



17<sup>th</sup> February 2015

# BP Energy Outlook 2035

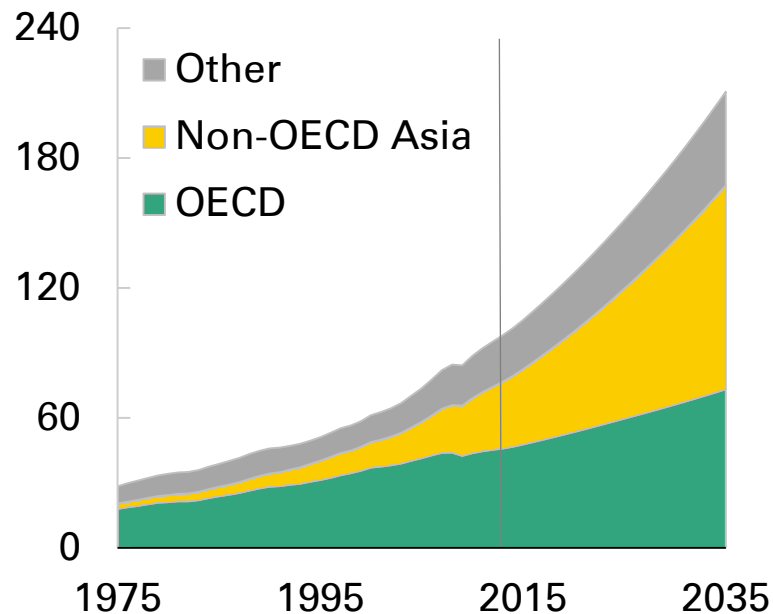
[bp.com/energyoutlook](http://bp.com/energyoutlook)

