

Mitigation Potentials and Costs

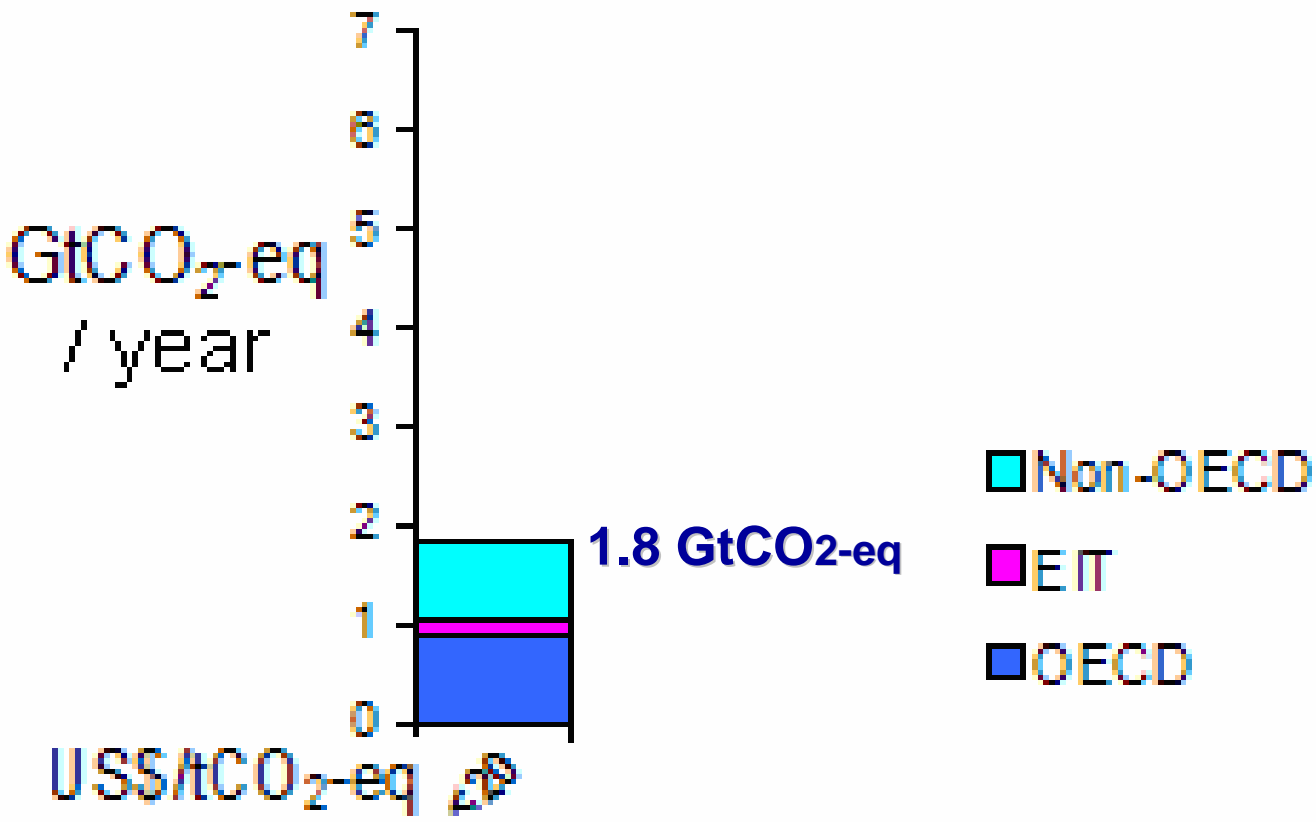
Energy, Buildings, Transport and Industry

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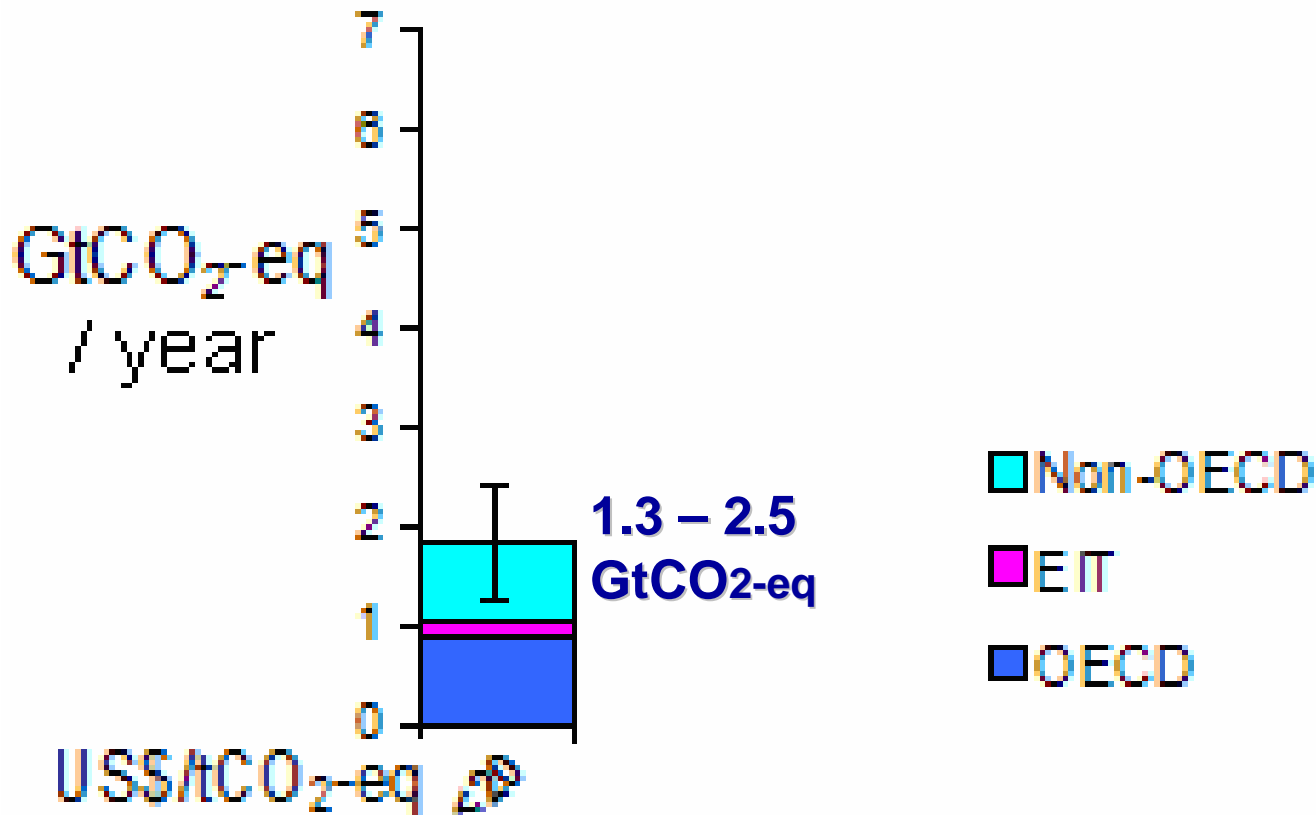
Energy supply economic potentials above the baseline by 2030 as a function of carbon price up to US\$ <20 / t CO₂ -eq.

