

BP Energy Outlook 2035

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Liquid fuels

Natural gas

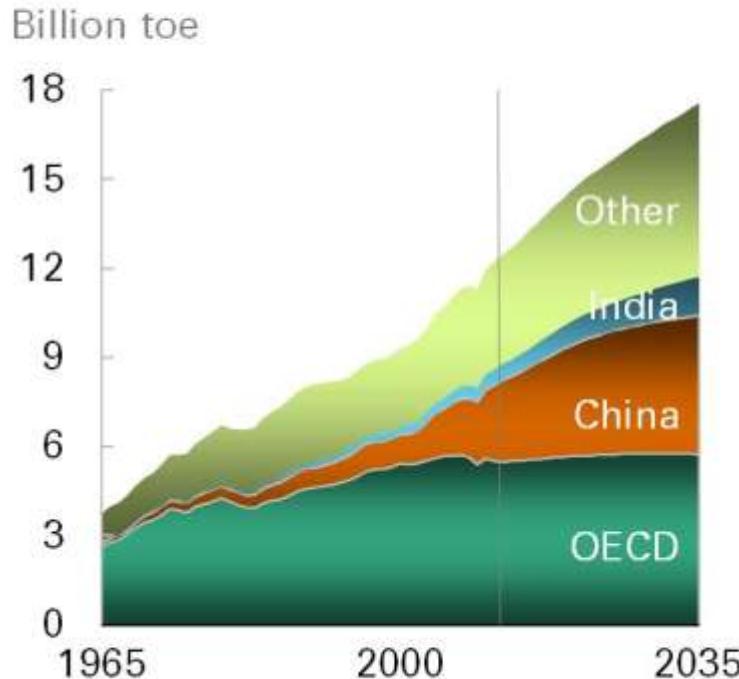
Coal and non-fossil fuels

Carbon emissions and the fuel mix

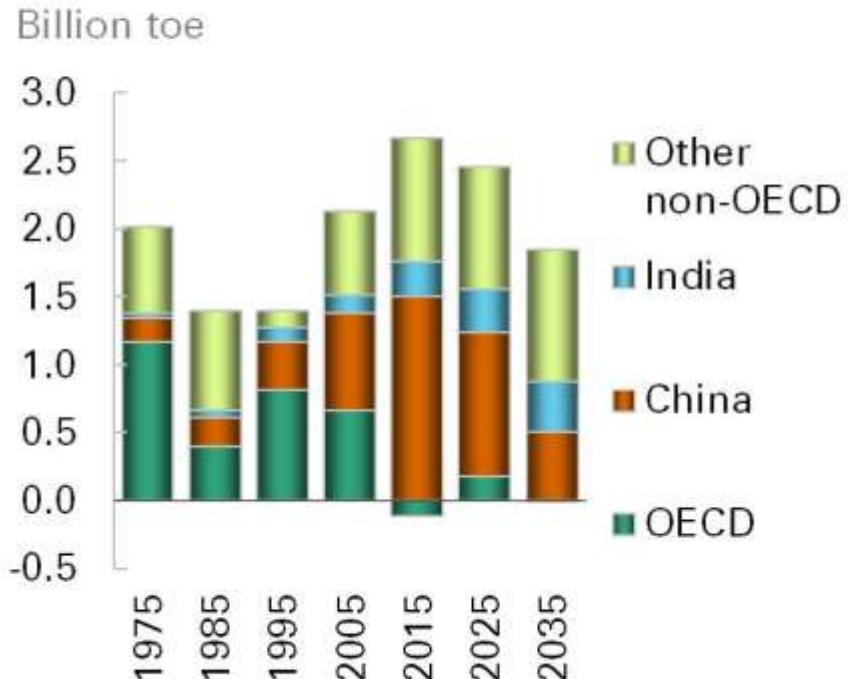
Conclusion

Primary energy consumption growth slows

Consumption by region



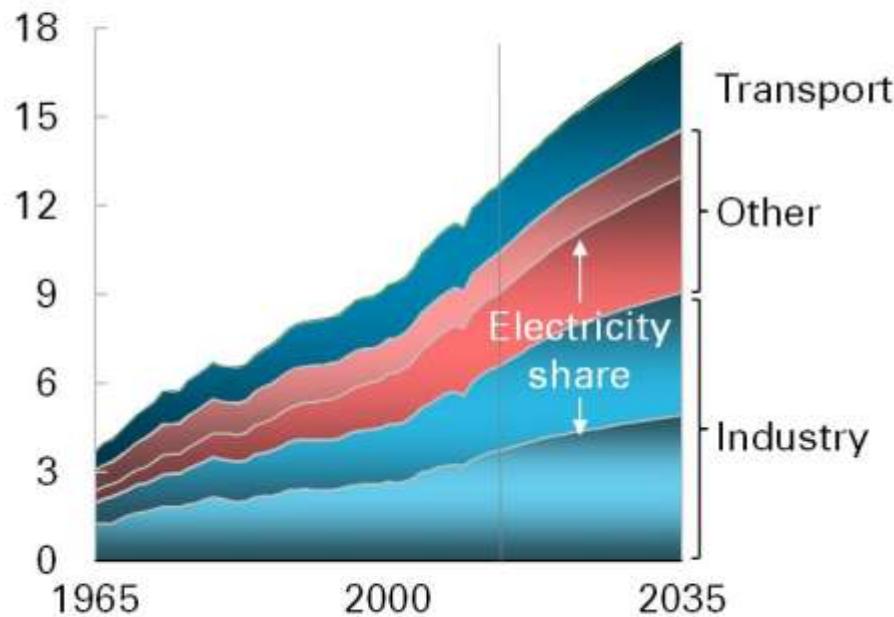
Ten year increments by region



The strong impetus from industrialization starts to fade

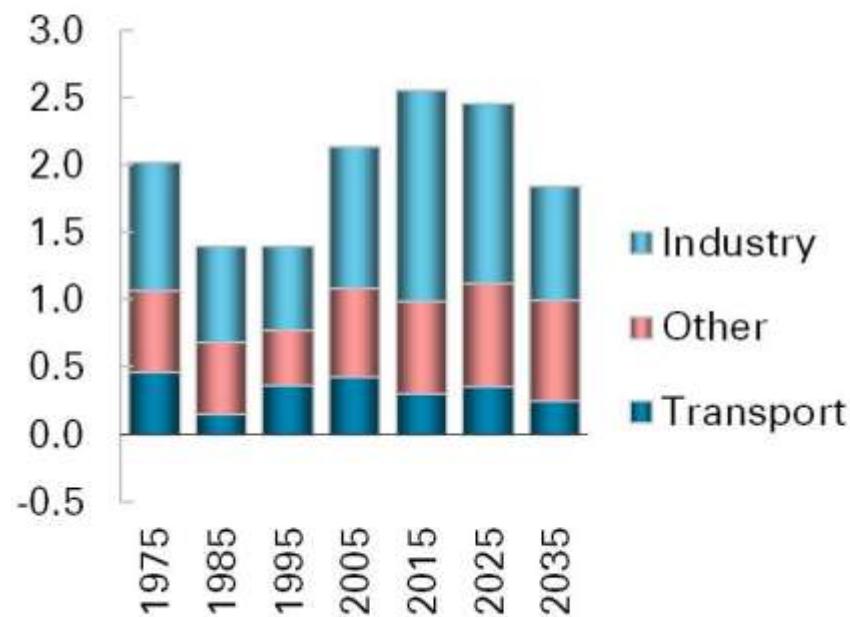
Consumption by sector

Billion toe



Ten year increments by sector

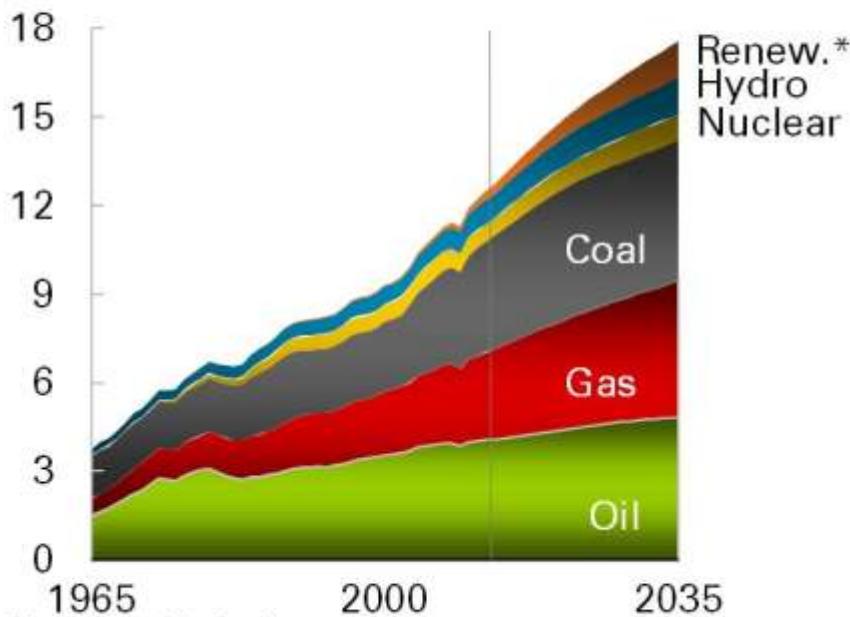
Billion toe



The slowdown in China and industry is reflected in coal

Consumption by fuel

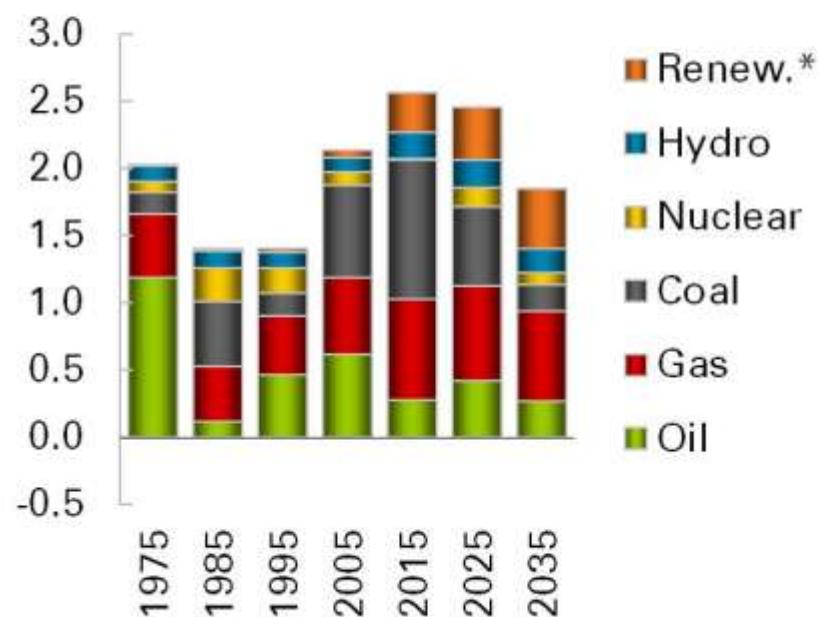
Billion toe



*Includes biofuels

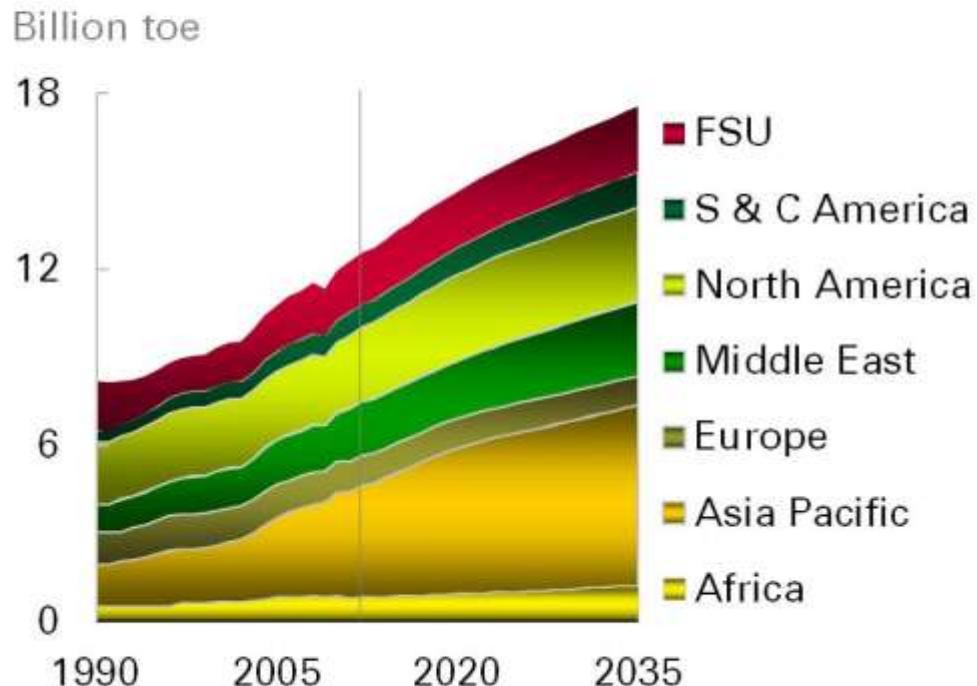
Ten year increments by fuel

Billion toe

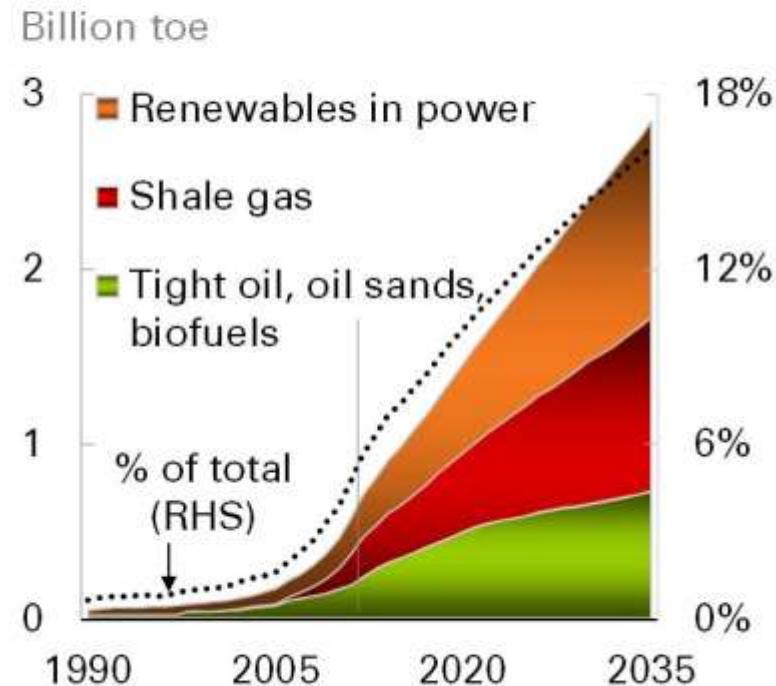


