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# BP Energy Outlook 2030

Christof Rühl, Group Chief Economist





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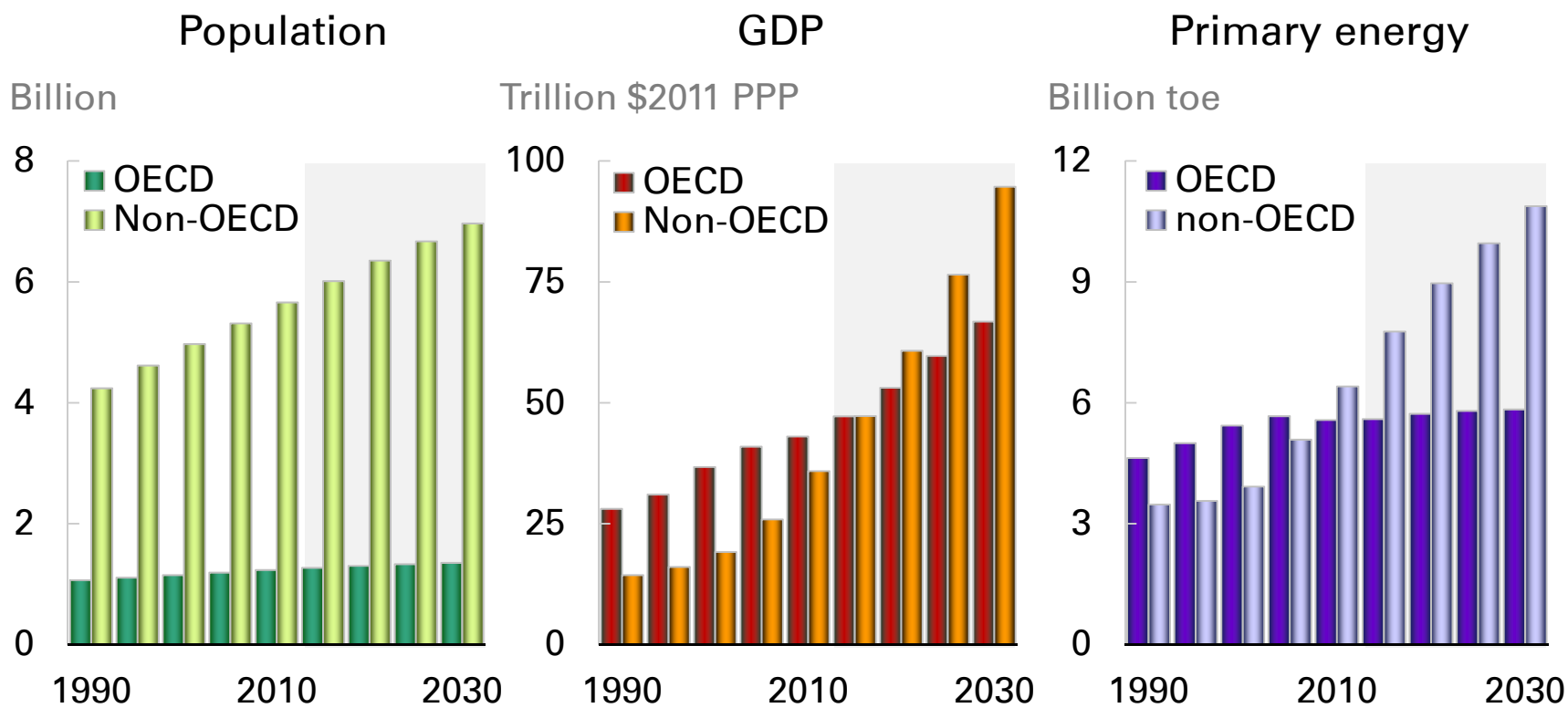
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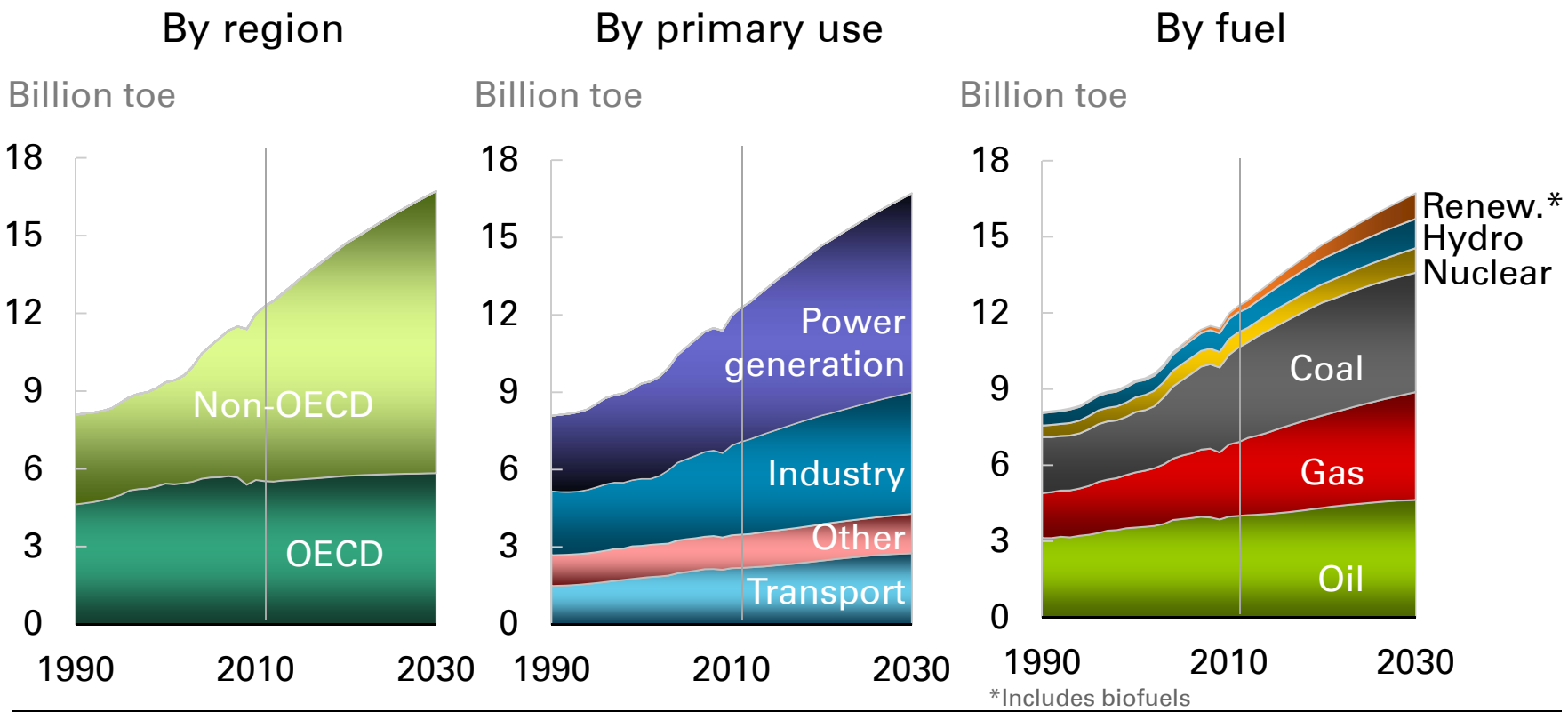
Implications