Energy Supply



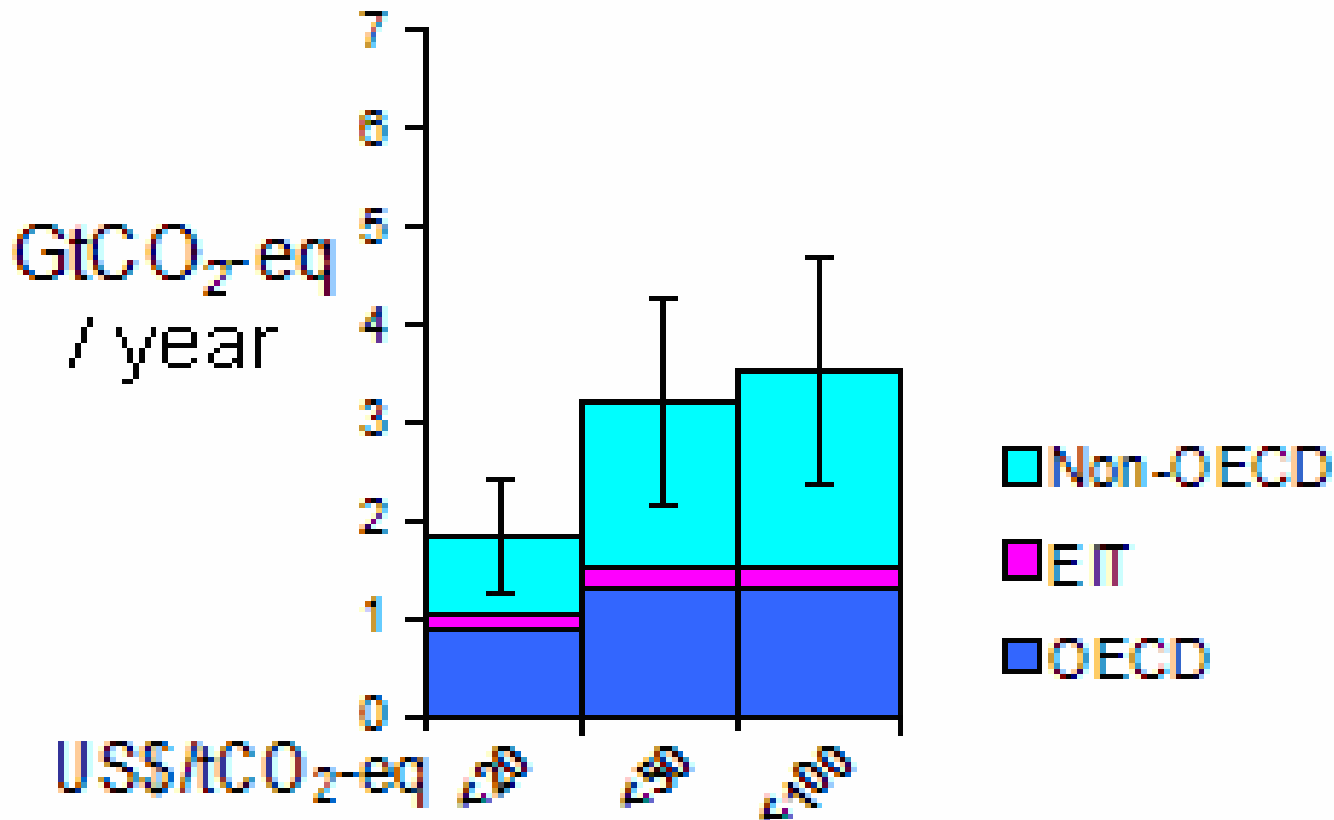
Range of economic potentials above the baseline by 2030