New sources help to supply sufficient energy

Primary energy production

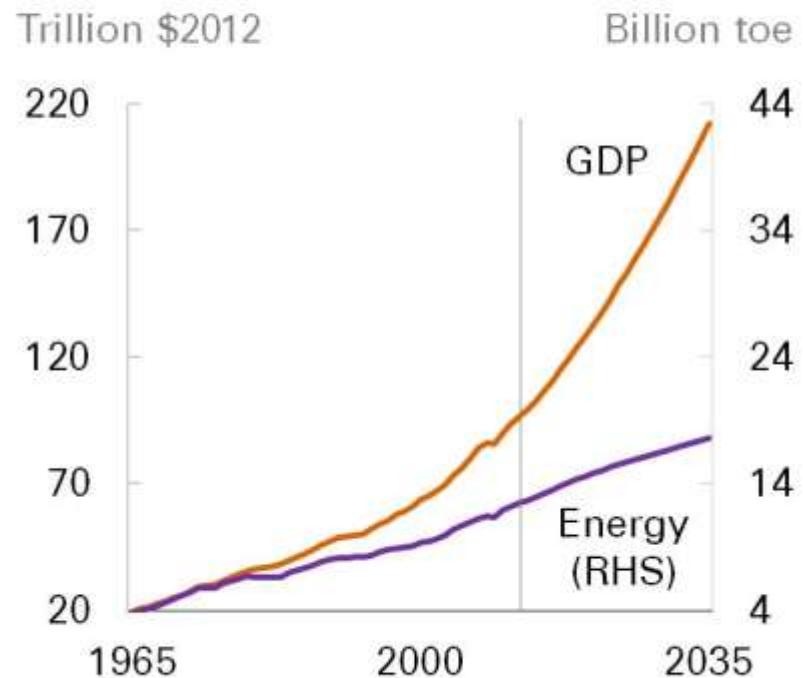


New energy forms

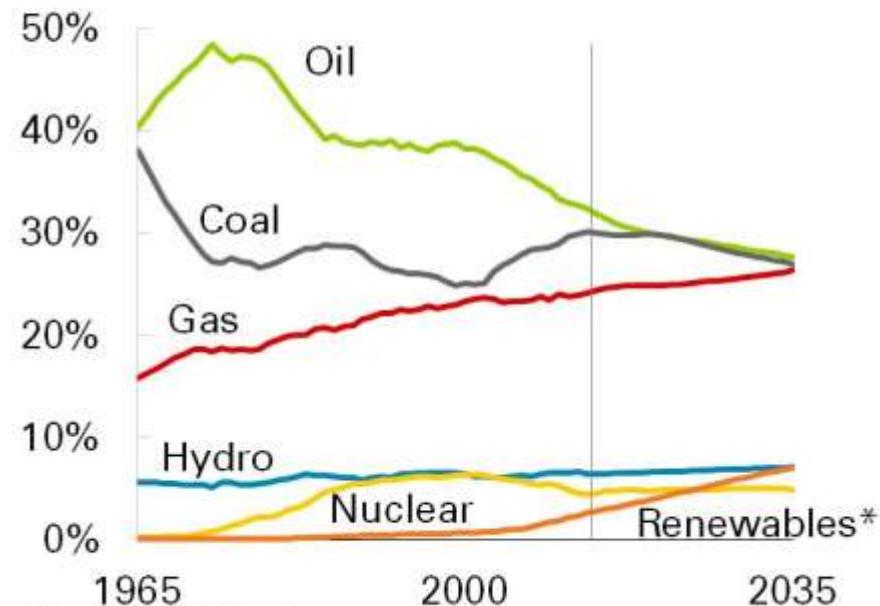


Energy decouples from GDP and fuel mix evolves

GDP and energy

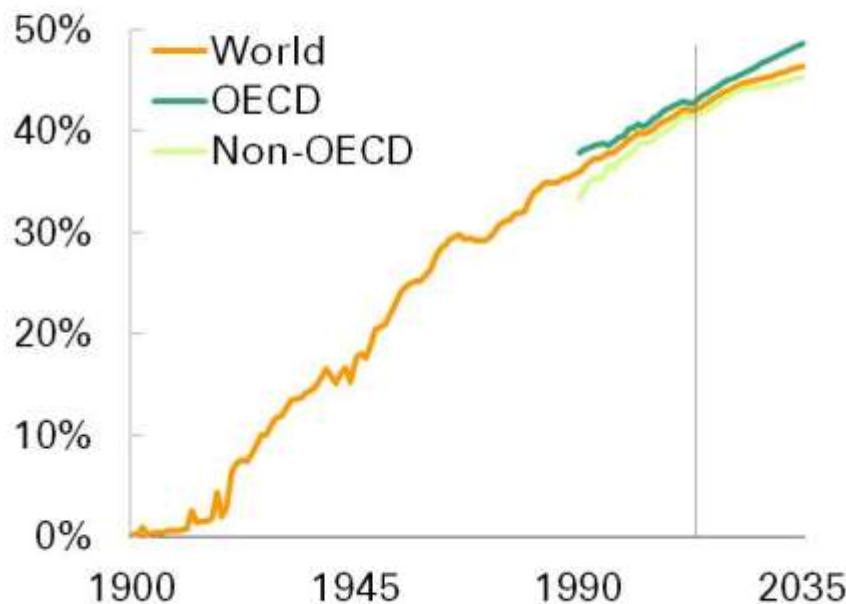


Shares of primary energy

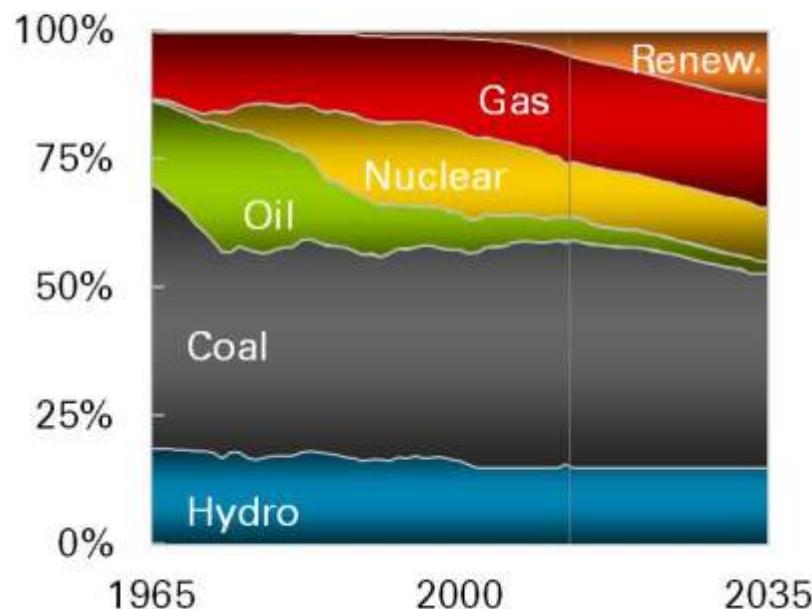


The power sector takes an increasing share of energy

Inputs to power as a share of total primary energy



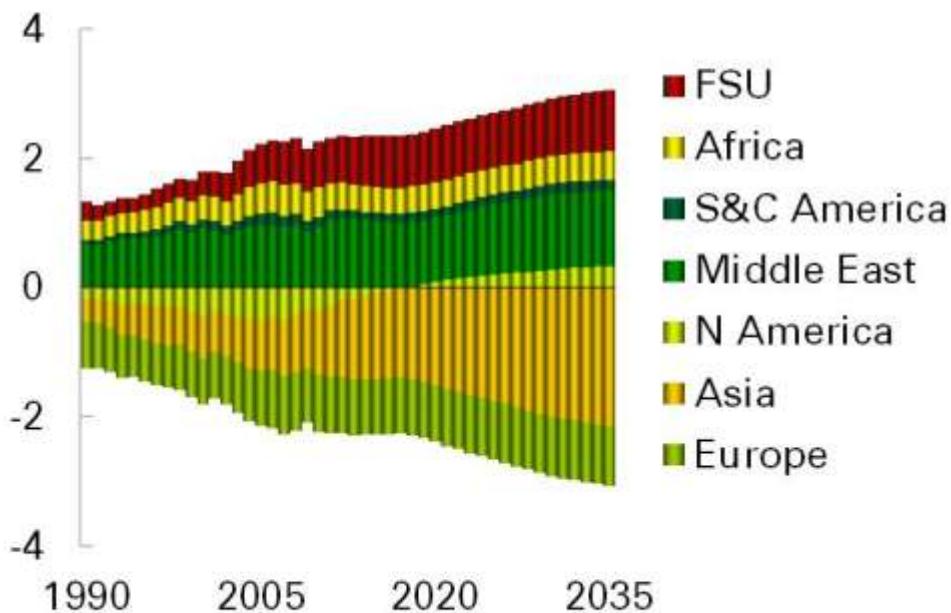
Primary inputs to power



Energy security and sustainability pose challenges

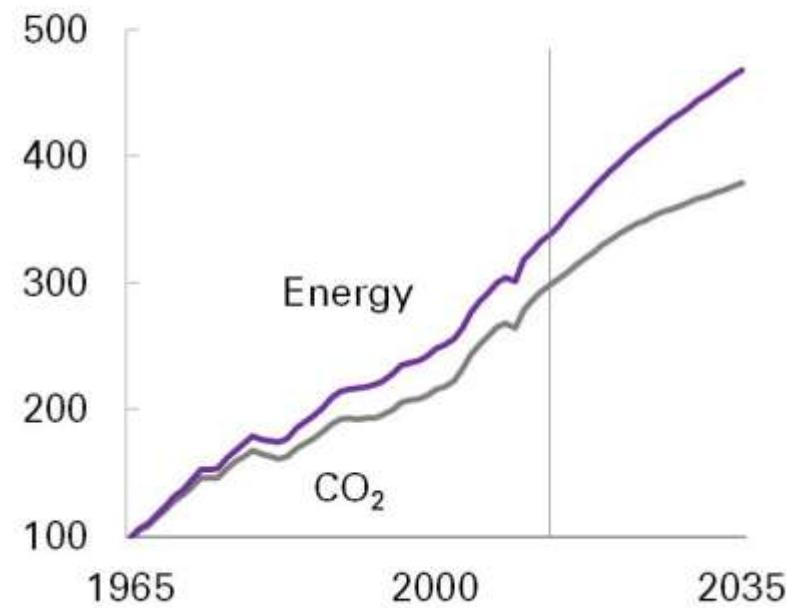
Primary energy net balances

Billion toe



Energy and CO₂ emissions

Index: 1965 = 100





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Natural gas

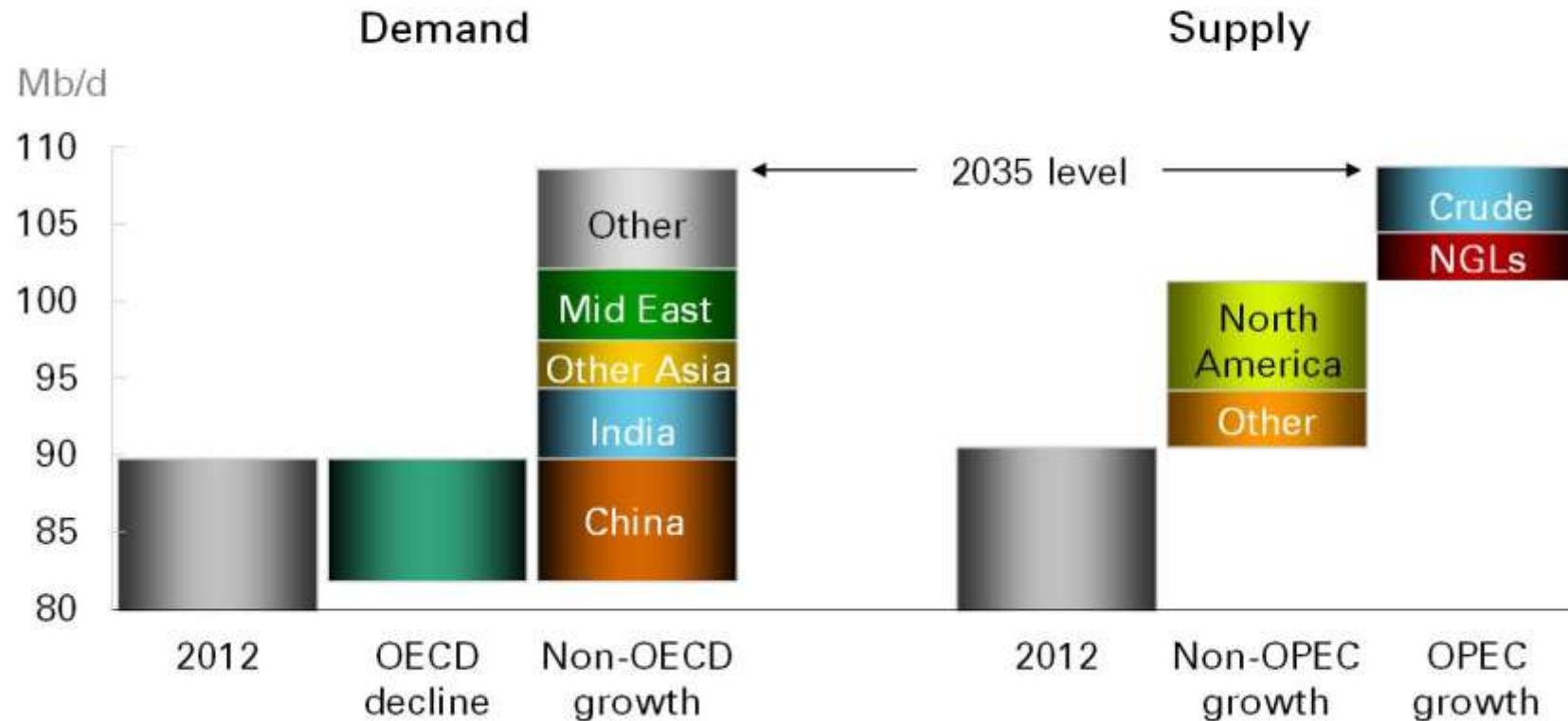
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Carbon emissions and the fuel mix

