Mitigation Potentials and Costs

Energy, Buildings, Transport and Industry

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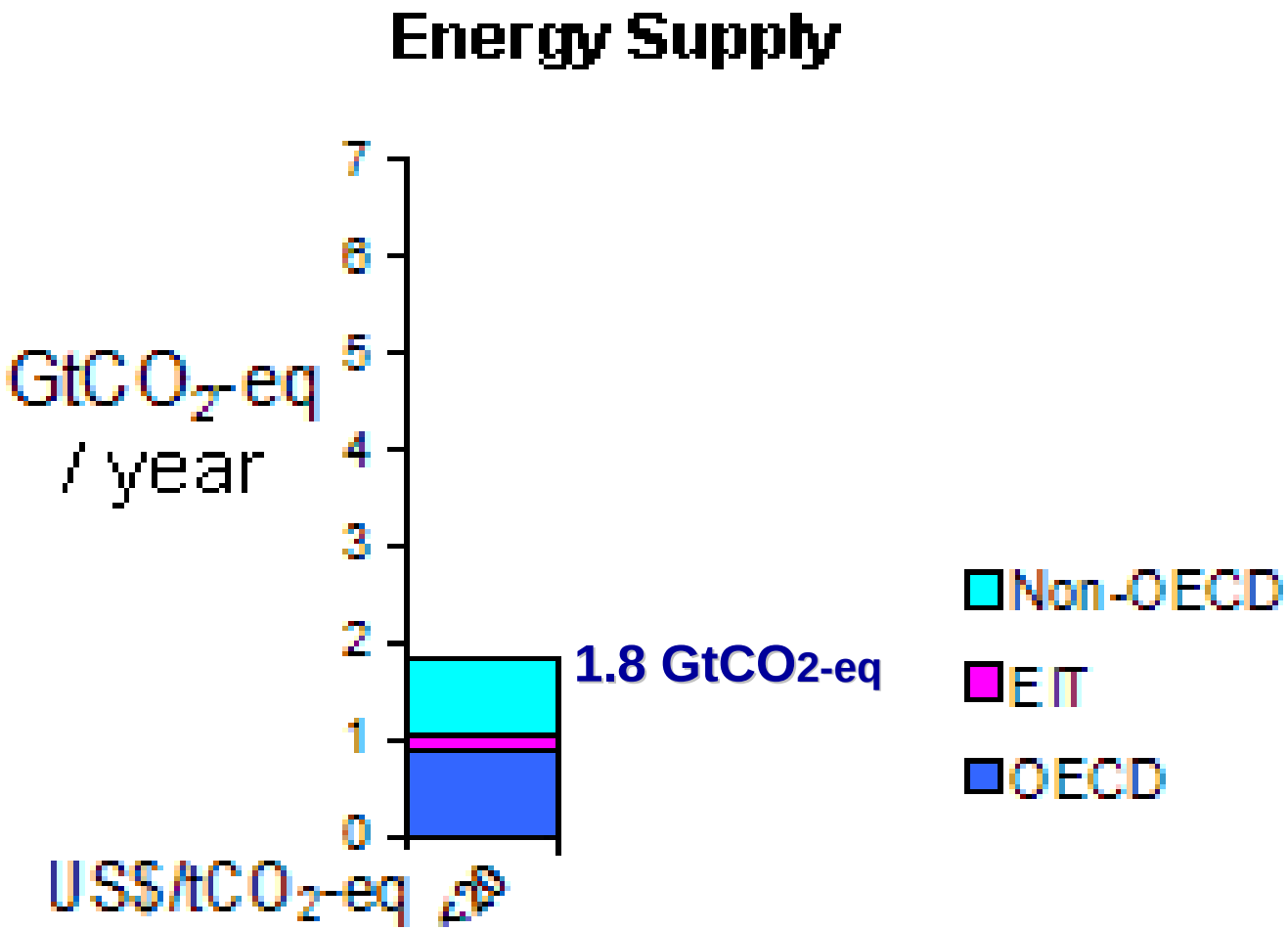
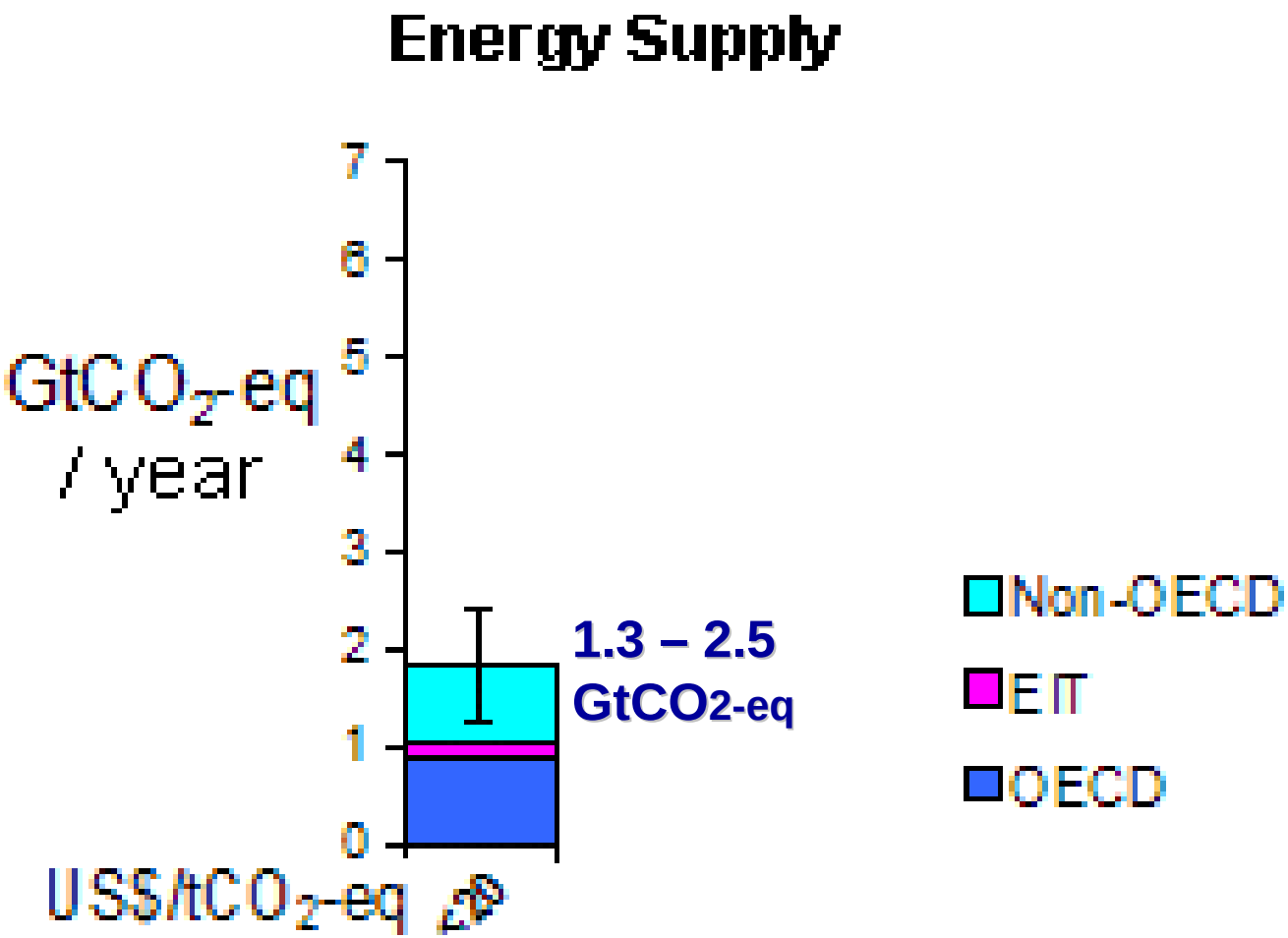
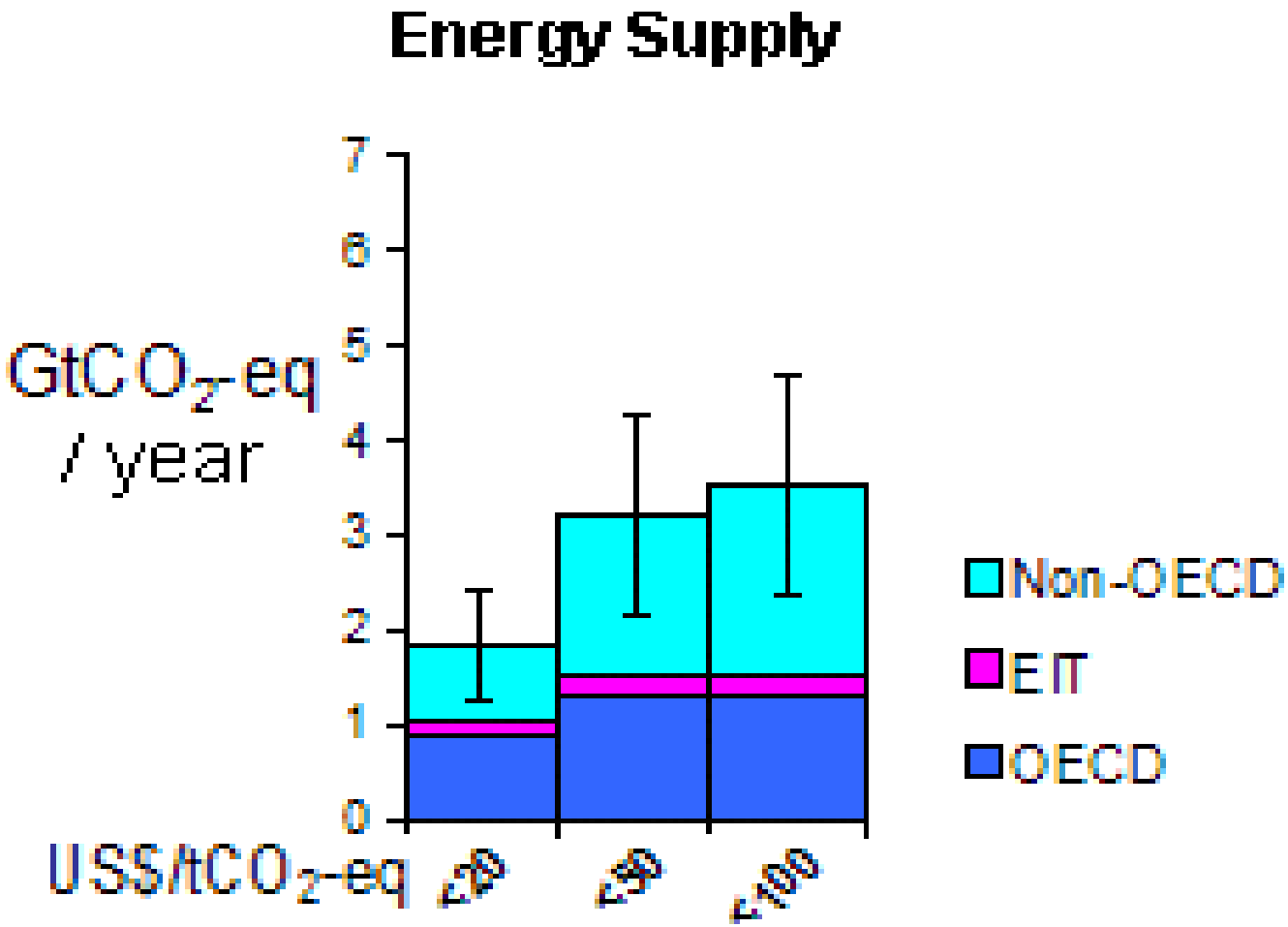
Energy supply economic potentials above the baseline by 2030 as a function of carbon price up to US$ <20 / t CO_2 -eq.