Energy Supply

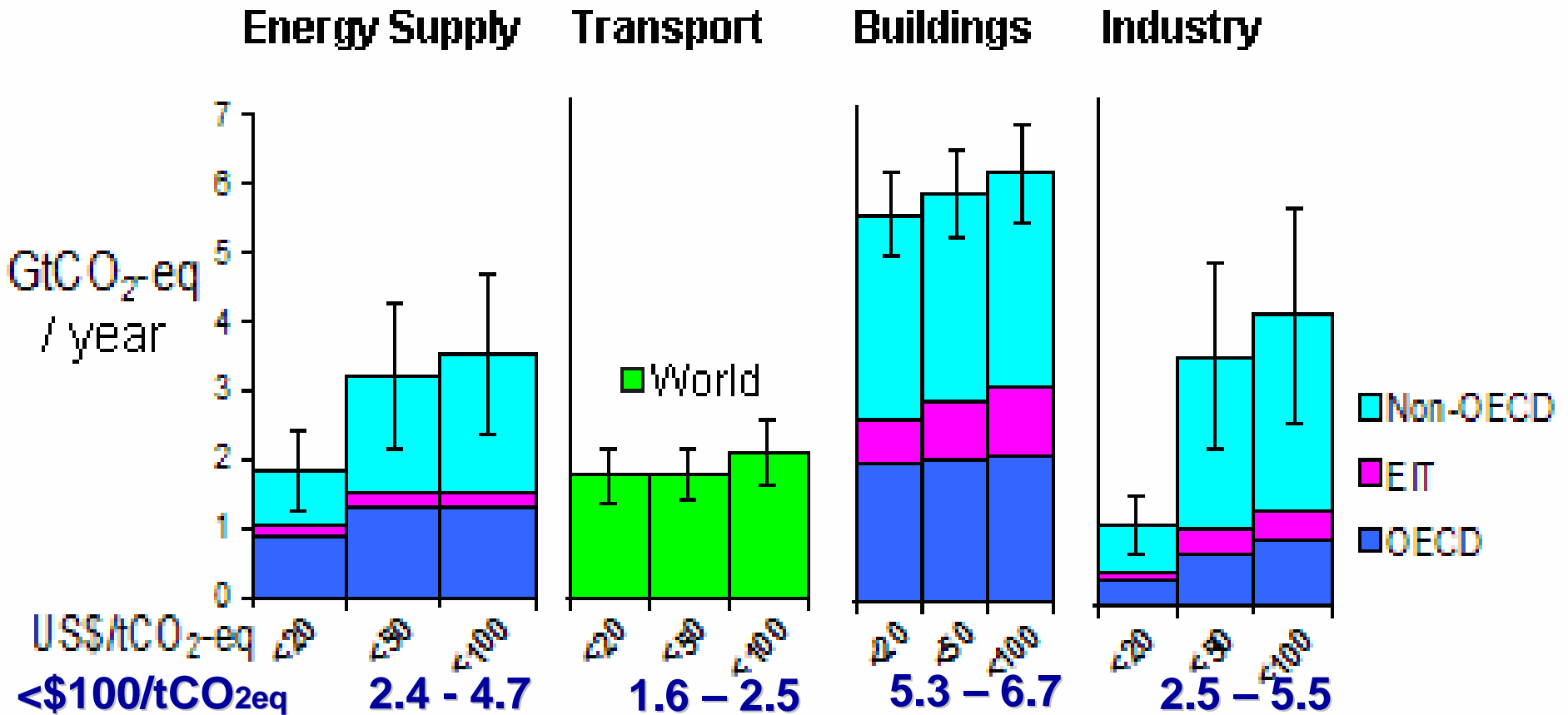


Economic potentials above the baseline by 2030 as a function of carbon prices of US\$ <20, 50 and 100 / t CO₂ -eq.

Energy Supply



Sectoral economic potentials above the baseline by 2030 as a function of carbon prices of US\$20, 50 and 100 / t CO₂ -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-CO₂ 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.**

