

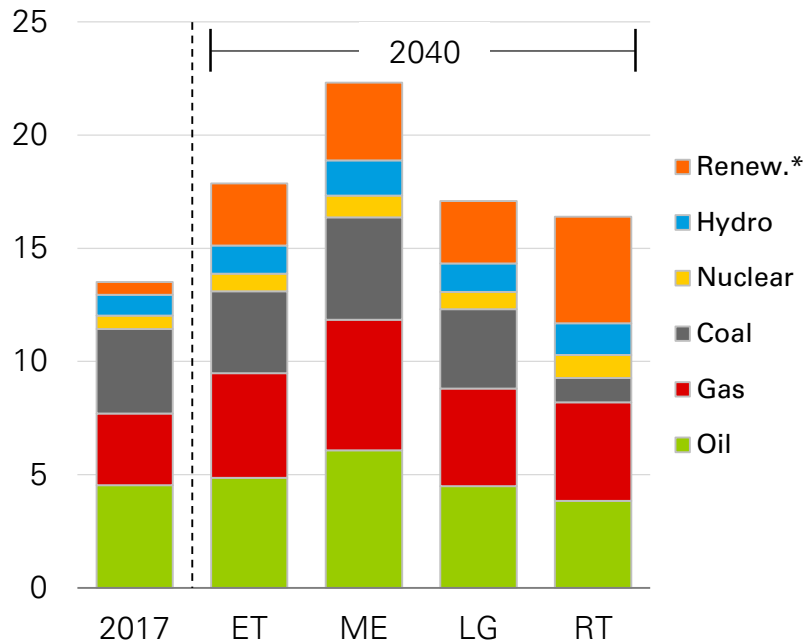
BP Energy Outlook
2019 edition

Anne-Sophie Corbeau
Head of gas analysis

Energy Outlook scenarios

Primary energy consumption by fuel

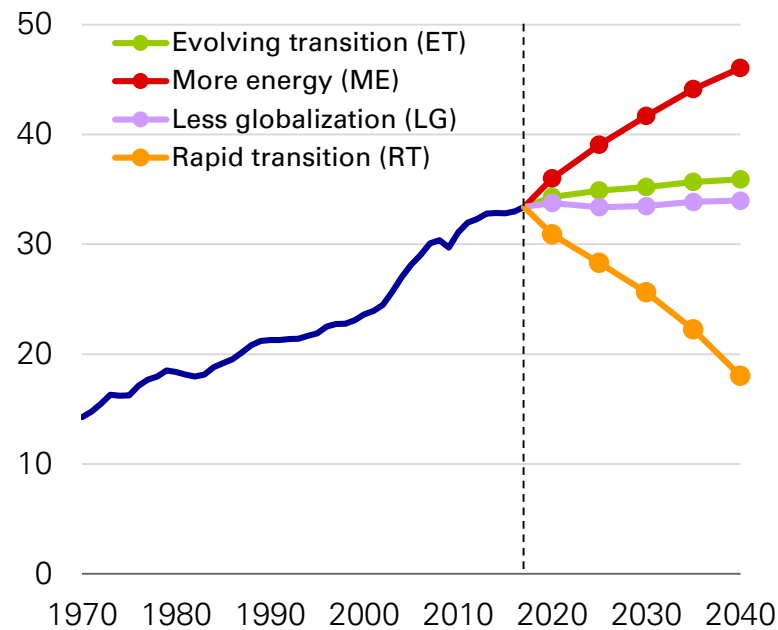
Billion toe



*Renewables includes wind, solar, geothermal, biomass and biofuels

CO₂ emissions

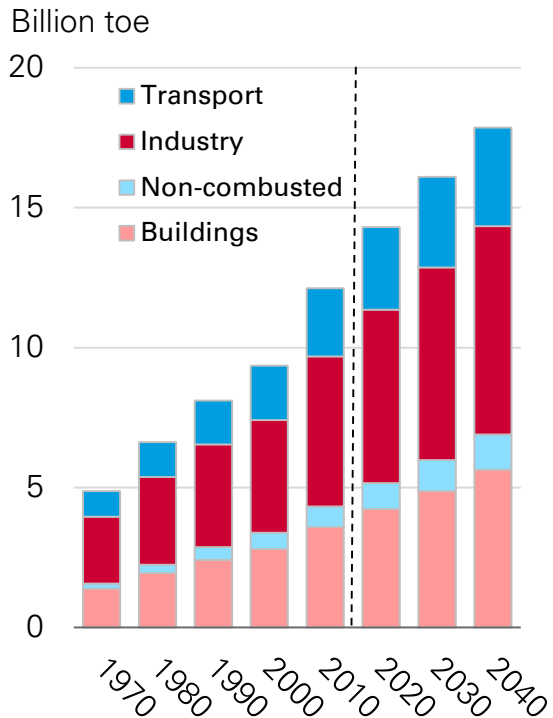
Gt of CO₂



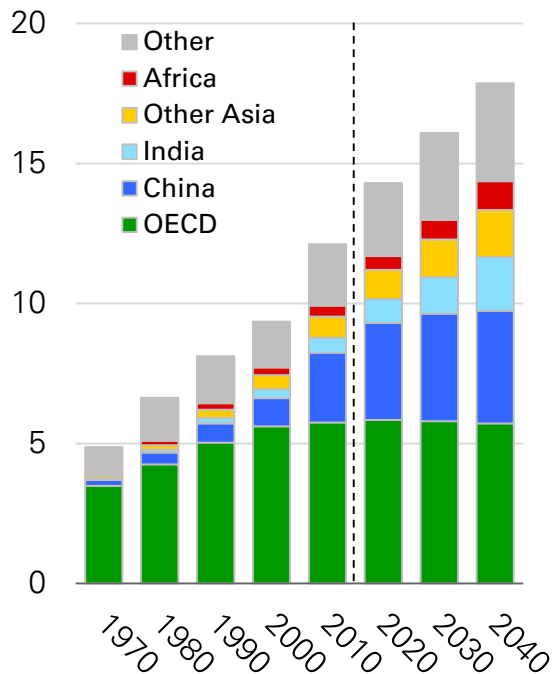
Three windows on the energy transition

Primary energy demand (ET scenario)