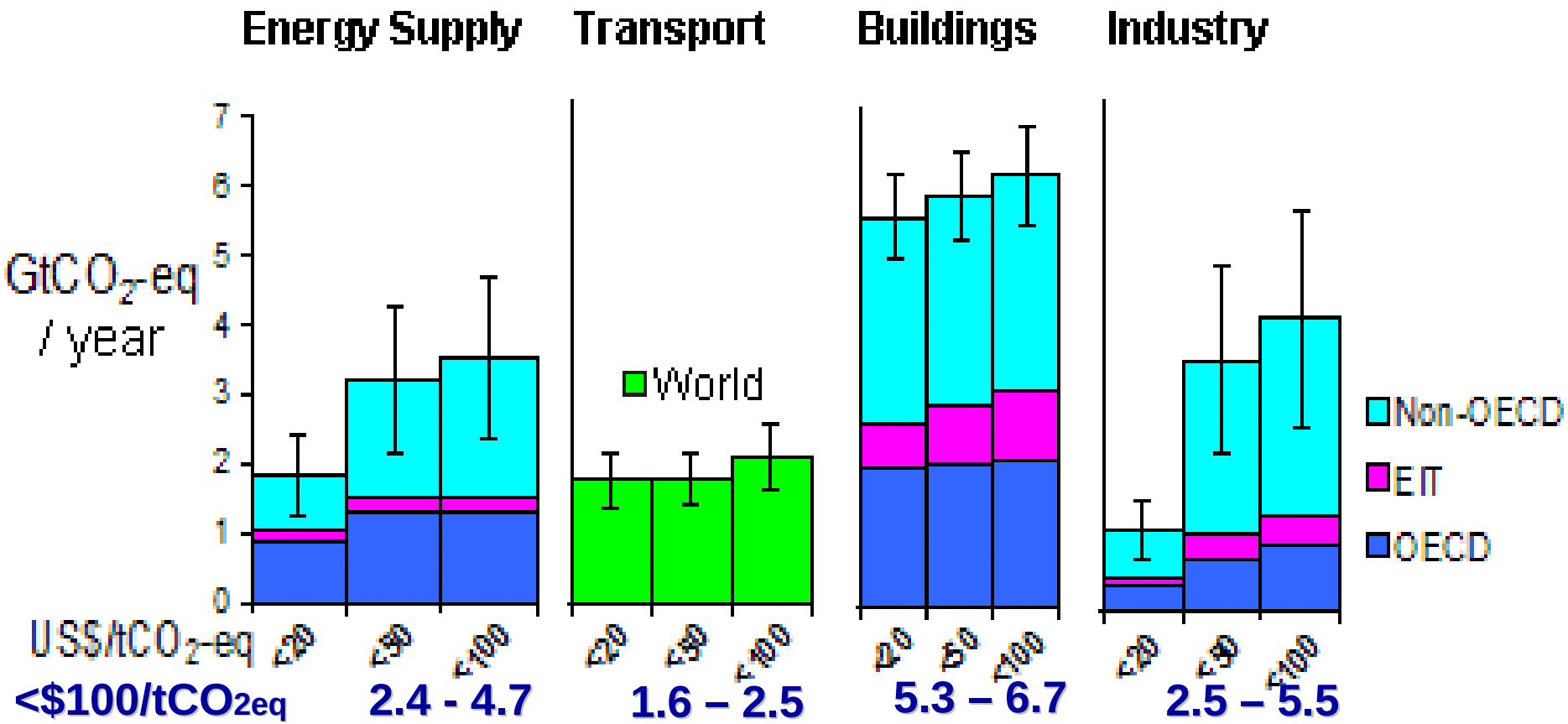
Range of economic potentials above the baseline by 2030



