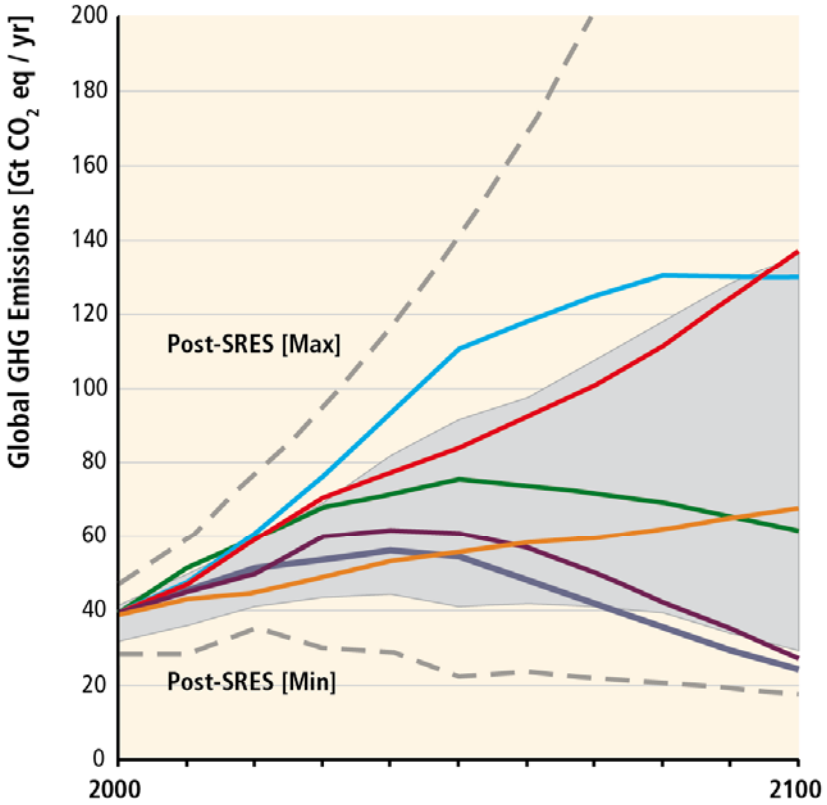
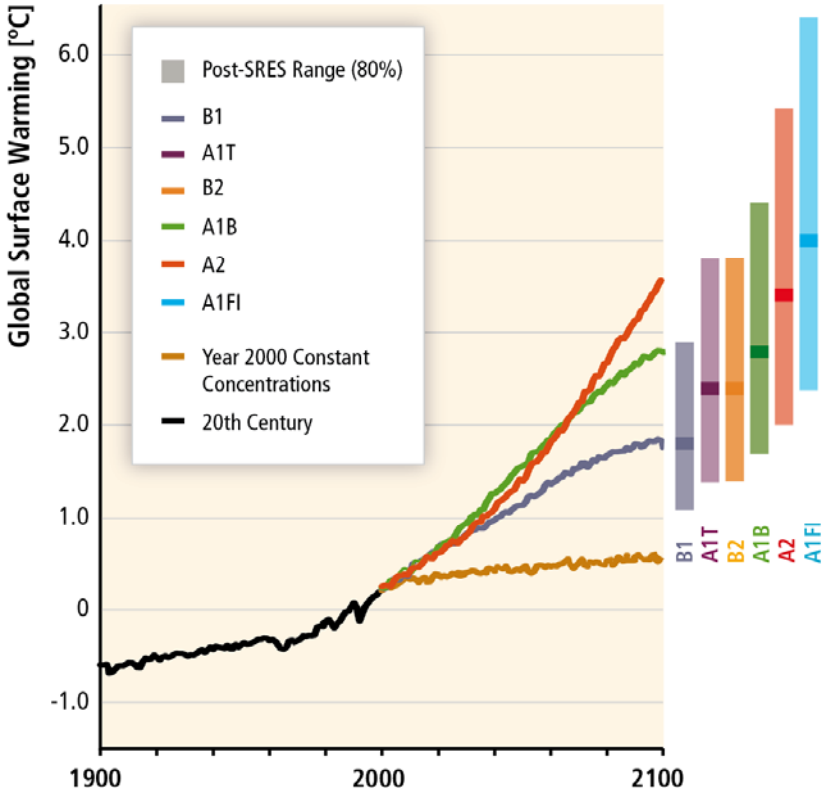
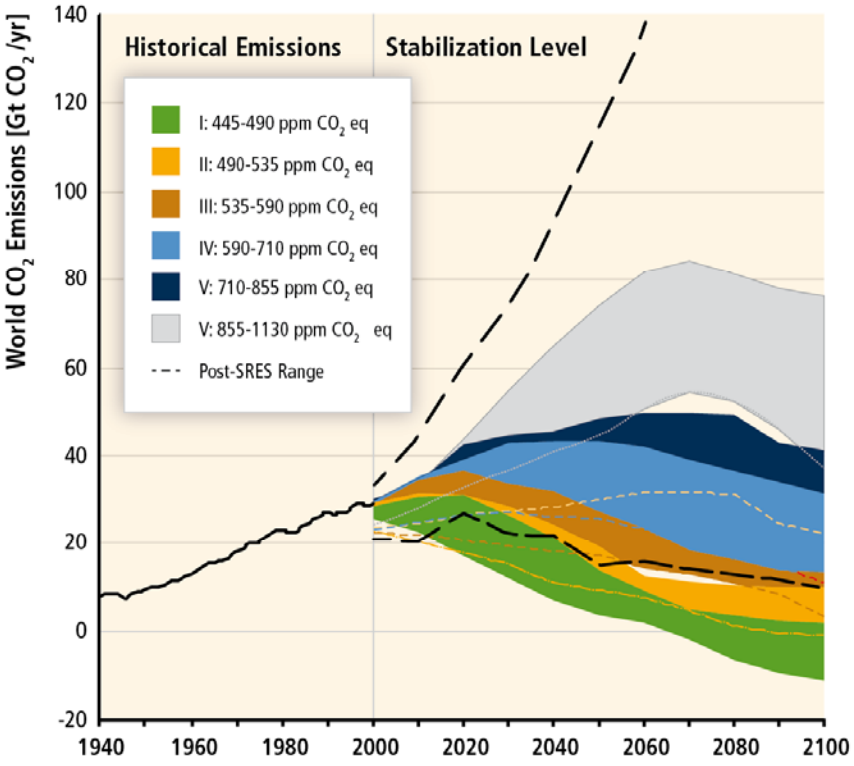
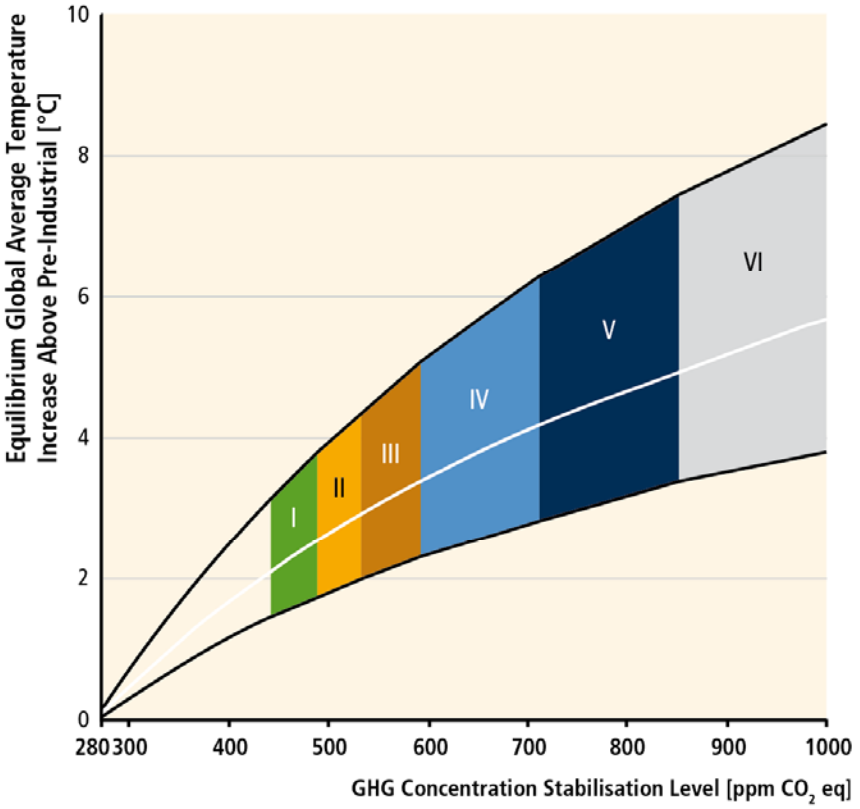
# In the absence of additional climate policies projected global average temperature will rise over this century