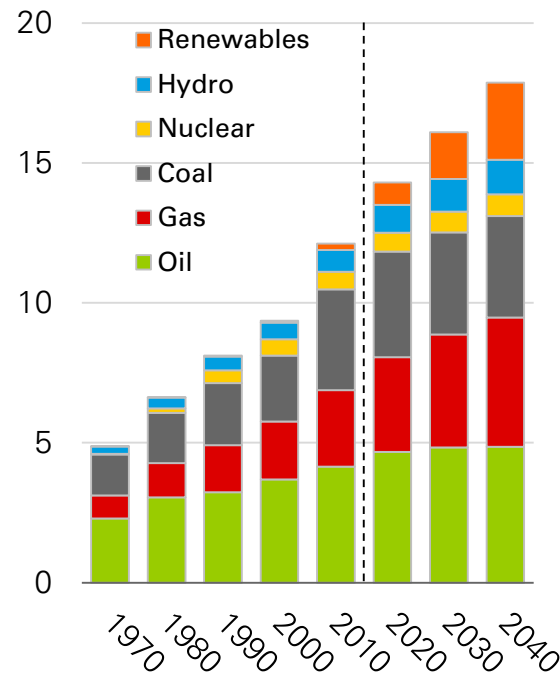
End-use sector



Region



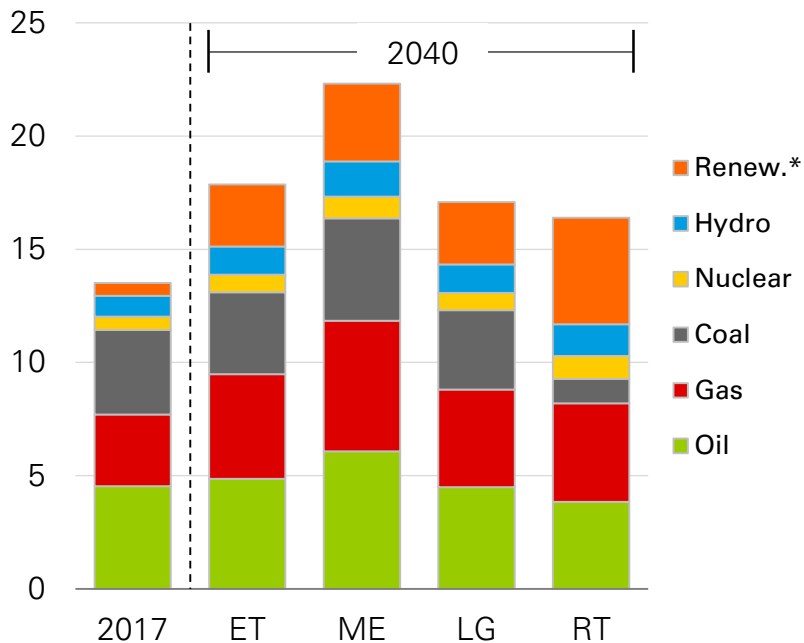
Fuel



Scenarios implications for gas demand

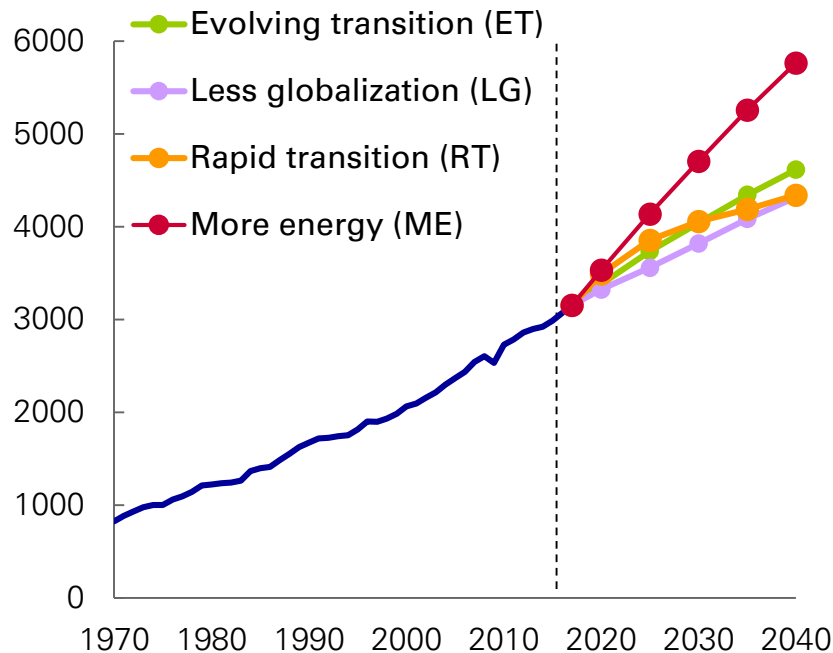
Primary energy consumption by fuel

Billion toe



Natural gas demand

mtoe