# Population, income and energy growth



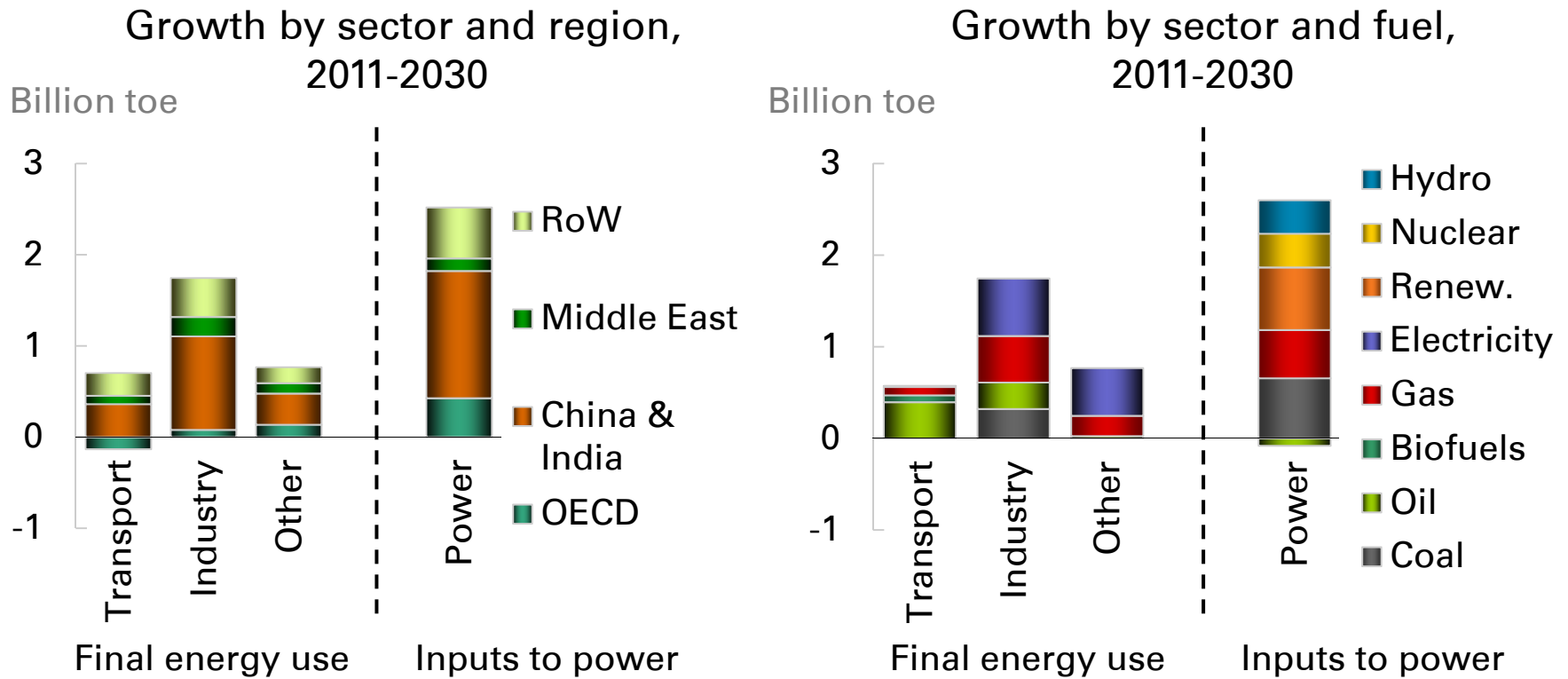


# Industrialisation drives energy growth



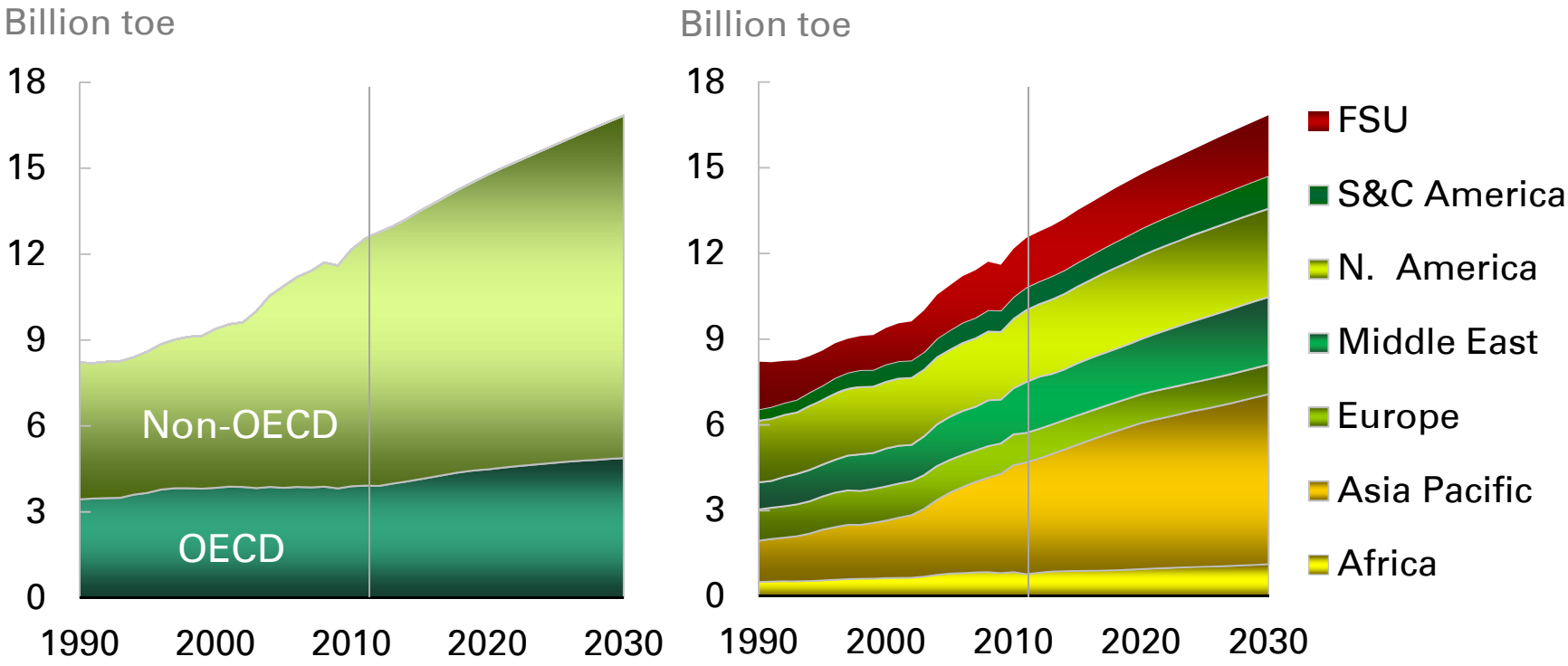


# The power sector leads primary energy growth





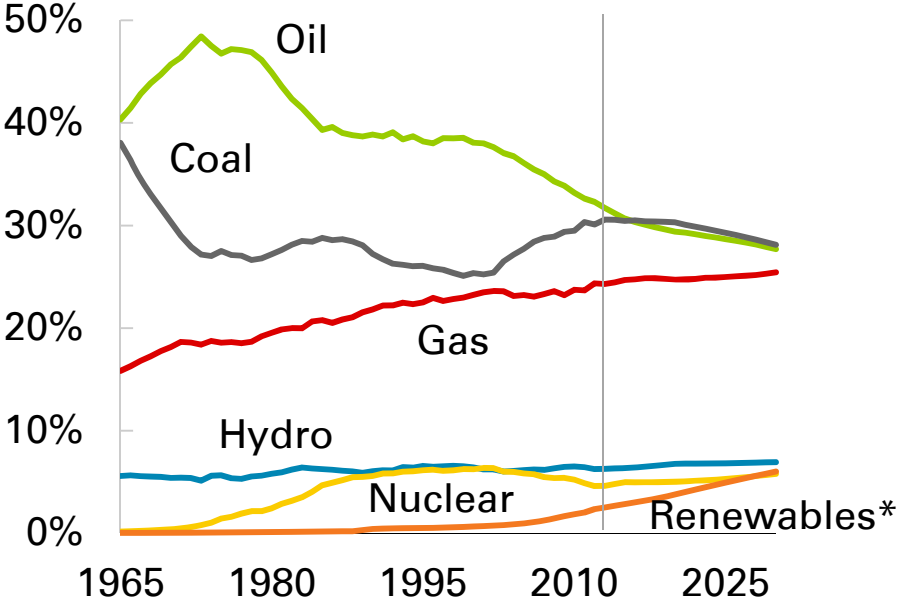
# Emerging economies dominate energy production