#BPstats

# Economic backdrop

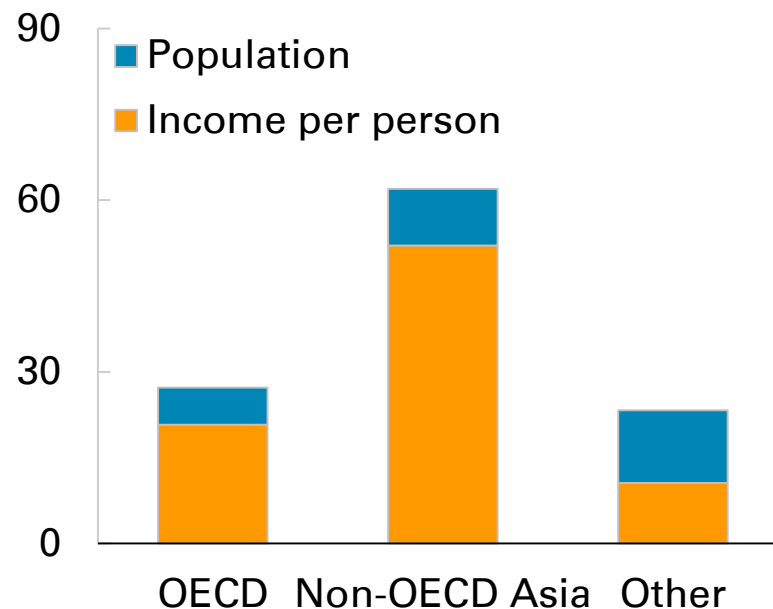
## GDP

Trillion, \$2011 PPP



## Contribution to GDP growth

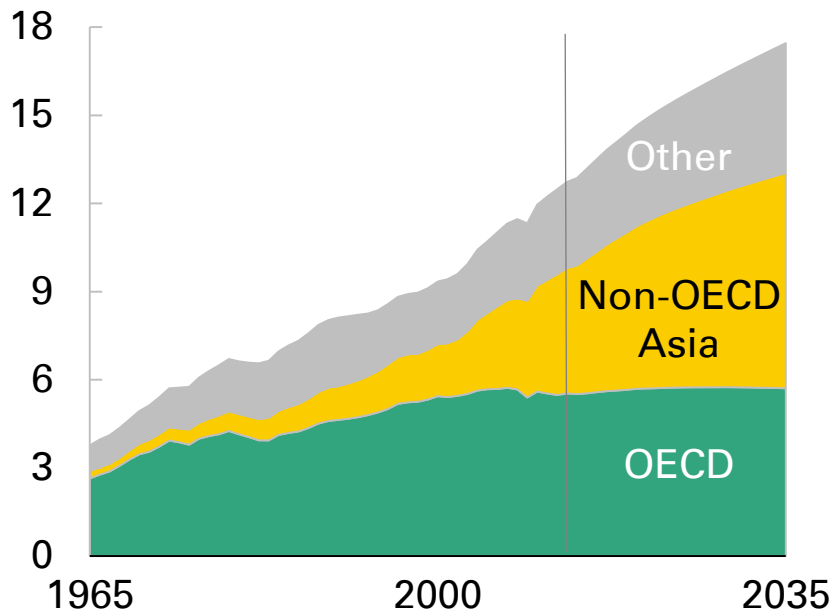
Trillion \$2011 PPP, 2013-35



# Global energy demand

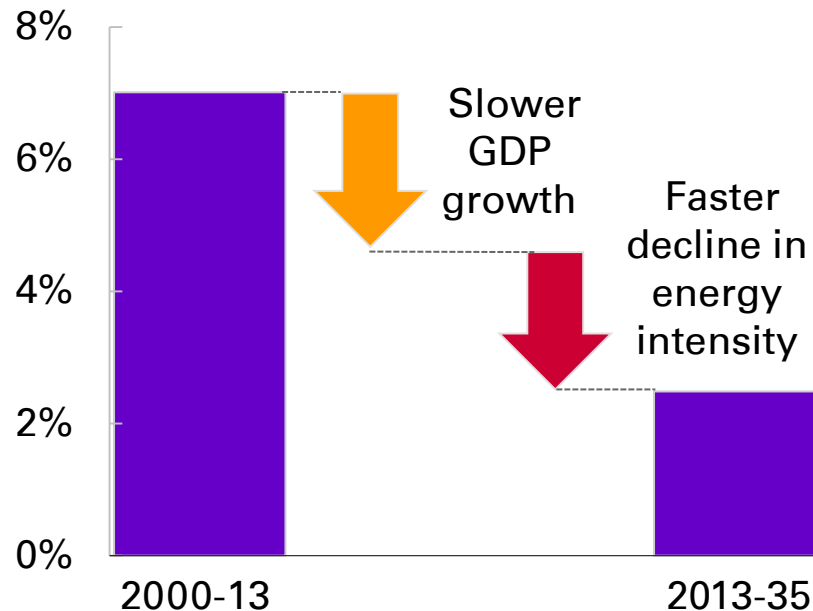