# For a 2° C target GHG concentrations would need to be in range of 450 ppm CO2-eq

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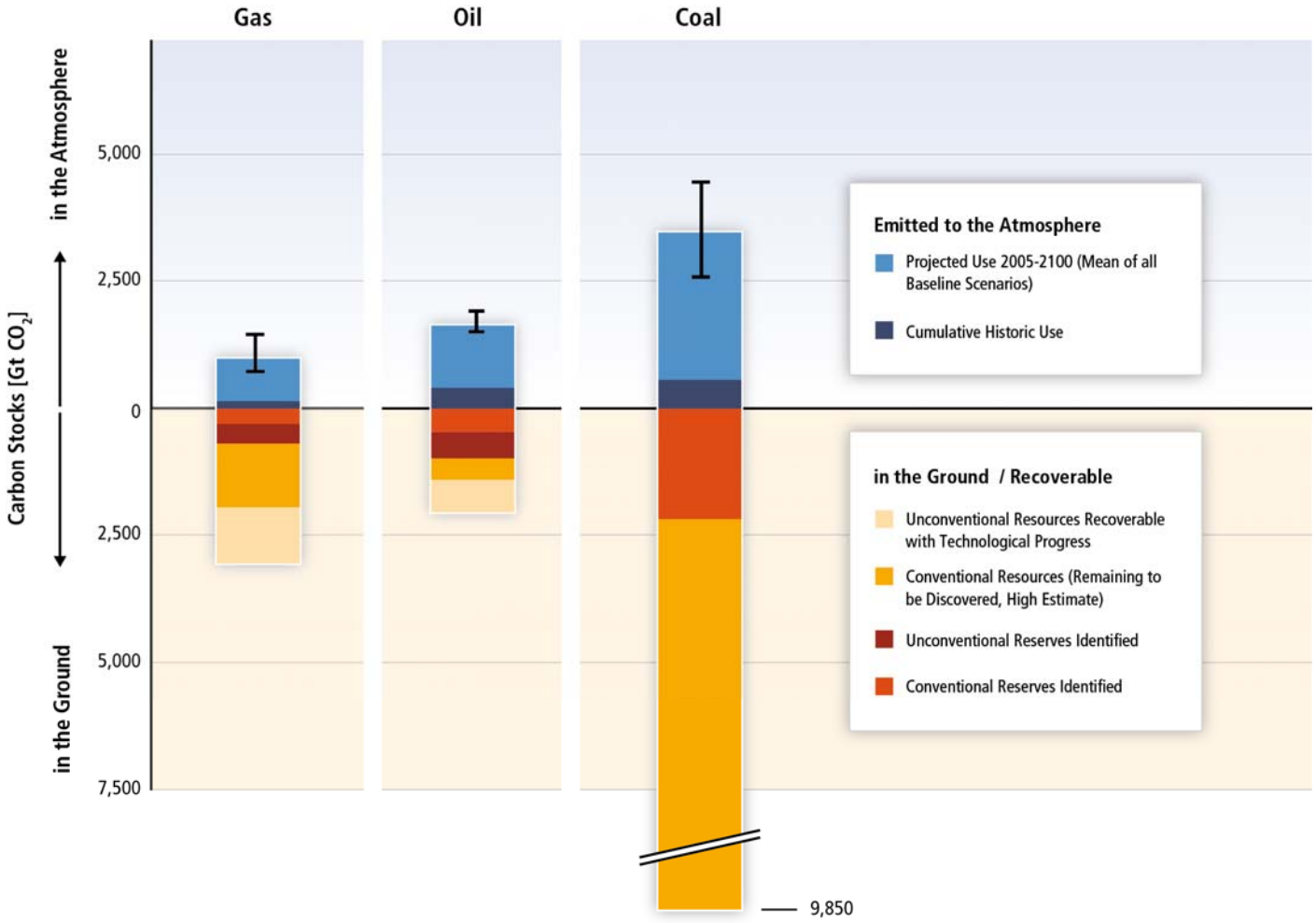