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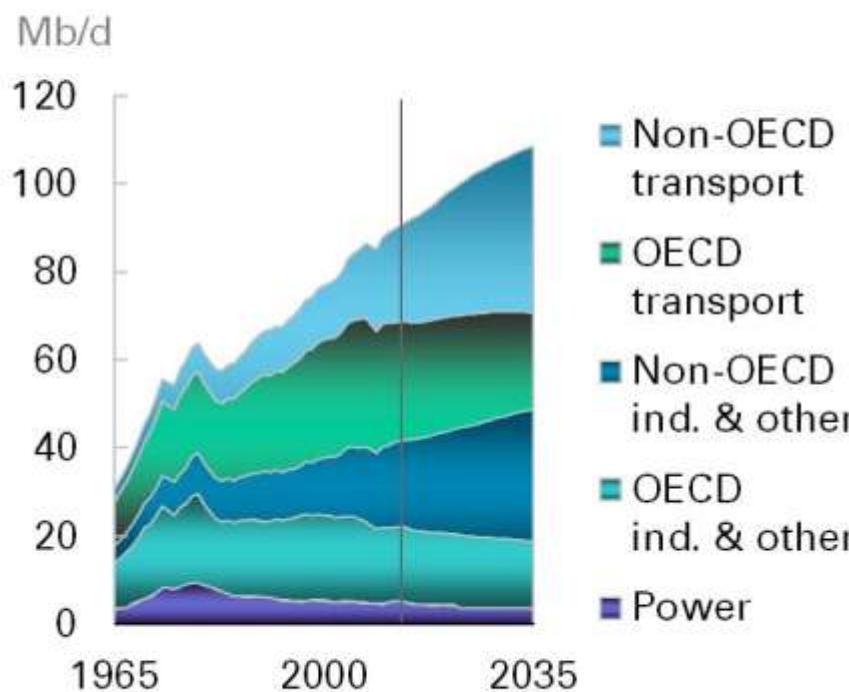