## Consumption by region

Billion toe



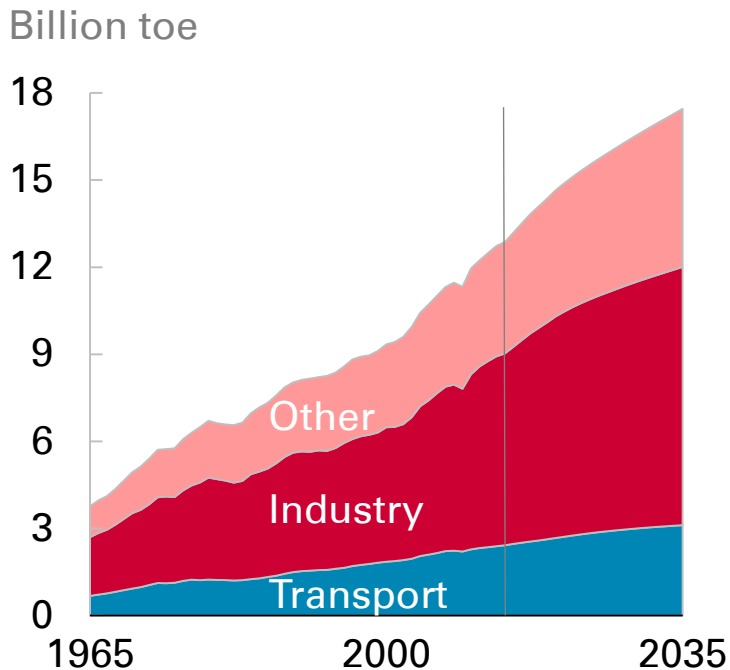
## Non-OECD Asia energy growth

% per annum

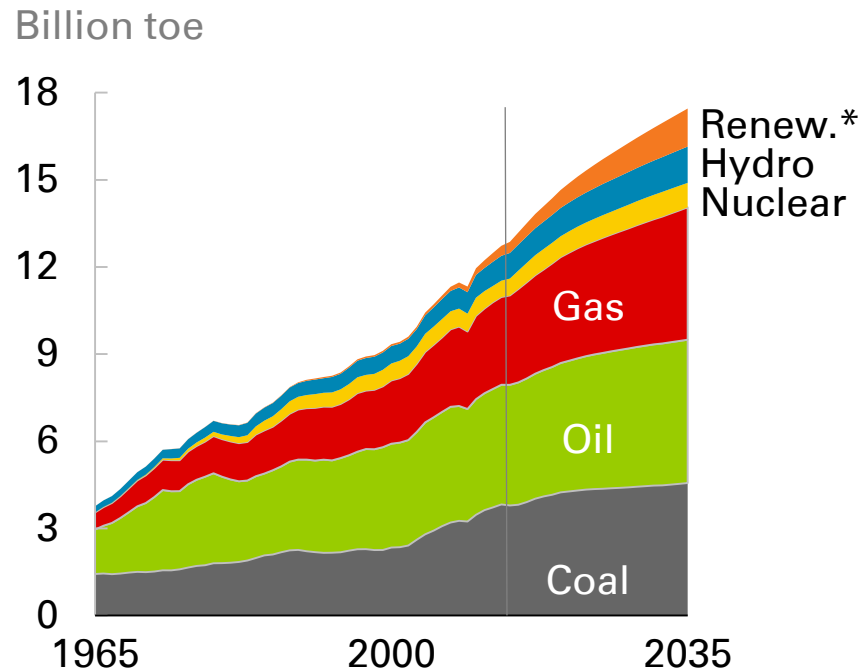


# Global energy demand by sector and fuel

## Consumption by sector

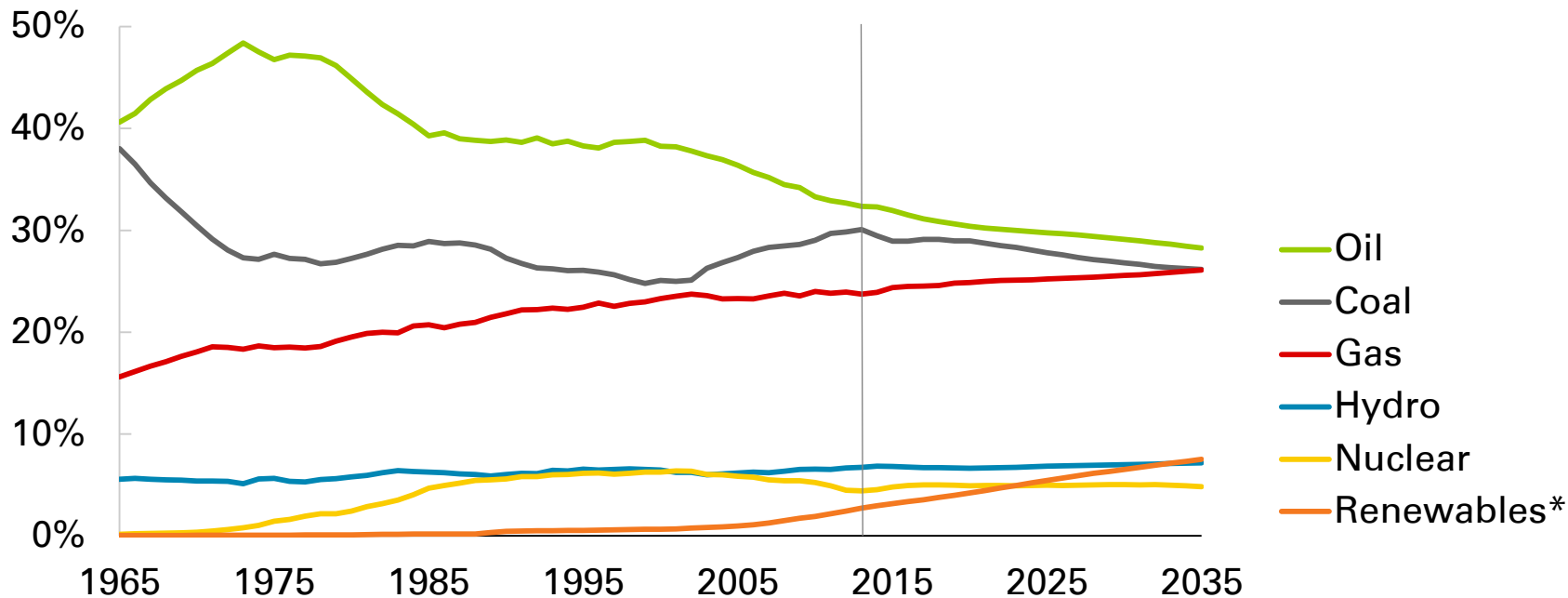