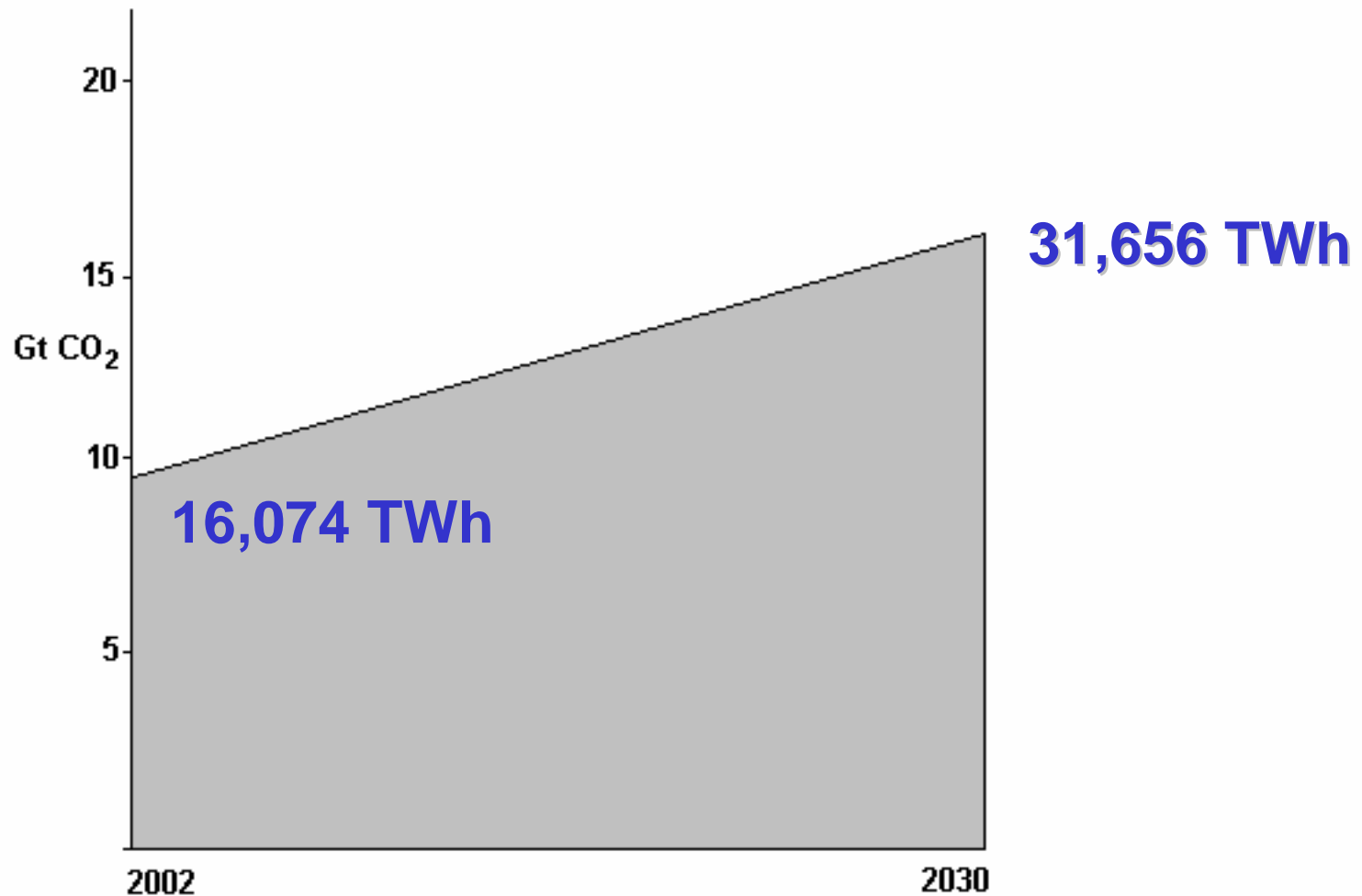
Energy Supply

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

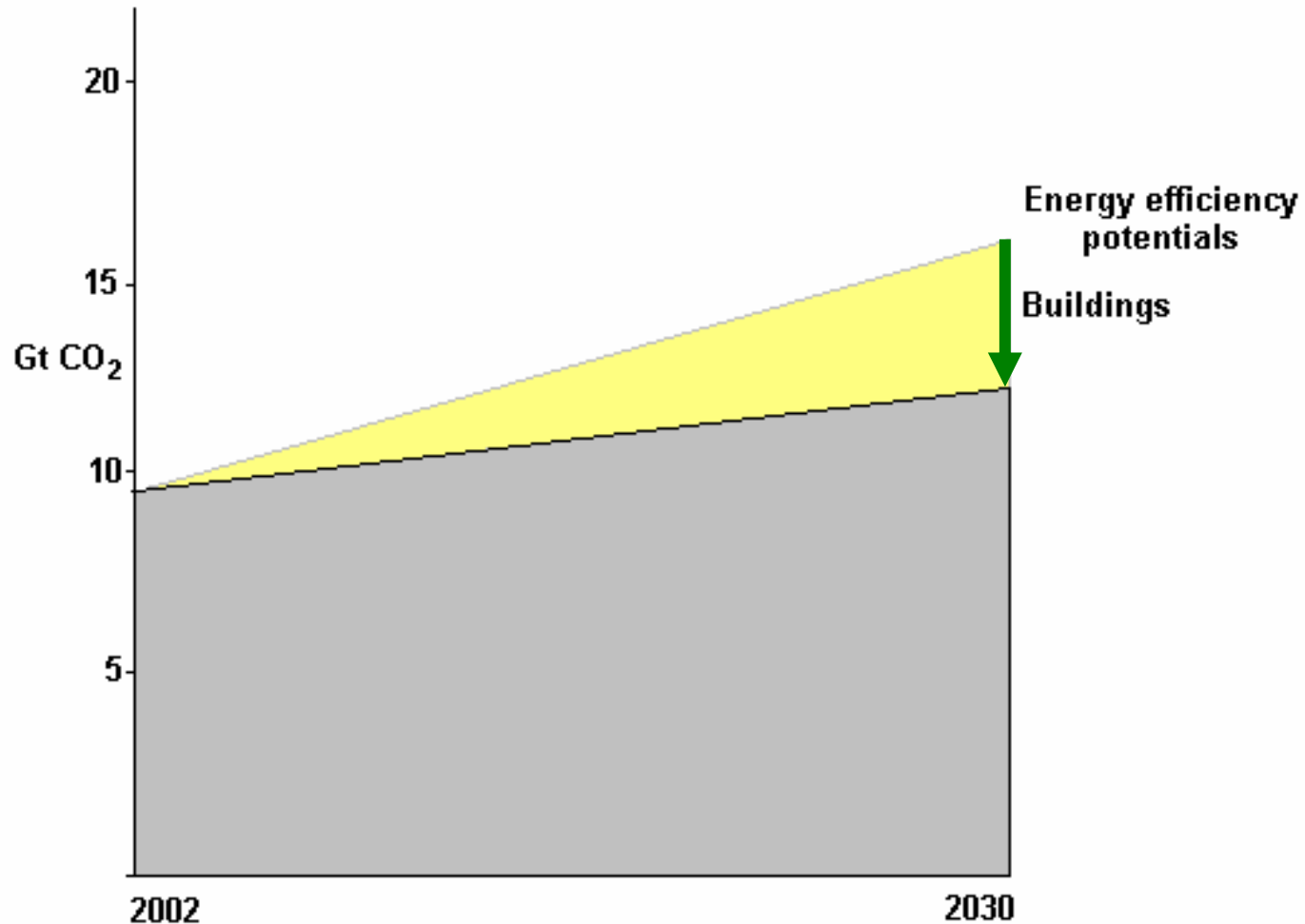
b) Carbon capture and storage (CCS) for gas, biomass and coal-fired electricity; advanced nuclear power; advanced renewable energy, including ocean energy, concentrating solar, and solar PV.

Electricity sector emissions, 2002 to 2030

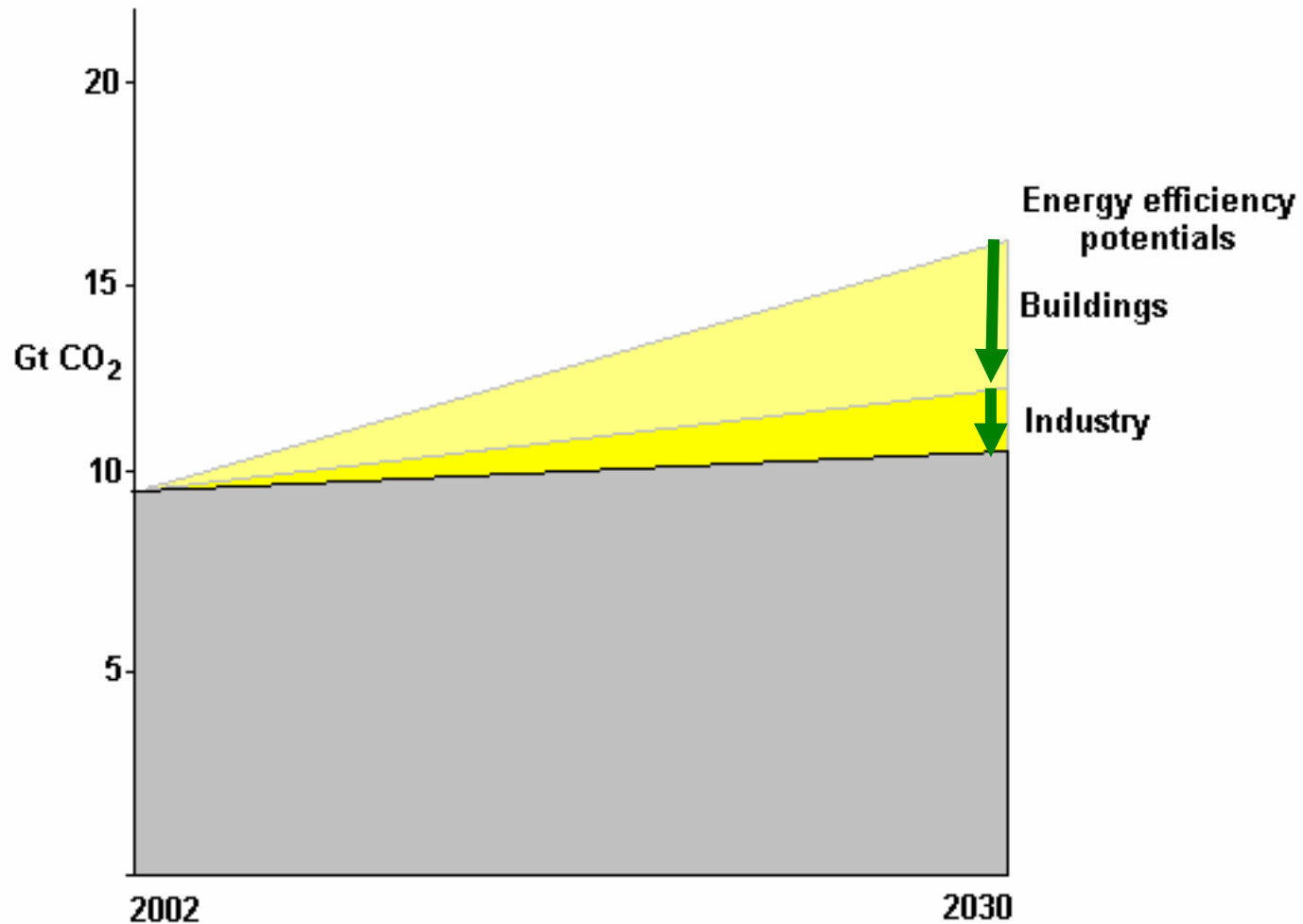
WEO, 2004 Reference scenario baseline.