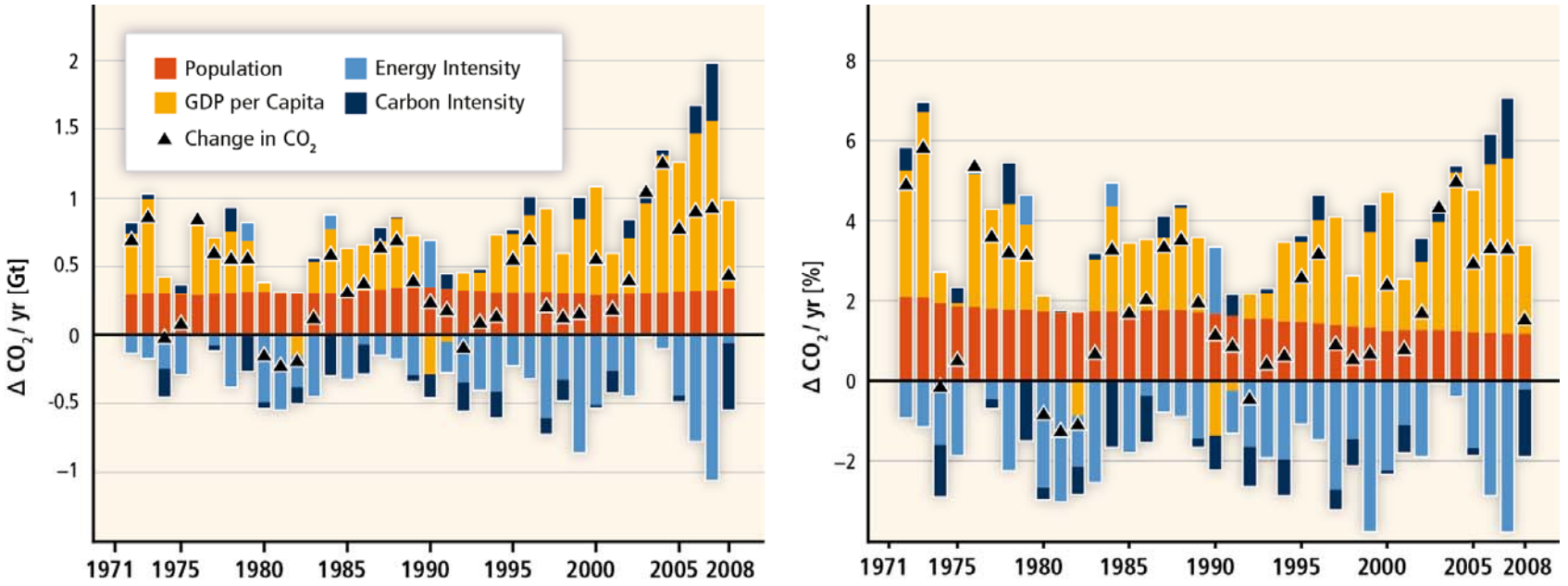
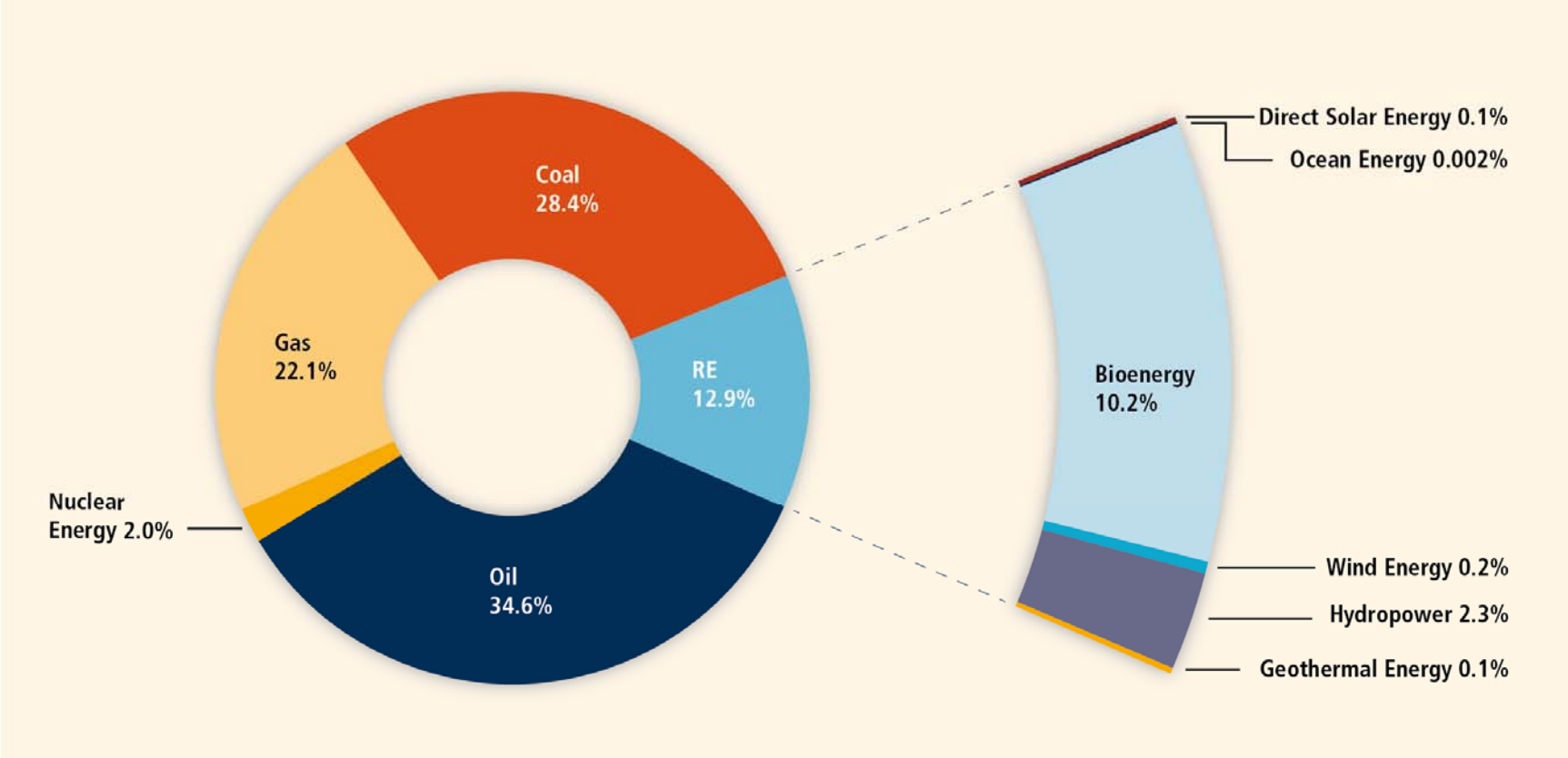
# Potential CO2 emissions from fossil fuels resources and reserves would exceed range of scenarios considered