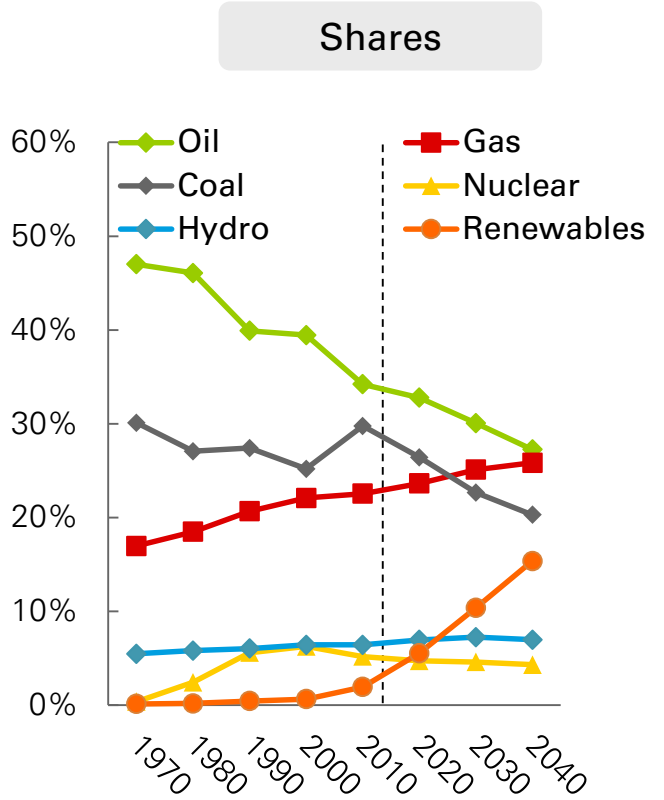
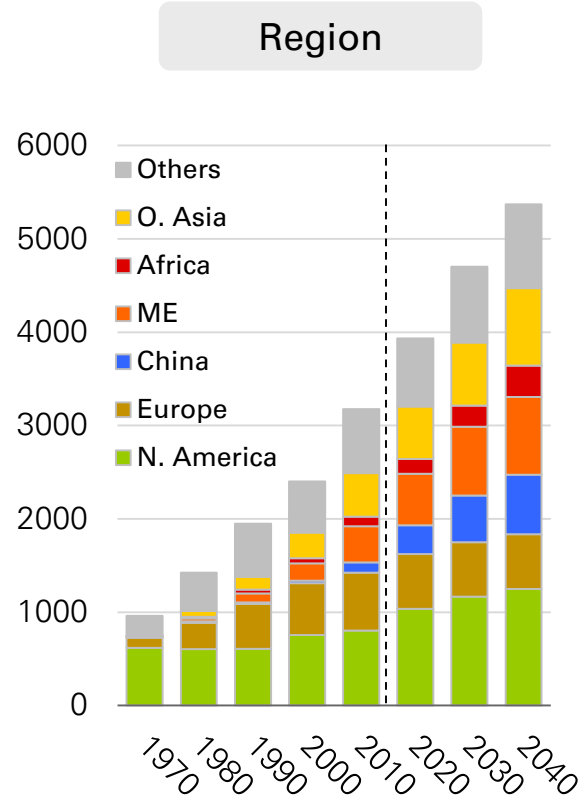
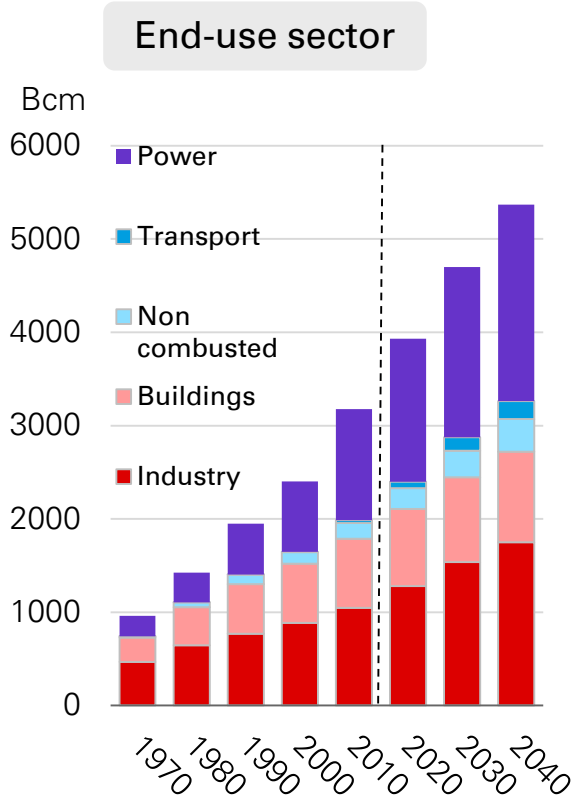


*Renewables includes wind, solar, geothermal, biomass and biofuels



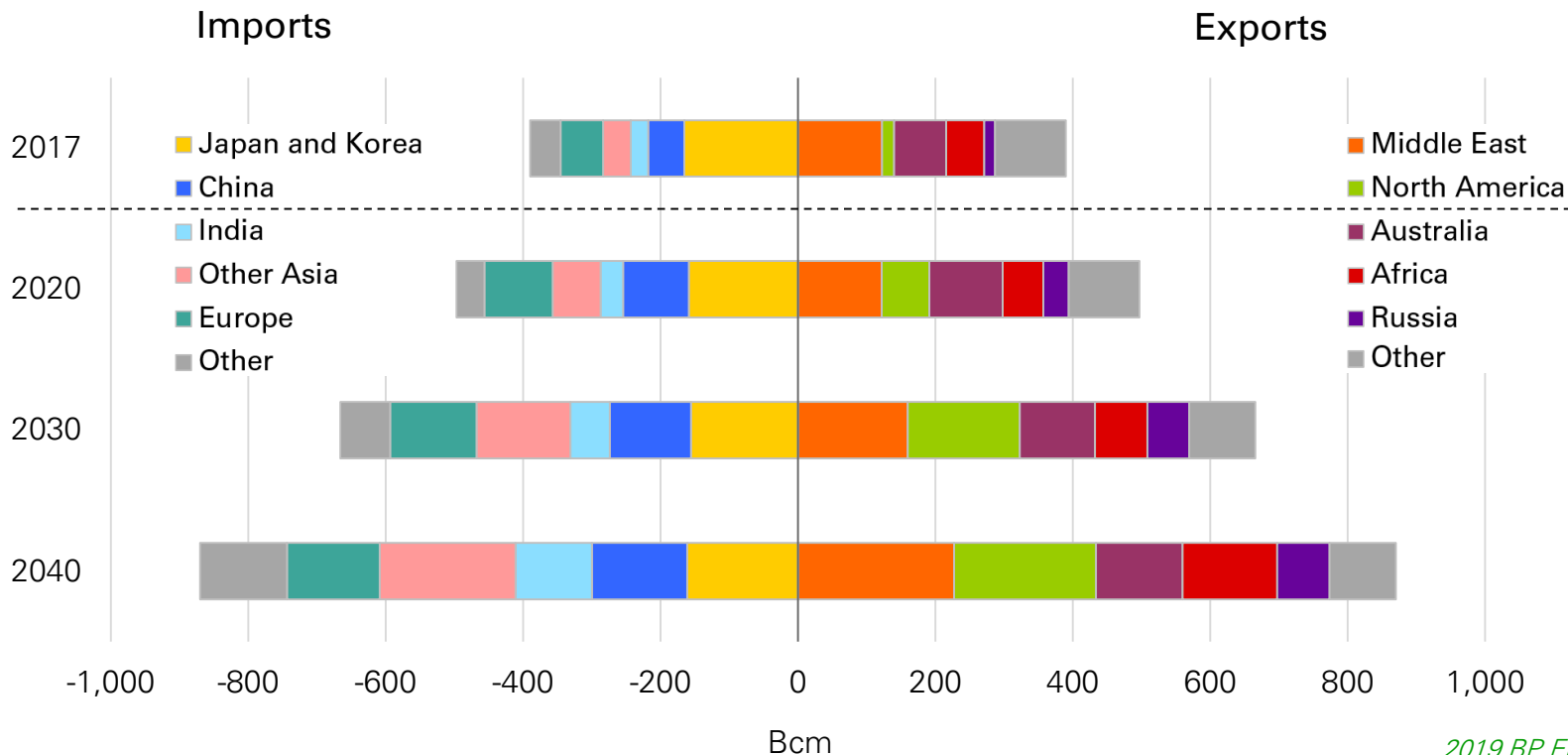
Looking at gas demand from different perspectives