The global liquids balance

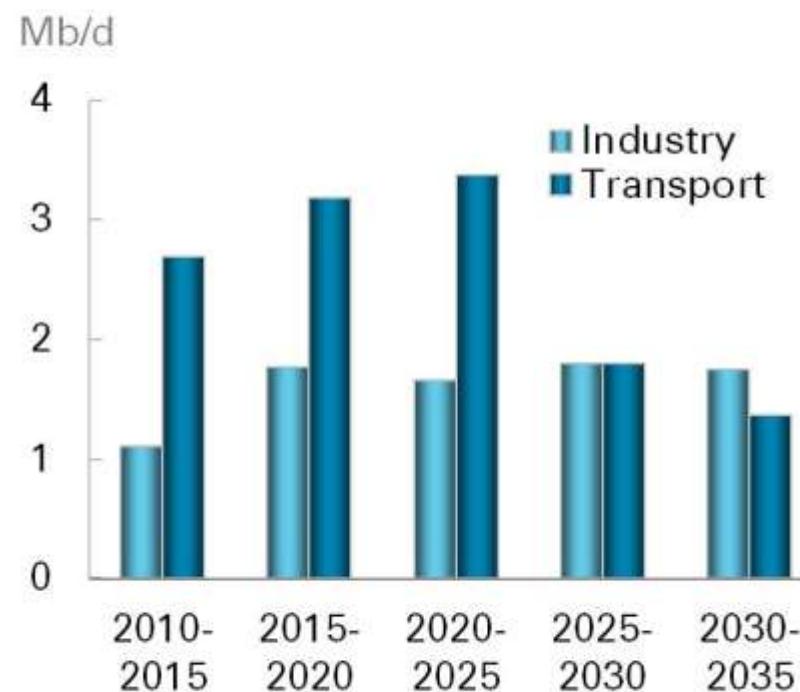


Liquids demand growth is largest in non-OECD transport

Demand by sector

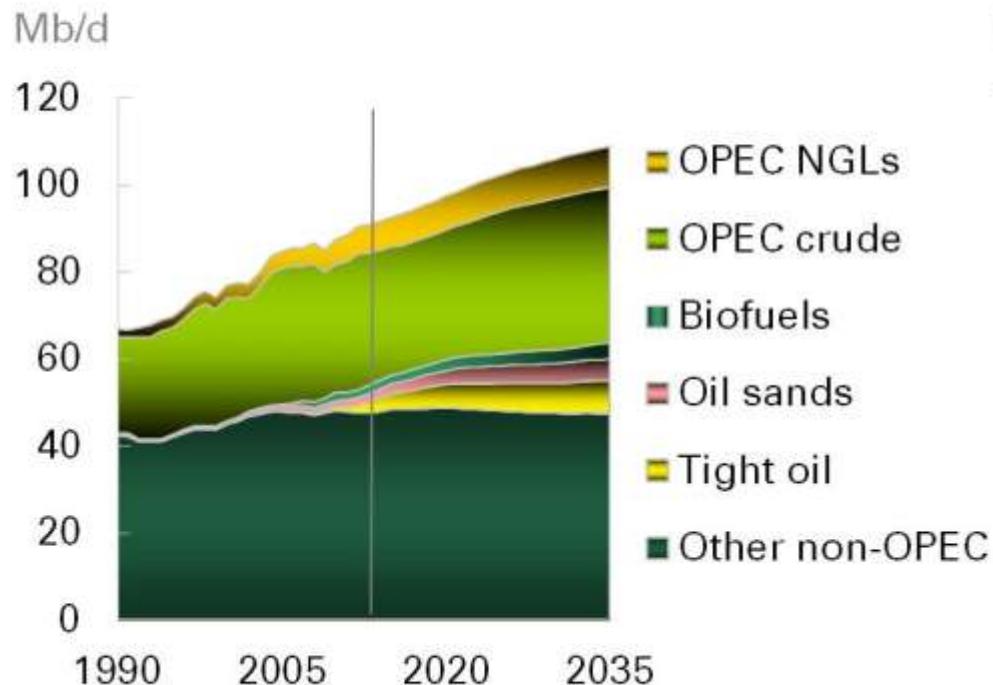


Five year increments

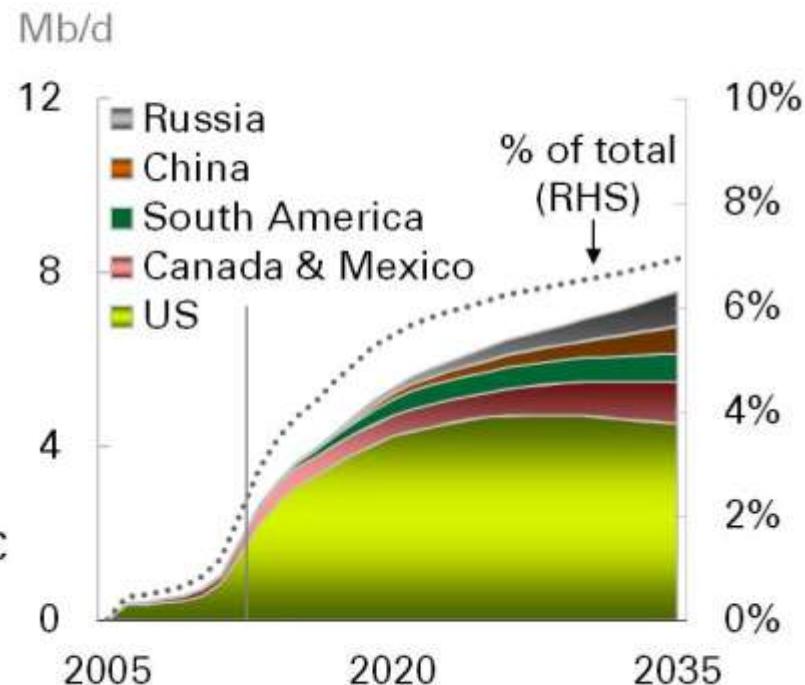


Supply growth is supported initially by unconventional

Liquids supply by type



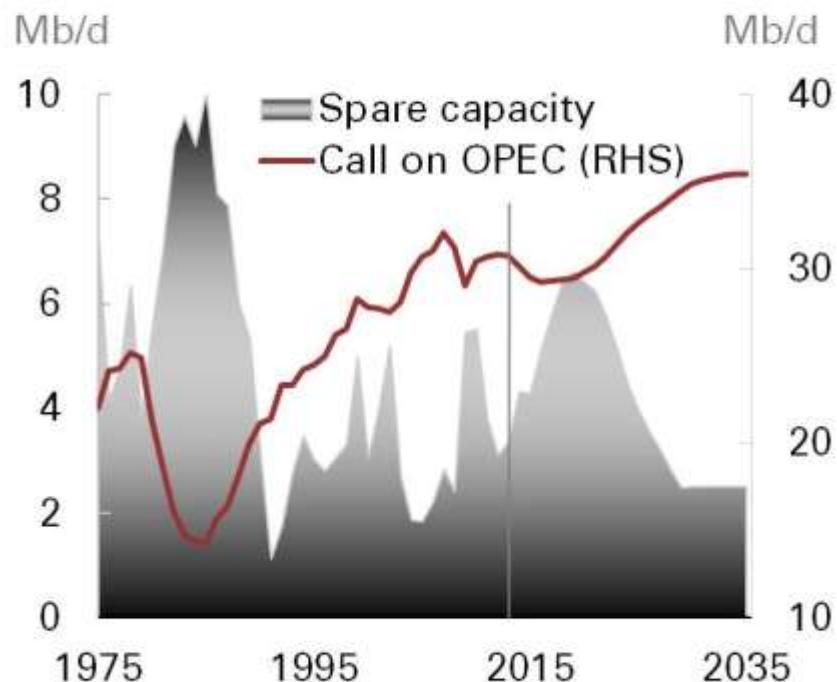
Tight oil supply





Oil balances suggest OPEC will be challenged

OPEC spare capacity



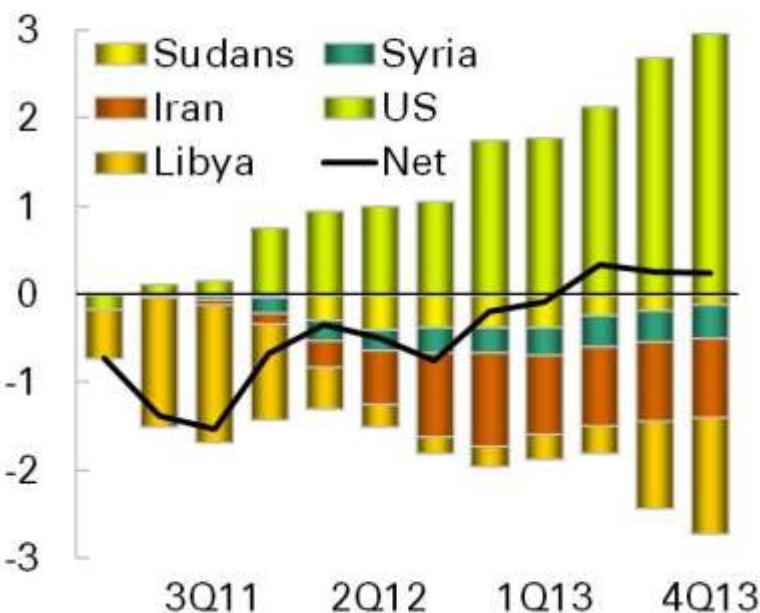
OPEC share of global supply



Supply disruptions reduce the immediate impact on OPEC

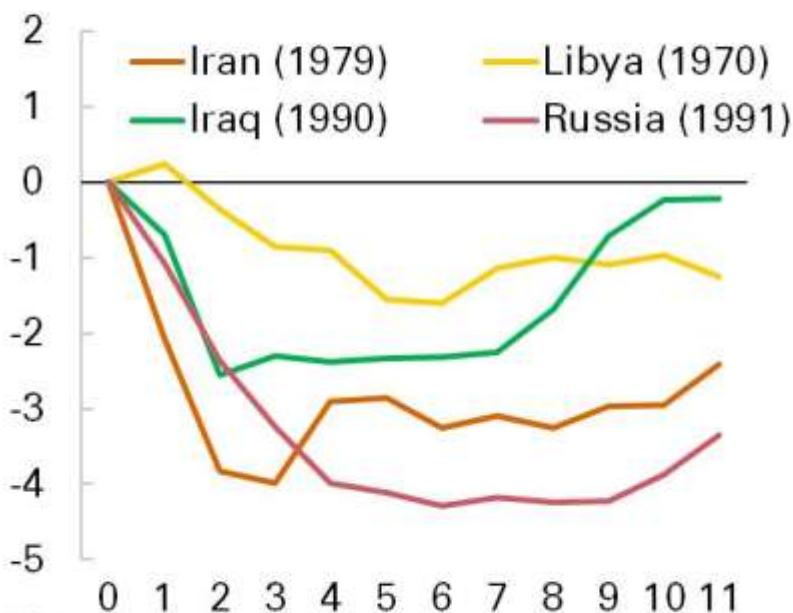
Recent disruptions and US growth

Change since 4Q10, Mb/d



Historical disruptions

Change from pre-disruption level*, Mb/d

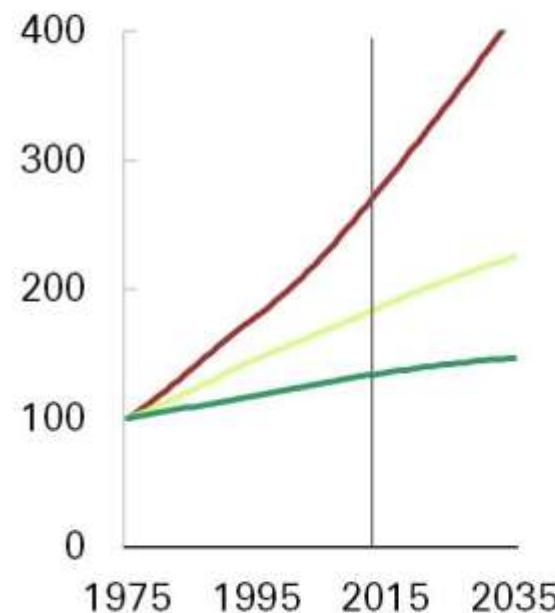




OPEC countries face pressure from rising populations

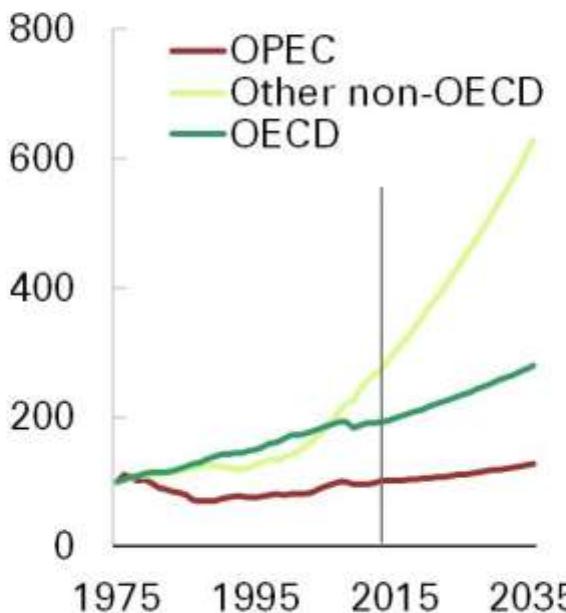
Population

Index: 1975 = 100



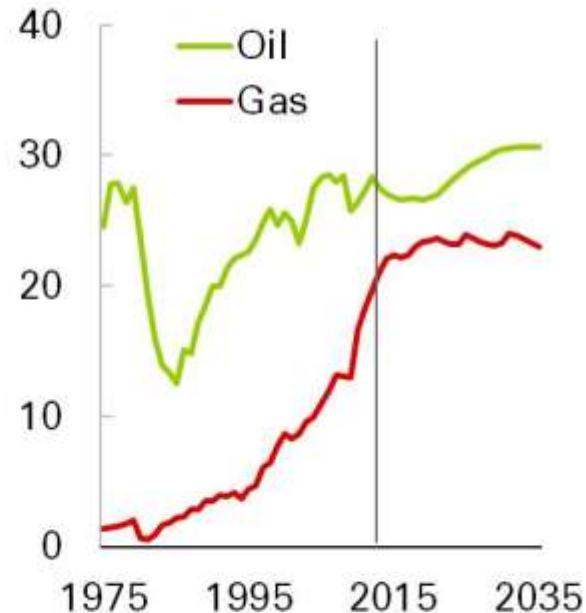
GDP per capita

Index: 1975 = 100