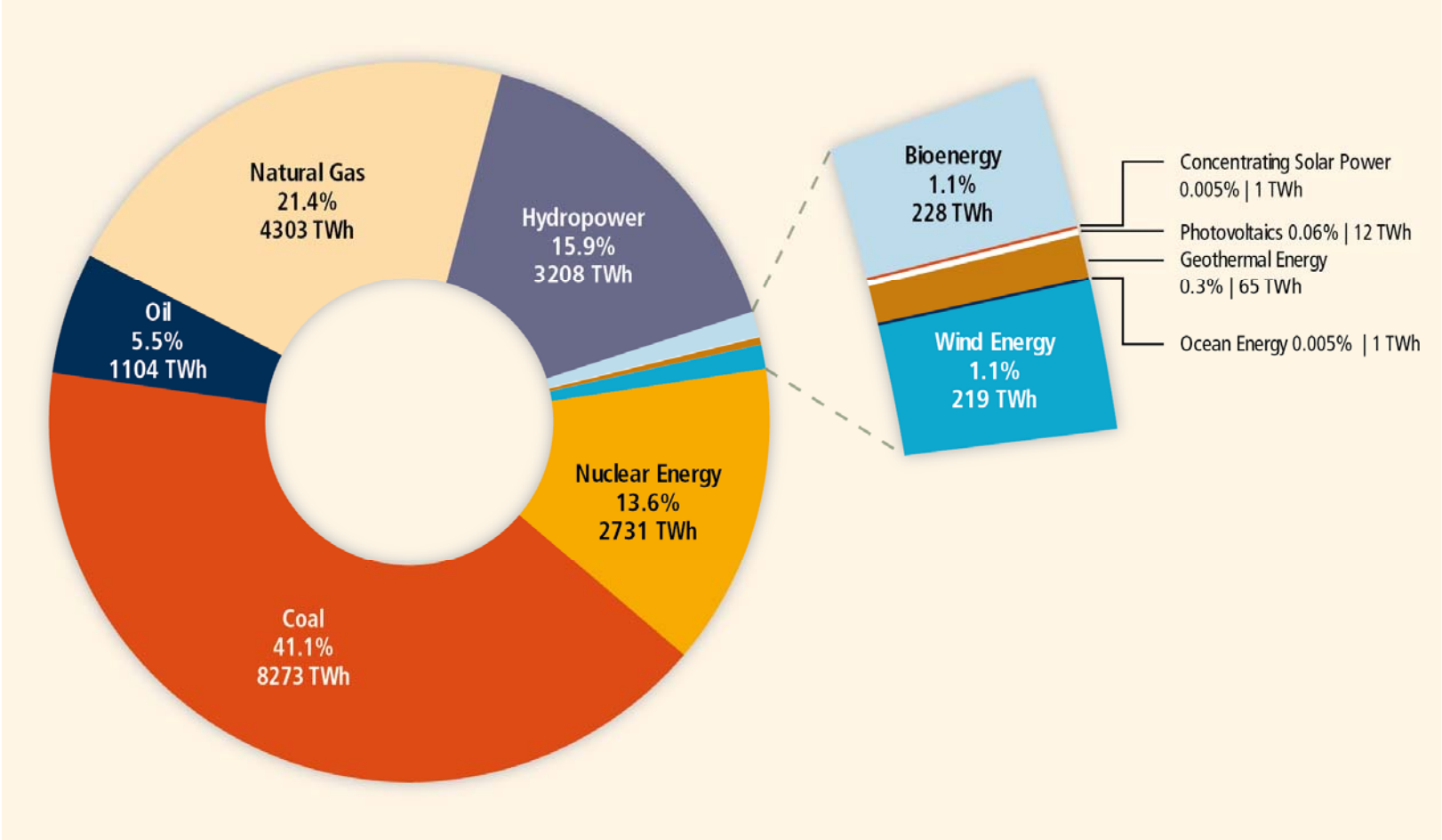
# CO2 emissions = Population x Affluence x Energy intensity x Carbon intensity



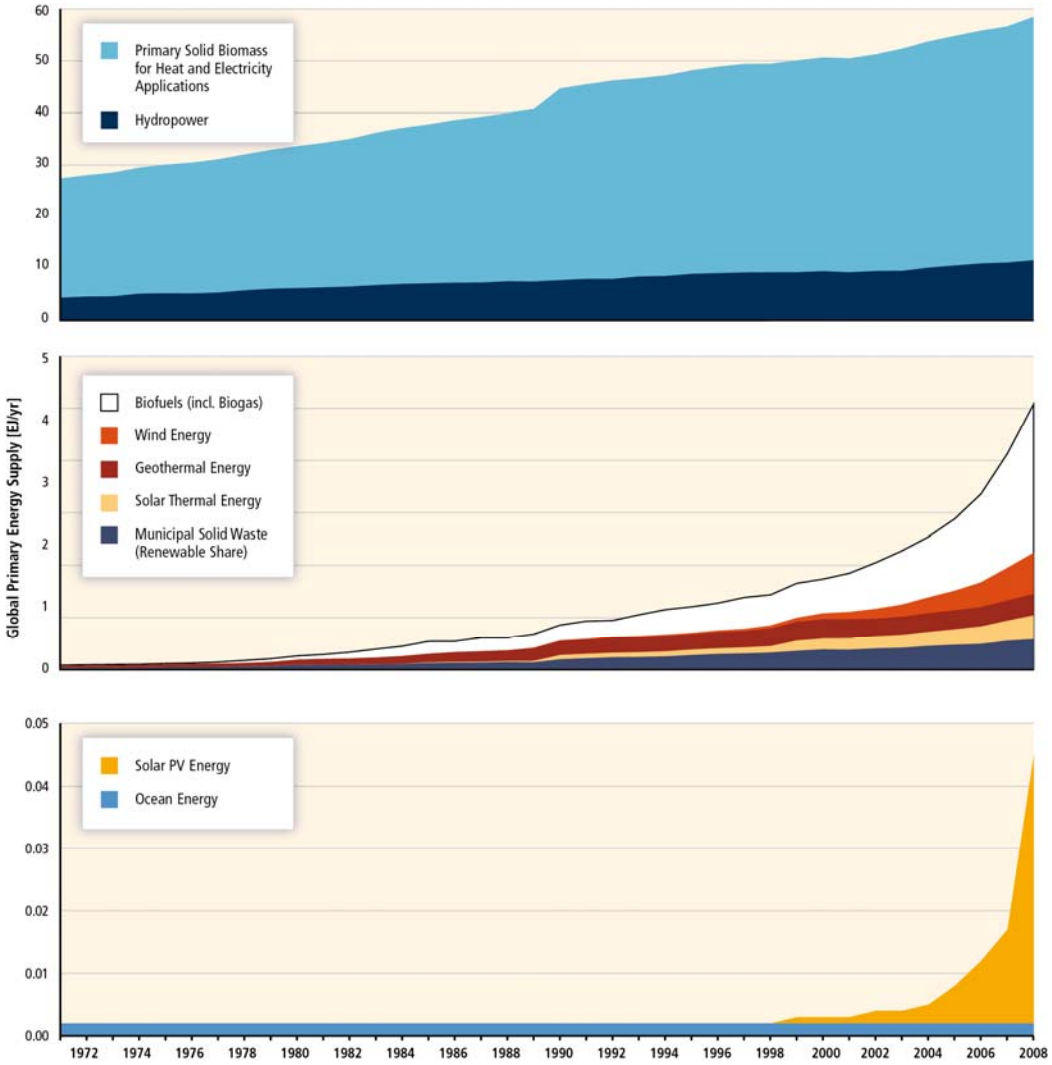
# RE share of global energy consumption is still relatively small and dominated by biomass