## Consumption by fuel



\*Includes biofuels

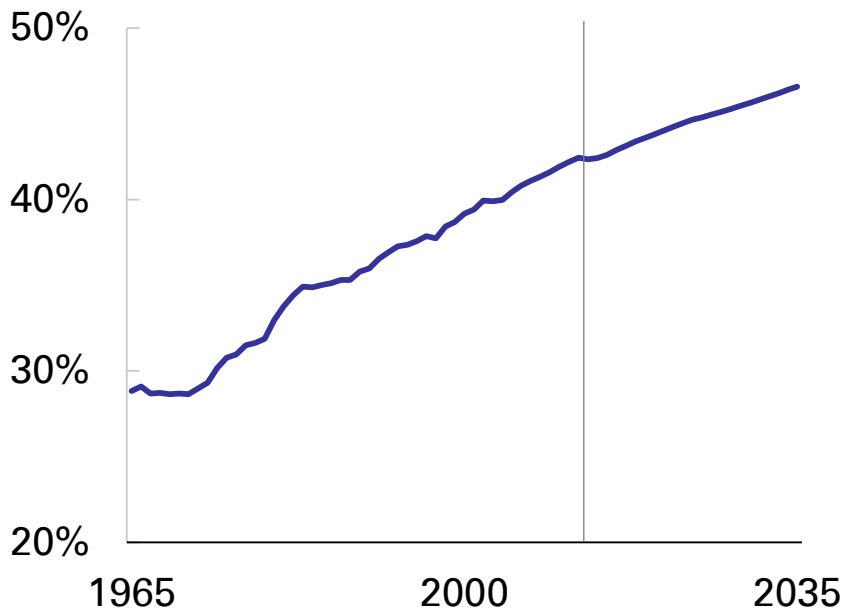
# Shares of primary energy



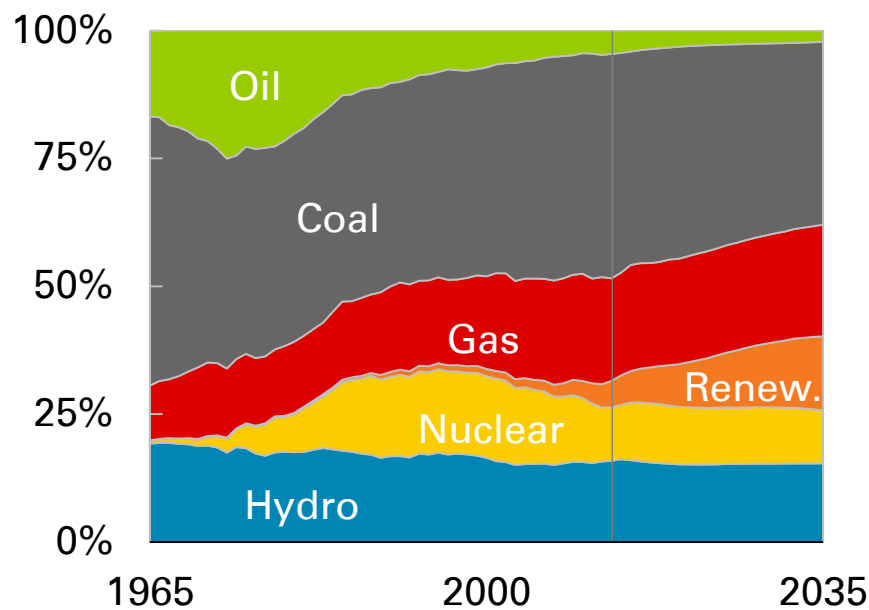
\*Includes biofuels

# Power sector

Inputs to power as a share of total primary energy



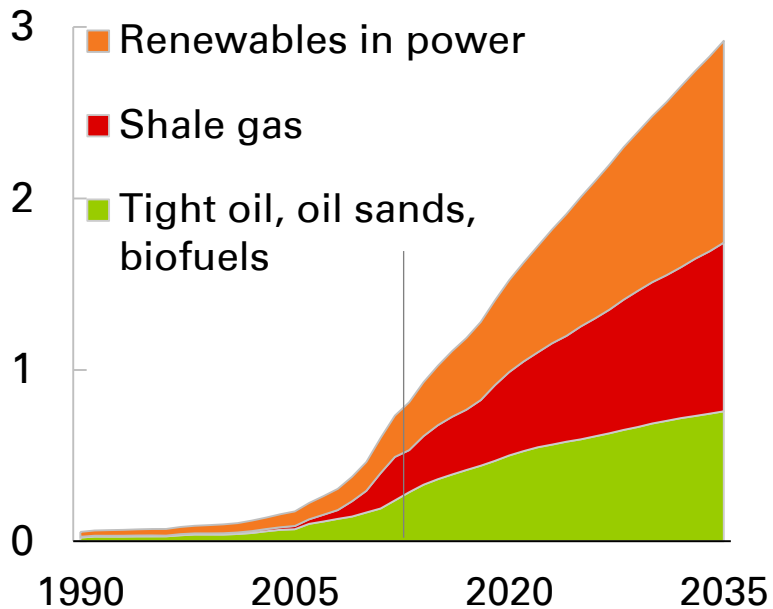