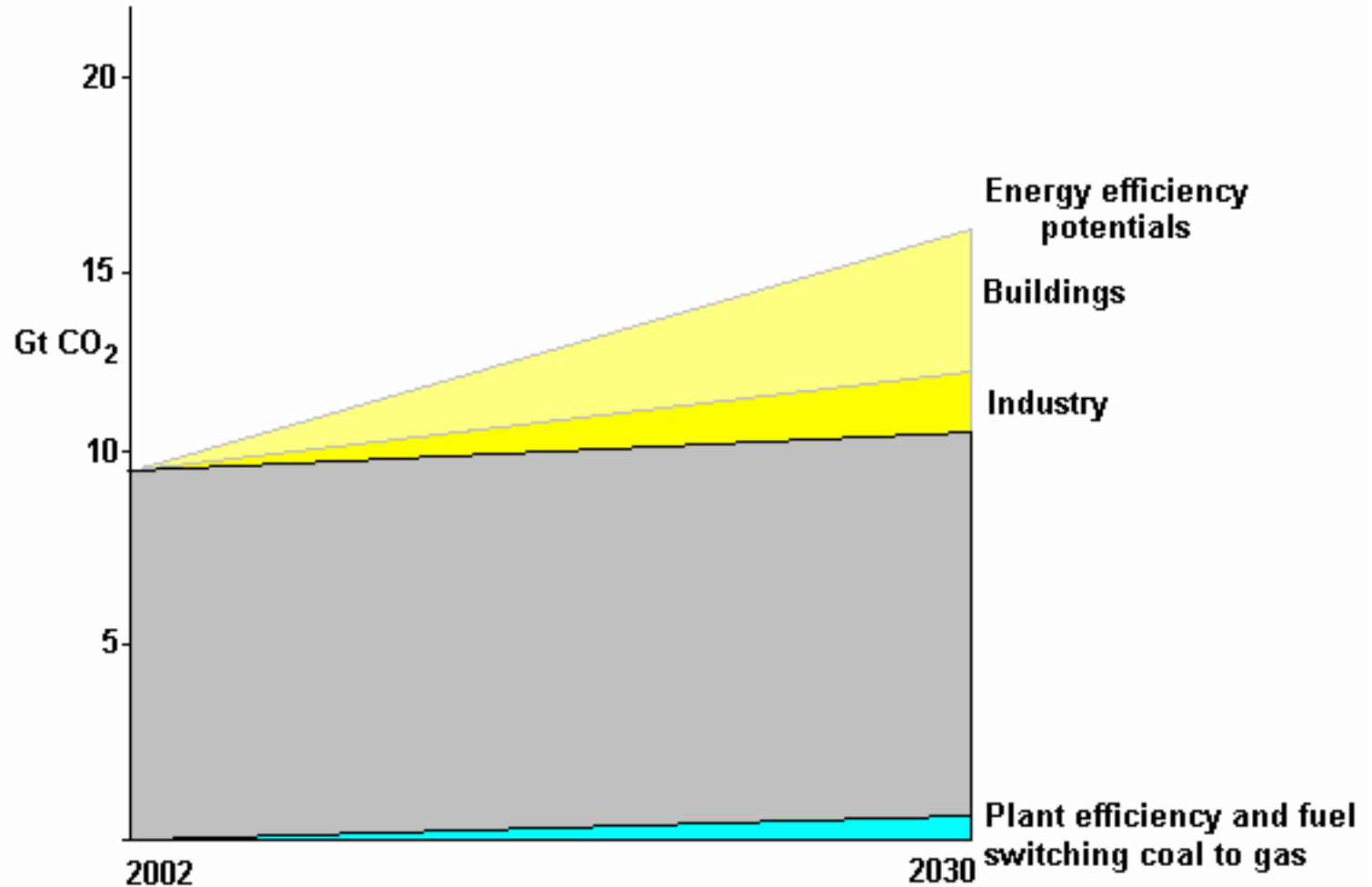
Potential below baseline from electricity saving in Building sector at <US\$ 50 /t CO₂