Natural gas demand (ET scenario)



LNG exports increase significantly, led by US and Qatar

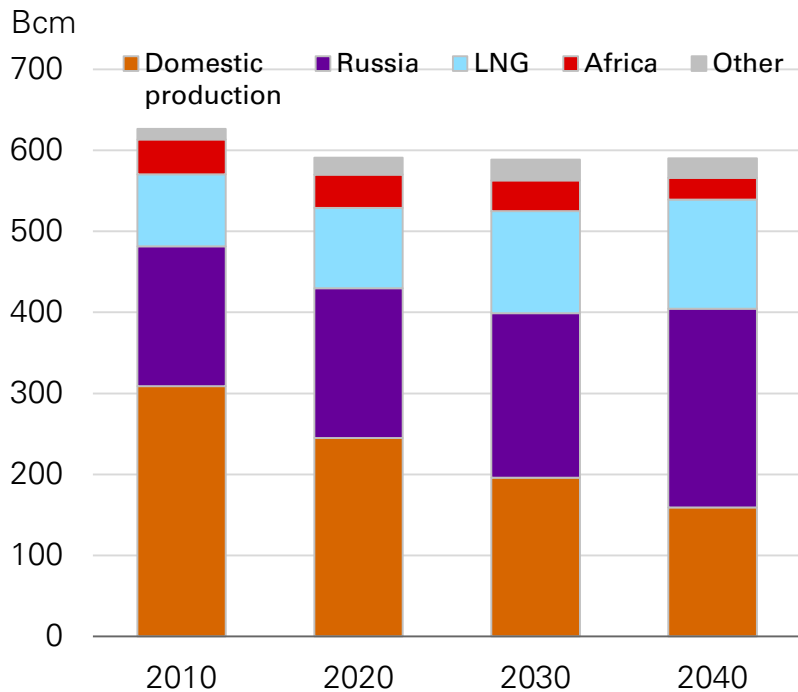
LNG imports and exports



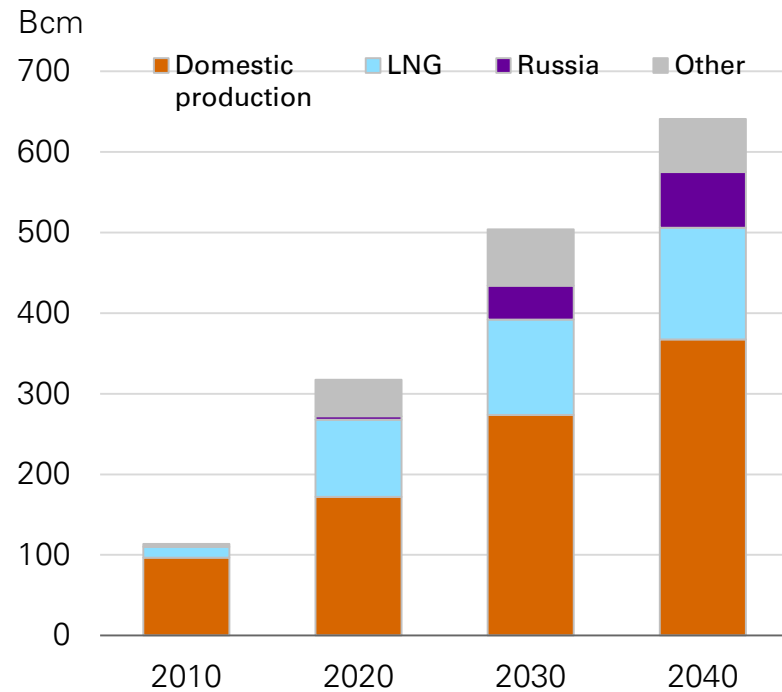


Increasing diversity of gas exports

Gas supply to Europe



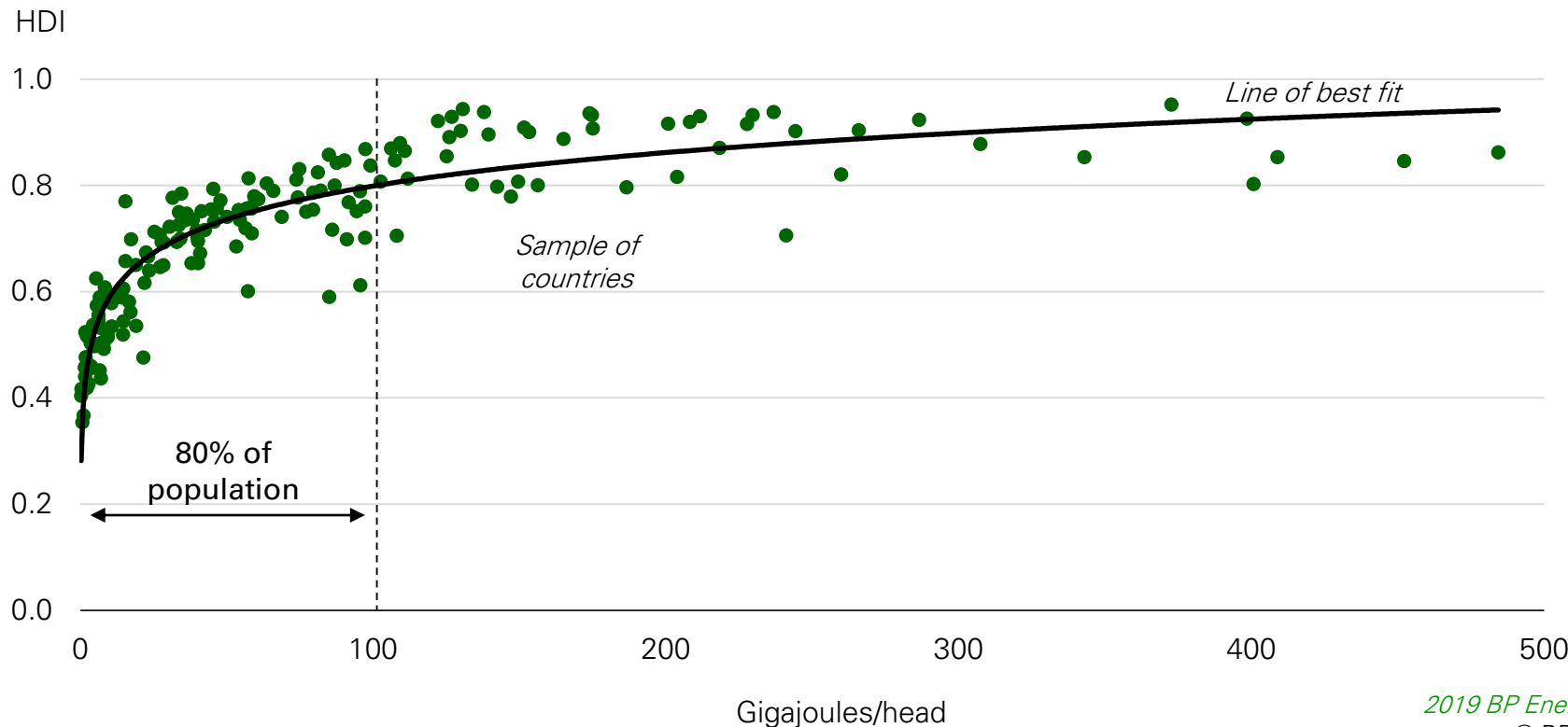
Gas supply to China





Human development and energy consumption