Economic potentials above the baseline by 2030 as a function of carbon prices of US$ <20, 50 and 100 / t CO_2 -eq.



Sectoral economic potentials above the baseline by 2030 as a function of carbon prices of US$20, 50 and 100 / t CO_2 -eq.



Notes: Emissions from electricity use are counted in the end-use sectors. Transport not split into regions because of international aviation fuel.

Key mitigation technologies and practices a) currently commercially available and b) projected to be commercialized by 2030.

Transport

a) More fuel efficient vehicles; hybrid vehicles; cleaner diesel vehicles; biofuels; modal shifts from road transport to rail and public transport systems; non-motorised transport (cycling, walking); land-use and transport planning.

b) Second generation biofuels; higher efficiency aircraft; advanced electric and hybrid vehicles with more powerful and reliable batteries.

Many mitigation options provide good economic potential in the transport sector but their effect may be counteracted by high growth and strong consumer preferences.

Biofuels could provide 5-10% of road transport fuel by 2030.

Key mitigation technologies and practices a) currently commercially available and b) projected to be commercialized by 2030.

Buildings

a) Efficient and natural lighting; more efficient electrical appliances; improved cook stoves; passive and active solar design for heating and cooling.

b) Integrated design of commercial buildings; intelligent meters to provide feedback and control; integrated solar PV in buildings.

About 30% of projected GHG emissions by 2030 can be avoided with net economic benefit.

Barriers to realising the potential include availability of technologies, financing, cost of reliable information and limitations in building designs.

Key mitigation technologies and practices a) currently commercially available and b) projected to be commercialized by 2030.

Industry

a) More efficient end-use electrical equipment; heat and power recovery; material recycling and substitution; control of non-CO_2 gas emissions; and a wide array of process-specific technologies.

b) Advanced energy efficiency; CCS for cement, ammonia, and iron manufacture; inert electrodes for aluminium manufacture.

Economic potential is predominantly in energy intensive industries.

Barriers include lack of financial resources, inability by firms to absorb technological information, and slow stock turnover.

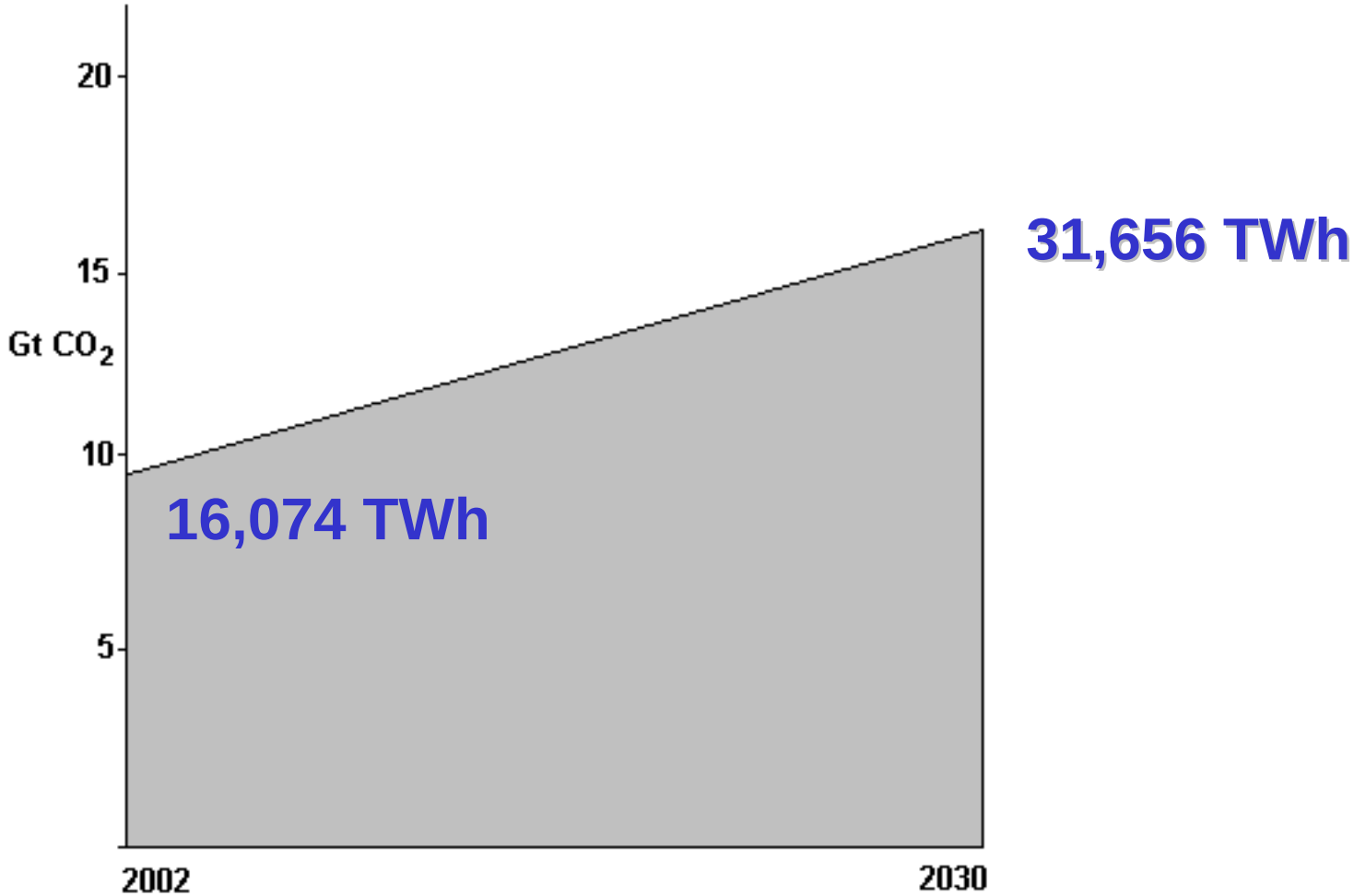
Key mitigation technologies and practices a) currently commercially available and b) projected to be commercialized by 2030.