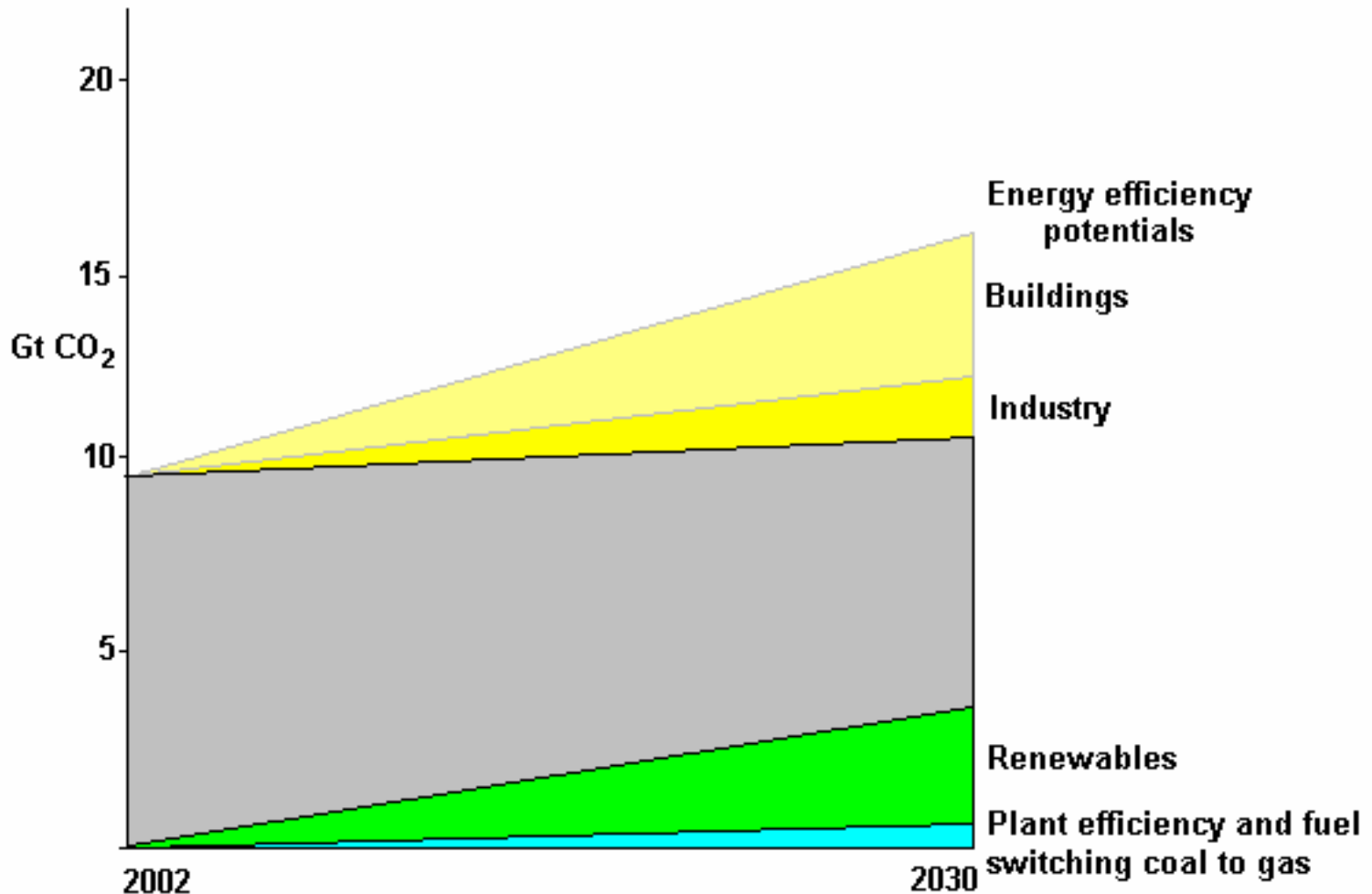
Potential from electricity saving in Building and Industry sectors at <US\$ 50 /t CO₂