# In 2008 RE contibuted 19% of global electricity supply mainly from hydropower



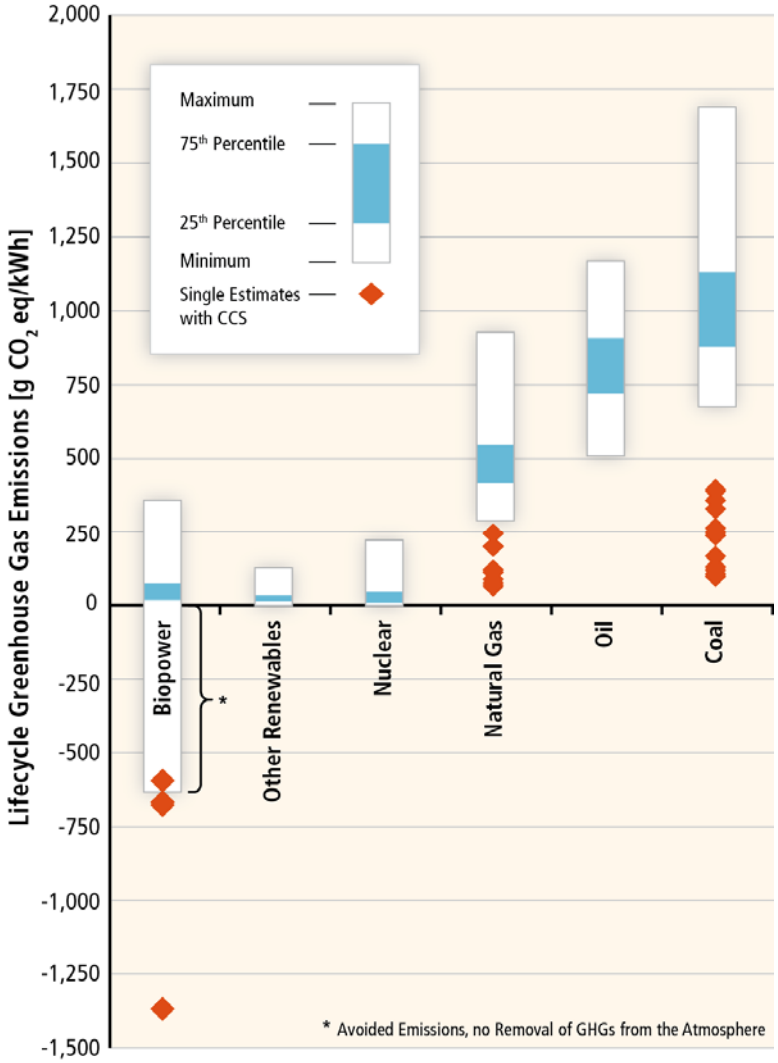
# Deployment of RE has been increasing rapidly in recent years



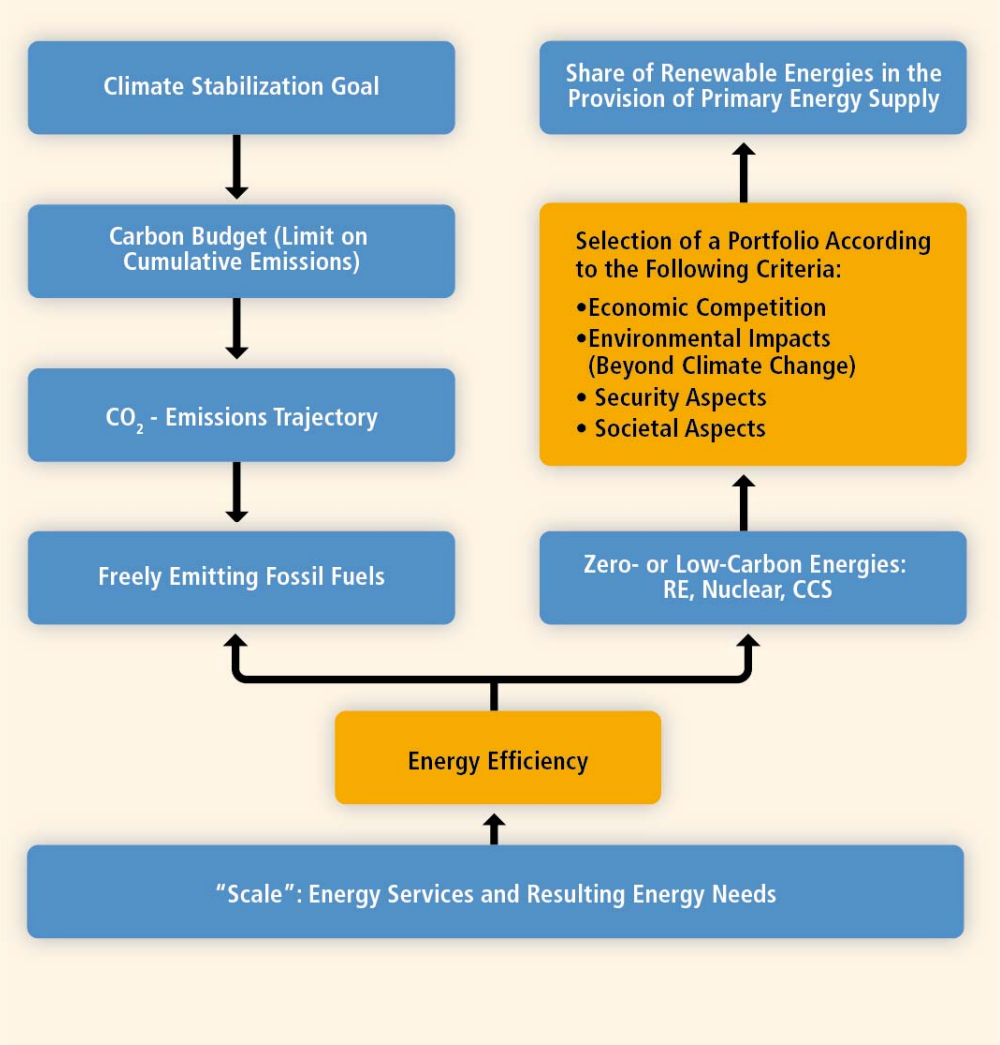

In 2009 RE capacity continued to grow

- Wind power 32%, 38 GW added
- Hydropower 3%, 31 GW added
- Grid-connected PV 53%, 7 GW added
- Geothermal power 4%, 0.4 GW added
- Solar hot water/heating 21%, 31 GWth
- Ethanol 10%, 7 billion liters added
- Biodiesel 9%, 2 billion liters added