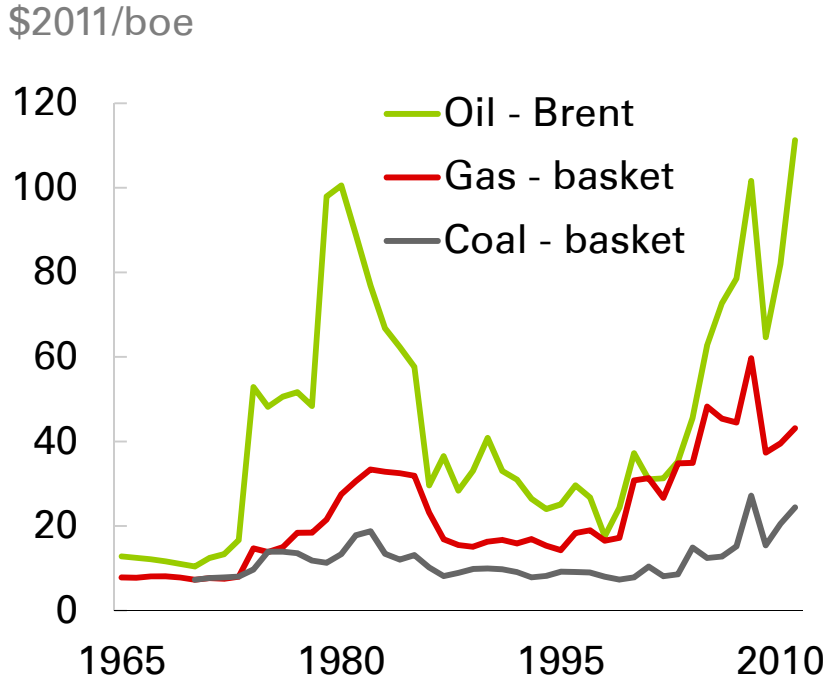
# Fuel shares and energy prices

### Shares of world primary energy



\*Includes biofuels

### Energy prices

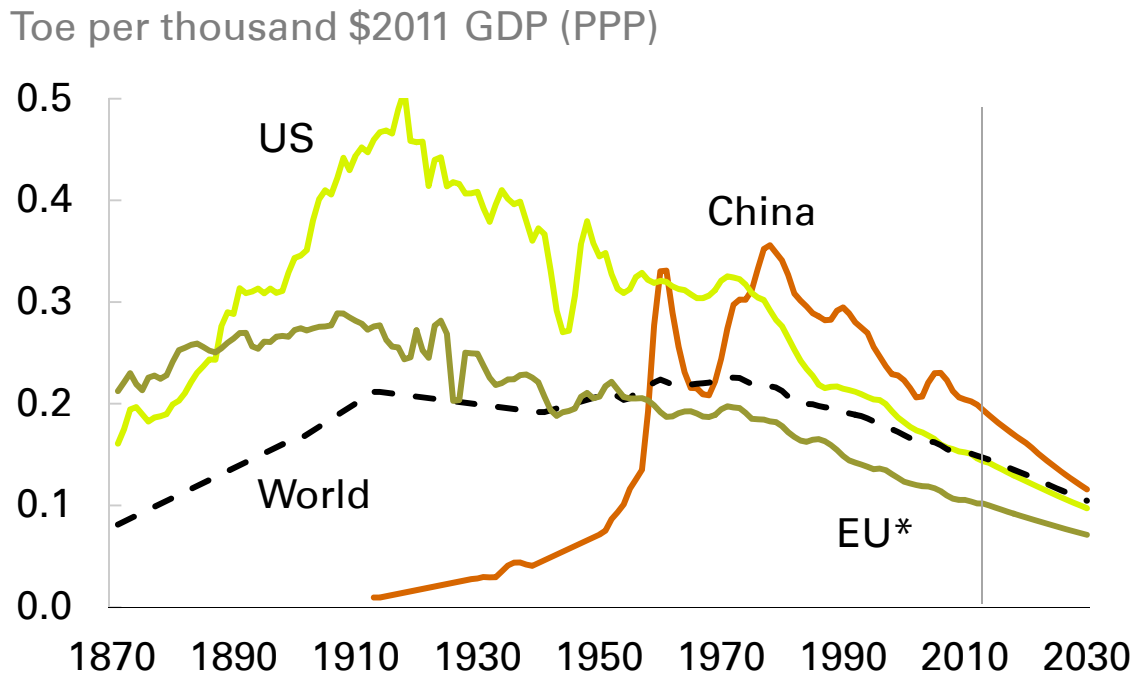




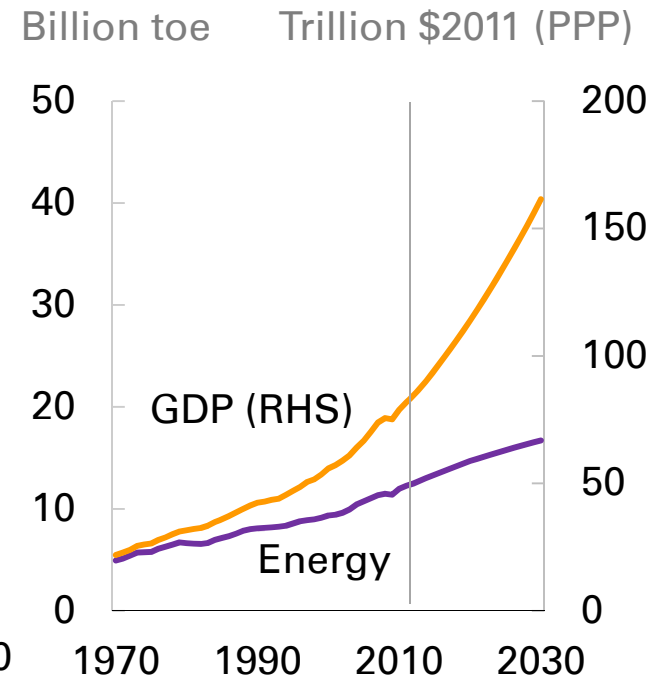
# Energy efficiency improvements



## Energy intensity by region



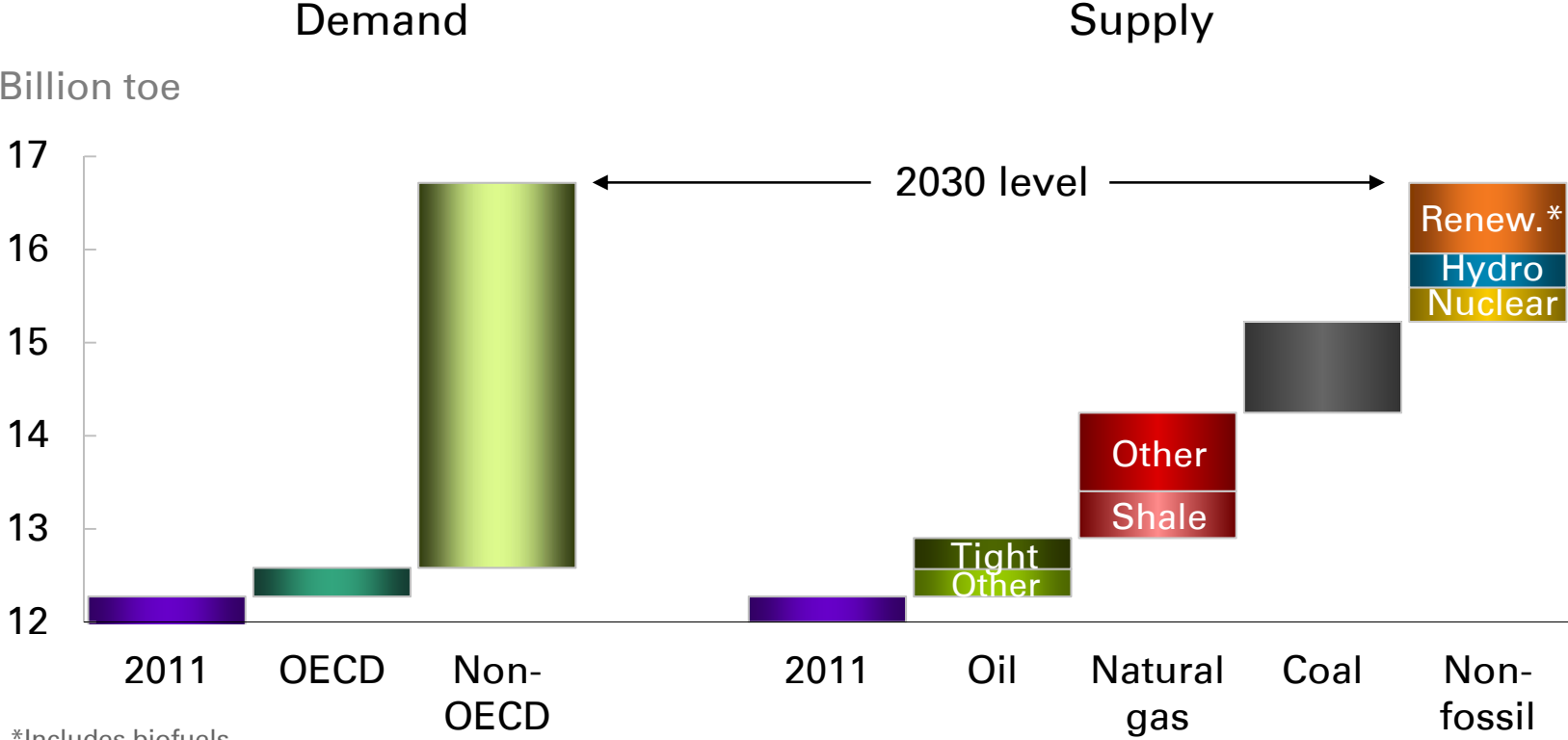
## Energy and GDP



\*Euro4 (France, Italy, Germany, UK) pre-1970



# Energy supply growth

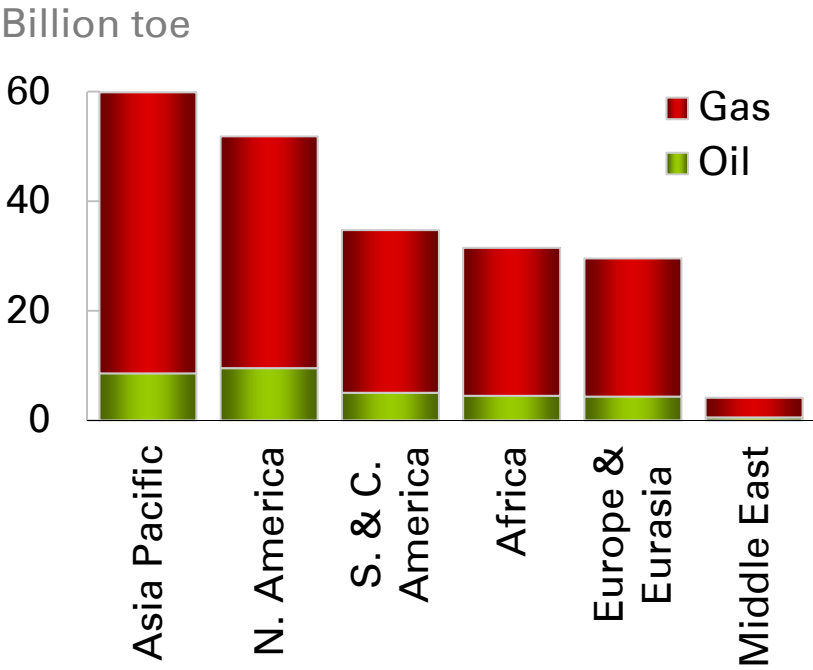


\*Includes biofuels

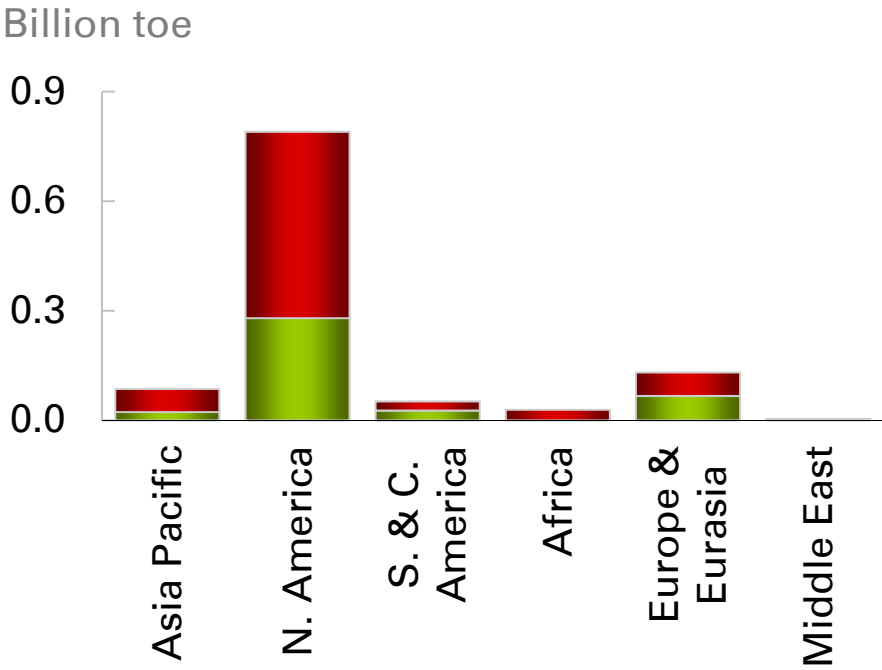


# Shale gas and tight oil: resources and production

Current resources



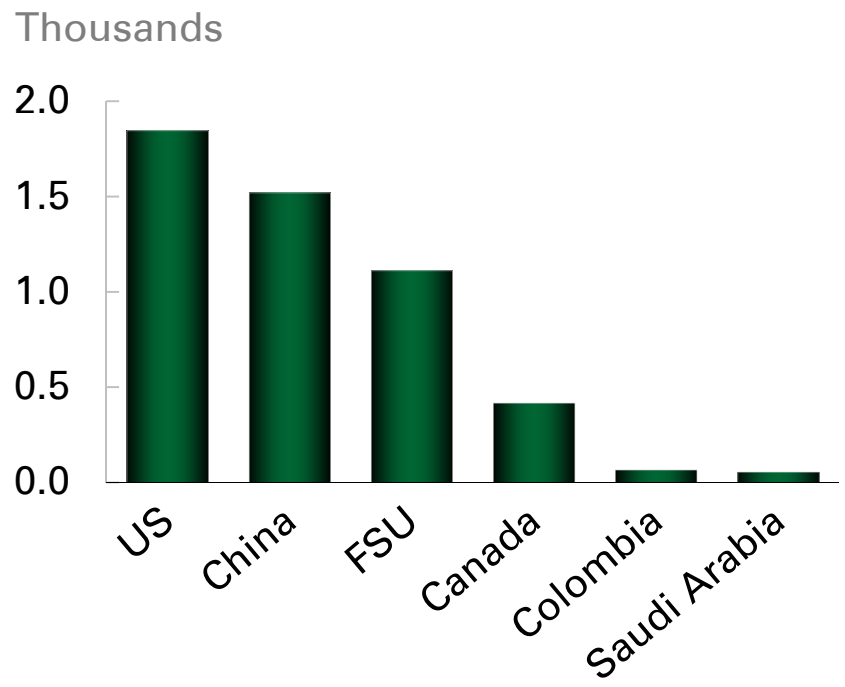
Production in 2030



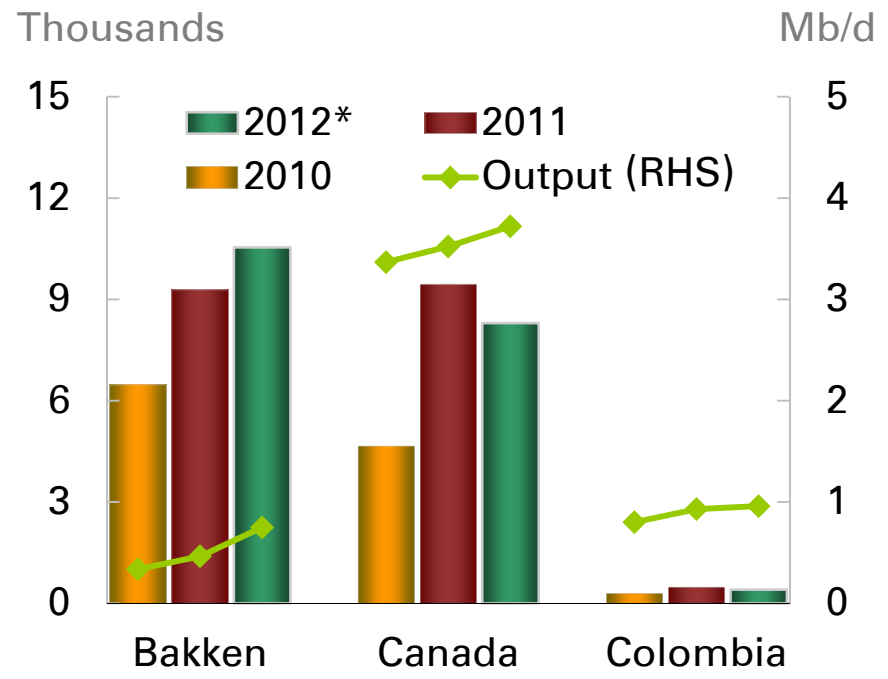


# US tight oil and shale gas: infrastructure requirements

### Onshore oil & gas rigs 2011



### Oil wells drilled and output



\*Annualised from 1Q-3Q data



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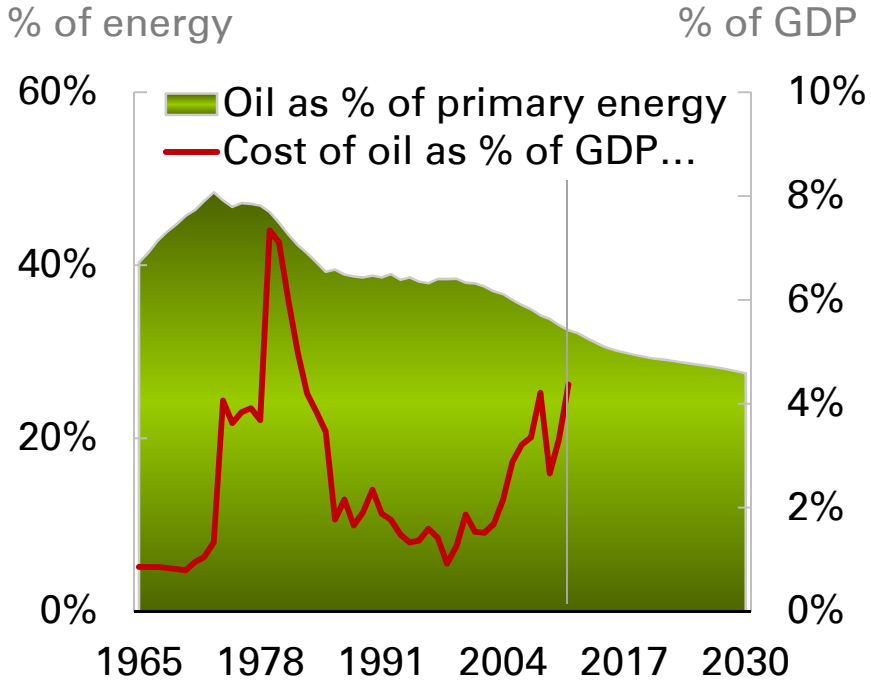
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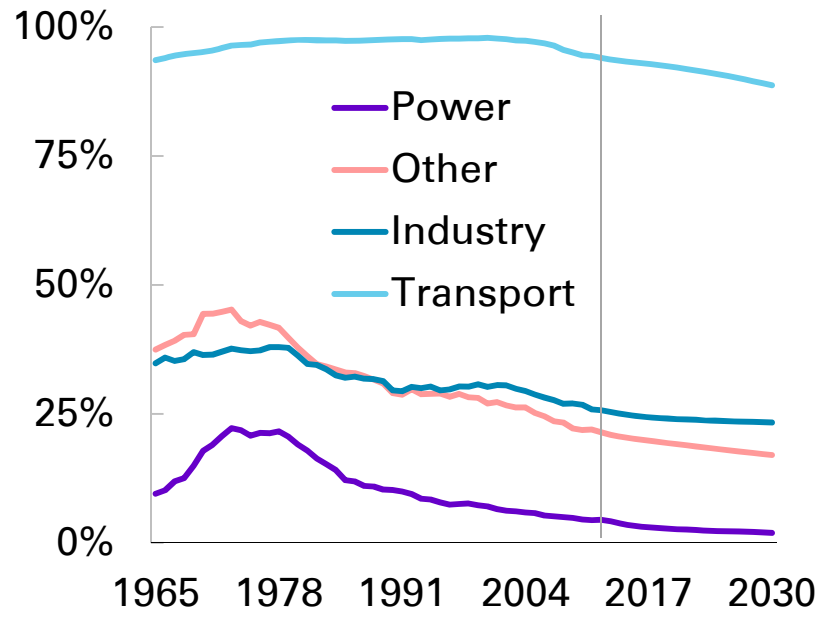