Primary inputs to power



# New sources of energy supply

## Production

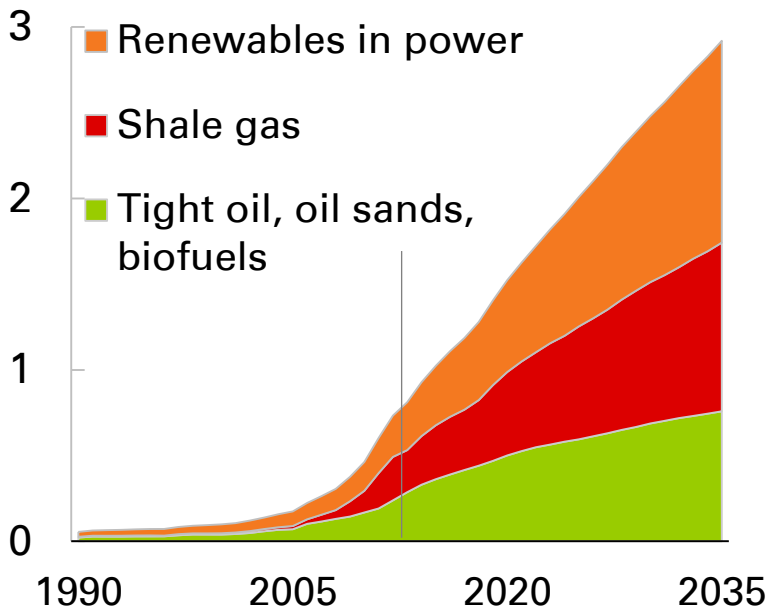
Billion toe



# New sources of energy supply

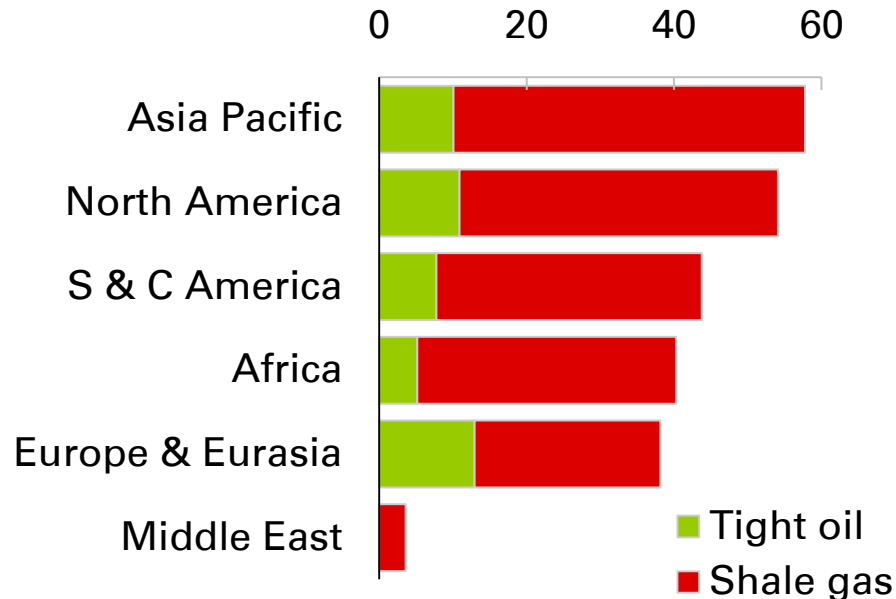
## Production

Billion toe



## Technically recoverable resources

Billion toe