UN Human Development Index and energy consumption, 2017

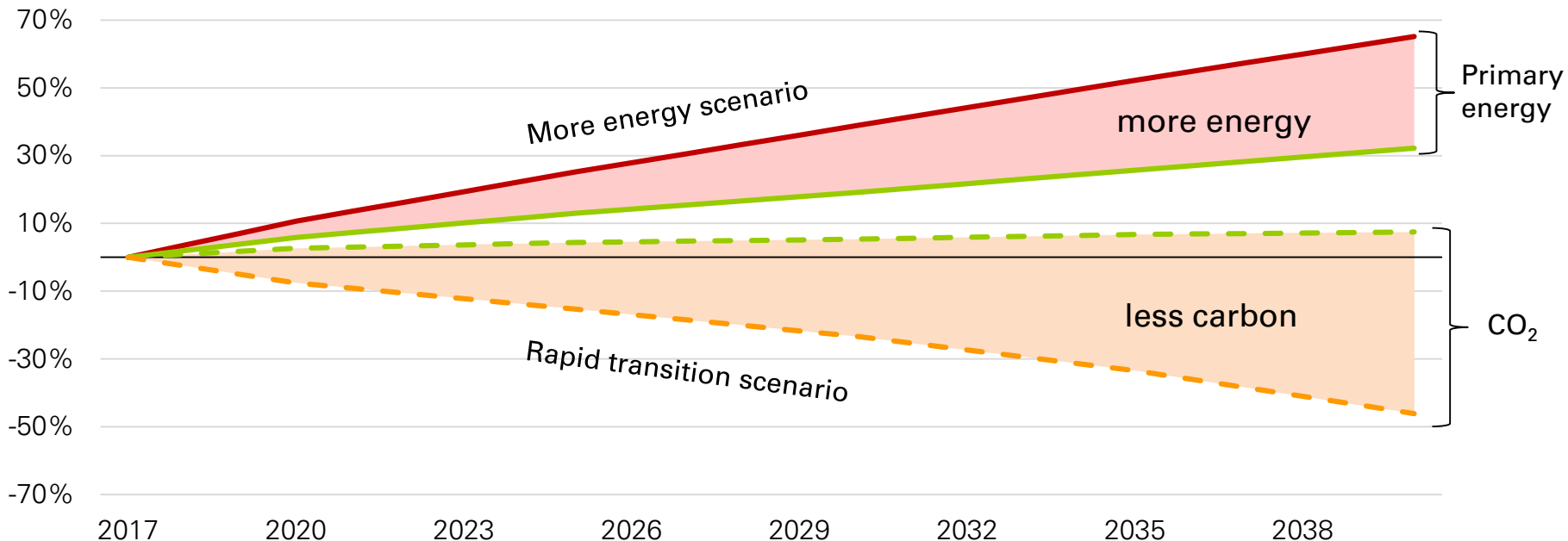




Dual challenge: more energy, less carbon

Primary energy demand and carbon emissions

Cumulative growth rate



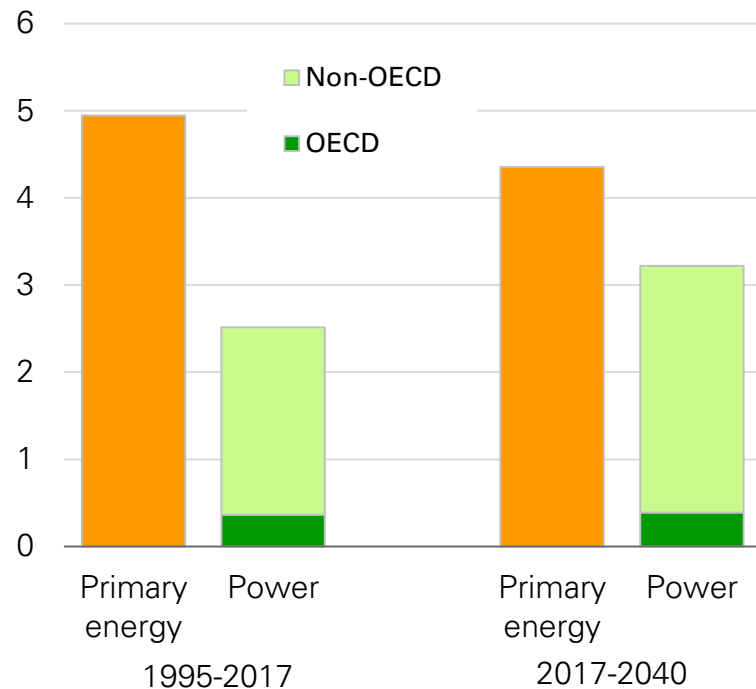
— Primary energy
- - - CO₂

} Evolving transition scenario

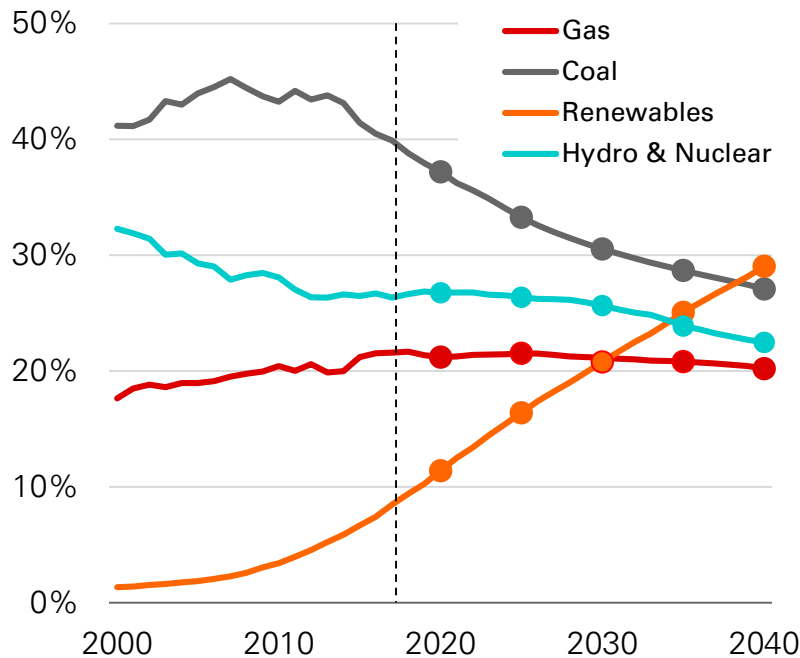
The world continues to electrify, led by developing economies