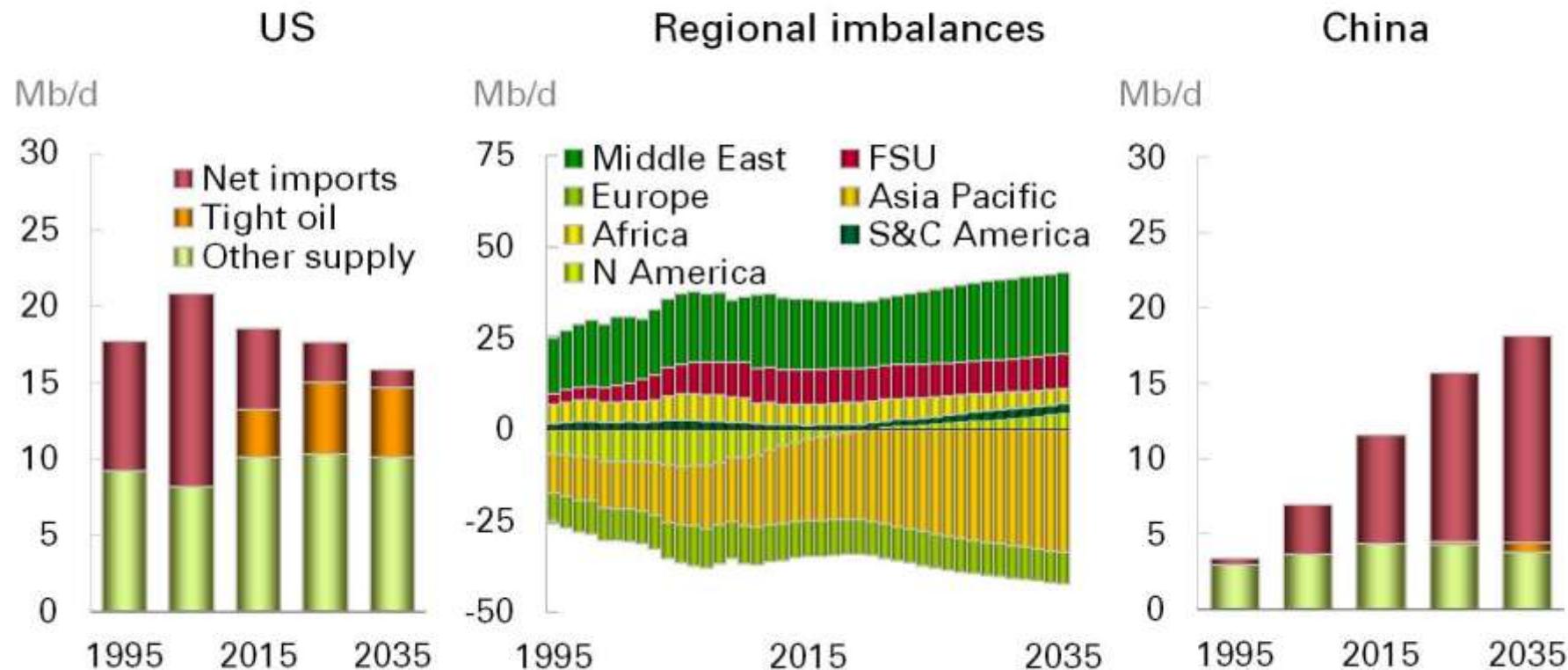


OPEC exports

Mb/d and Bcf/d

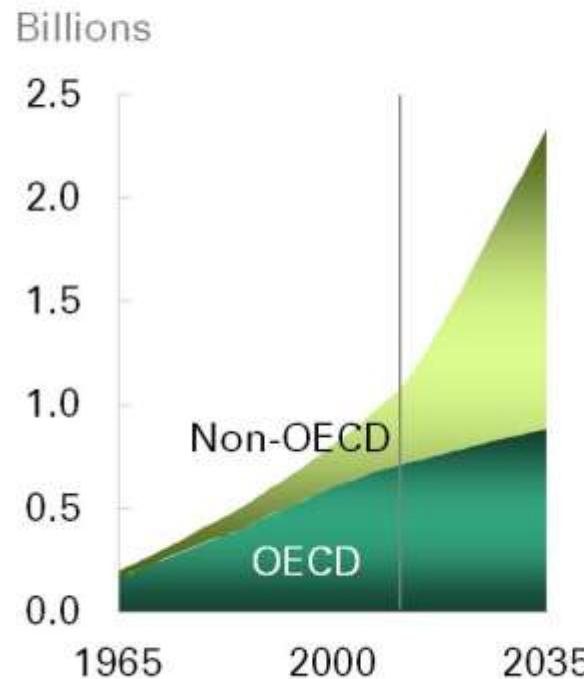


Oil trade continues to shift from West to East

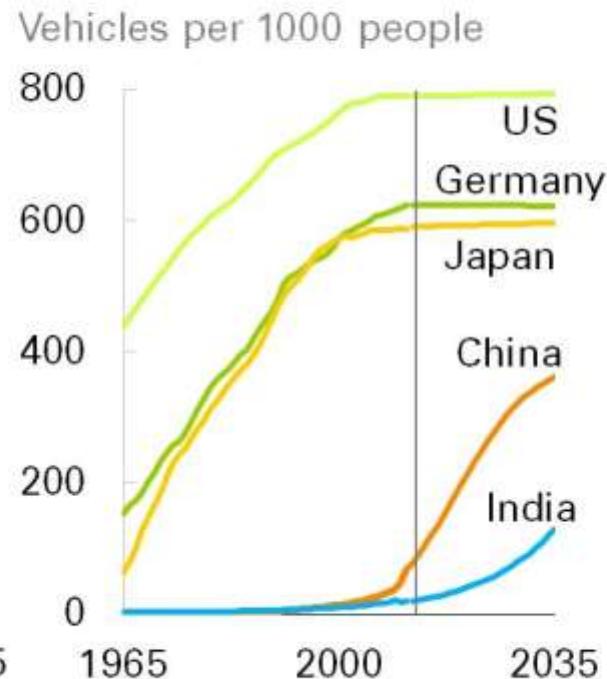


Vehicle numbers are set to grow rapidly in the non-OECD

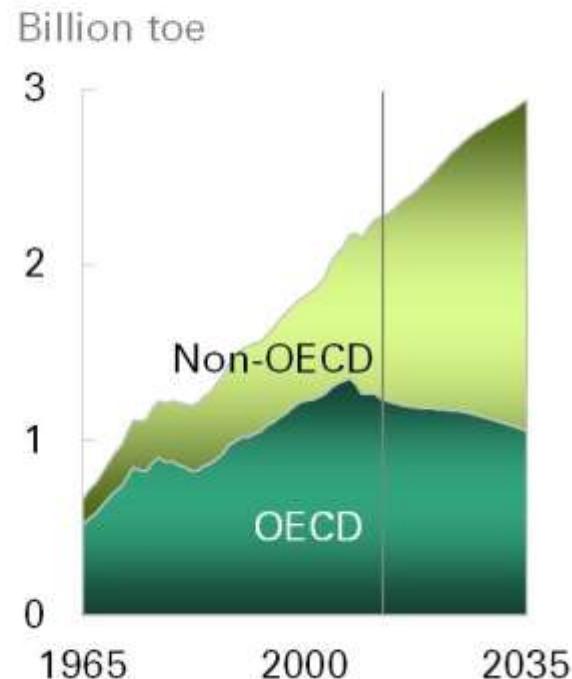
Vehicle fleet



Vehicle ownership



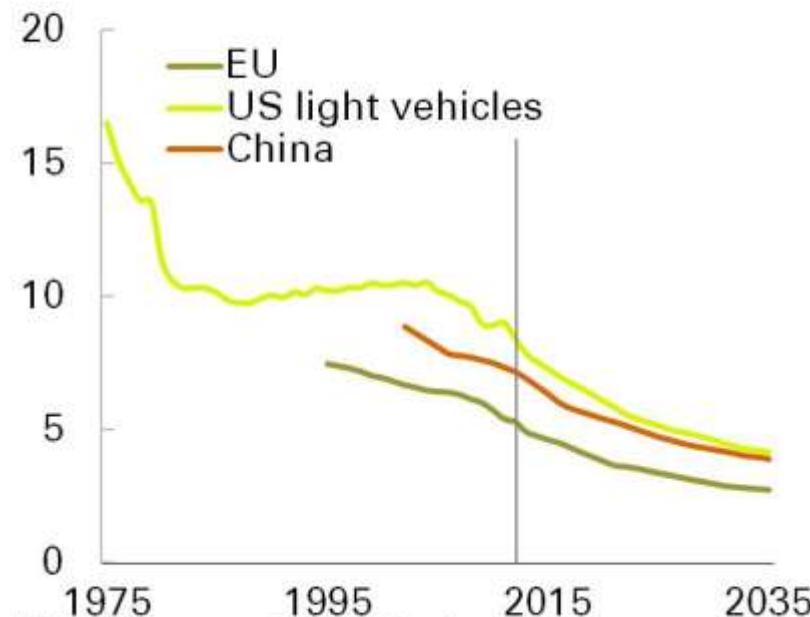
Transport demand



Policy and technology enable efficiency improvements

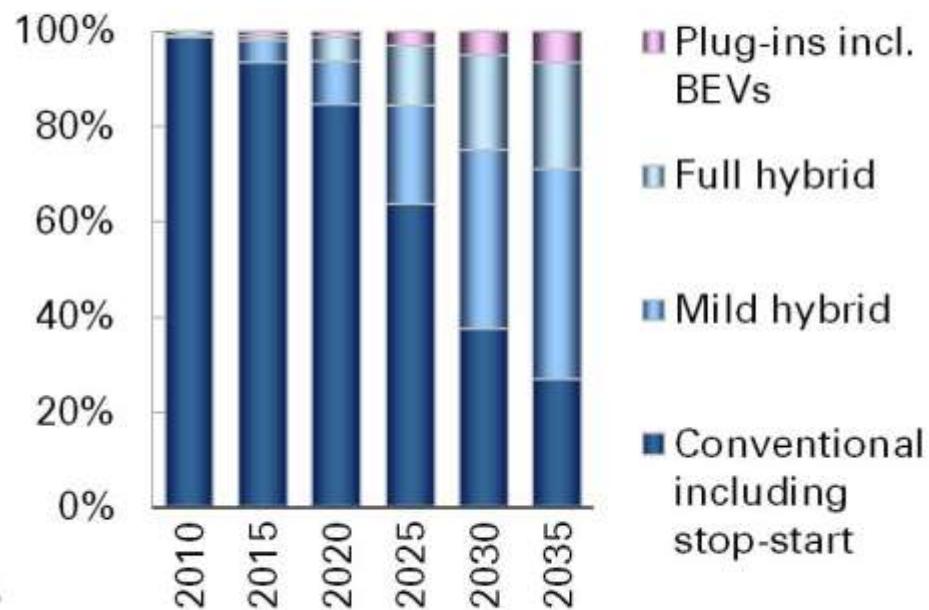
Fuel economy of new cars

Litres per 100 km*



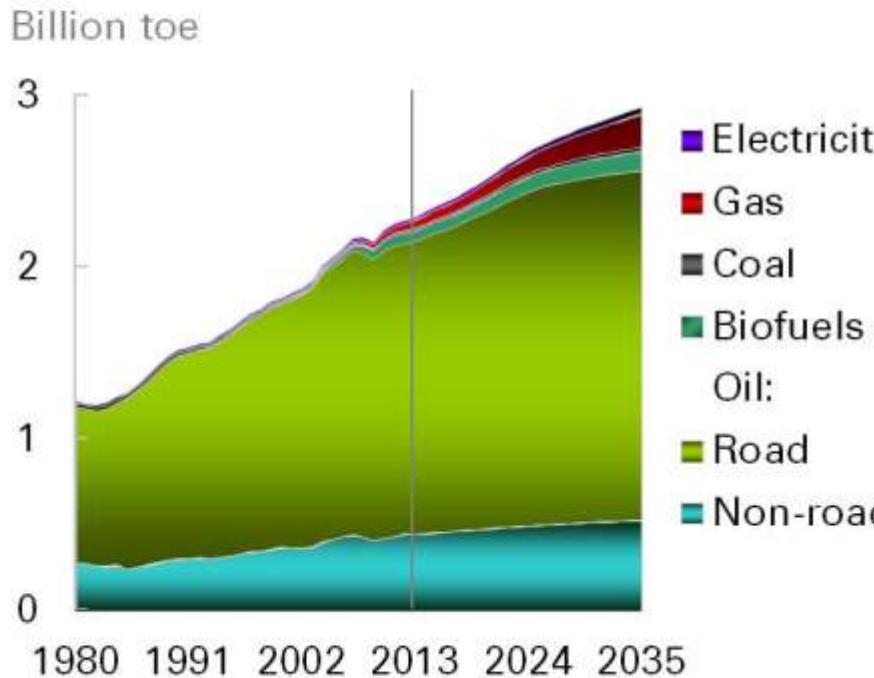
*New European Driving Cycle

Vehicle sales by type

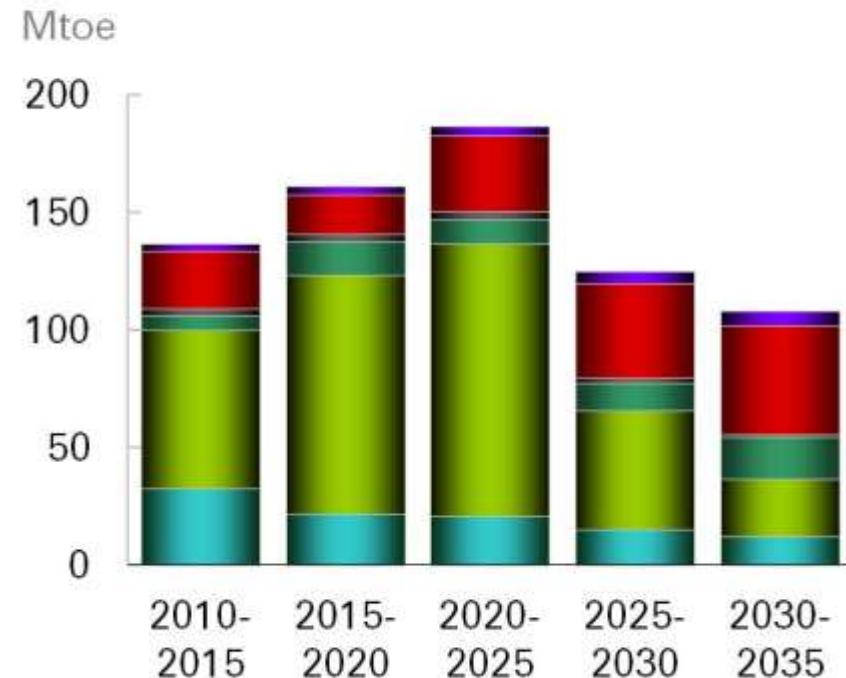


Global transport demand growth slows

Transport demand by fuel



Five year increments by fuel





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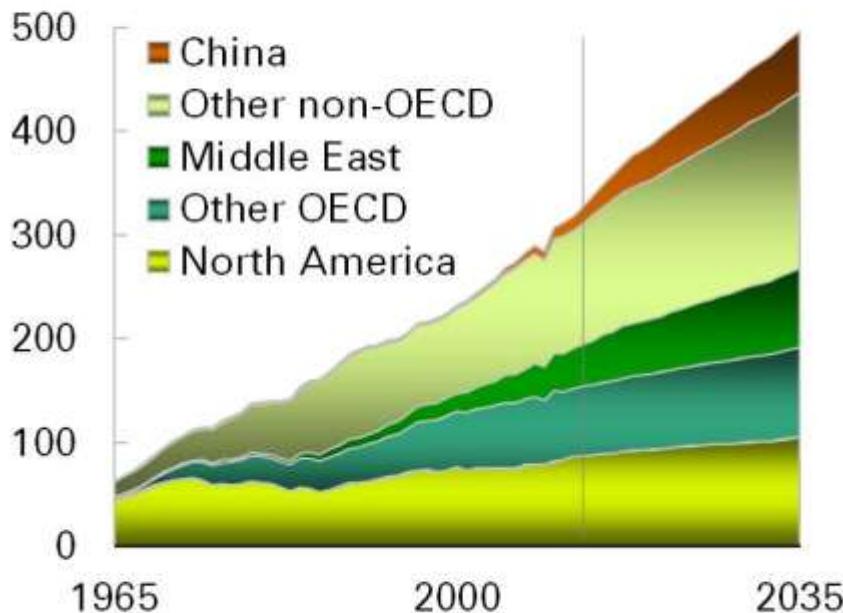
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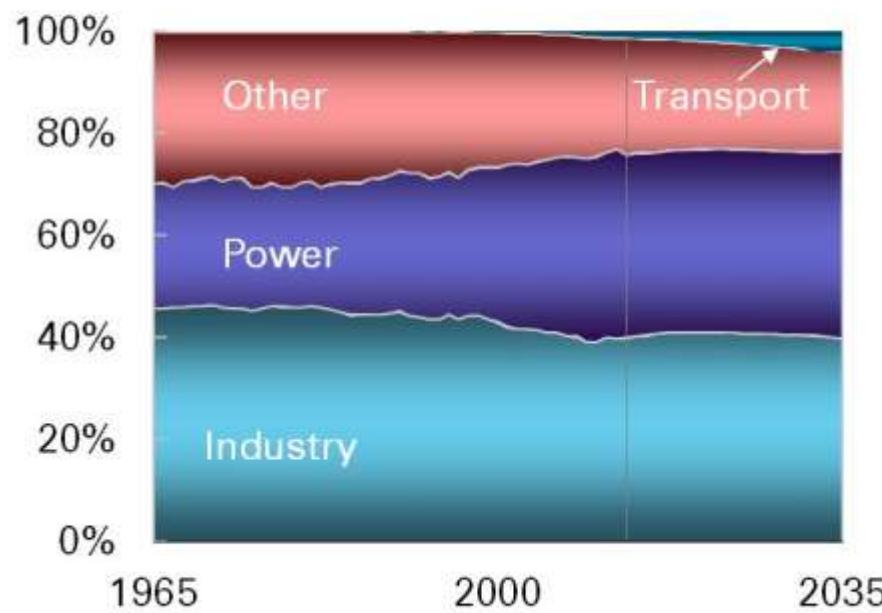
Natural gas demand grows in all regions and sectors