# High oil prices are reducing oil's share of primary energy

### Oil share of energy and GDP



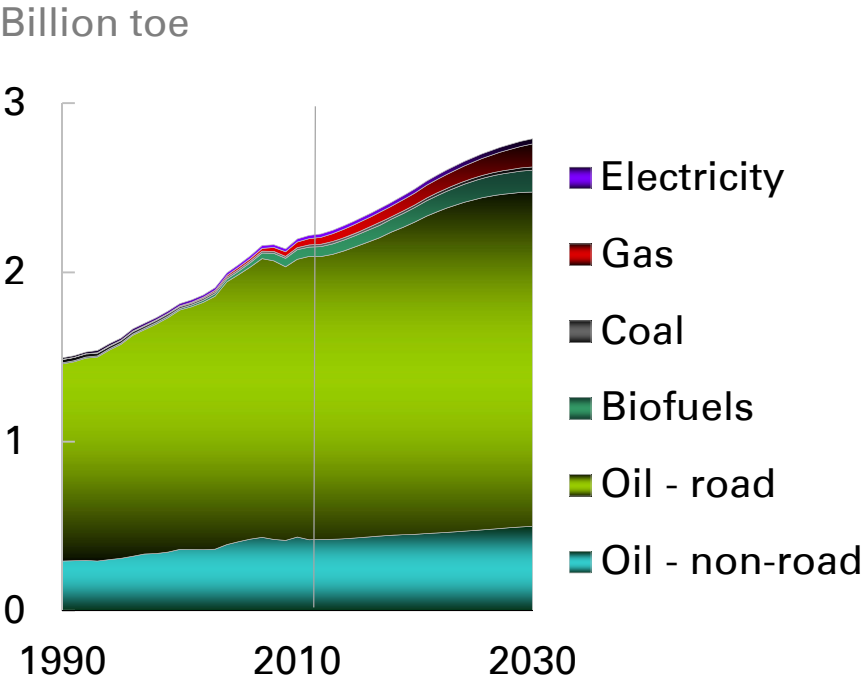
### Oil share in sector



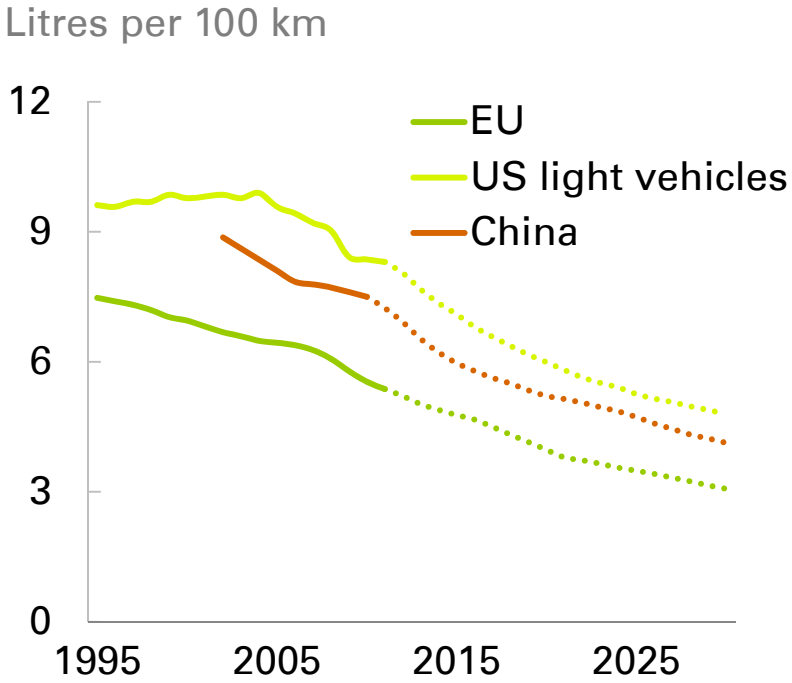


# Global transport demand

### Transport demand by fuel



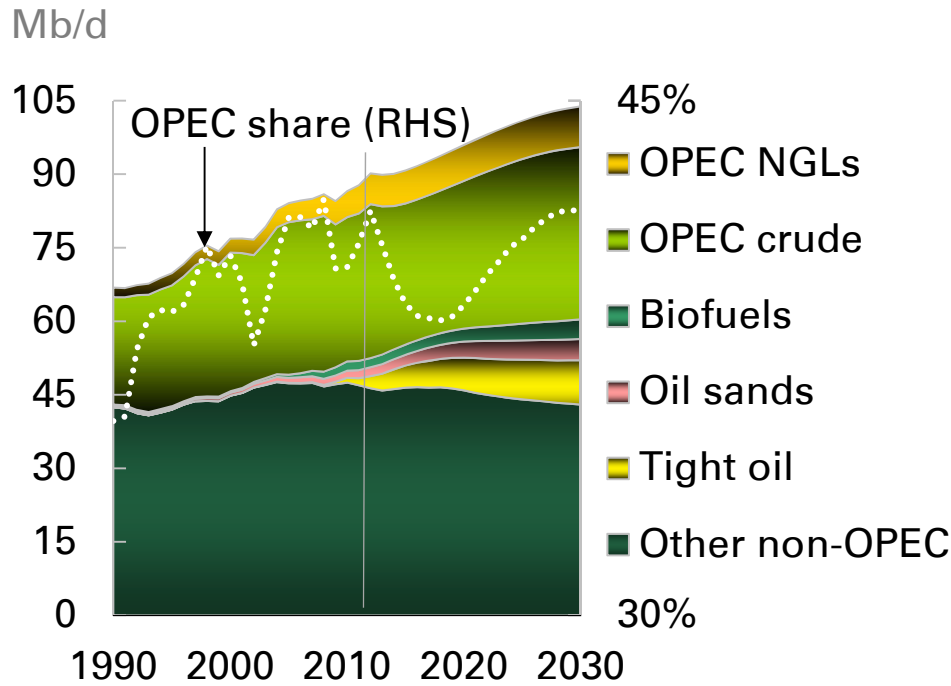
### Fuel economy of new cars



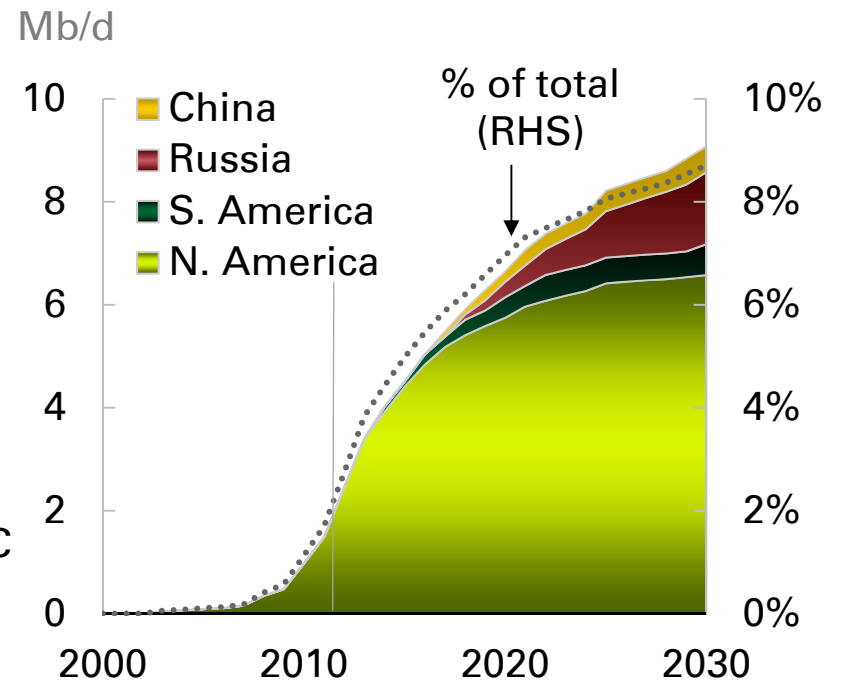
# Global supply growth and tight oil



### Liquids supply by type



### Tight oil output

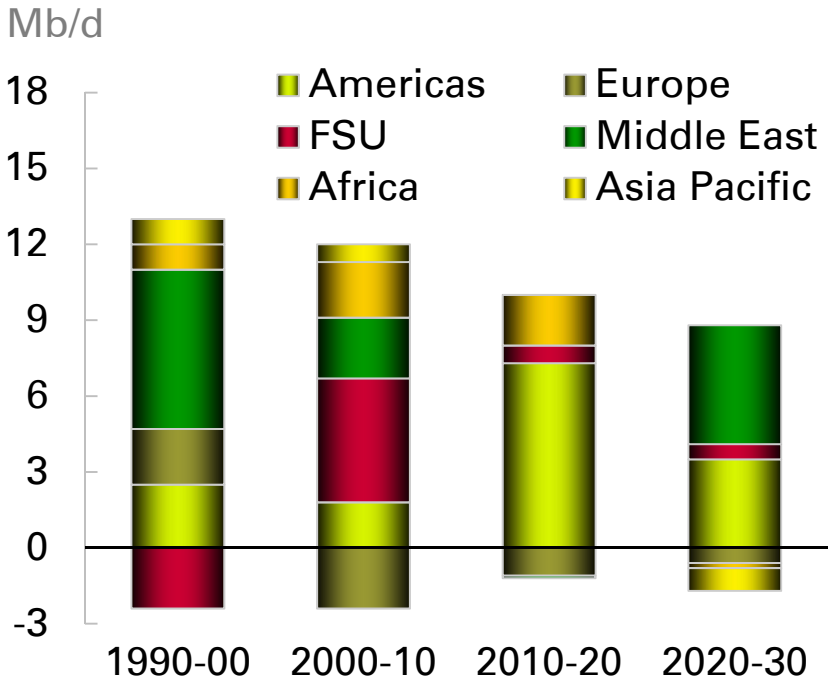




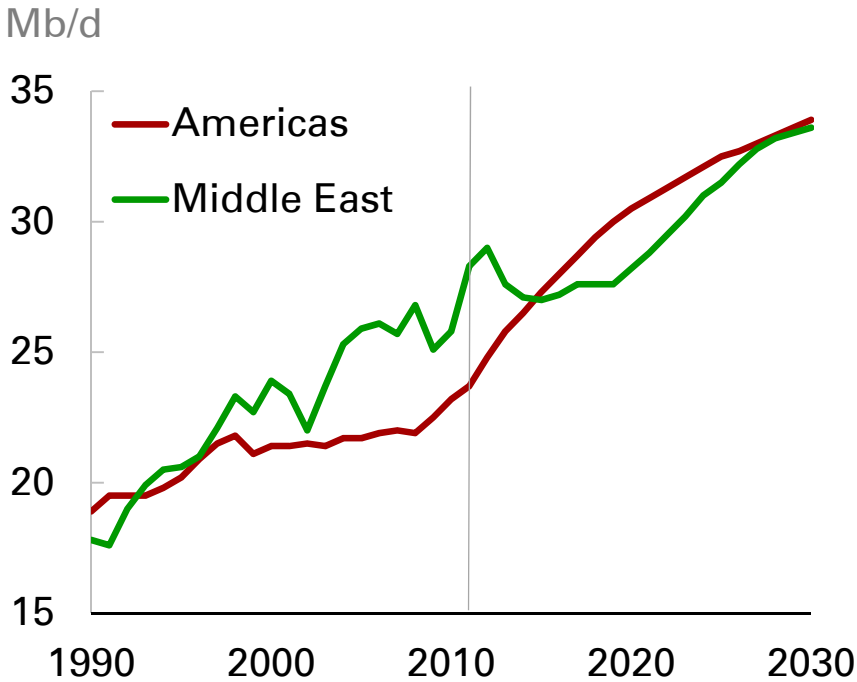