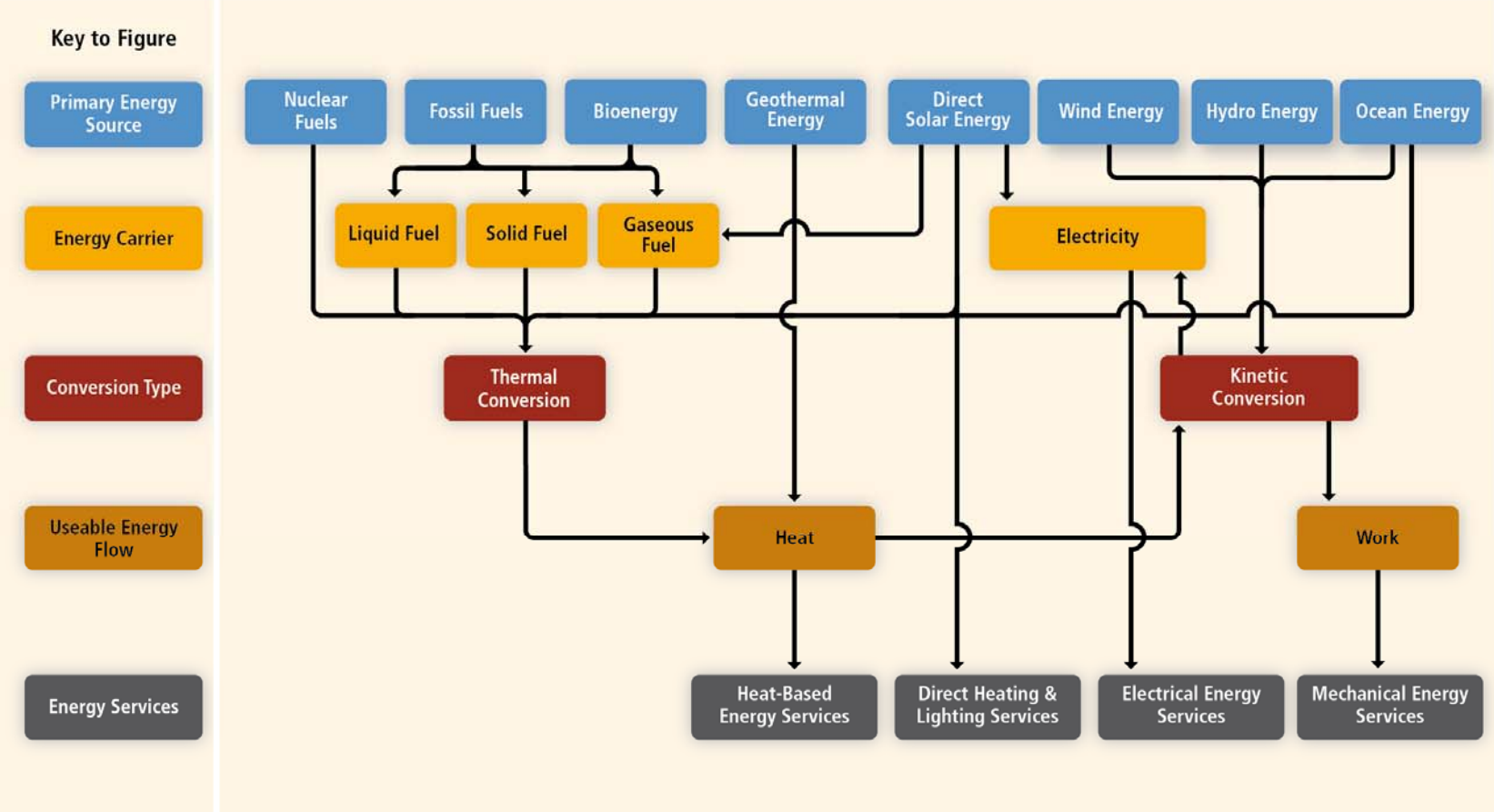
# Most of RE have low specific emissions of CO2 relative to fossil fuels



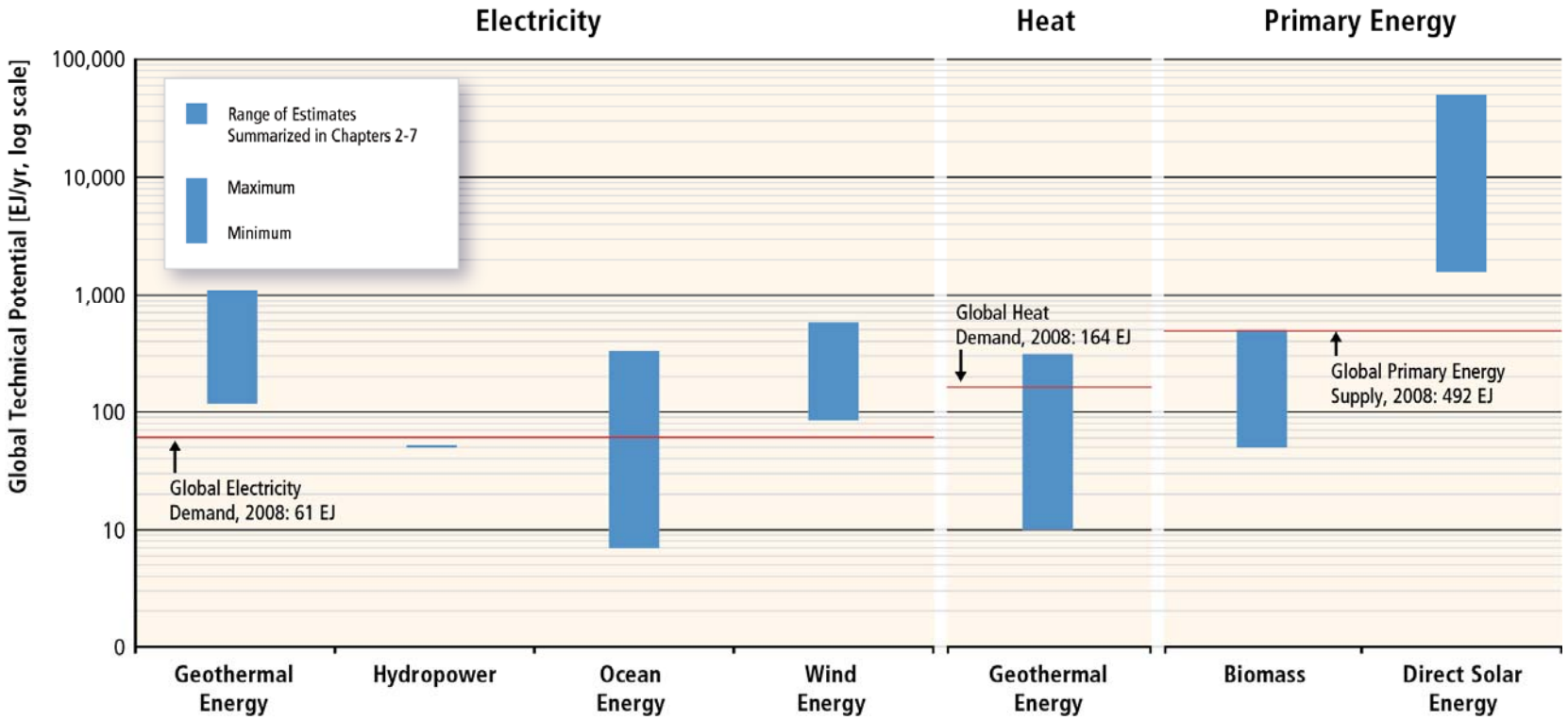
# Future share of RE applications will depend on climate potection goals