Demand by region

Bcf/d

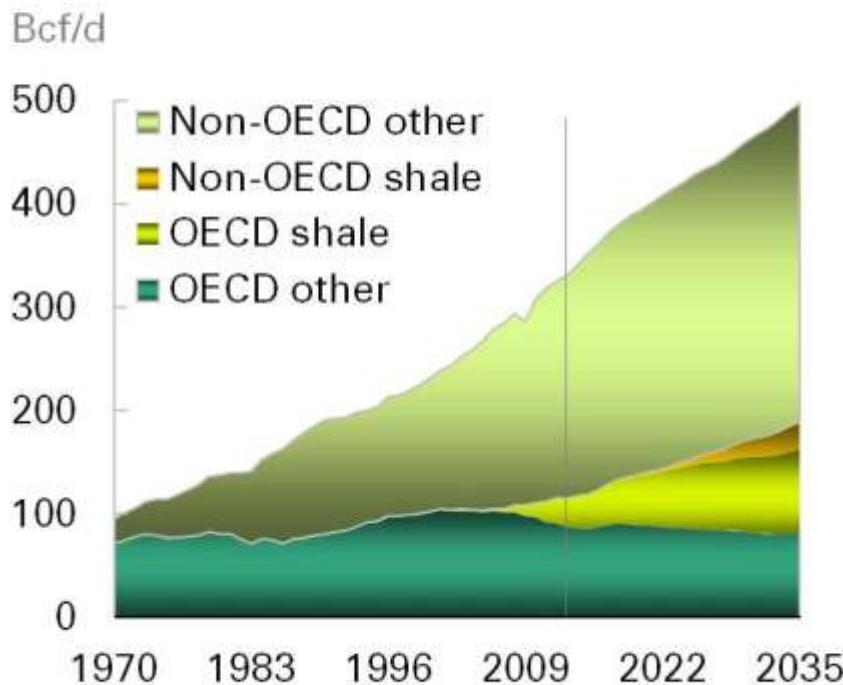


Demand by sector

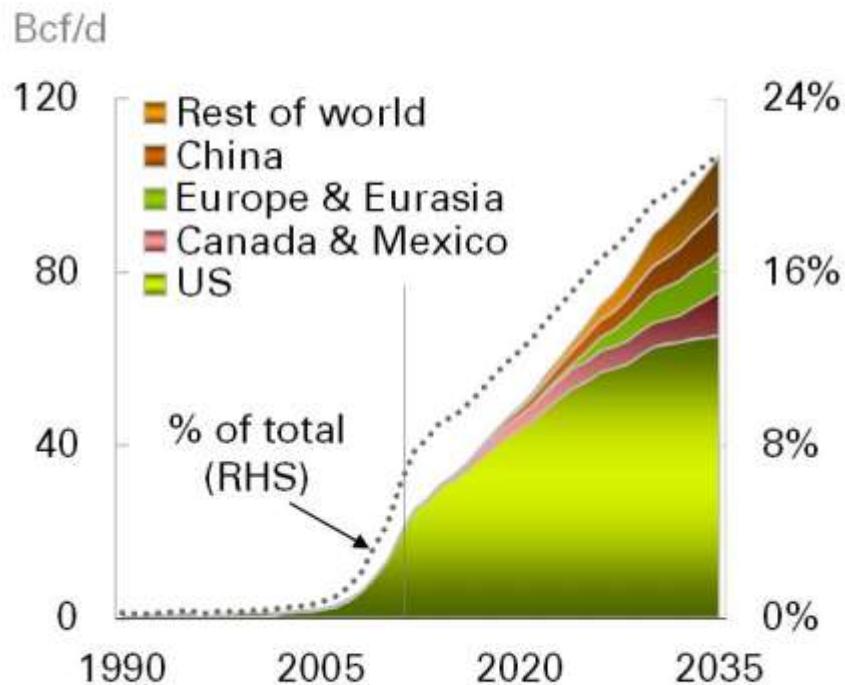


Shale gas shows the fastest production growth

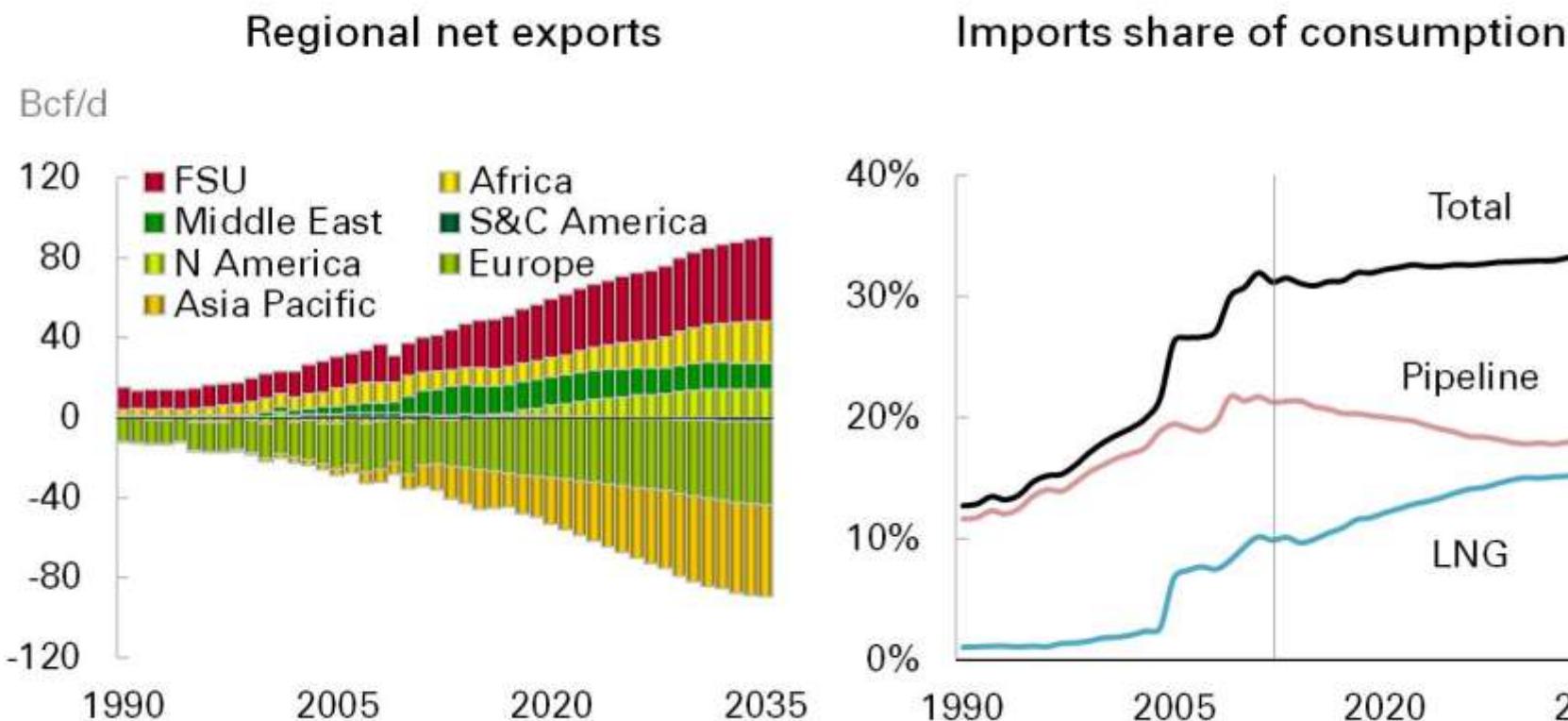
Gas production by type and region



Shale gas production

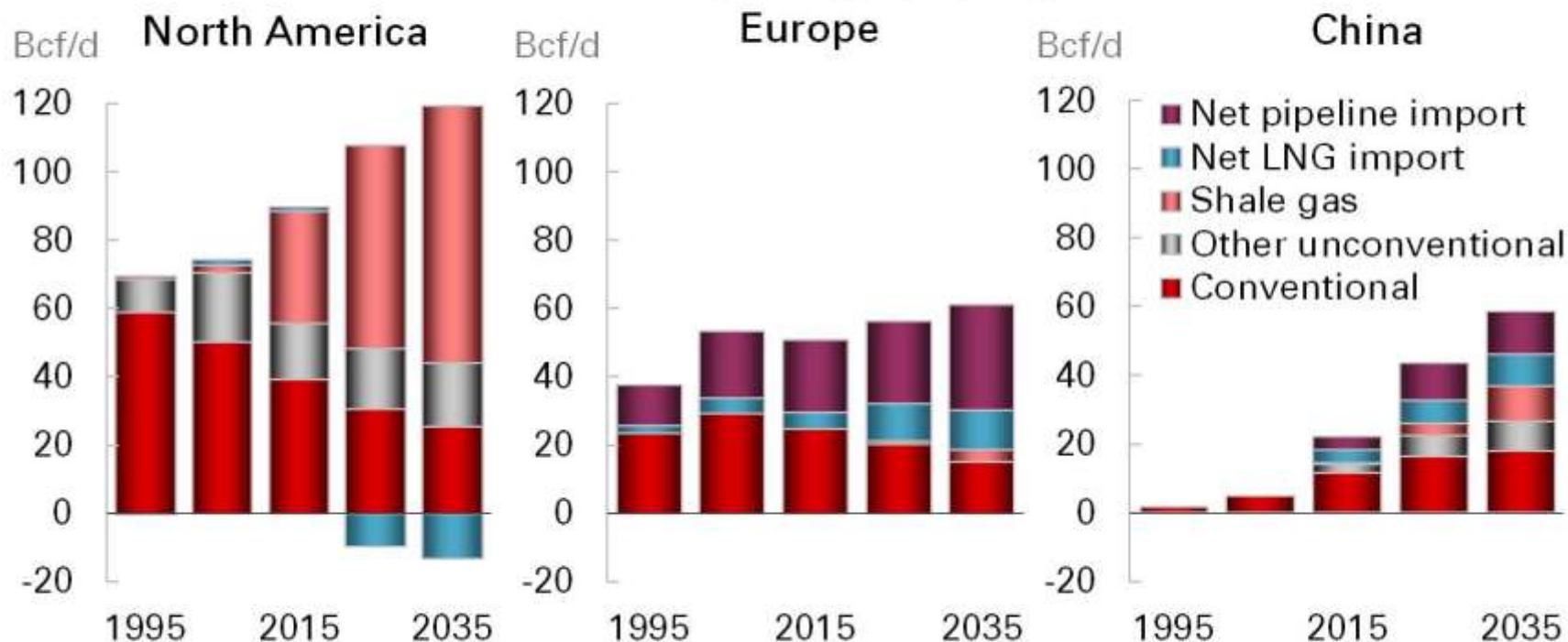


Gas trade continues to expand

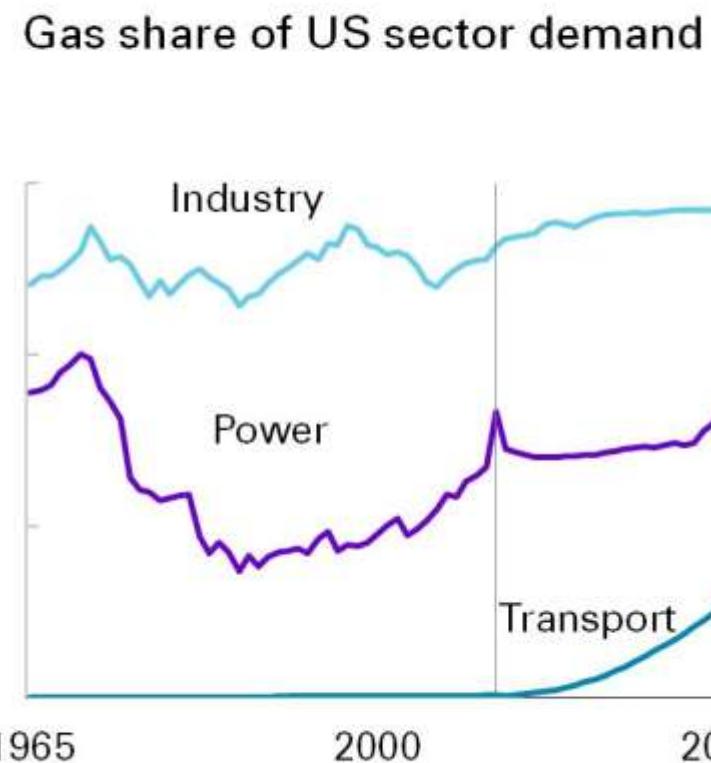
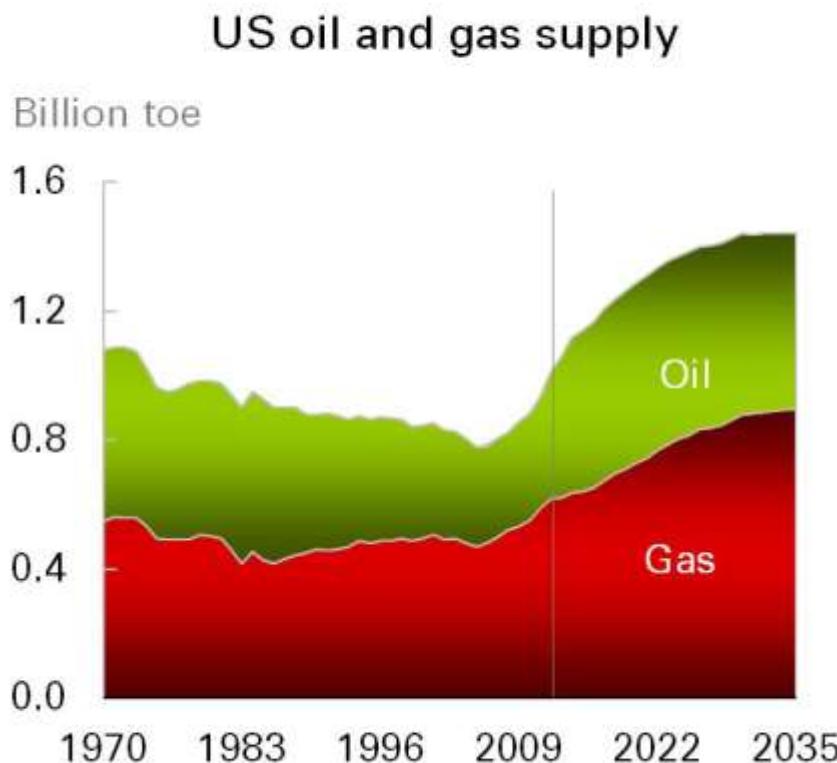


Regional supply patterns differ

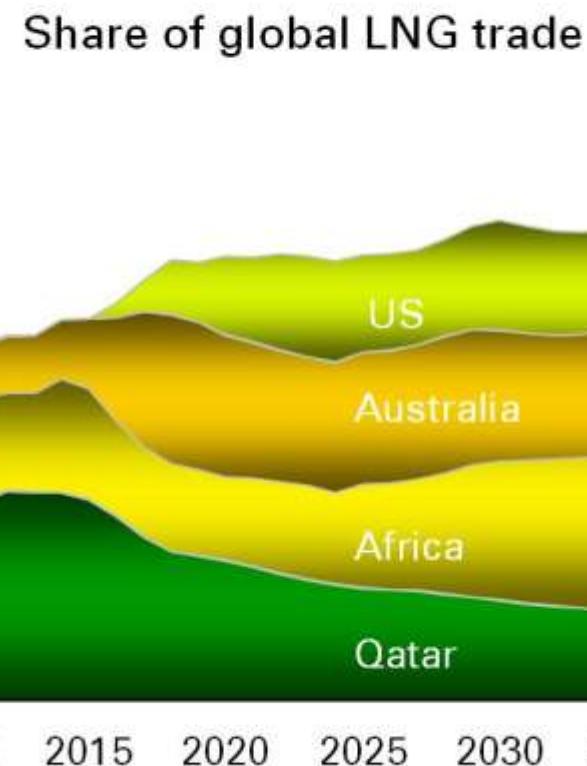
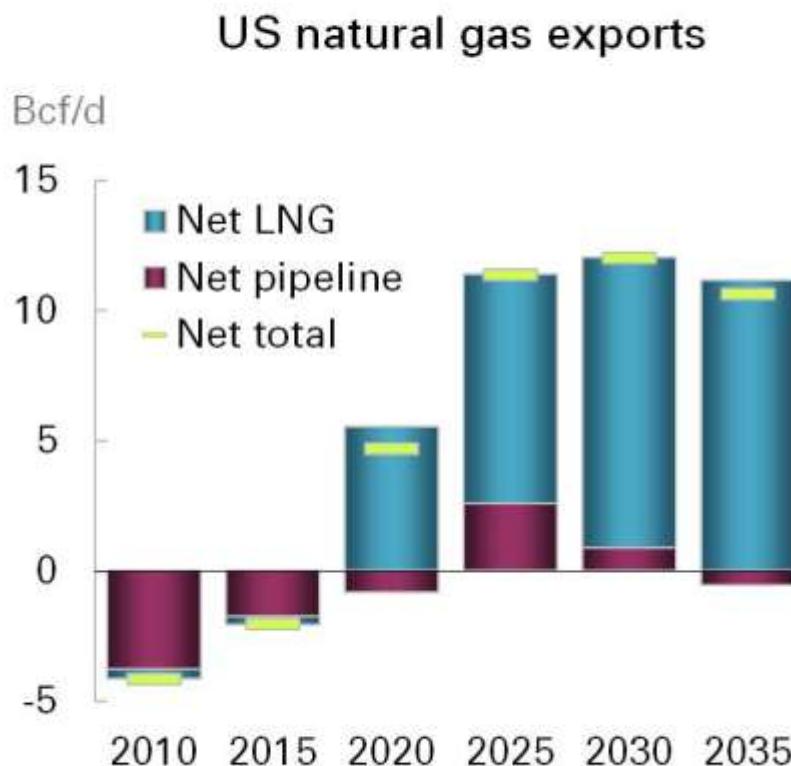
Sources of gas supply by region



The US shale revolution leads to market adjustments



Shale gas changes the US and global gas trade picture





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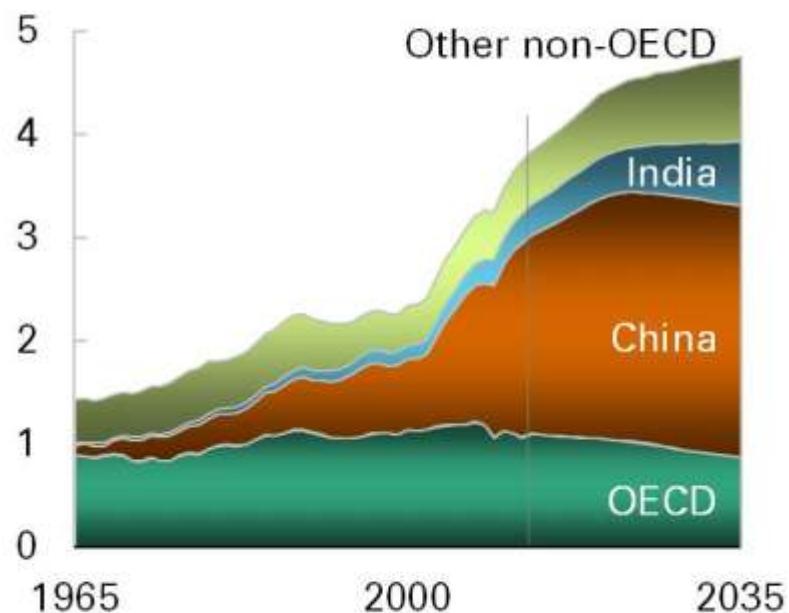
Carbon emissions and the fuel mix

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Coal consumption growth slows in the non-OECD