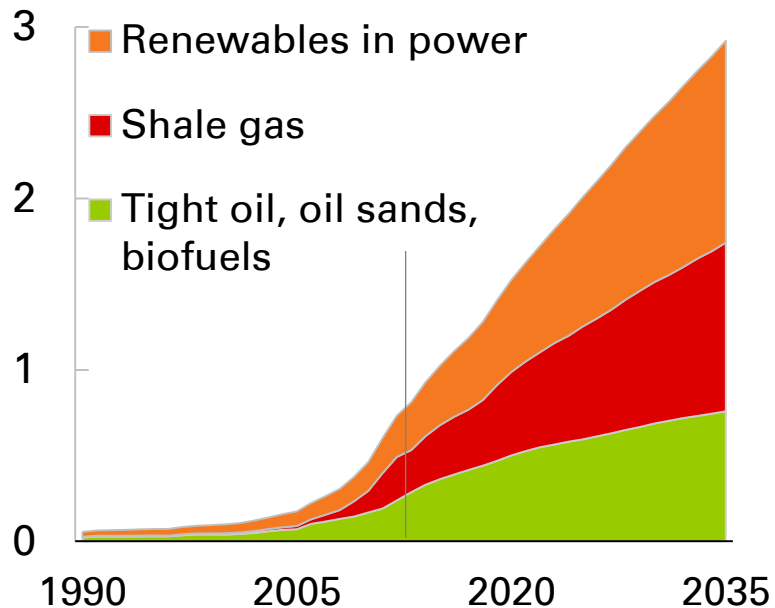
Source: © OECD/IEA 2014



# New sources of energy supply

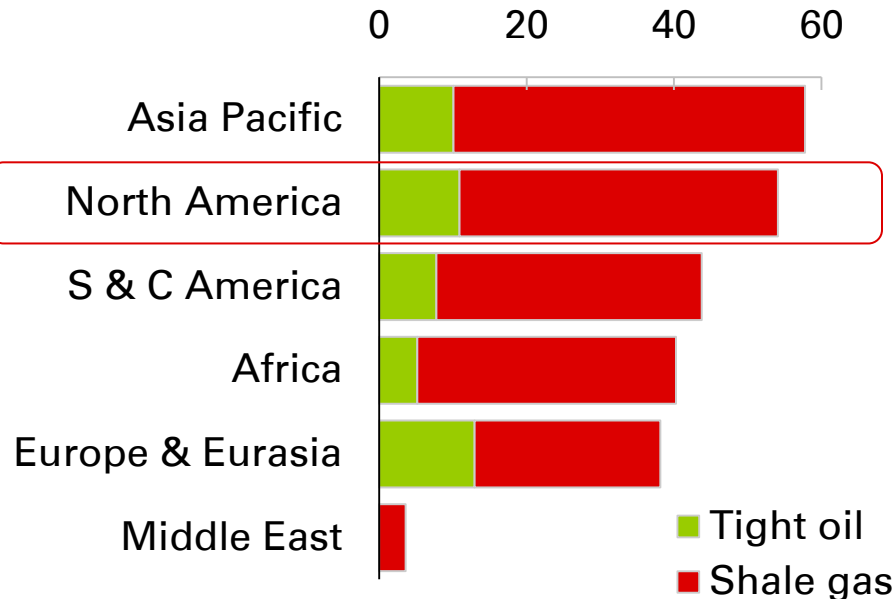
## Production

Billion toe



## Technically recoverable resources

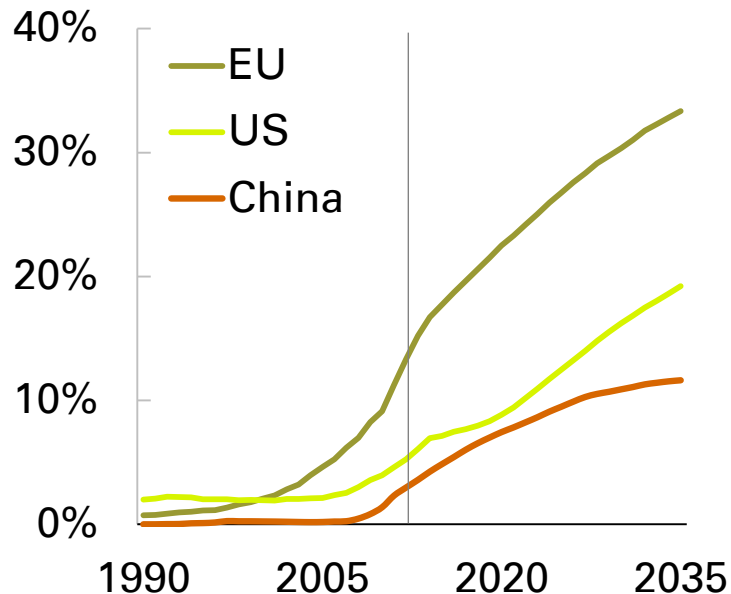
Billion toe