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

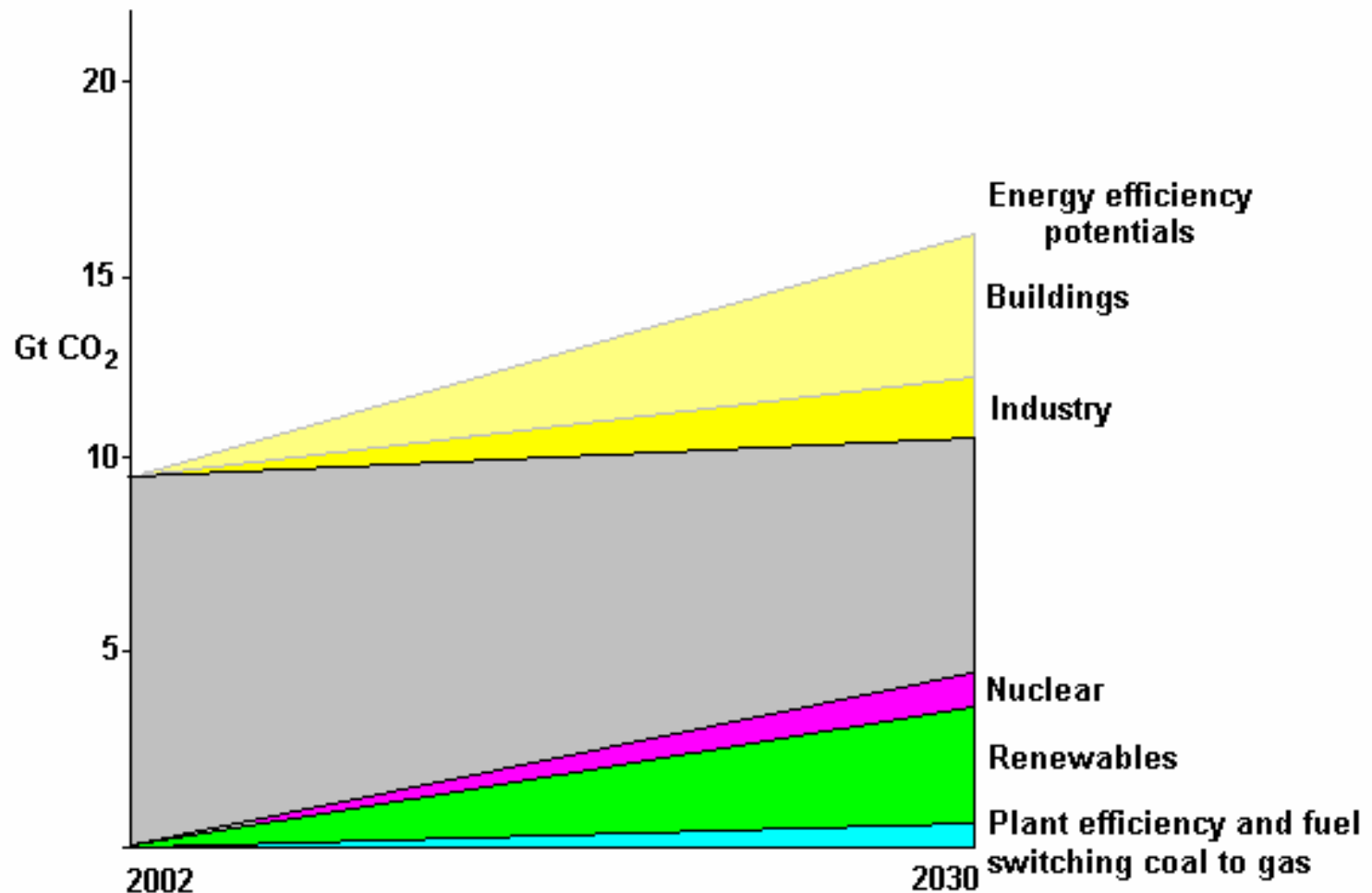


Potential below baseline from hydro, wind, geothermal, bioenergy, solar at <US\$ 50 /tCO₂



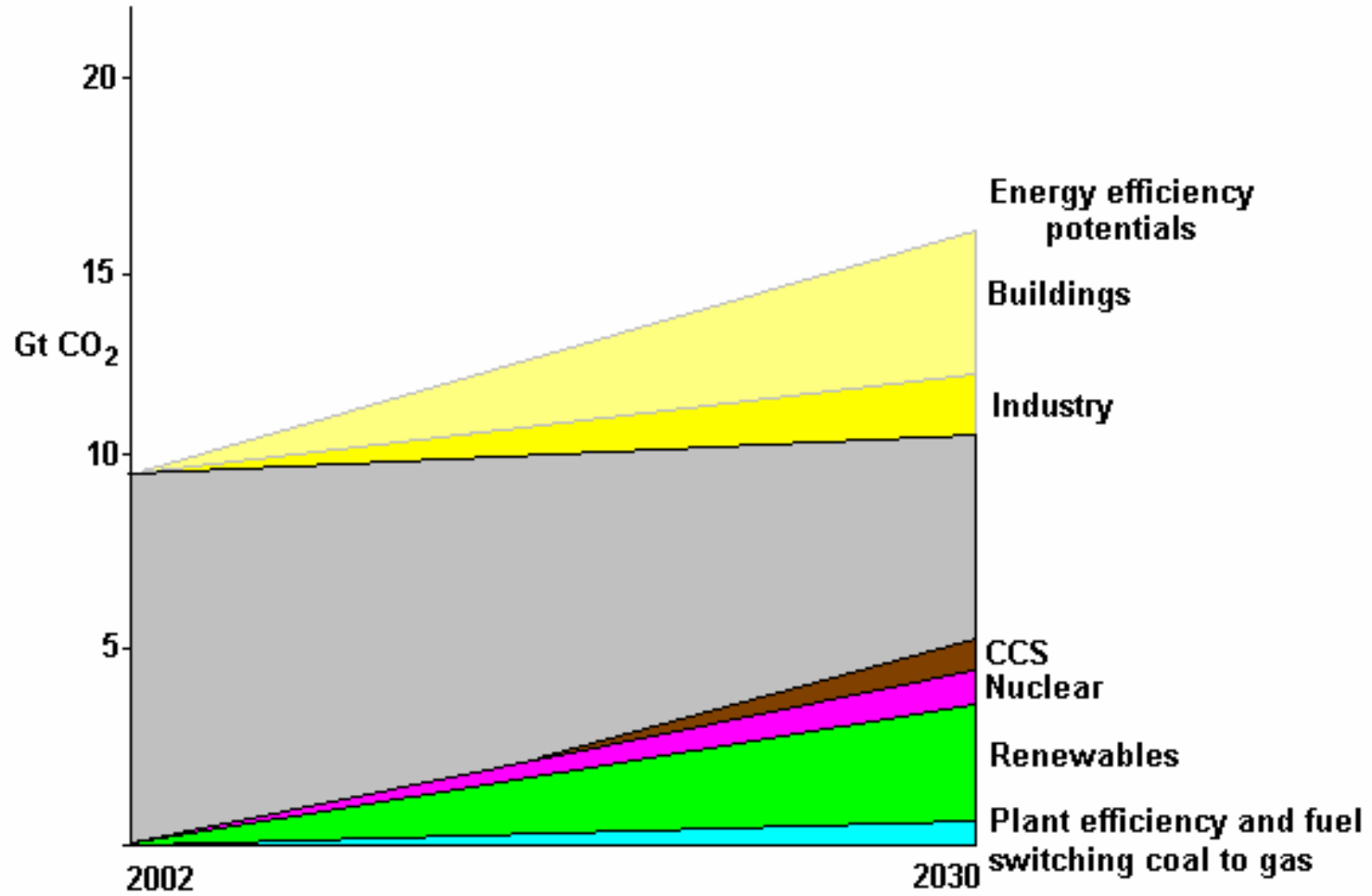
The share of renewables in the total electricity supply rises from 18% in 2005 to 30 – 35% by 2030.