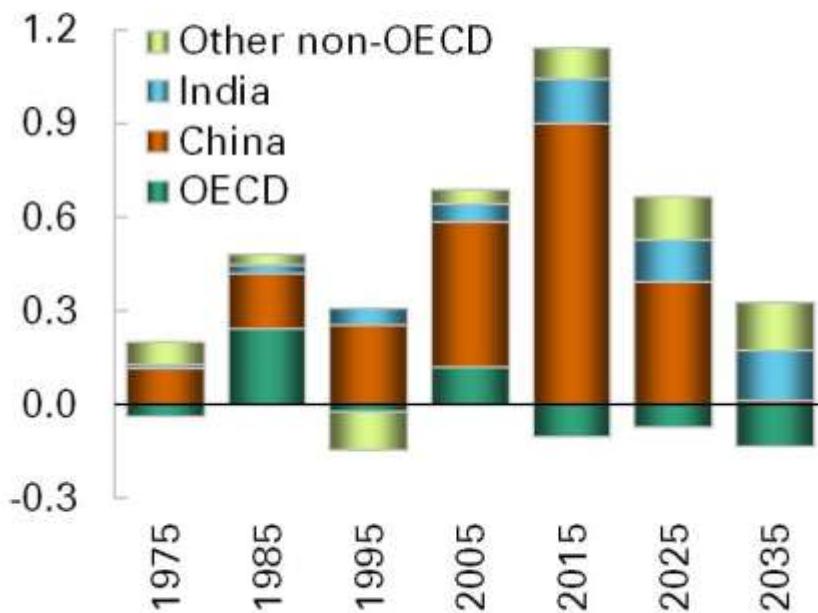
Consumption by region

Billion toe

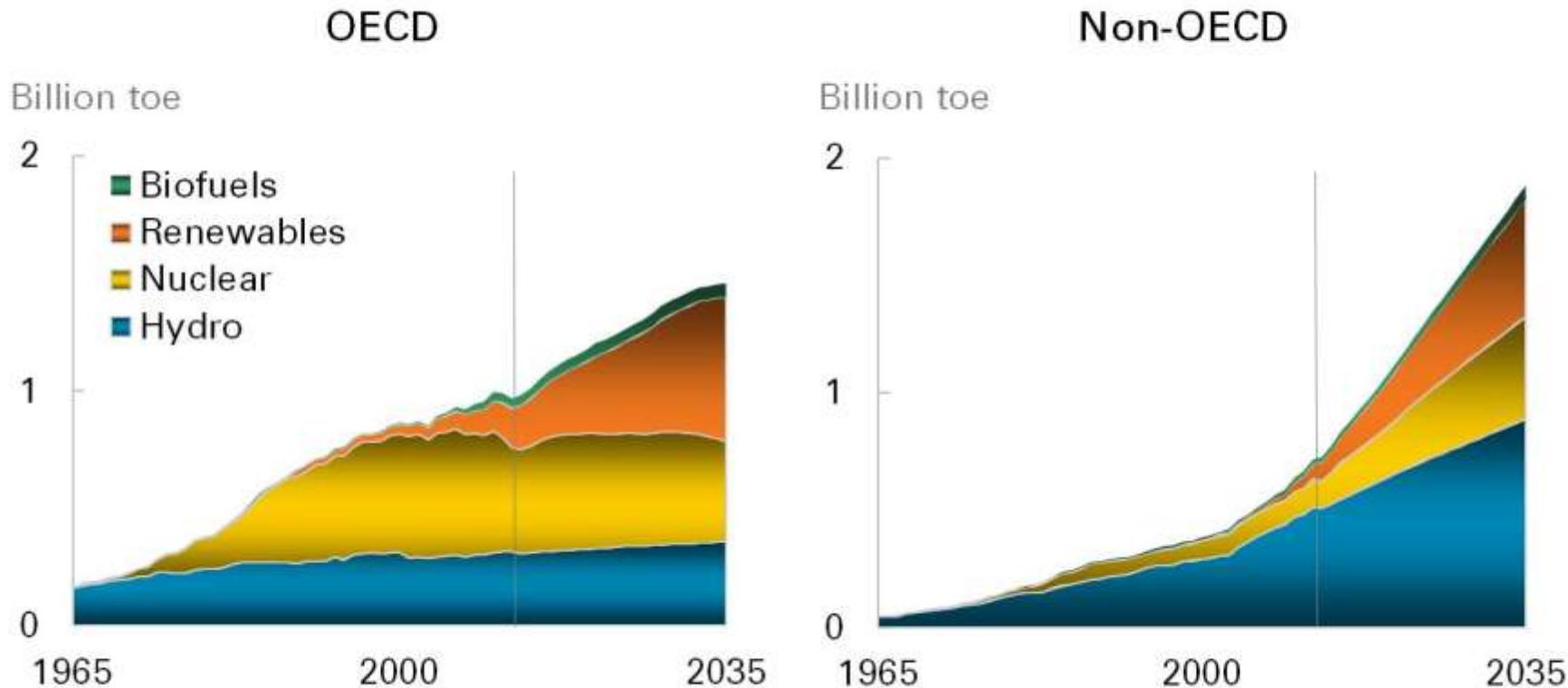


Ten year increments by region

Billion toe

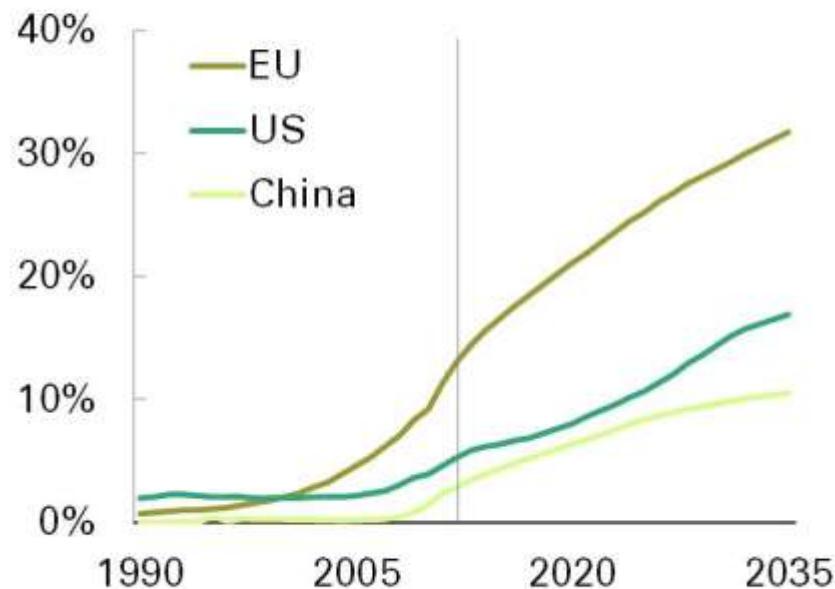


Non-fossil fuels grow rapidly

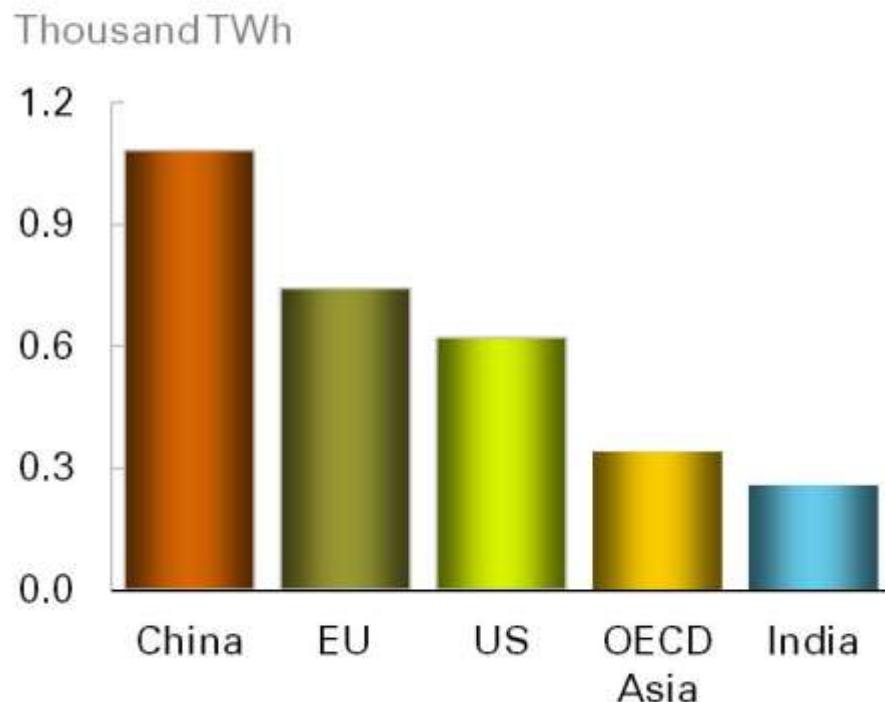


Renewables in power gain share most rapidly in Europe

Renewables share of power



Renewables growth 2012-35





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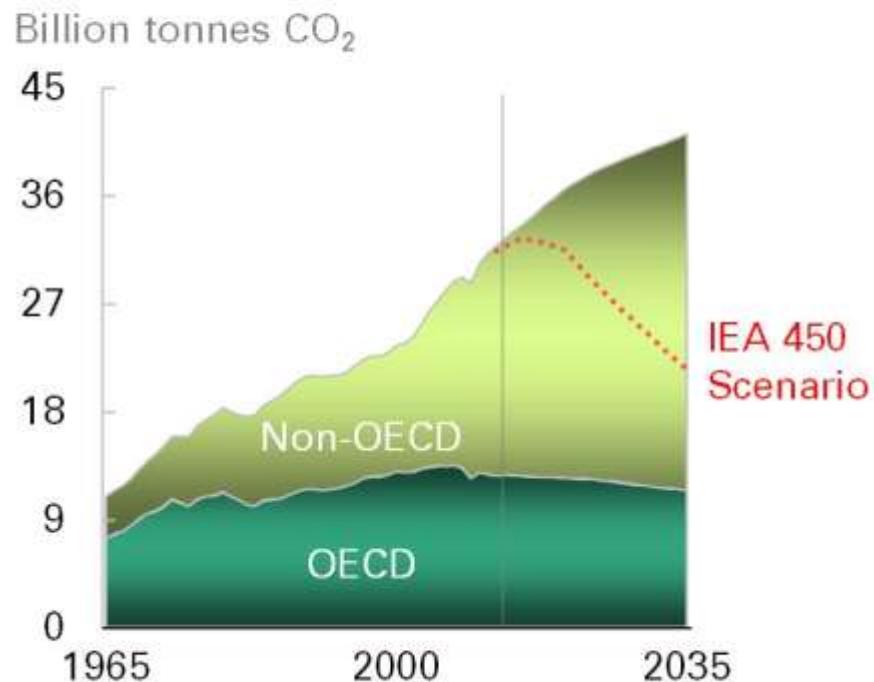
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Carbon emissions and the fuel mix