# Multiple energy service needs can be satisfied by various types of RE



# Global technical potential for RE is substantially higher than both current and projected future global energy demand




Range of Estimates of Global Technical Potentials

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Max (in EJ/yr) | 1109 | 52 | 331 | 580 | 312 | 500 | 49837 |
| Min (in EJ/yr) | 118 | 50 | 7 | 85 | 10 | 50 | 1575 |

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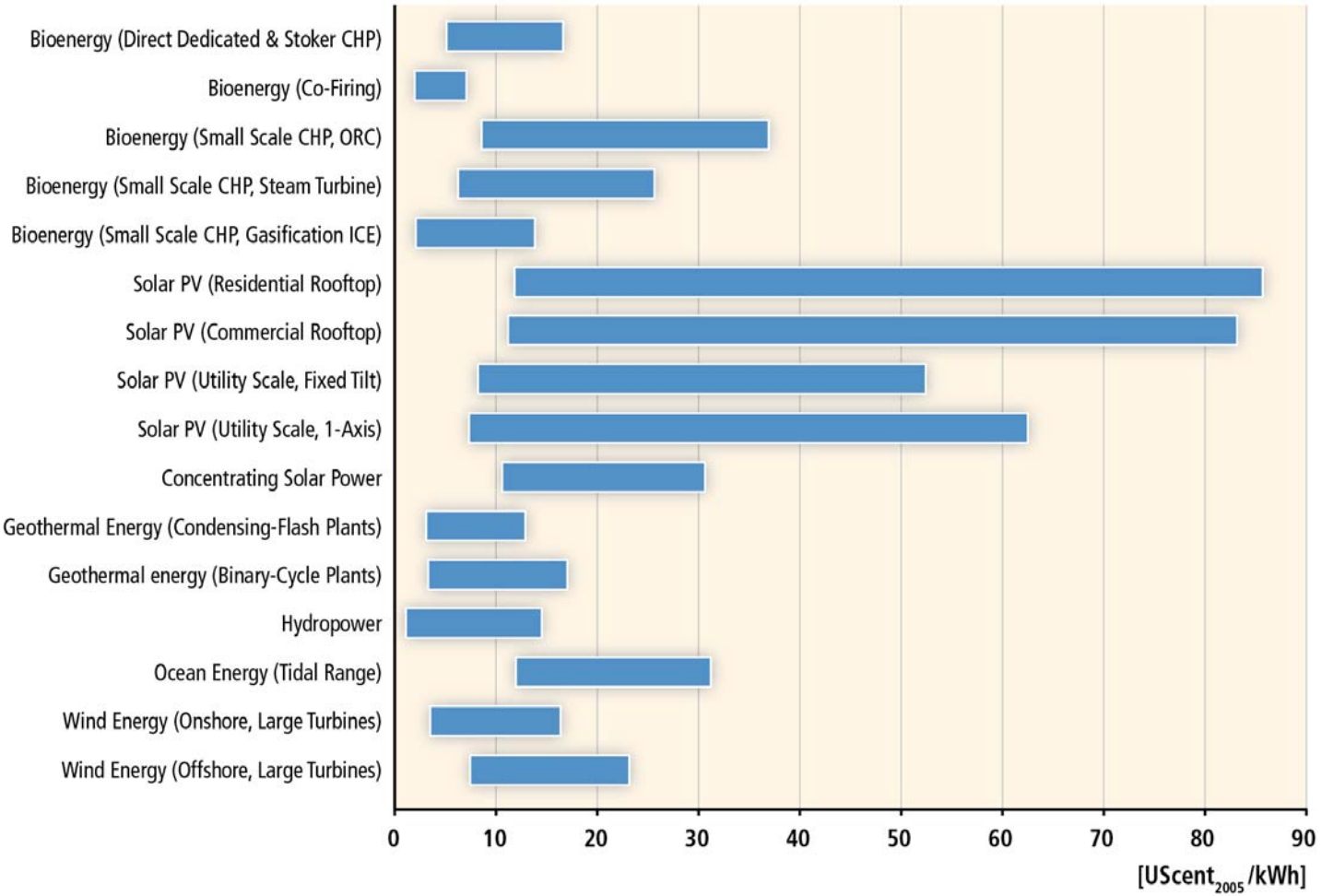
# Levelized Cost of Electricity for commercially available RE technologies