# Role of the Americas

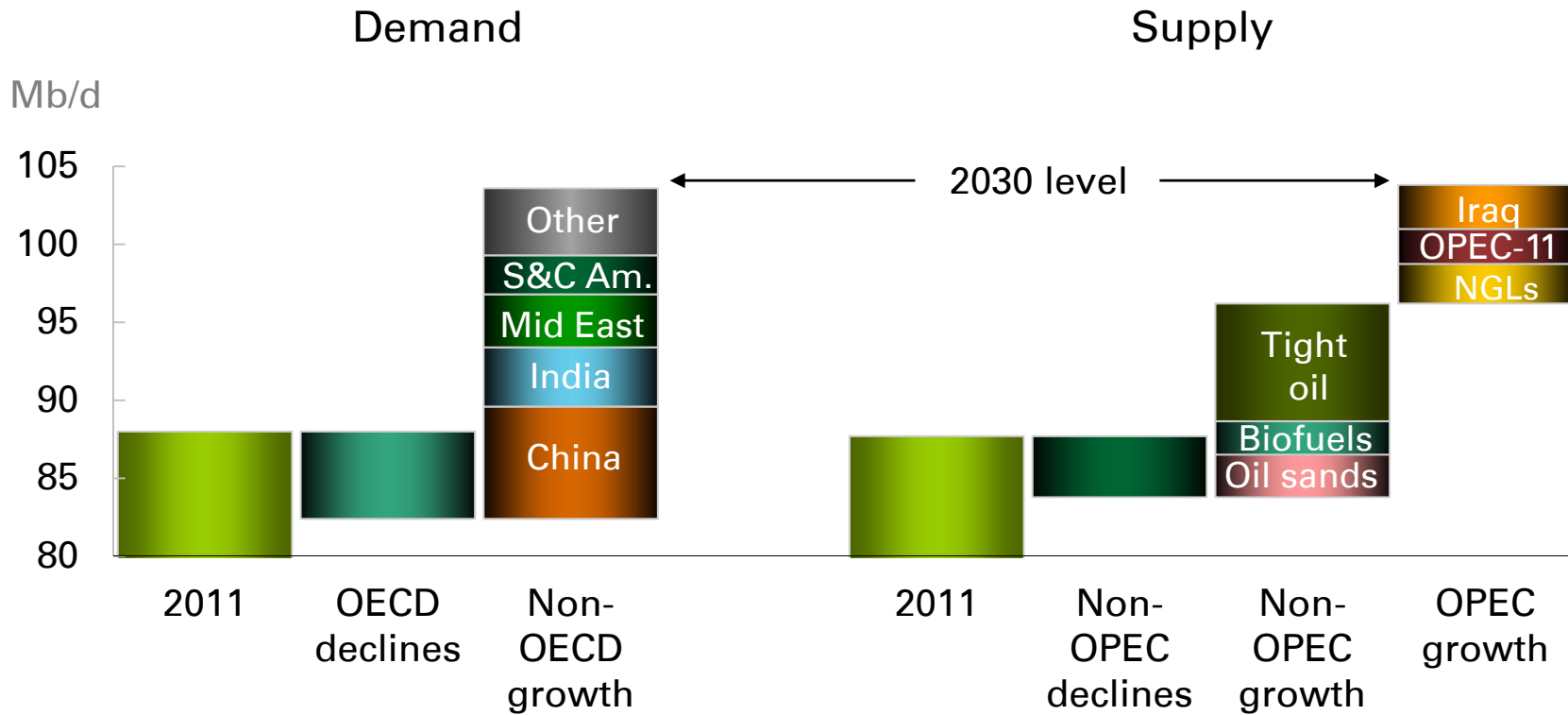
### Supply growth by decade



### Americas surpass Middle East



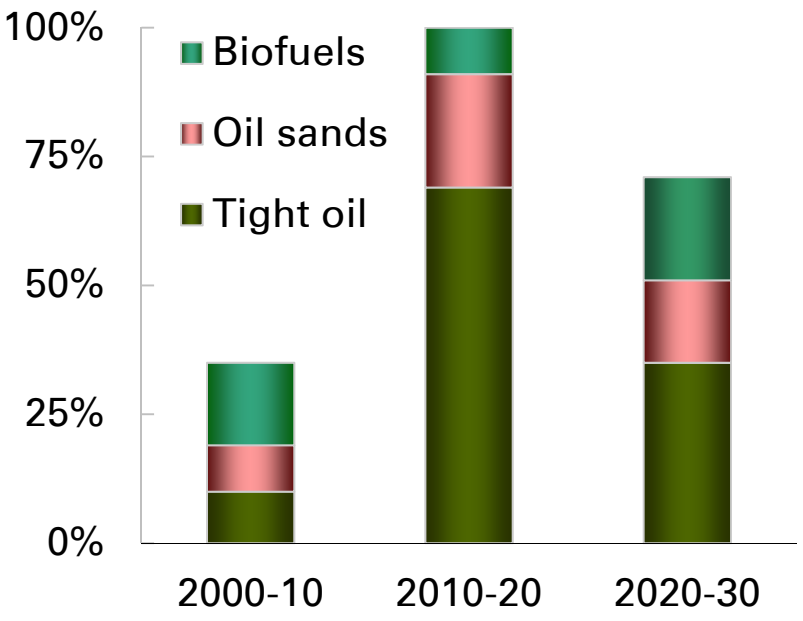
# Global liquids balance



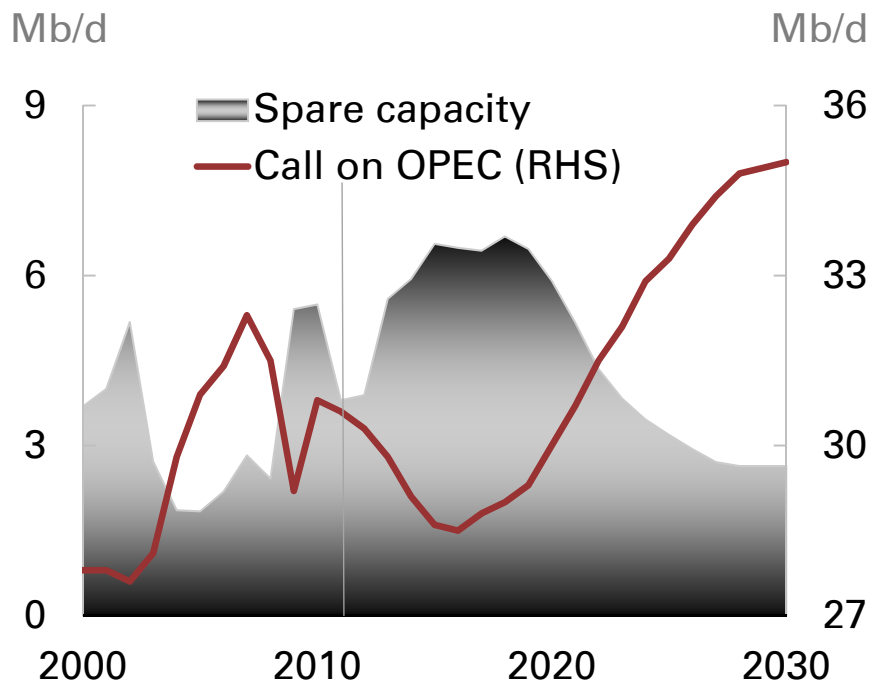


# Unconventional oil and the call on OPEC

### Unconventionals share of net global supply growth



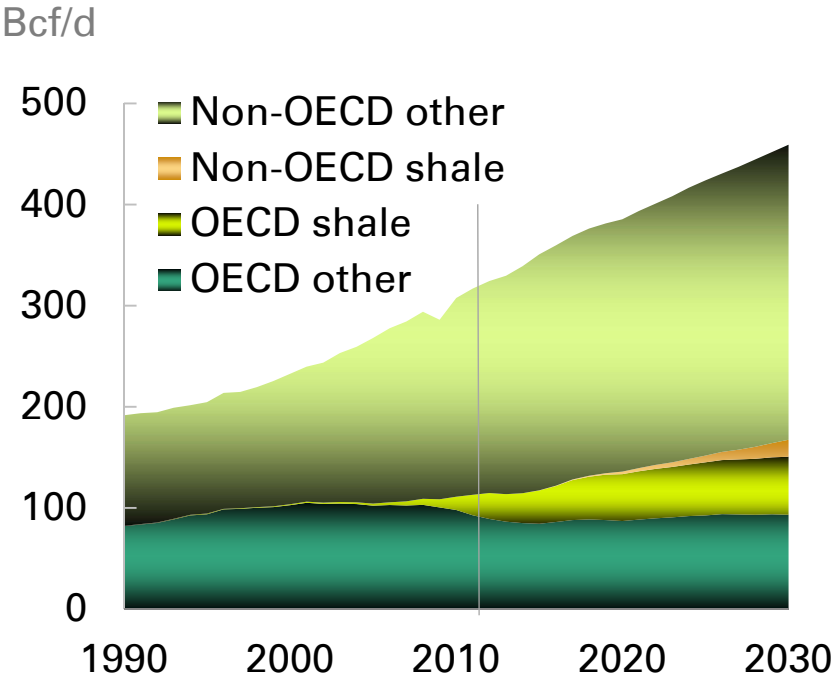
### Call on OPEC & spare capacity



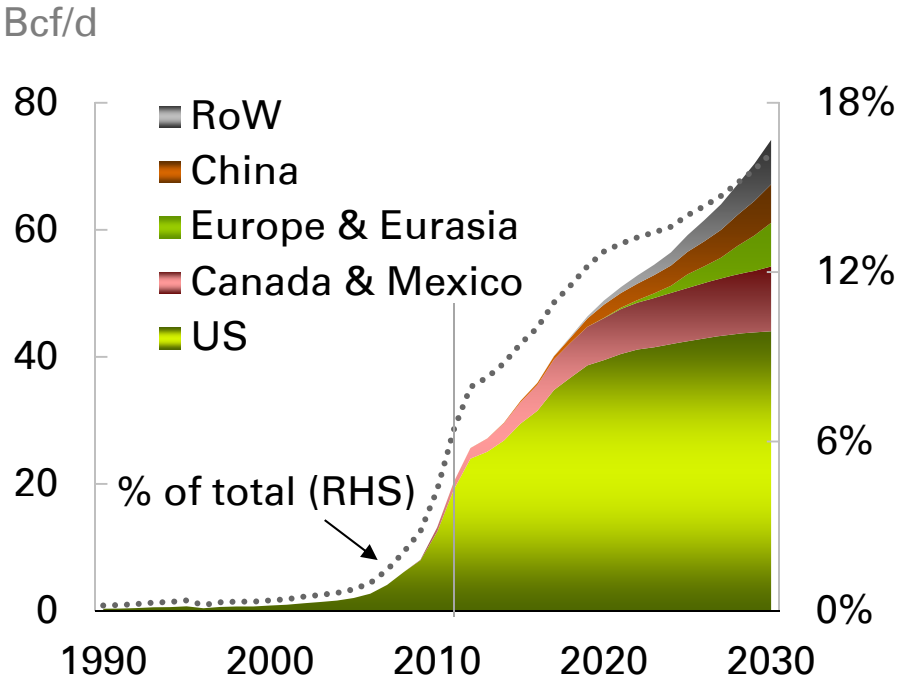


# Shale gas and global supply growth

### Gas production by type and region



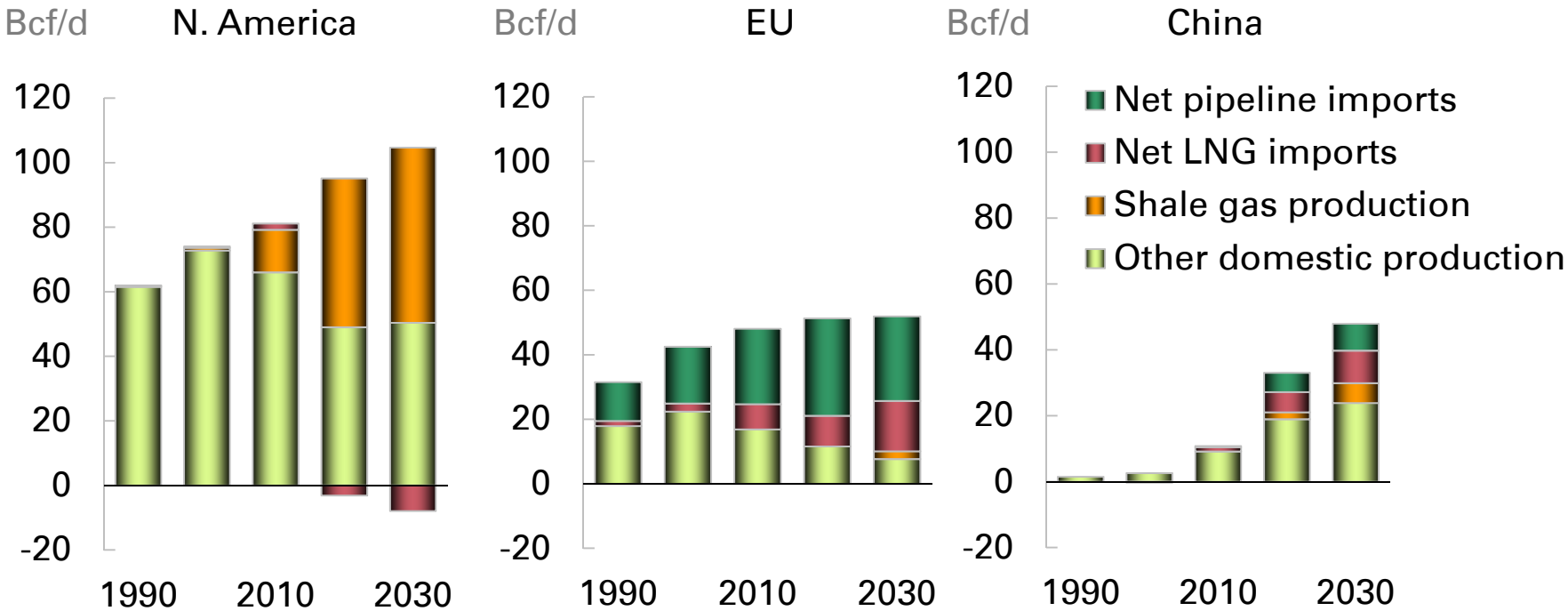