Energy Supply

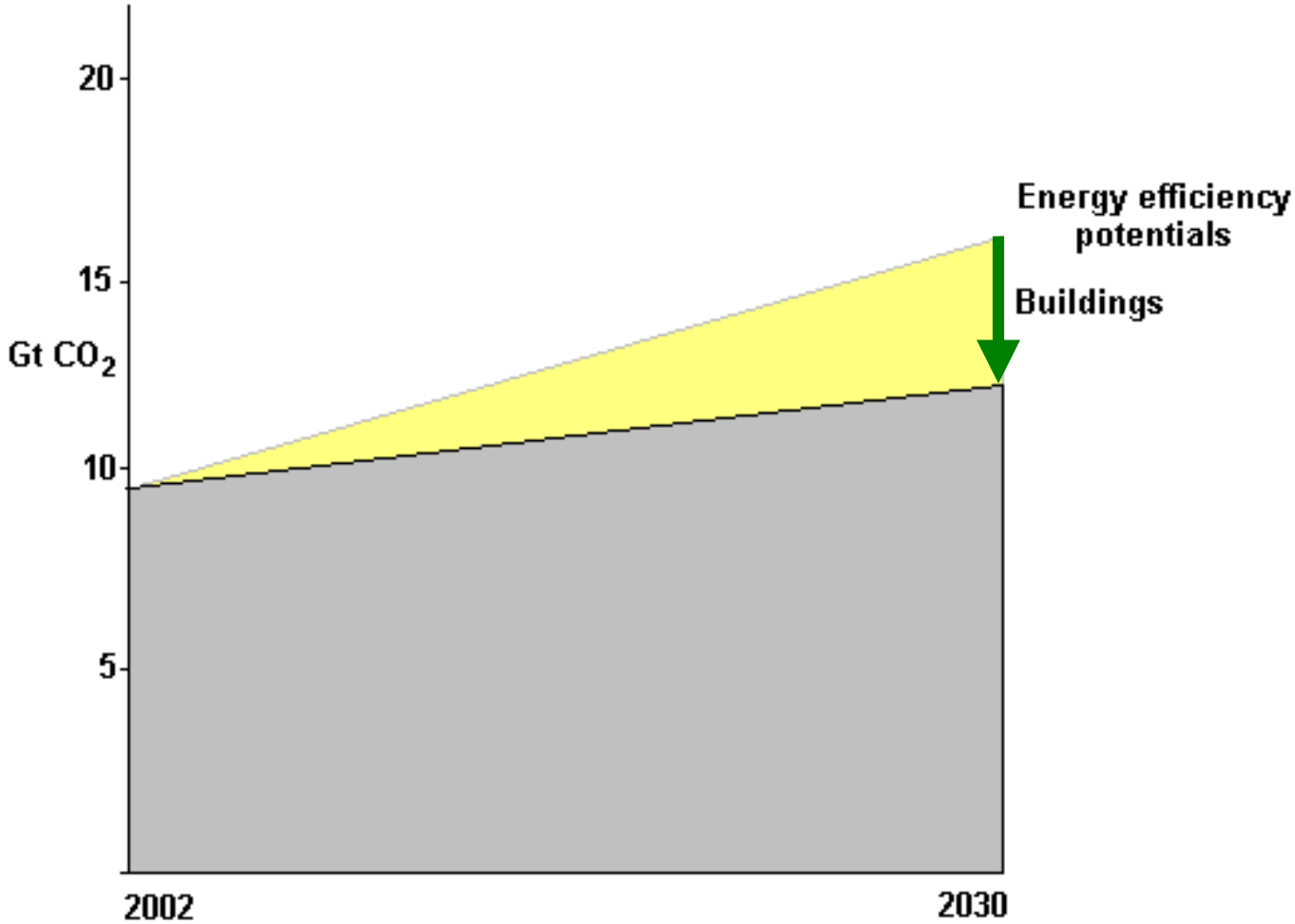
a) Improved supply and distribution efficiency; fuel switching from coal to gas; nuclear power; renewable heat and power (hydropower, solar, wind, geothermal and bioenergy).

b) Carbon capture and storage (CCS) for gas, biomass and coal-fired electricity; advanced nuclear power; advanced renewable energy, including ocean energy, concentrating solar, and solar PV.