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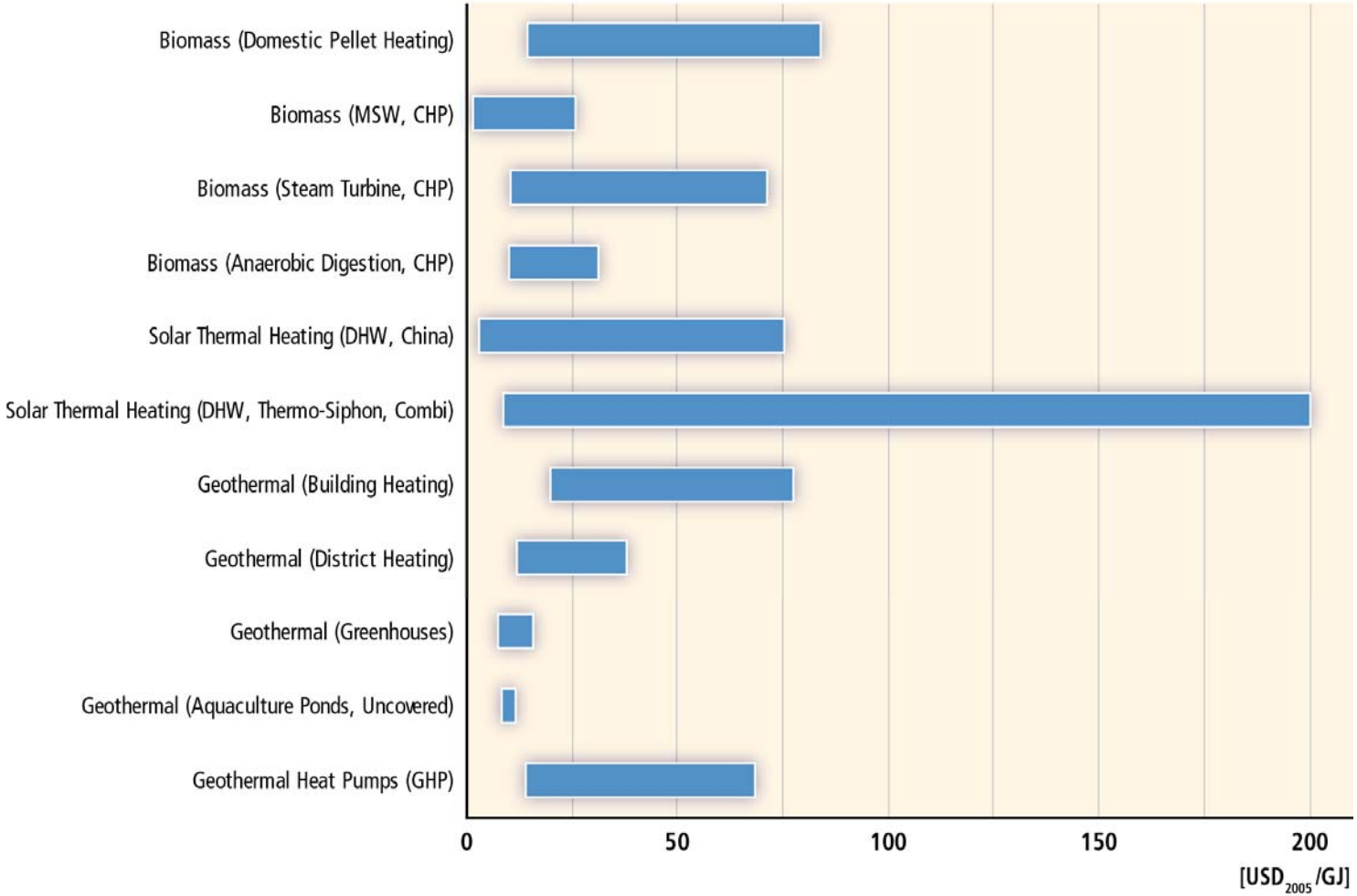
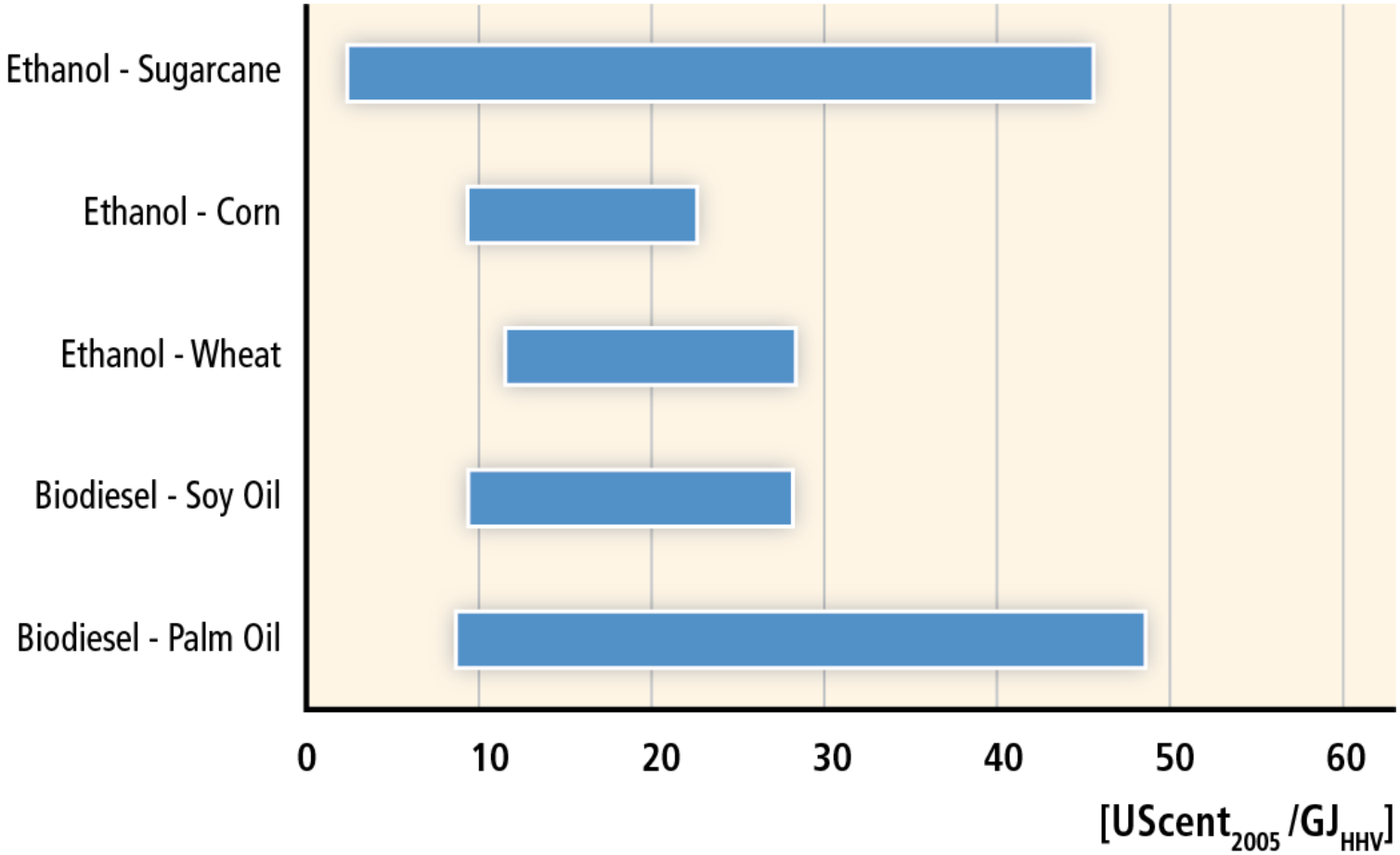
# Levelized Cost of Heat for commercially available RE technologies



# Levelized Cost of Fuels for commercially available biomass conversion technologies



Lifecycle structure for Carbon dioxide emission
Analysis and relative GHG
Implications for RE, nuclear
Power and fossil fuels