### Shale gas production





# Shale gas: regional growth

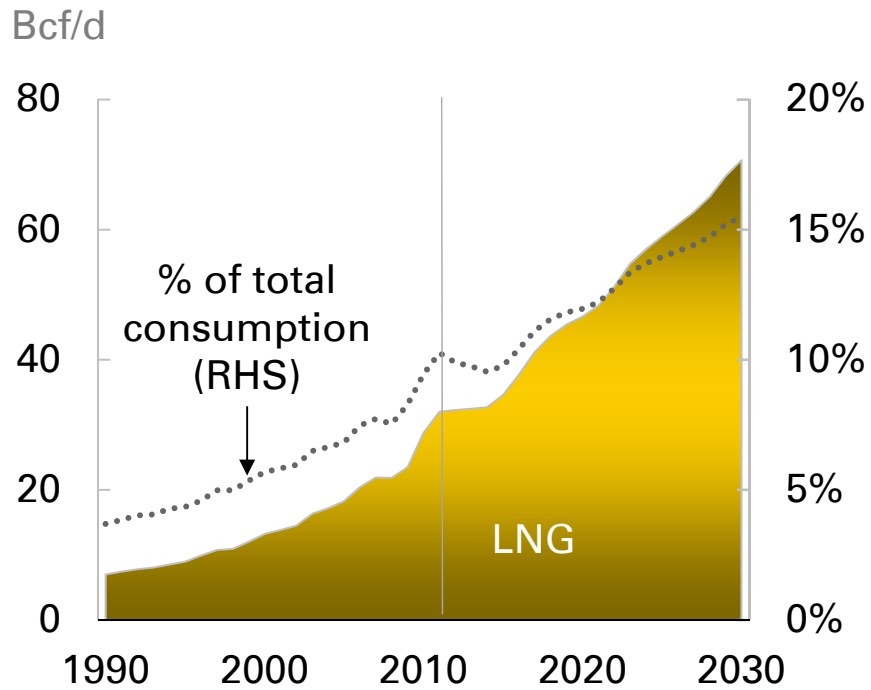
Sources of gas supply, by region



# Gas trade and market integration



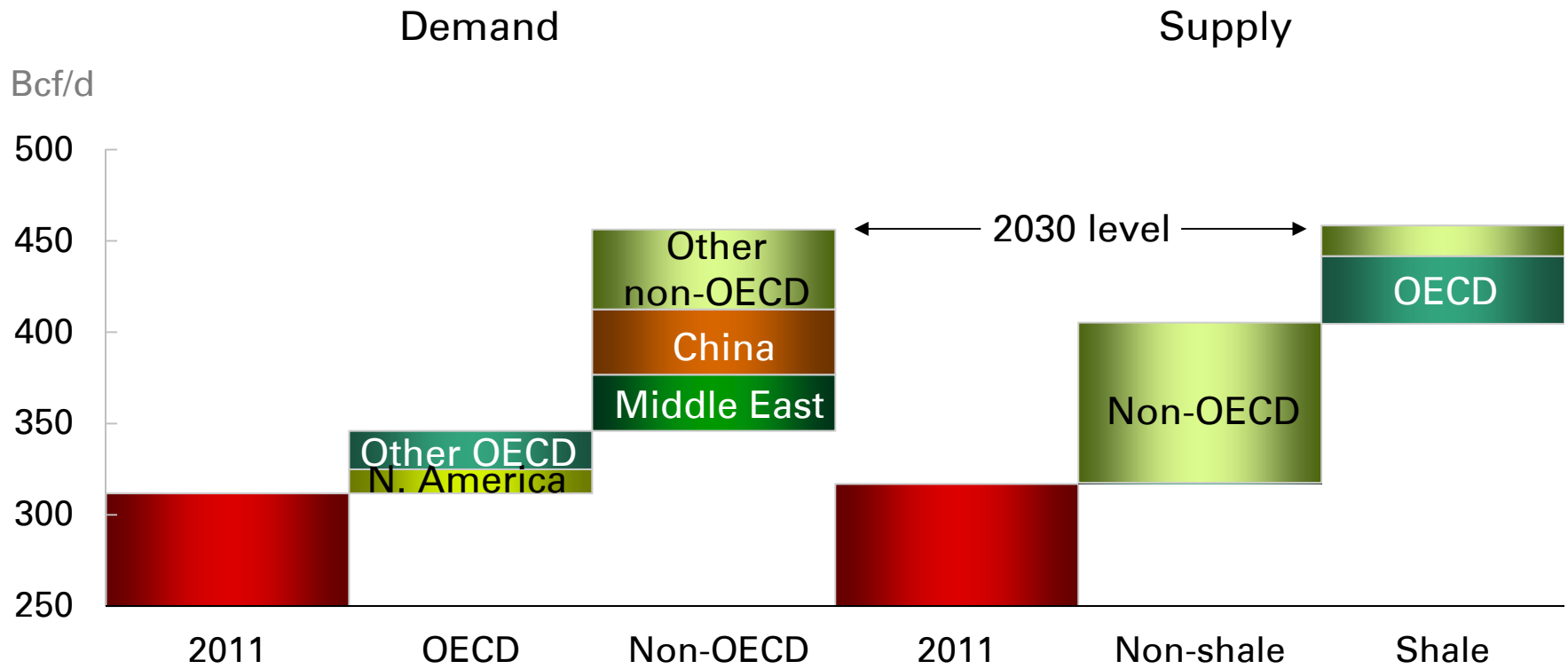
### LNG exports



### LNG diversification



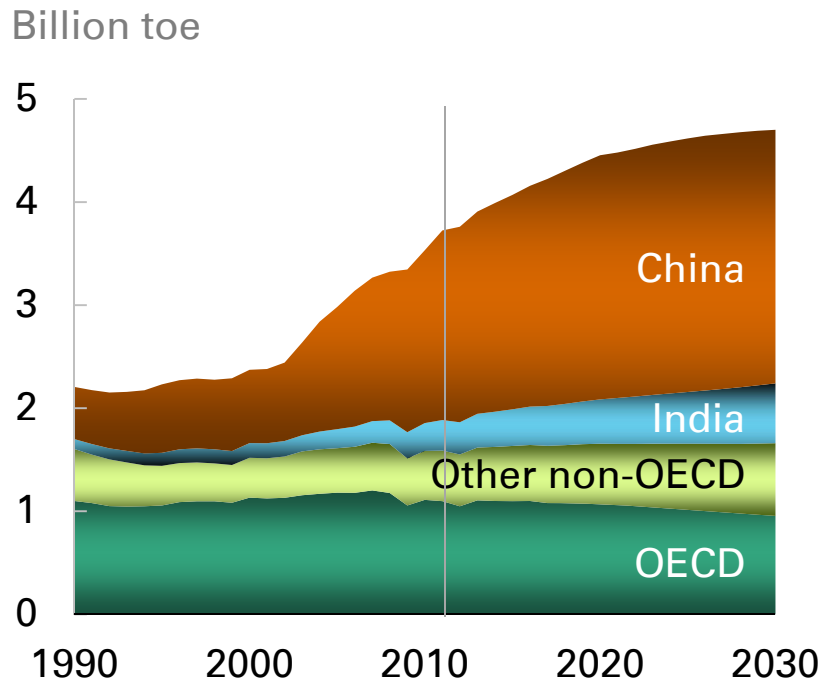
# Global gas balance



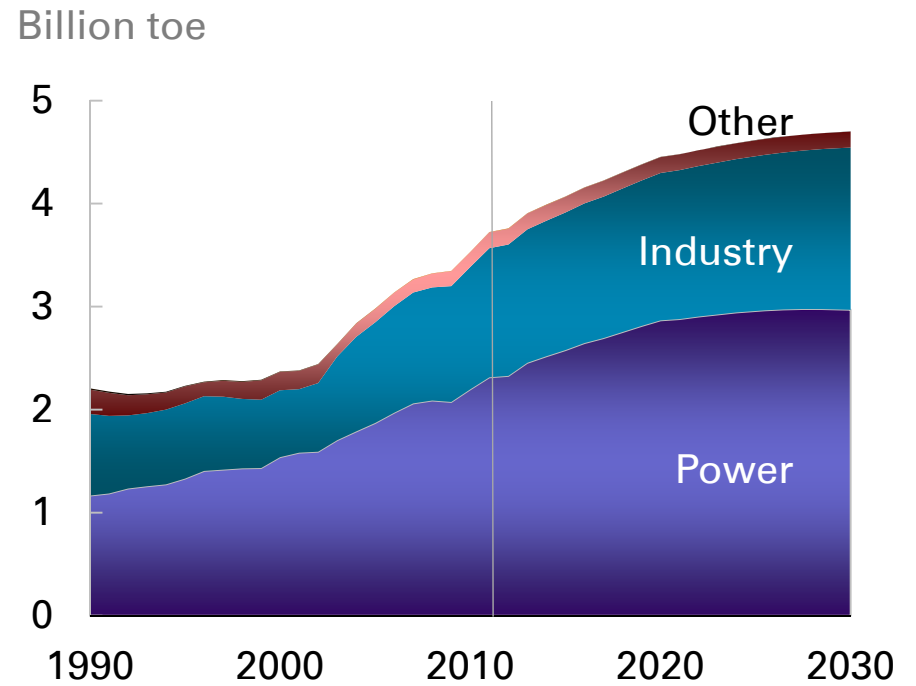
# Coal consumption



### Coal demand by region



### Coal demand by sector





# Non-fossil fuels

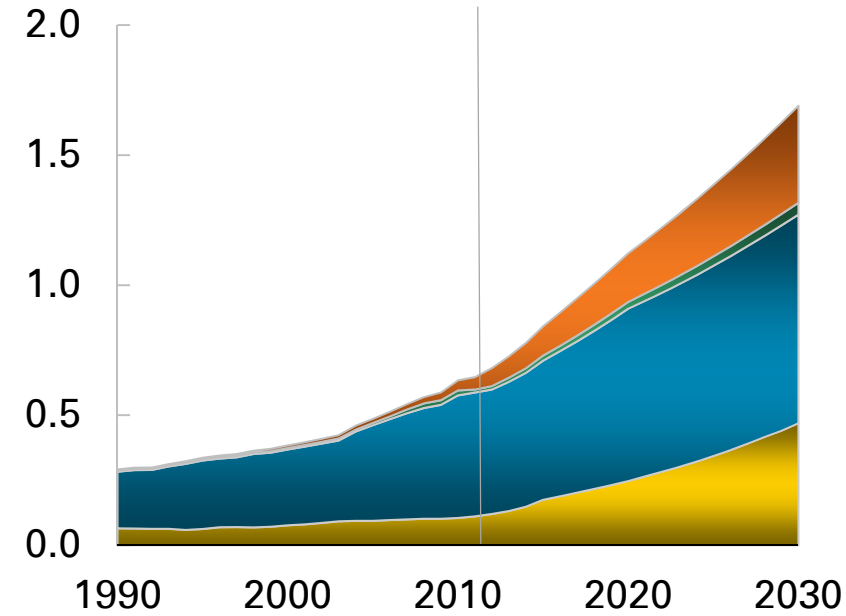
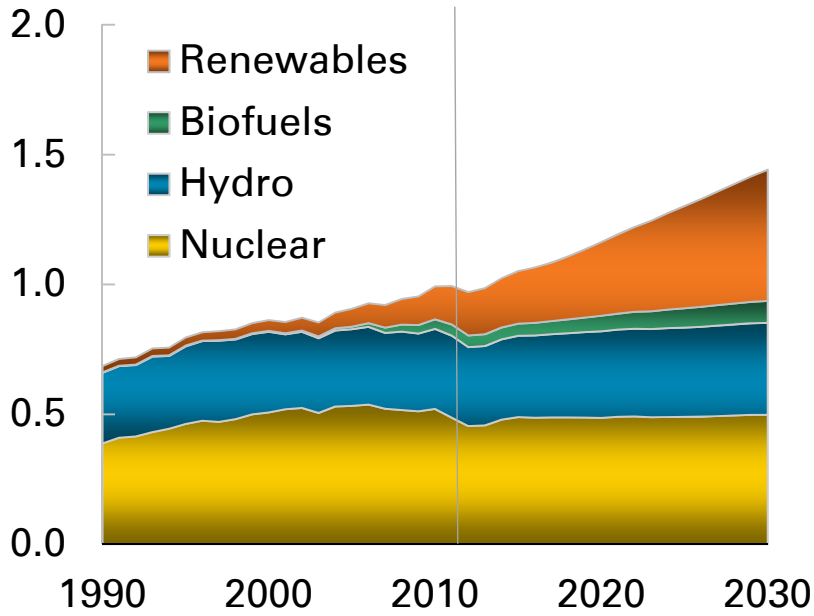