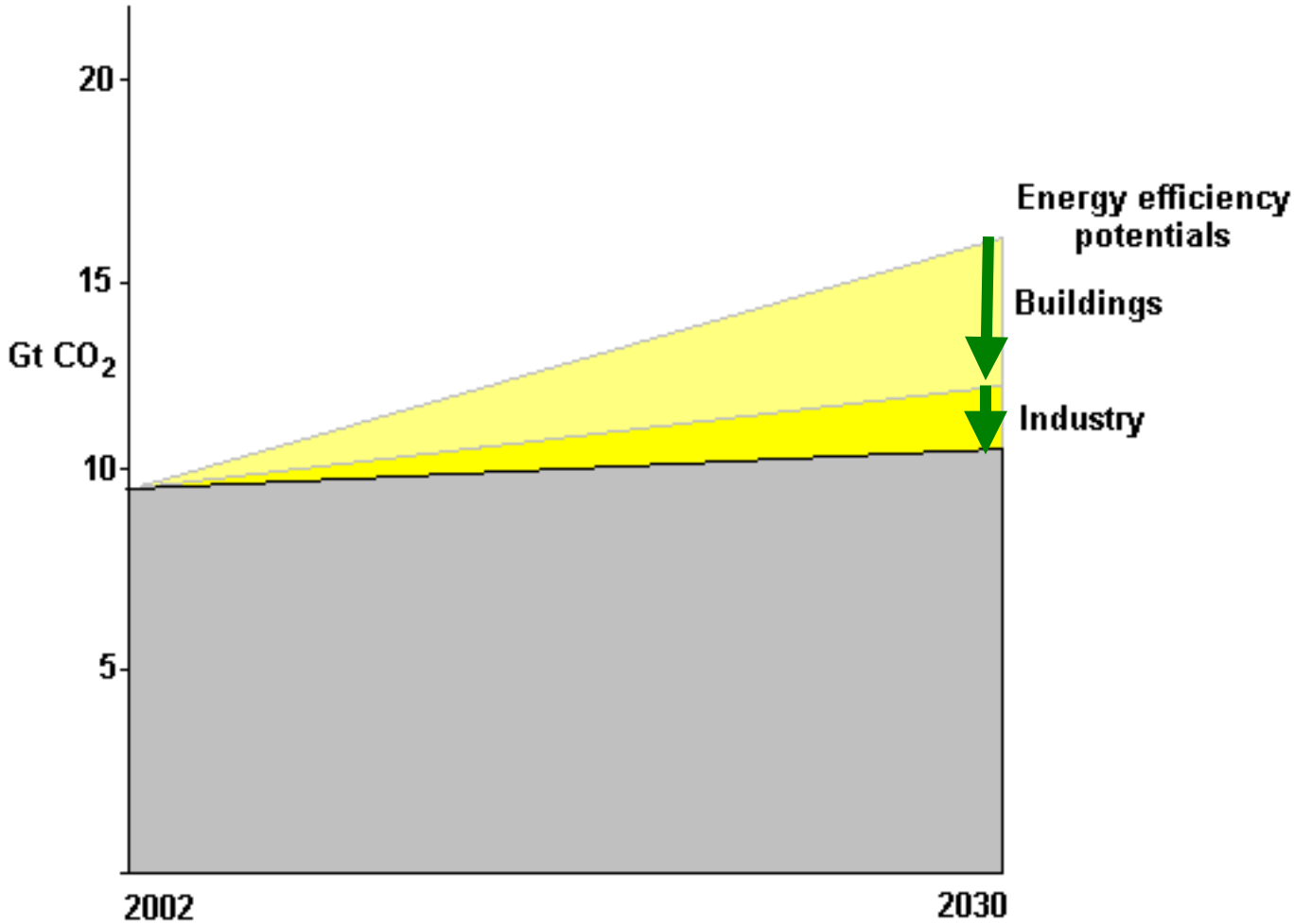
Electricity sector emissions, 2002 to 2030 WEO, 2004 Reference scenario baseline.



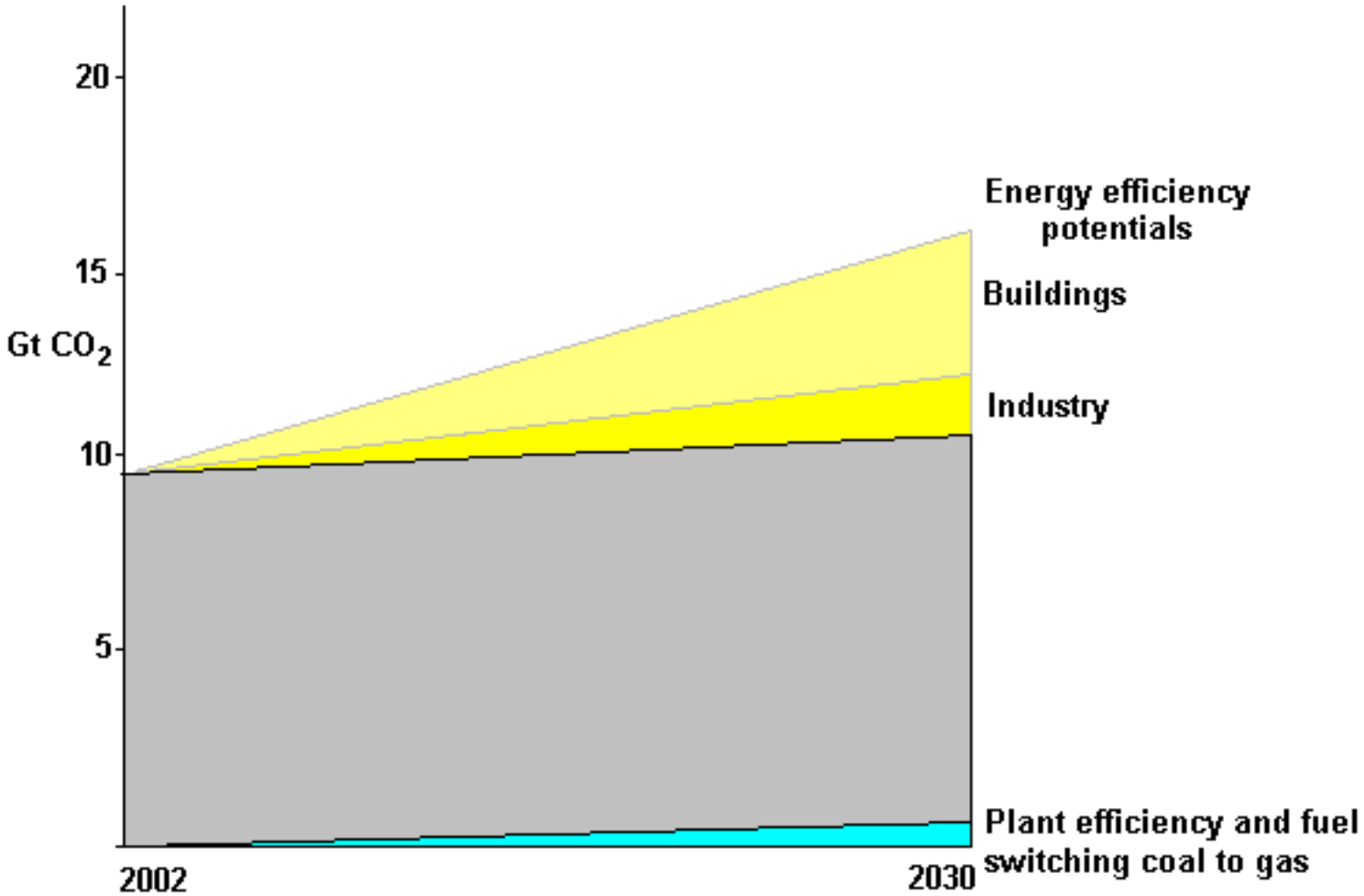
Potential below baseline from electricity saving in Building sector at <US$ 50 /t CO_2