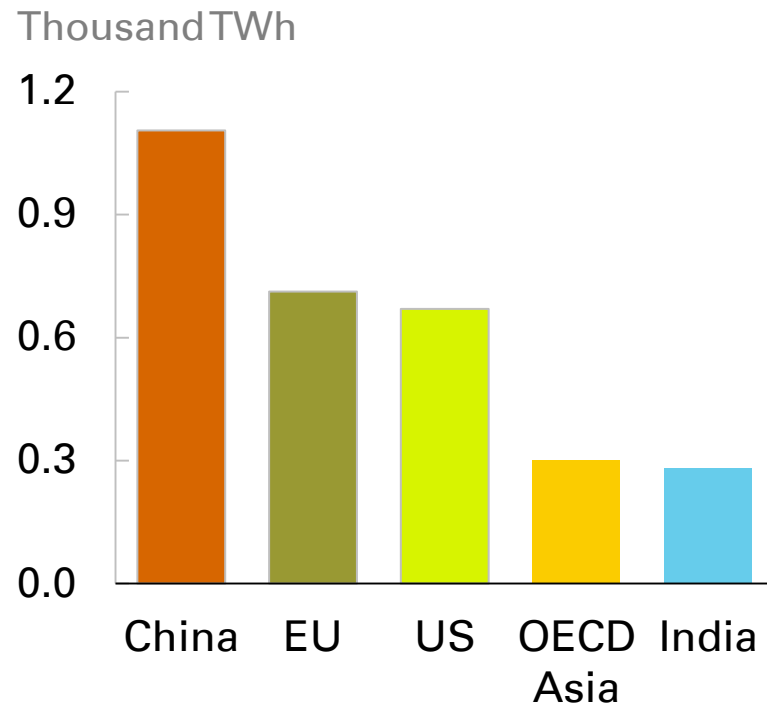
Source: © OECD/IEA 2014

# Renewables in power generation

## Renewables share of power

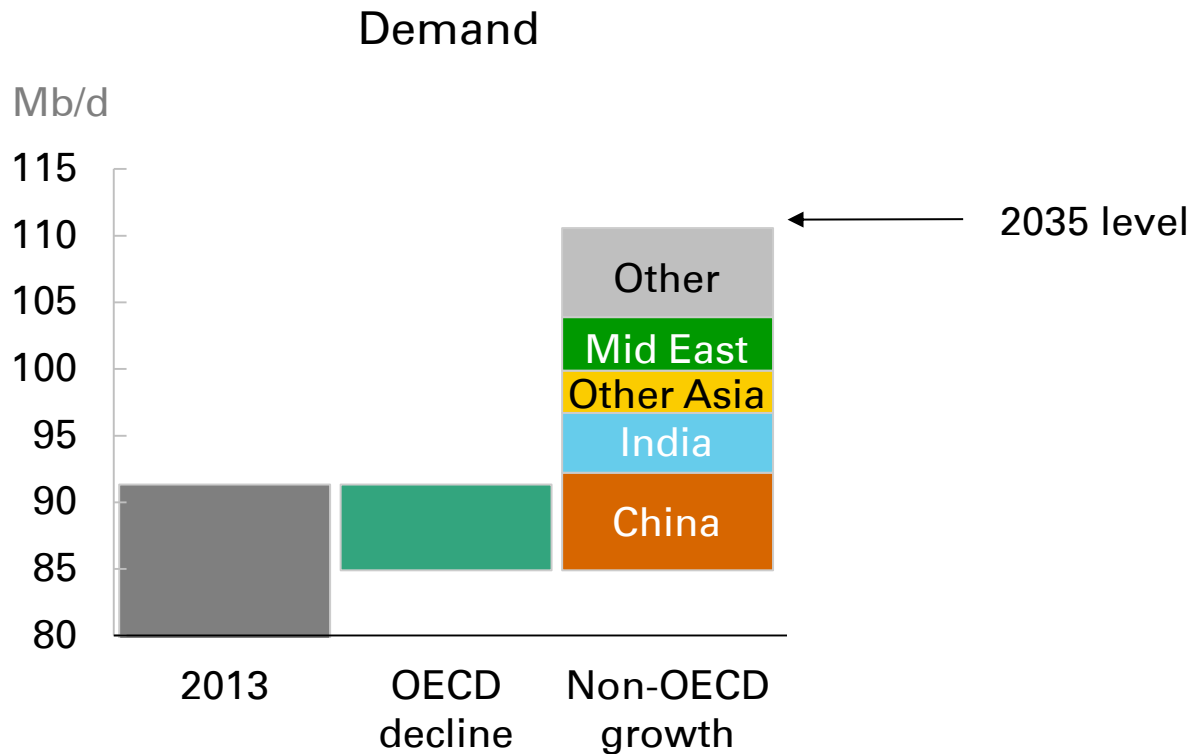


## Renewables growth 2013 to 2035

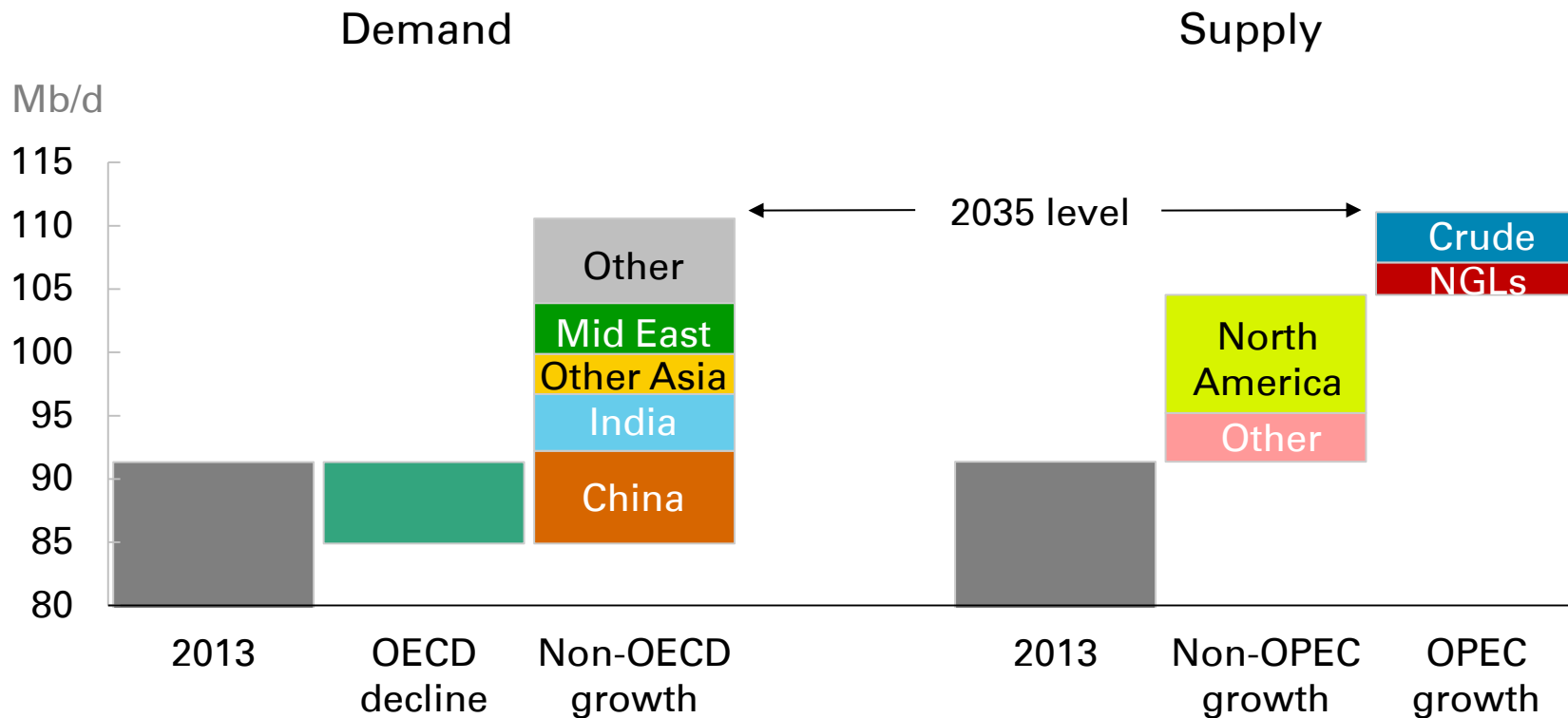