### OECD

### Non-OECD

Billion toe

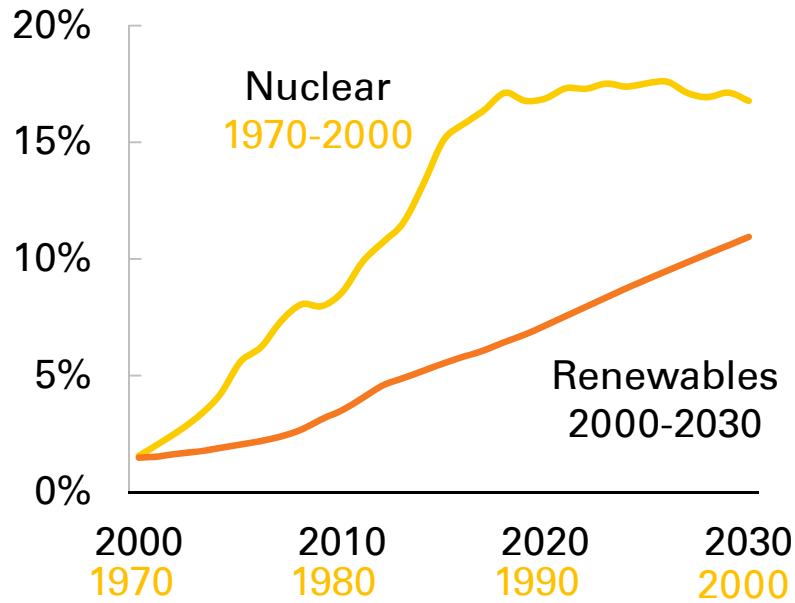
Billion toe





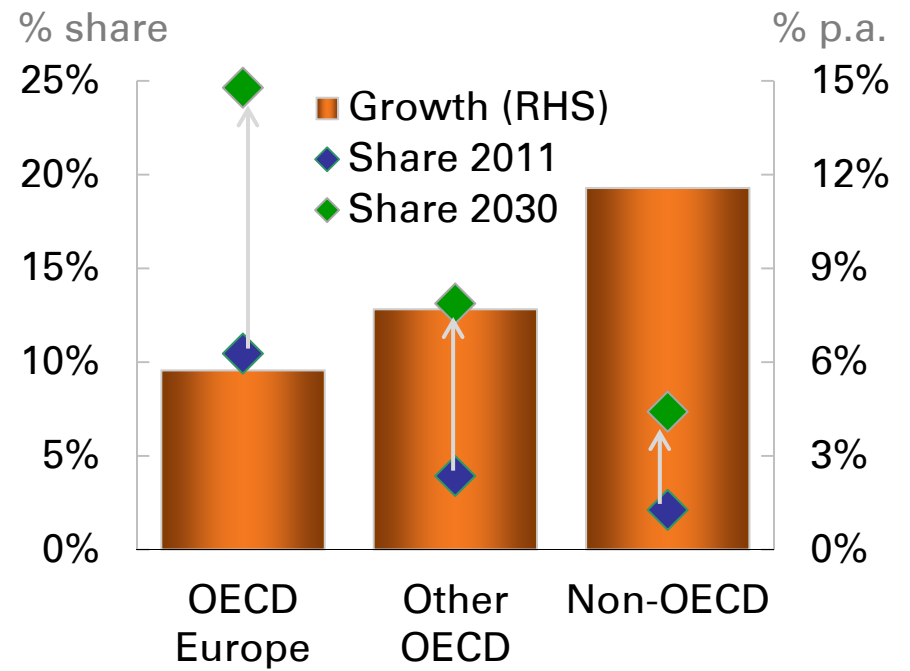
# Growth of renewables in power

## Share of power generation



## Renewable power

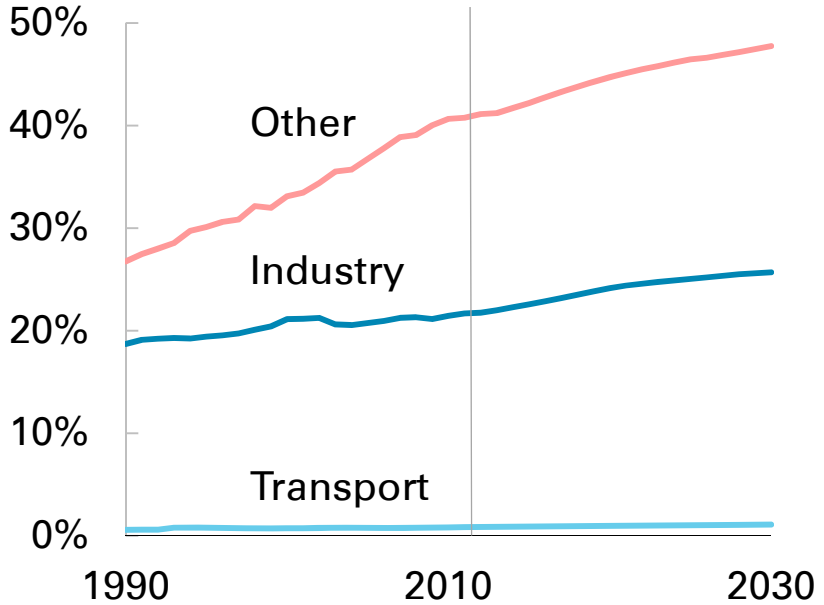
Growth 2011-30, and share of power



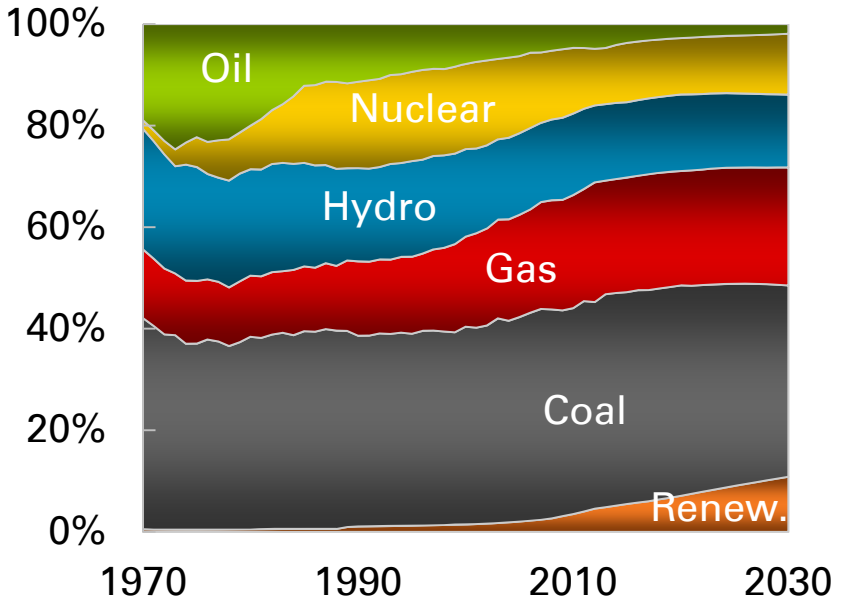


# Power generation and electricity use

Electricity share of final consumption



Shares of power output





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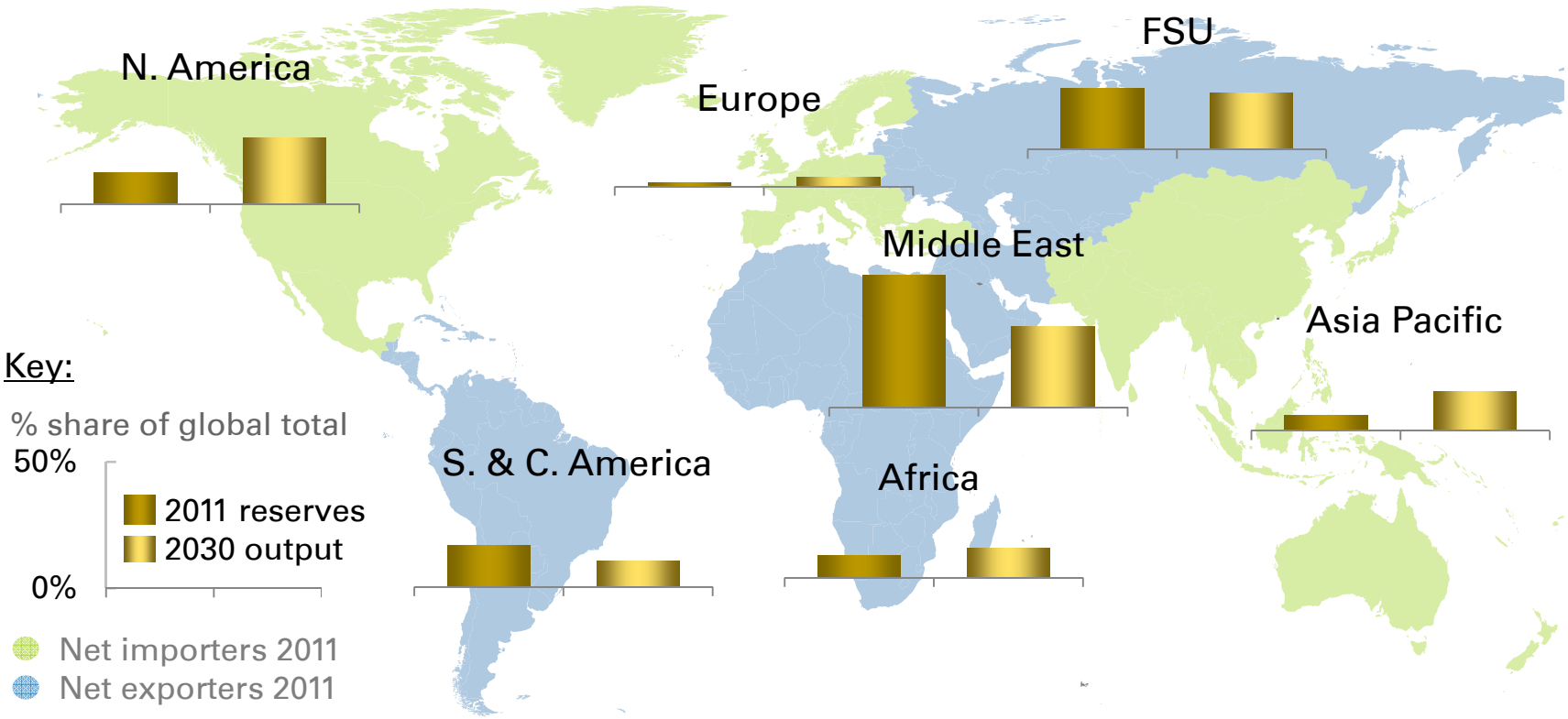
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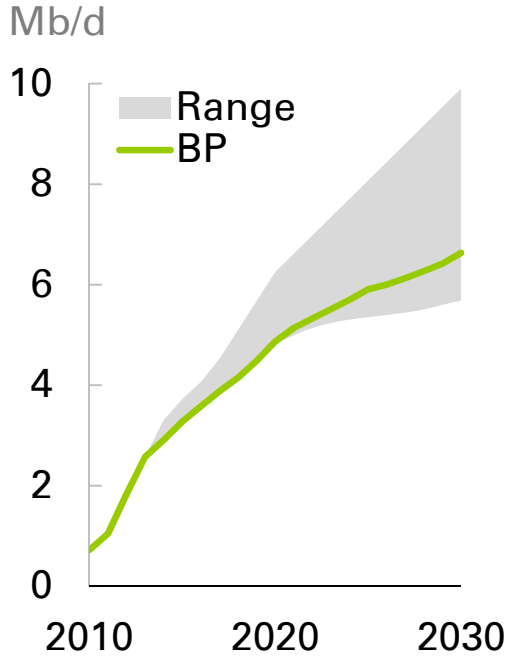
# Oil and gas: reserves and production



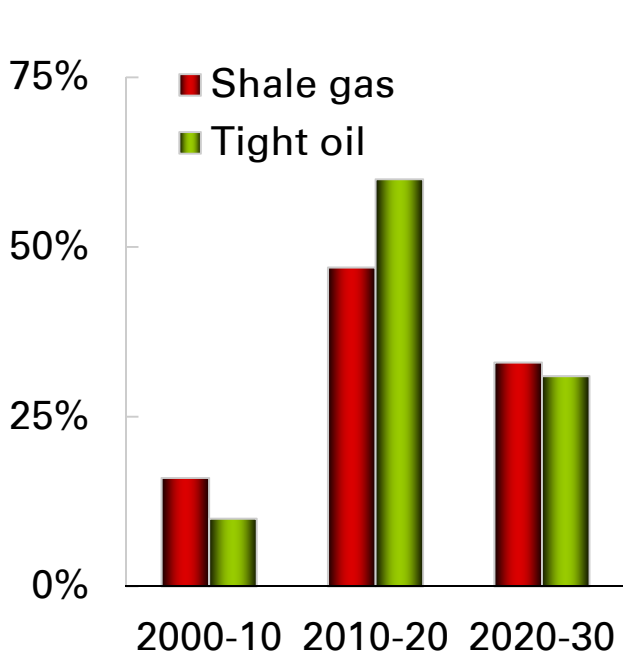


# Tight oil and shale gas uncertainties

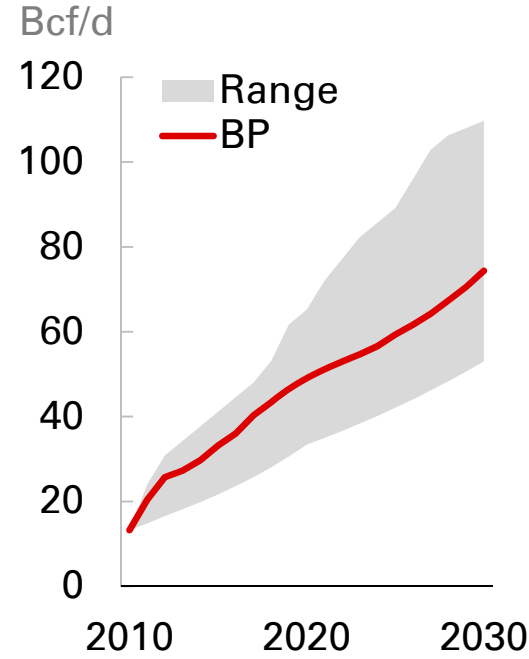
### Range of tight oil forecasts (excludes NGLs)