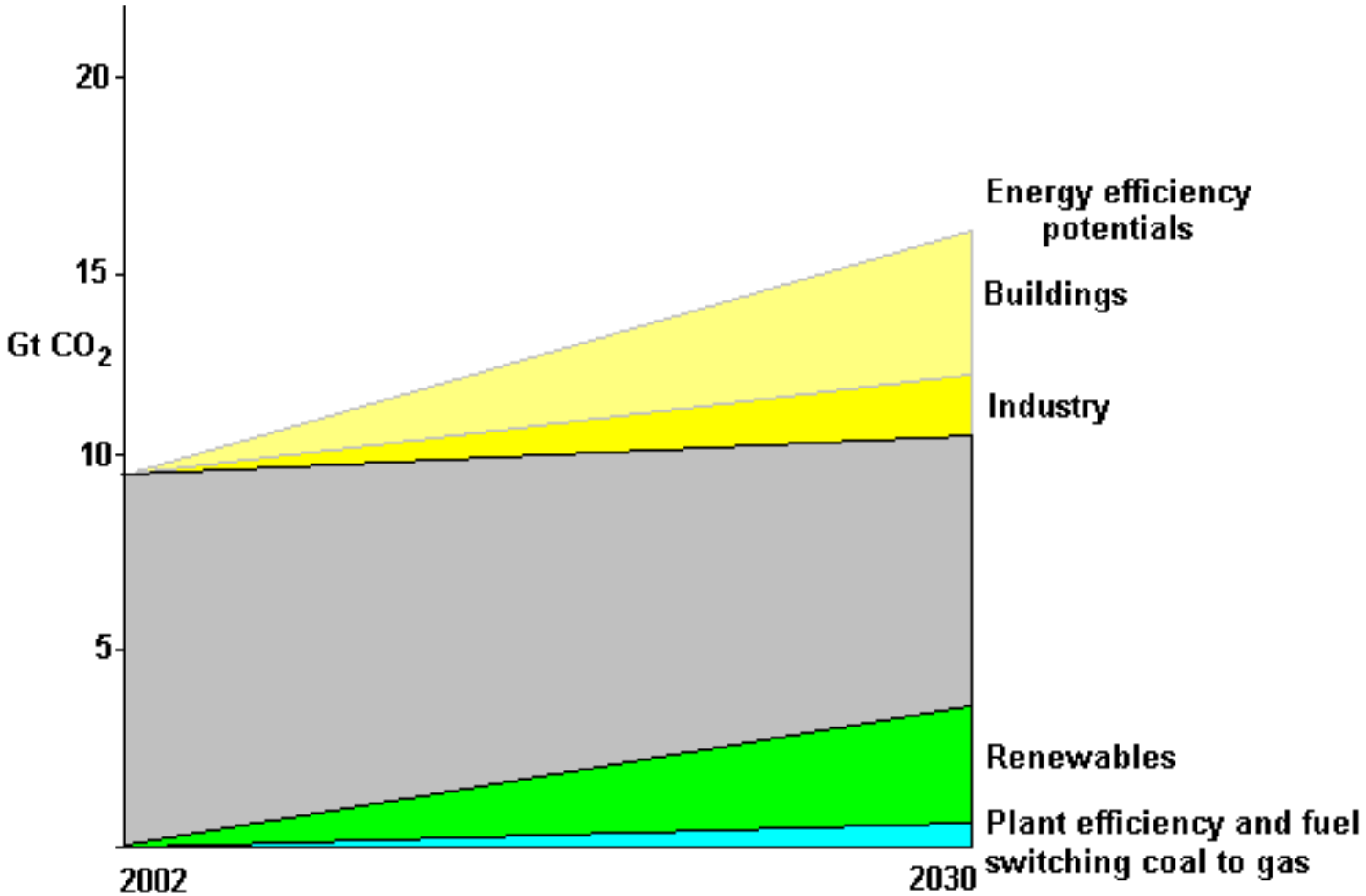
Potential from electricity saving in Building and Industry sectors at <US$ 50 /t CO_2



Potential from improved generation plant efficiency and fuel switching at <US$50 /tCO2