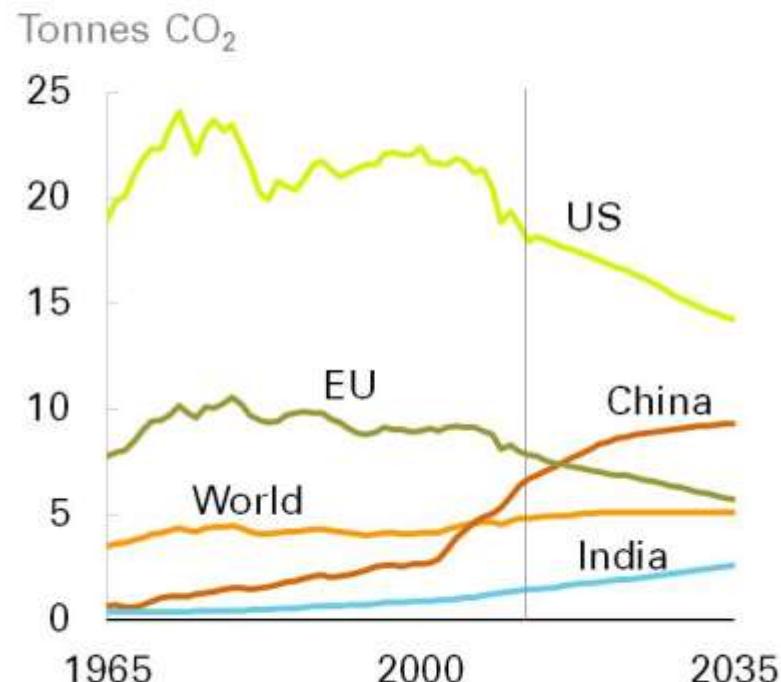
Conclusion

CO₂ emissions from energy use continue to rise

Emissions by region



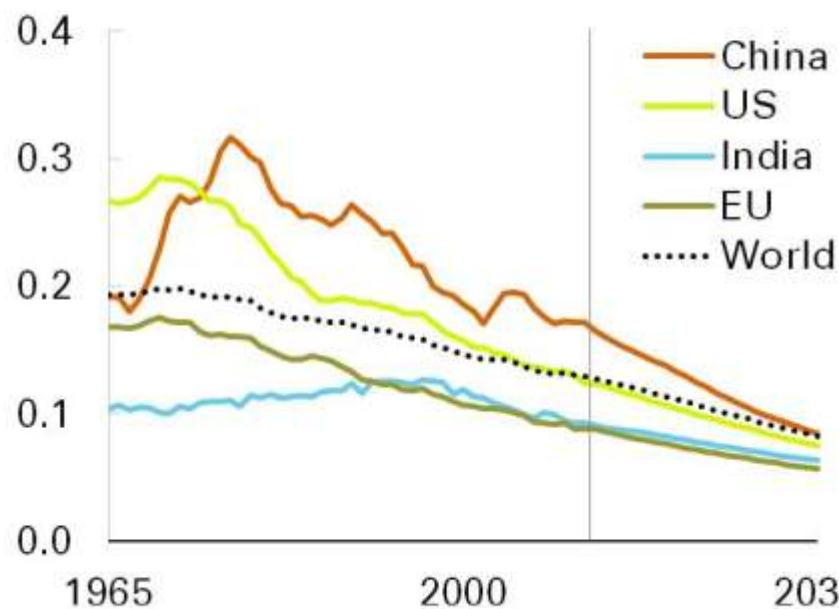
Emissions per capita



Energy intensity and carbon intensity follow different patterns

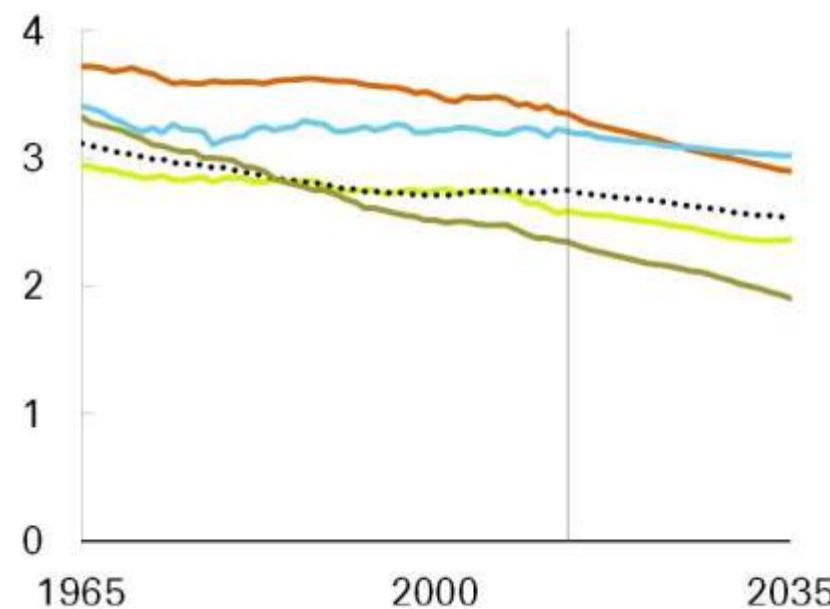
Energy intensity

Toe per thousand \$2012 GDP



Carbon intensity

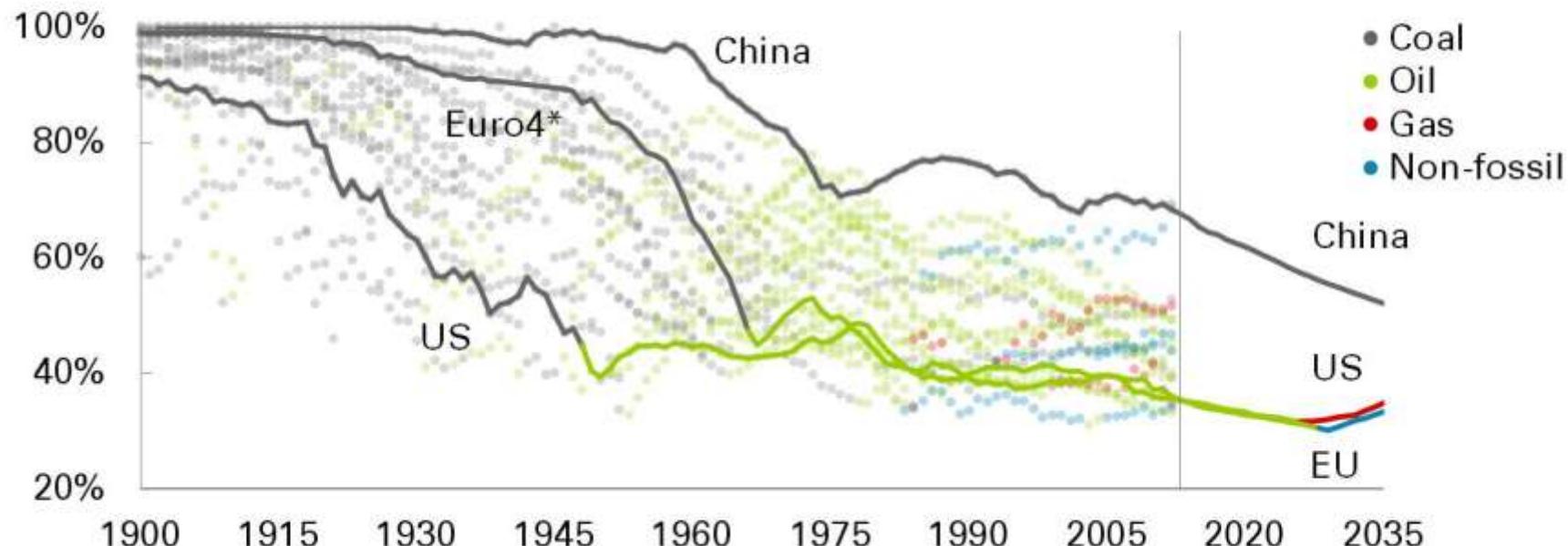
Tonnes CO₂ per toe



The fuel mix diversifies over time

Evolution of the fuel mix in 20 major countries

Share of dominant fuel

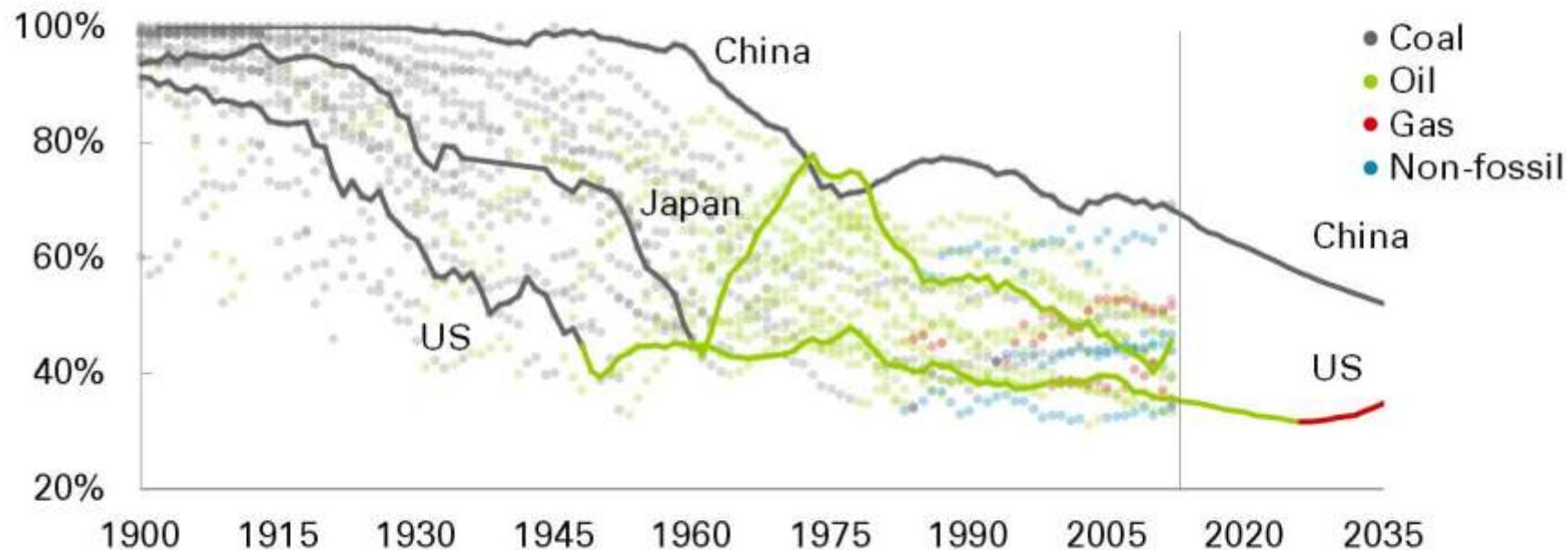


*France, Germany, Italy and United Kingdom pre-1965

The fuel mix diversifies over time

Evolution of the fuel mix in 20 major countries

Share of dominant fuel

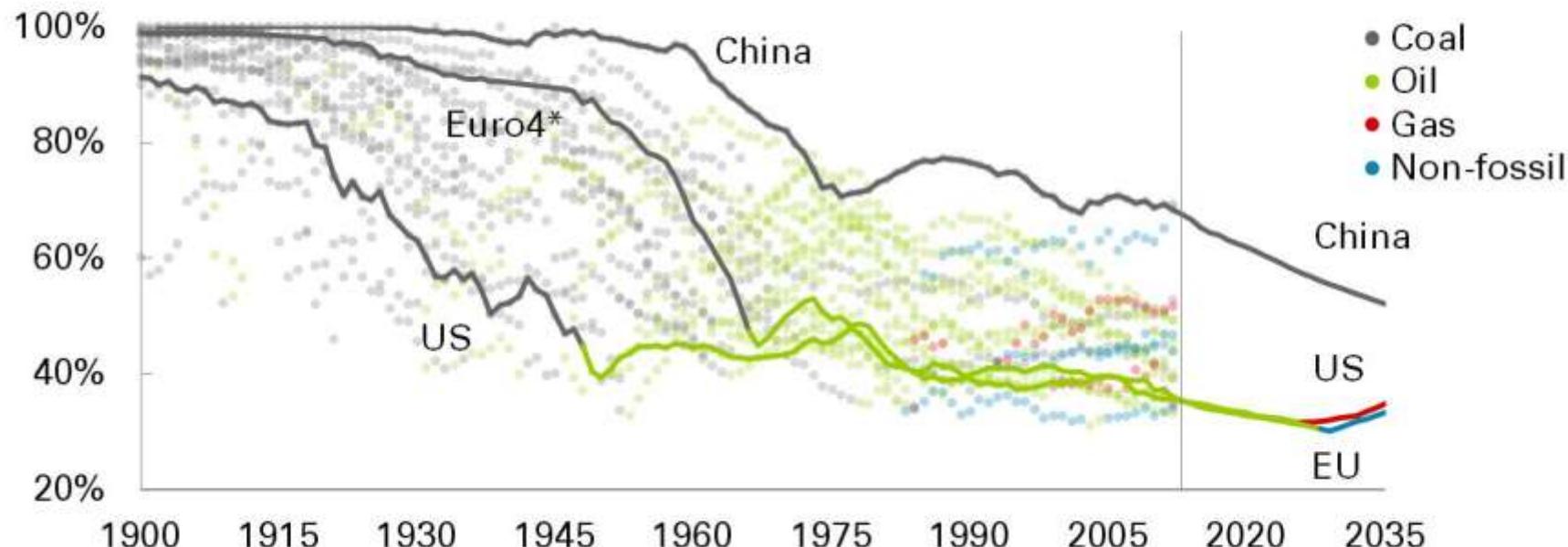


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The fuel mix diversifies over time

Evolution of the fuel mix in 20 major countries

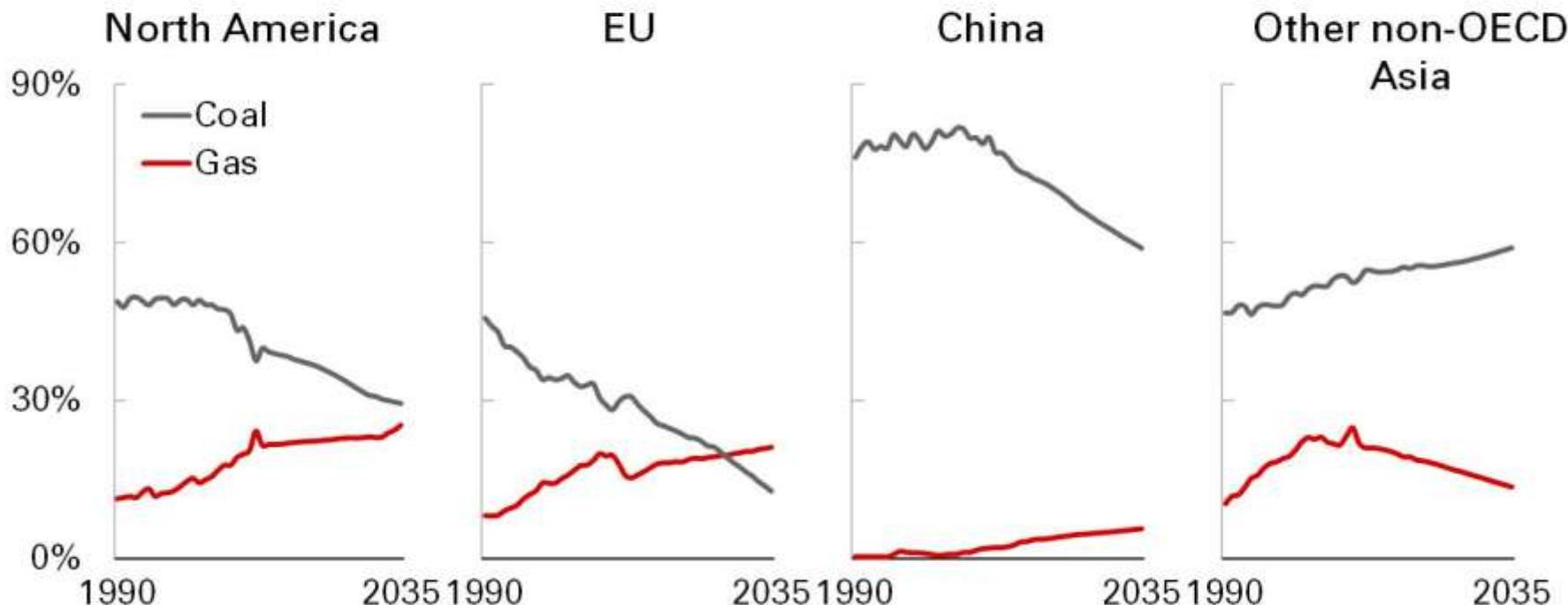
Share of dominant fuel



*France, Germany, Italy and United Kingdom pre-1965

The power sector is the main driver of fuel mix changes

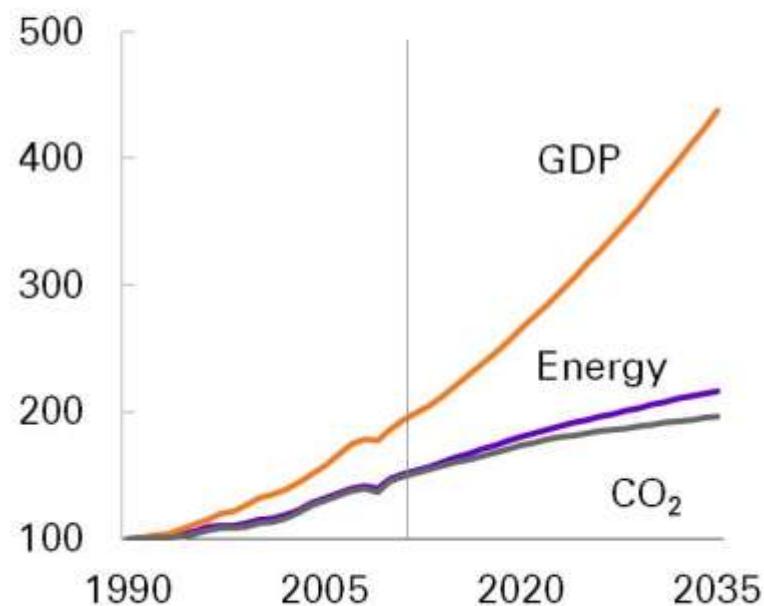
Share of power sector fuel consumption



Energy efficiency and fuel mix restrain emissions growth

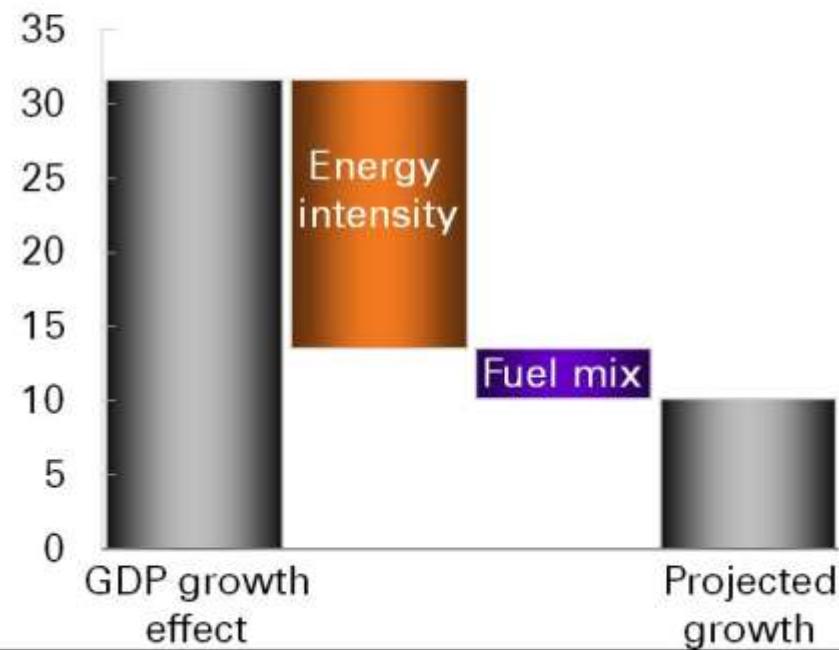
GDP, energy and emissions

Index: 1990 = 100



Emissions growth 2012 to 2035

Billion tonnes CO₂





Conclusion

Meeting the global energy challenge



- Sufficient and available?
 - Yes – new energy sources and efficiency improvements
- Secure and reliable?
 - Mixed – improving for some, a concern for others
- Sustainable?
 - Room for improvement

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