### Share of global supply growth

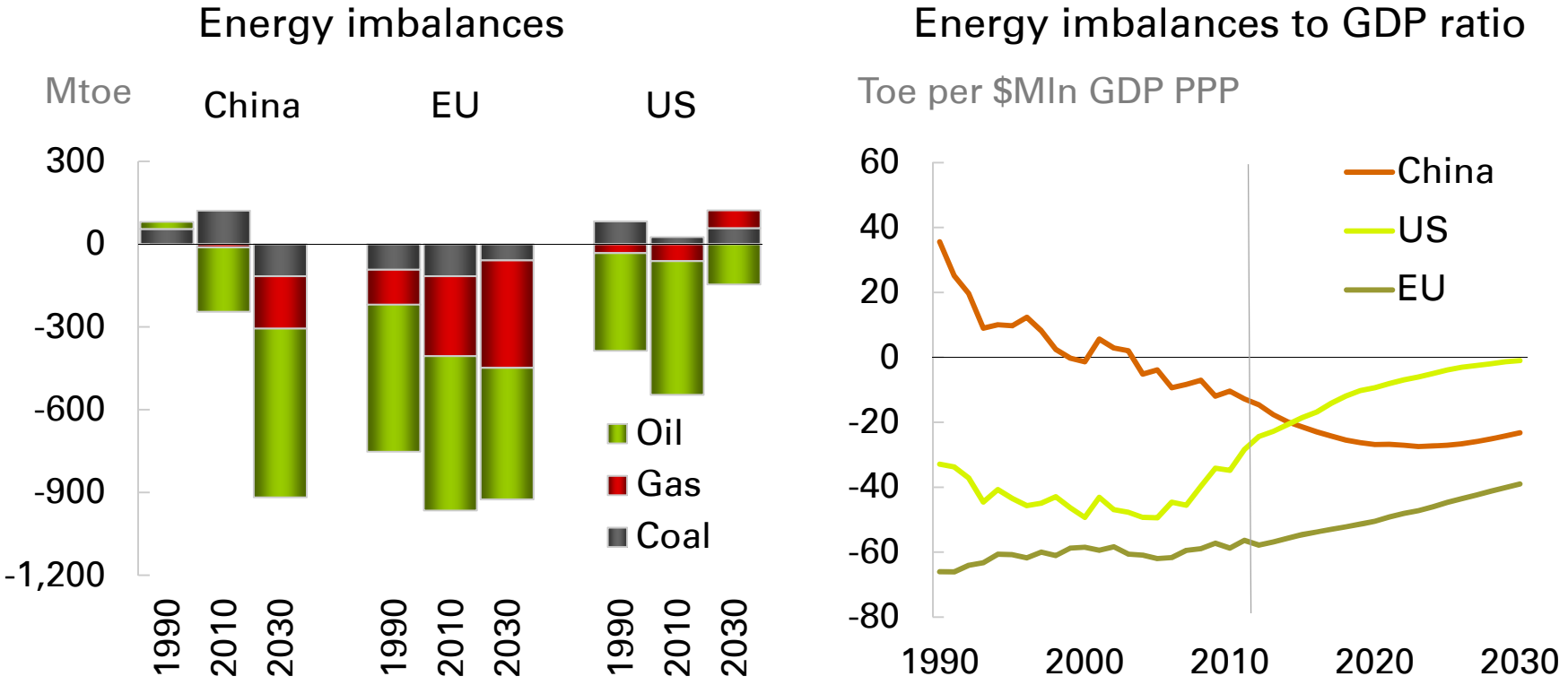


### Range of shale gas forecasts



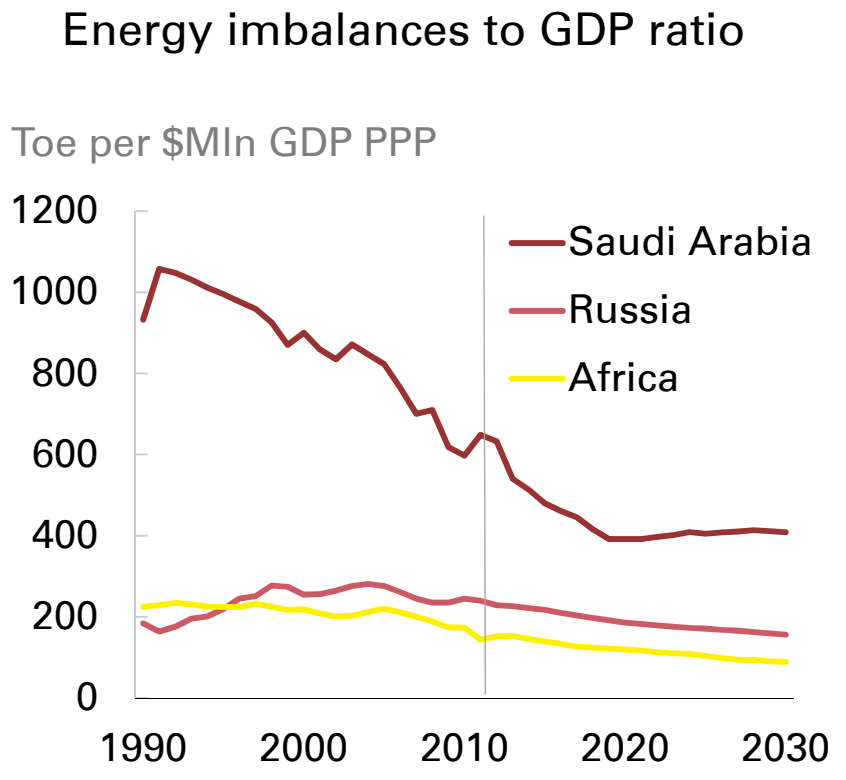
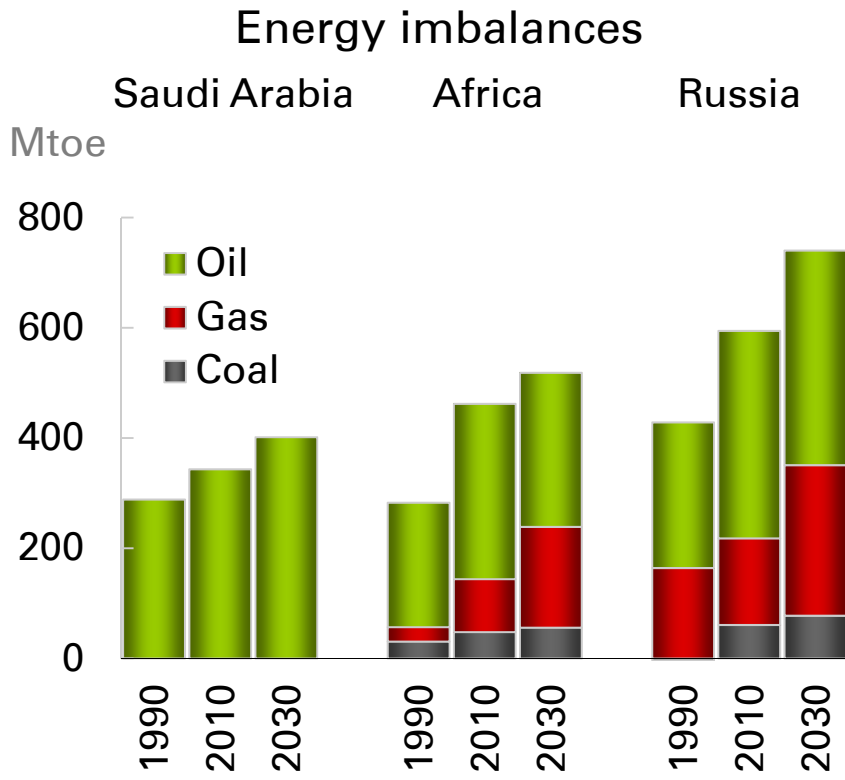


# Energy imbalances: import profiles





# Energy imbalances: export profiles

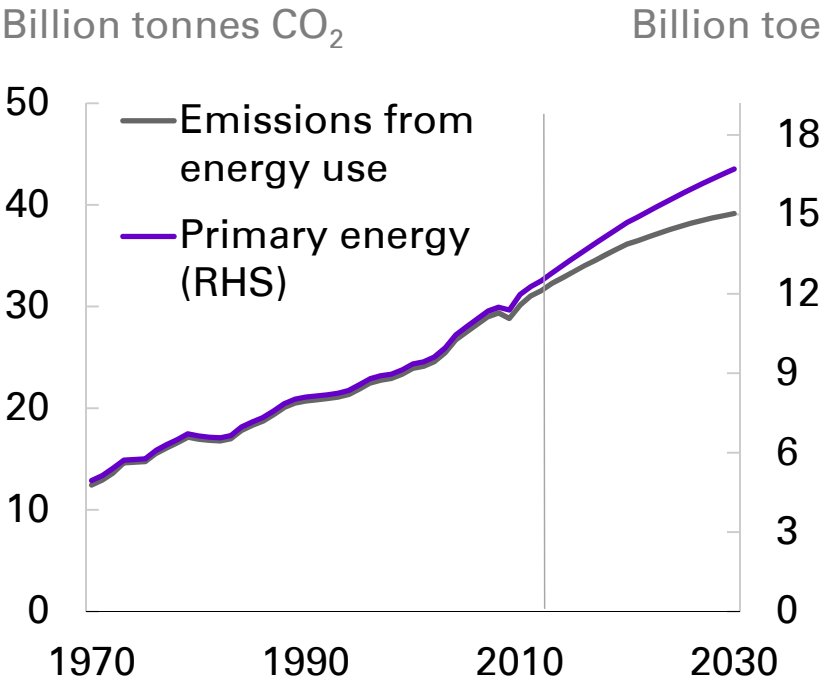




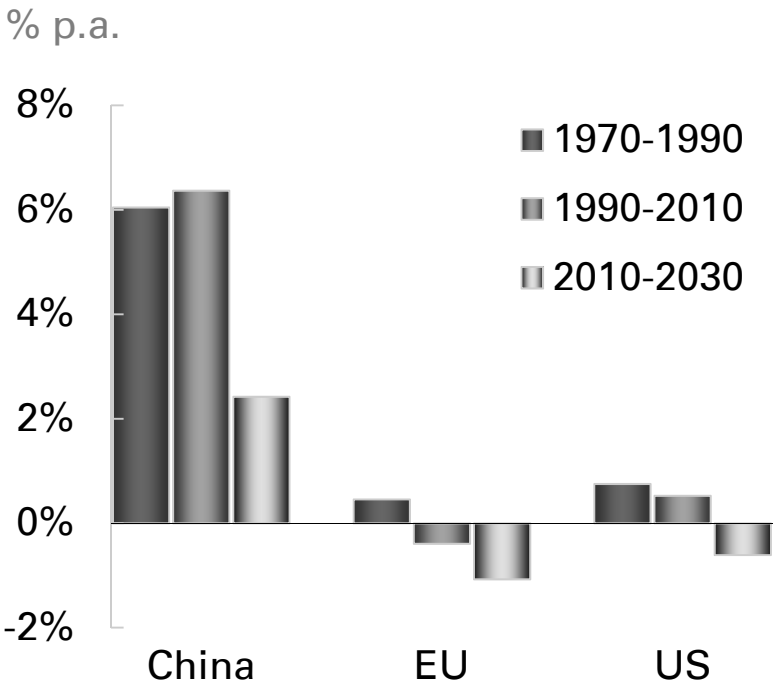


# Energy and carbon emissions

### CO<sub>2</sub> emissions and primary energy

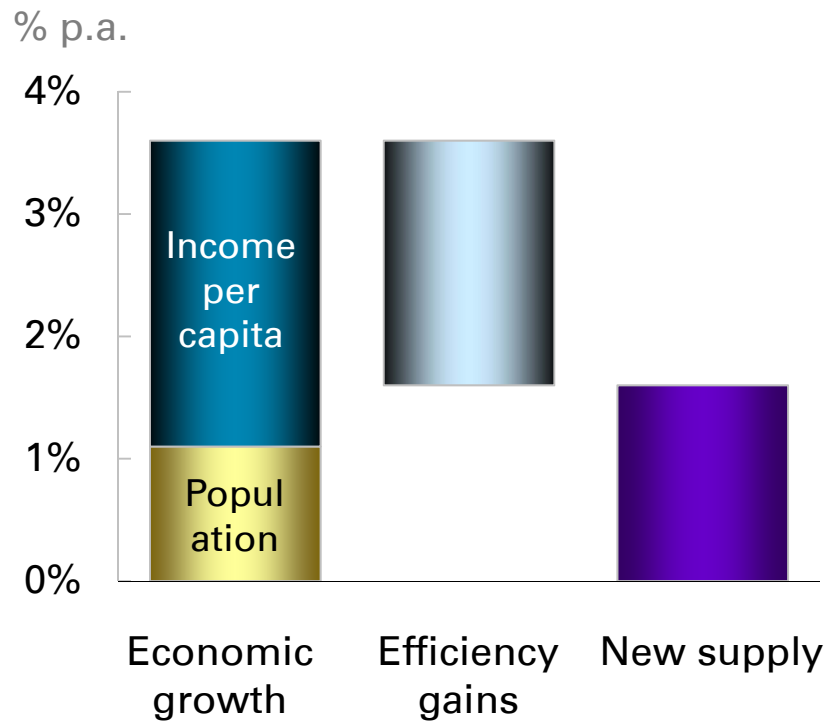


### Growth of CO<sub>2</sub> emissions





# Conclusion



- Economic growth needs energy
- Competition and innovation are the key to meeting this need
  - energy efficiency
  - new supplies
- Energy security and climate change remain challenges

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# BP Energy Outlook 2030