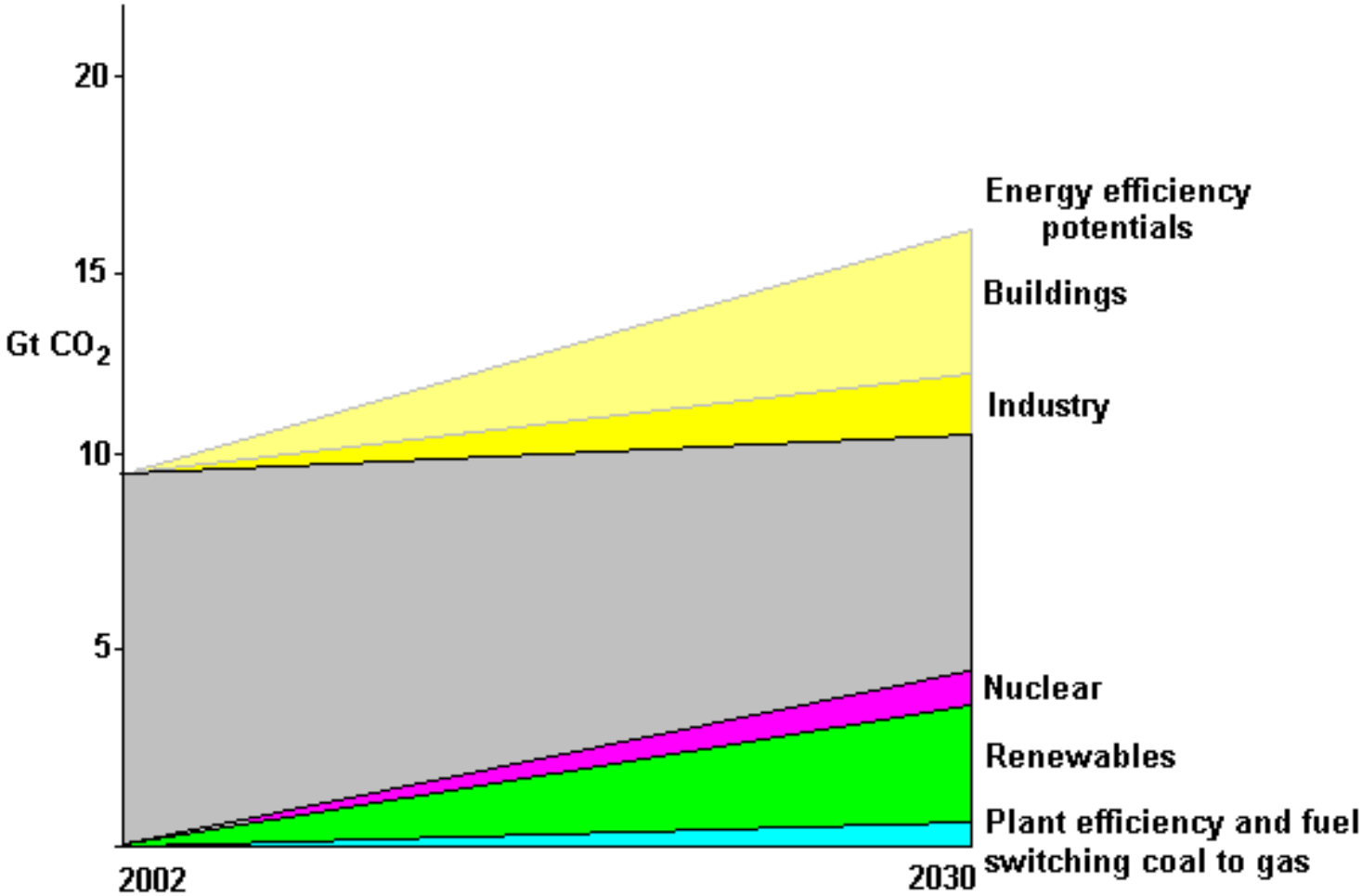


Potential below baseline from hydro, wind, geothermal, bioenergy, solar at <US$ 50 /tCO2



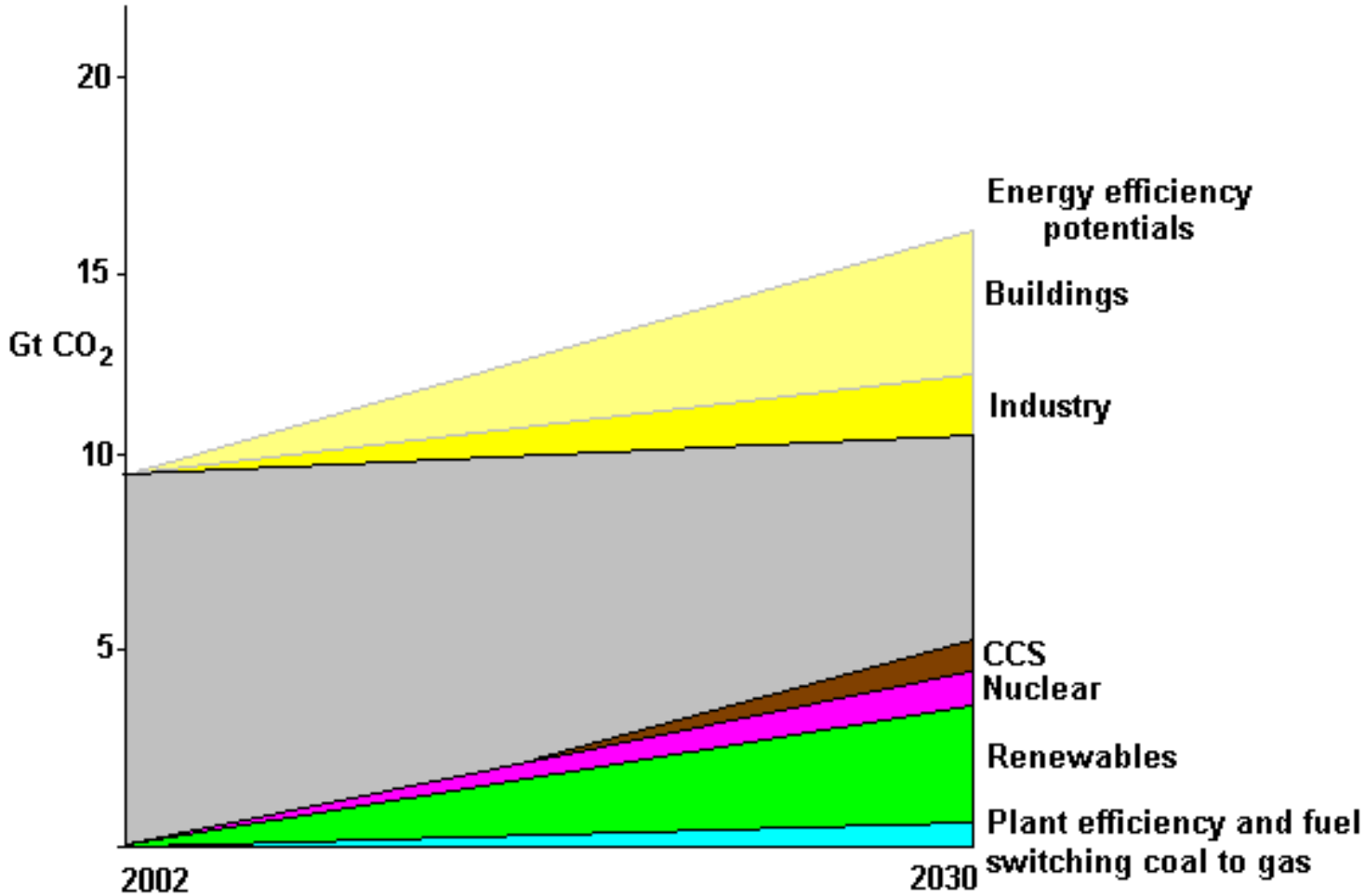
The share of renewables in the total electricity supply rises from 18% in 2005 to 30 – 35% by 2030.

Potential below baseline from nuclear power above baseline at <US$ 50 /tCO2



Nuclear share increases from 16% of the electricity supply in 2005 up to 18% in 2030.