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

**BIOMASS
RESOURCE**

IPCC AR4 Biomass - cross cutting chapters

Industry

Food, fibre and wood process residues

Agriculture

Energy and short rotation crops. Crop residues. Animal wastes

Forestry

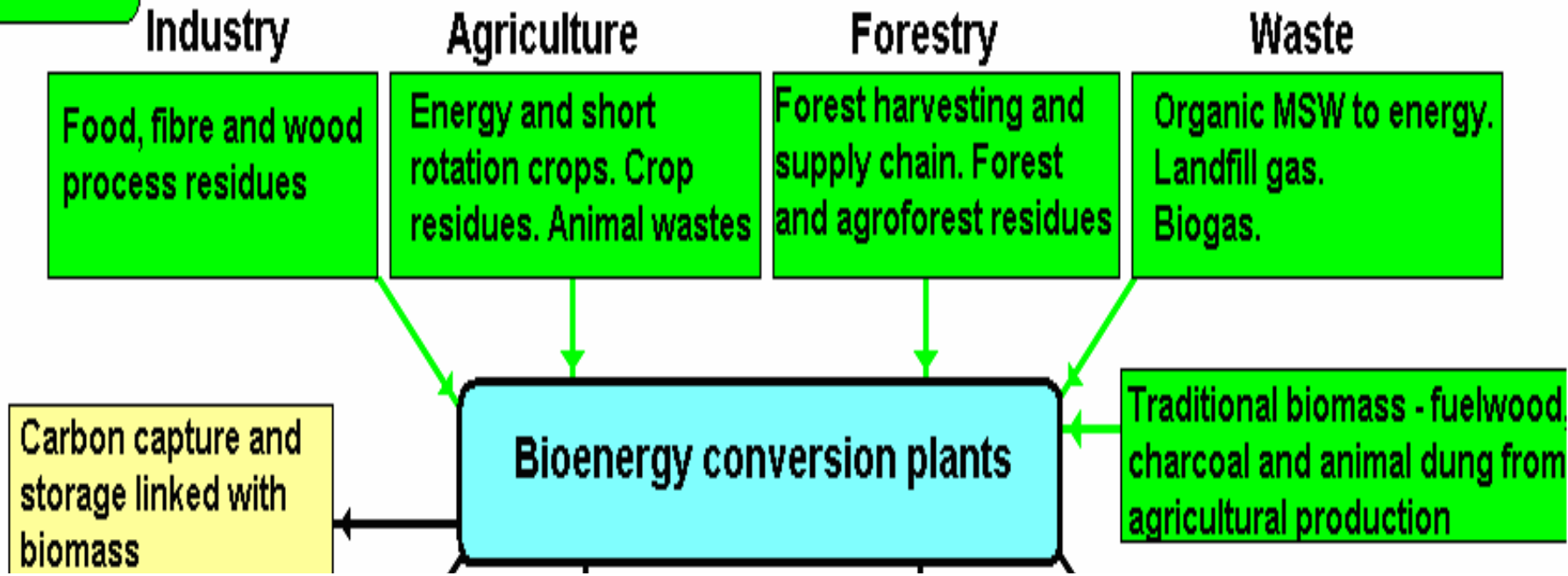
Forest harvesting and supply chain. Forest and agroforest residues

Waste

Organic MSW to energy. Landfill gas. Biogas.

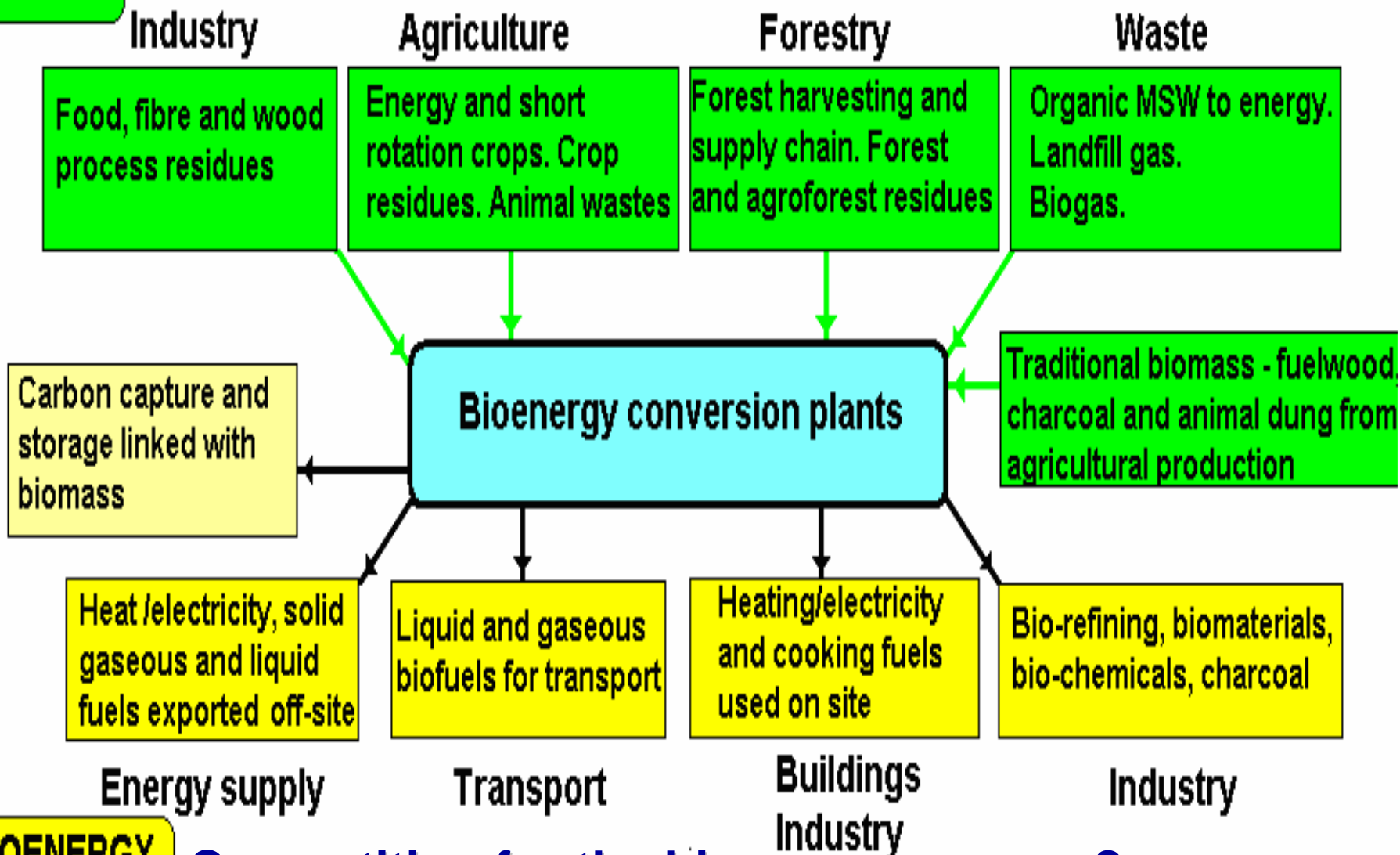
**BIOMASS
RESOURCE**

IPCC AR4 Biomass - cross cutting chapters



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**BIOMASS
RESOURCE**



**BIOENERGY
UTILIZATION**

Competition for the biomass resource?

Limited by bioenergy demand not biomass supply