Growth in primary energy and inputs to power

Billion toe



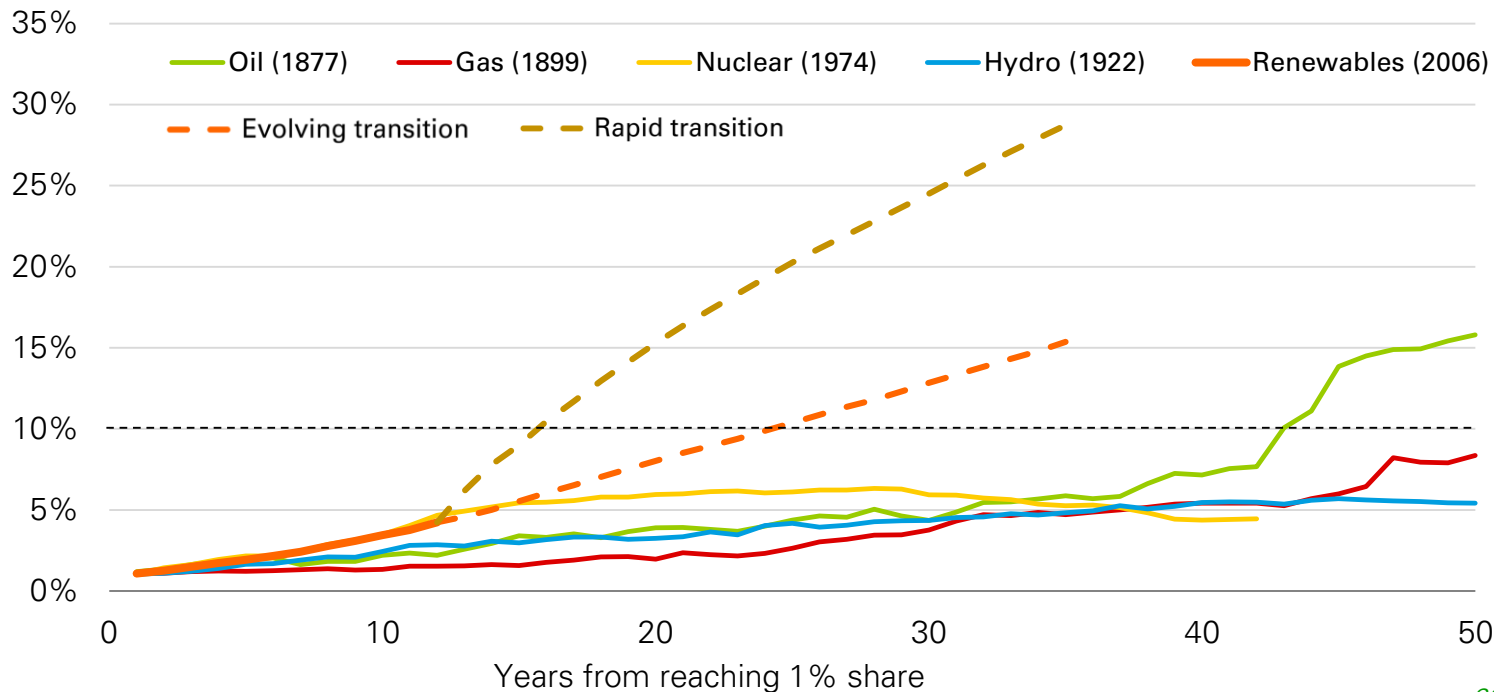
Fuel shares in power



Speed of energy transition

Speed of penetration of new fuels in global energy system

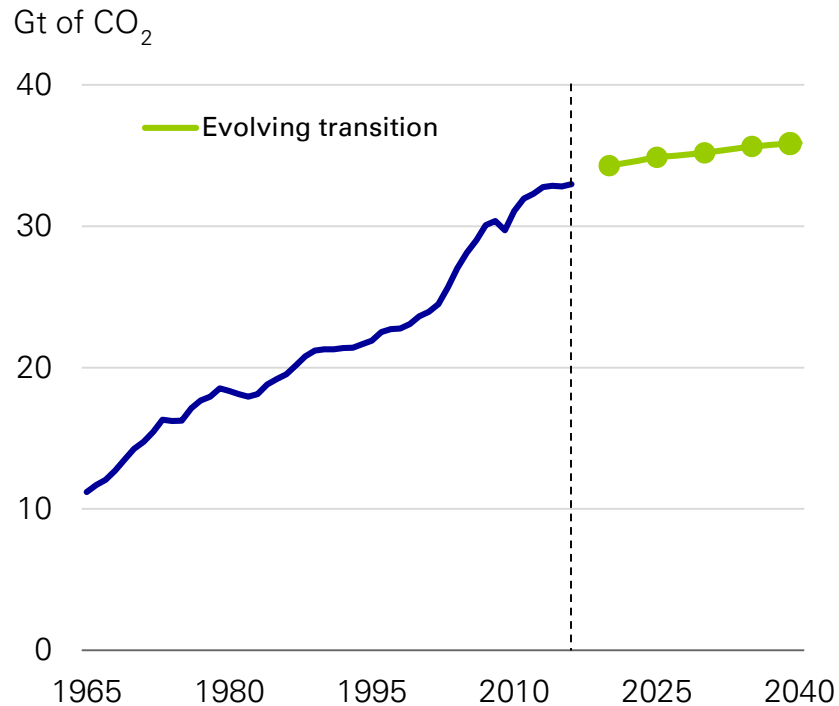
Share of world energy



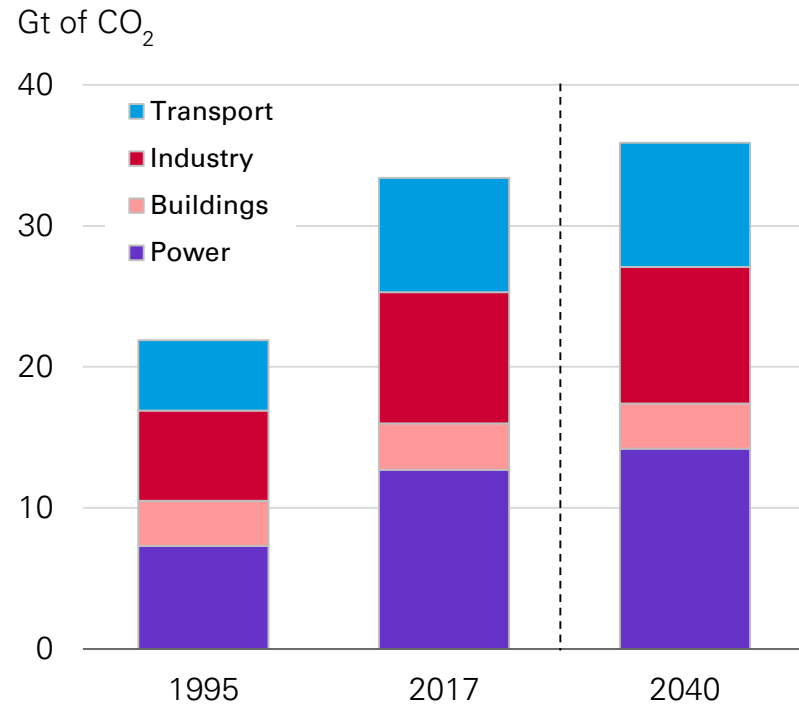


CO₂ emissions in ET scenario

CO₂ emissions

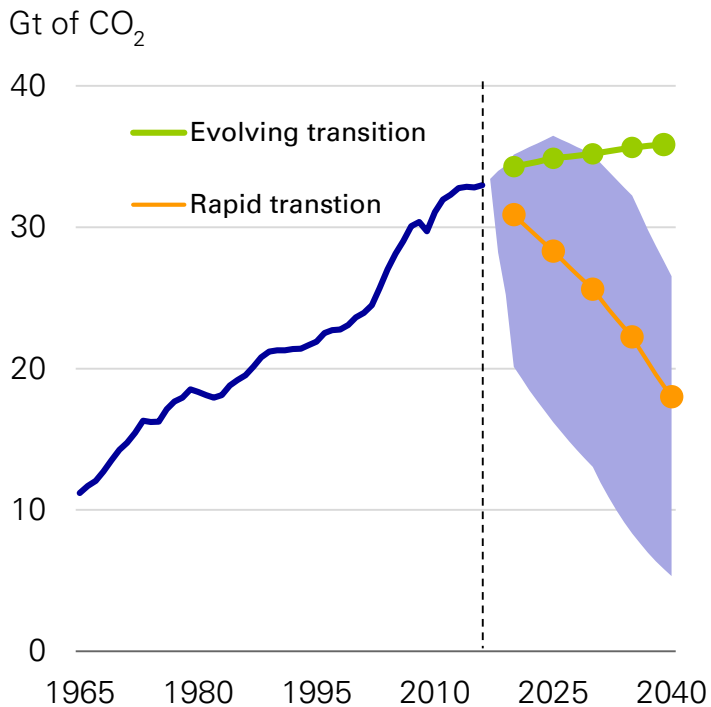