Potential from CCS in new coal and gas plants beginning 2015 at <US$ 50 /tCO2



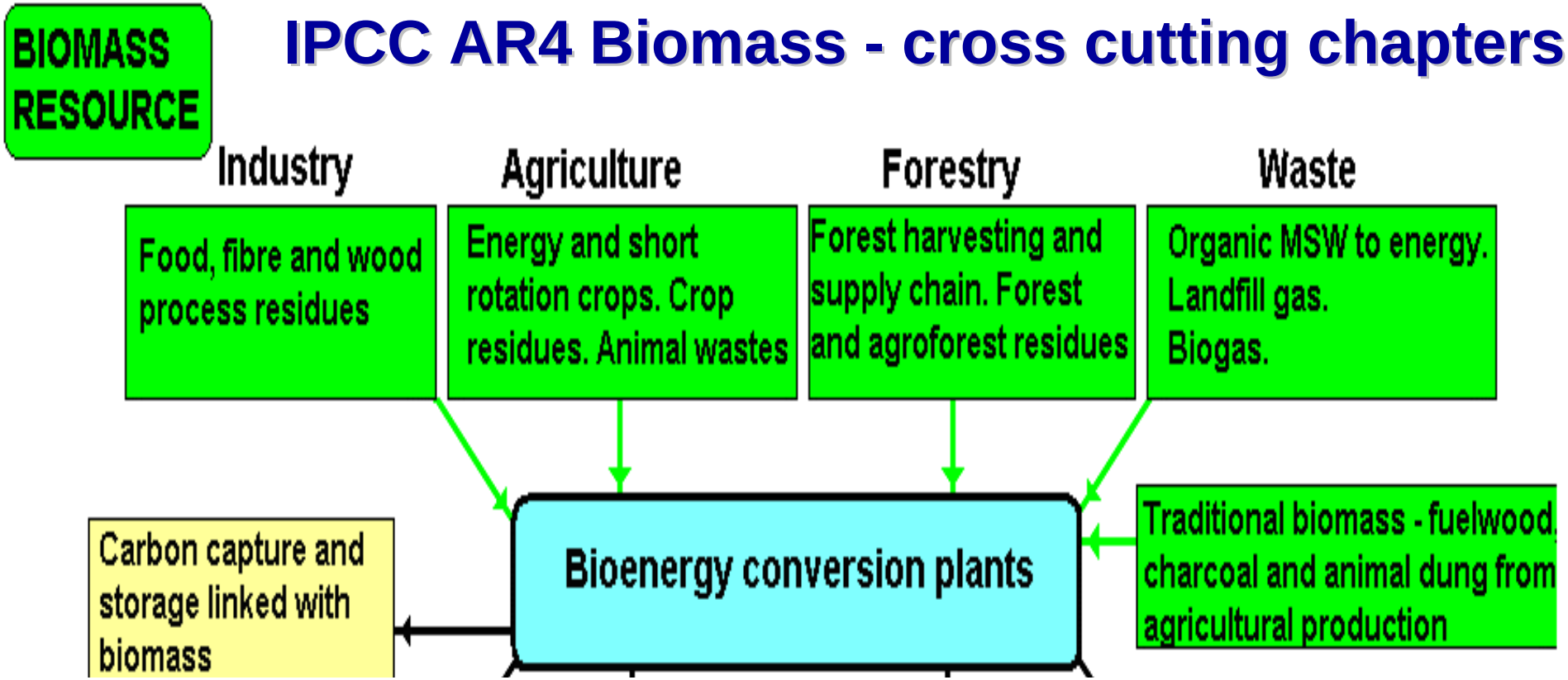
Fossil fuel share of electricity generation without CCS drops to < 50% of total supply by 2030

IPCC AR4 Biomass - cross cutting chapters

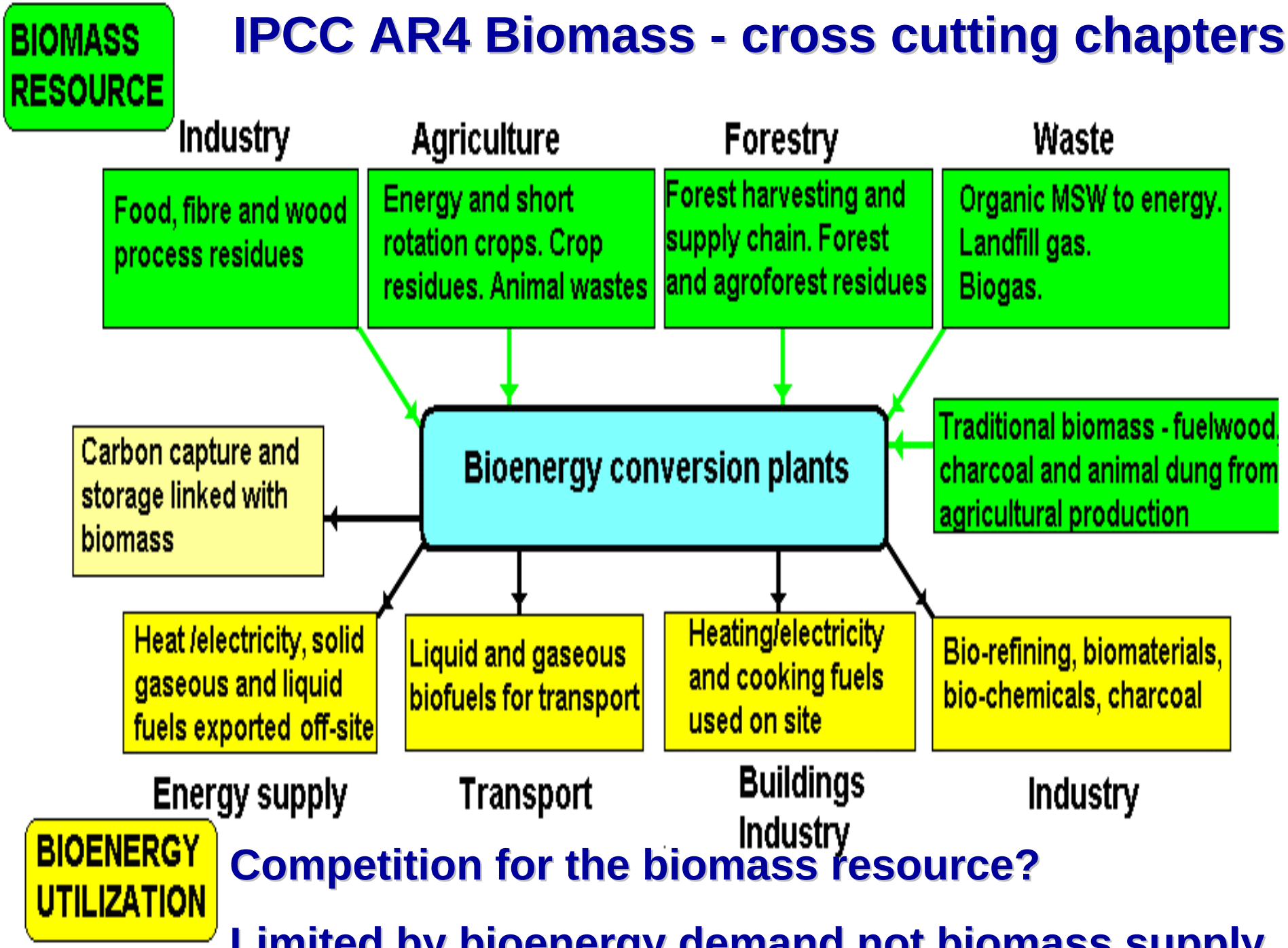
BIOMASS RESOURCE

Industry	Agriculture	Forestry	Waste
Food, fibre and wood process residues	Energy and short rotation crops. Crop residues. Animal wastes	Forest harvesting and supply chain. Forest and agroforest residues	Organic MSW to energy. Landfill gas. Biogas.

IPCC AR4 Biomass - cross cutting chapters



IPCC AR4 Biomass - cross cutting chapters



Competition for the biomass resource?

Limited by bioenergy demand not biomass supply