CO₂ emissions by sector

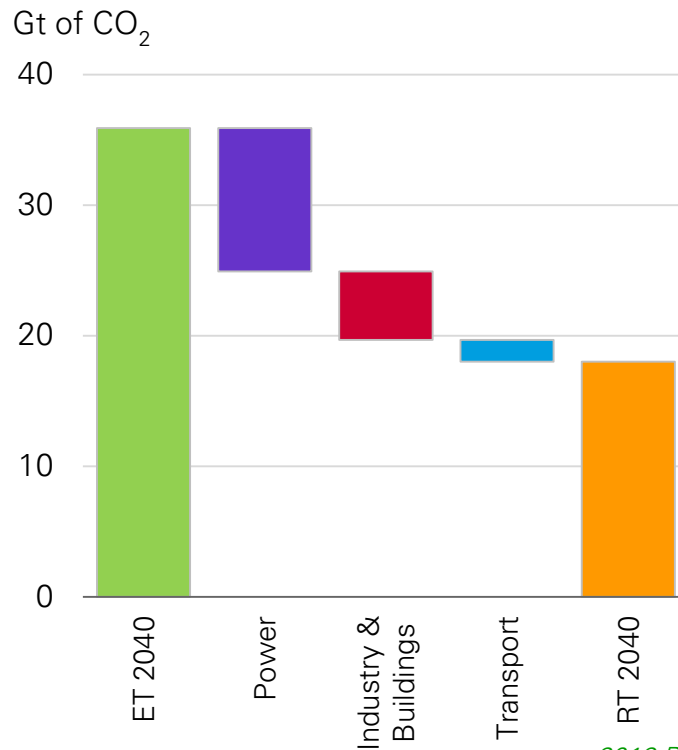


CO₂ emissions

CO₂ emissions

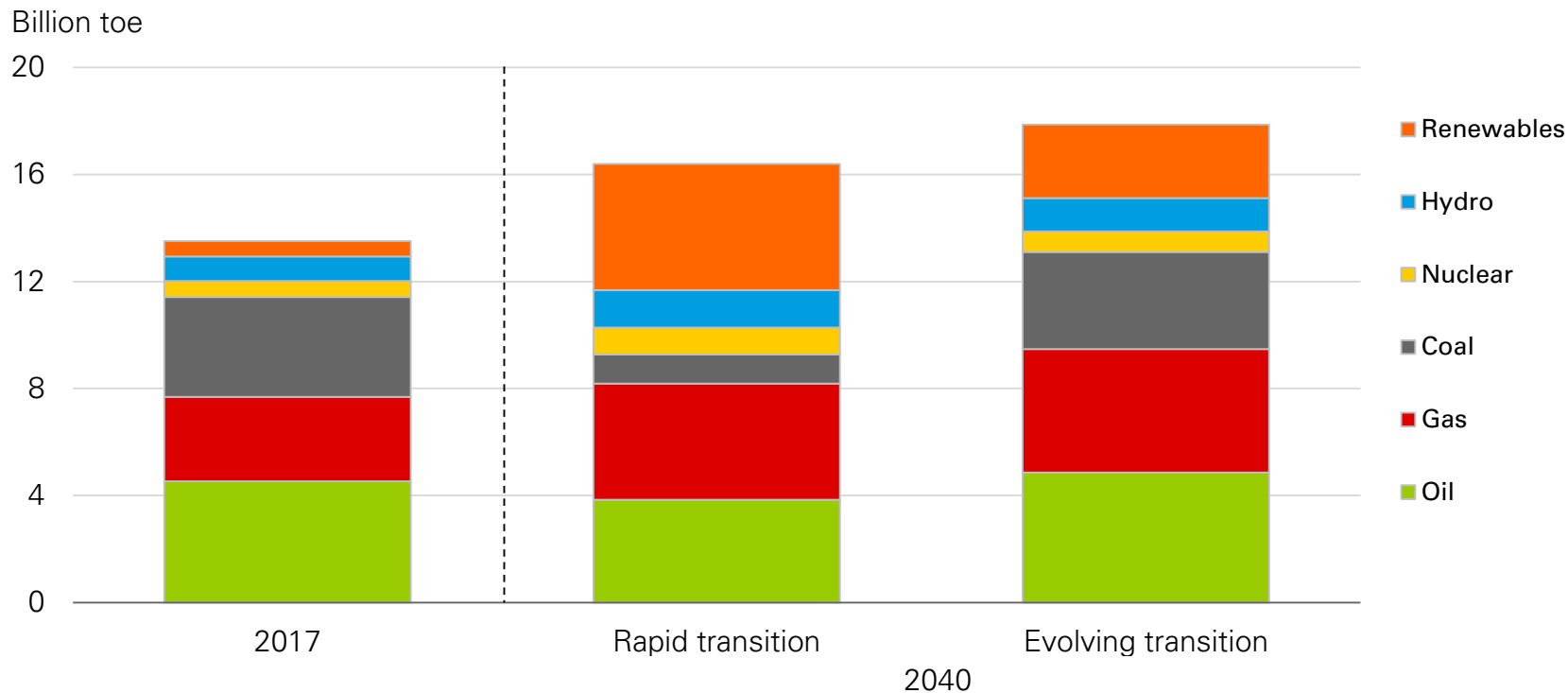


CO₂ in 2040: ET vs RT scenario



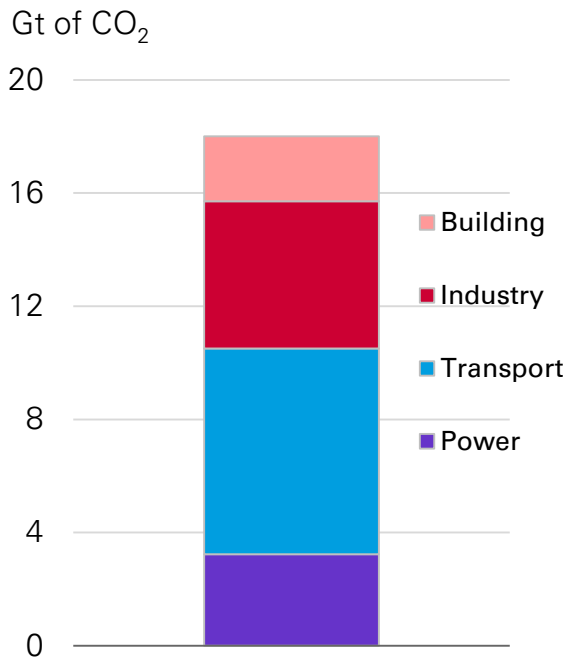
Global energy demand and fuel mix

Primary energy consumption by fuel



Hard-to-abate carbon emissions

CO₂ emissions in RT scenario in 2040



Decarbonise power sector

- Renewables
- Gas (and coal) plus CCUS
- Energy storage and demand-side-response

Other low-carbon energy sources and carriers

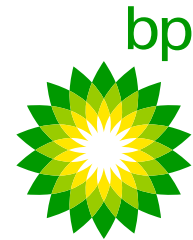
- Hydrogen
- Bioenergy

Efficiency

- Circular economy
- Process efficiency

Storage and removal of carbon

- CCUS
- Negative emission technologies, eg land carbon, bioenergy with CCS (BECCS)



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