# Oil and other liquid fuels

# Global liquids demand

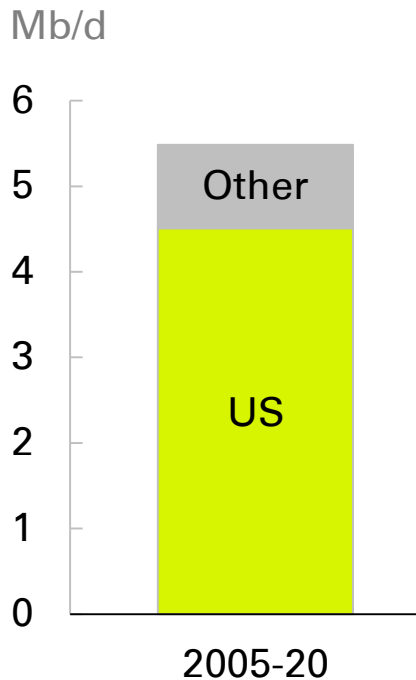


# Global liquids demand and supply

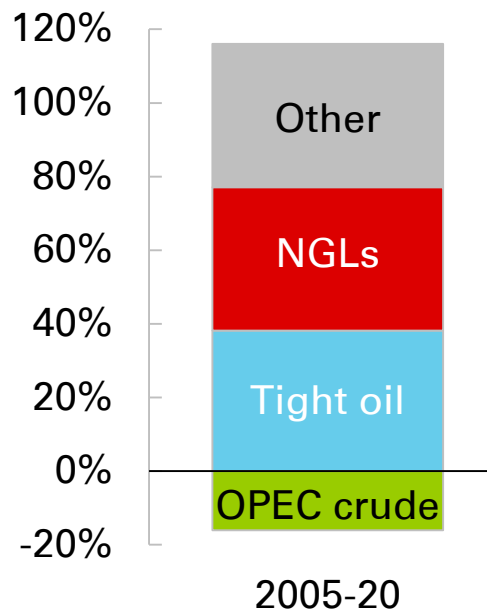


# Tight oil and OPEC balance

## Tight oil supply growth

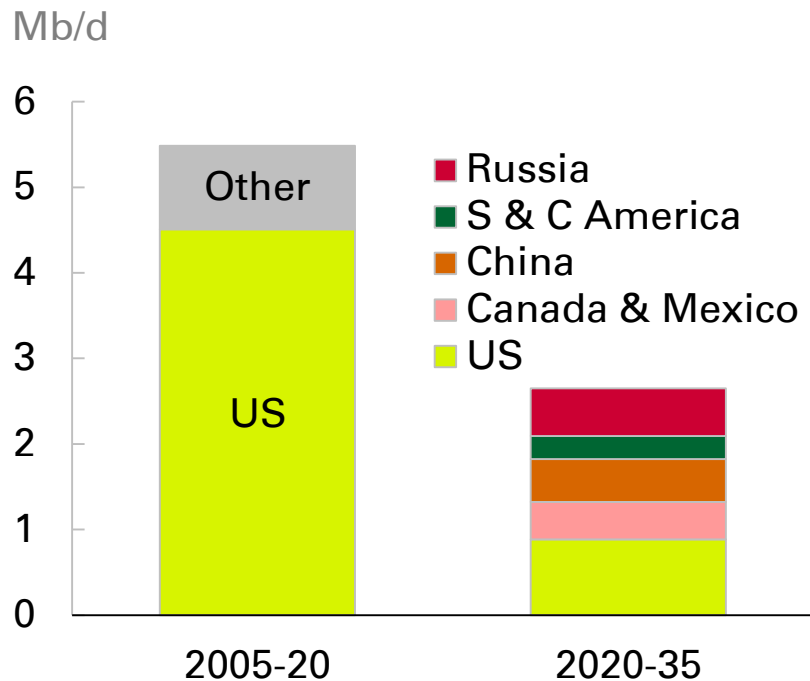


## Share of global liquids growth

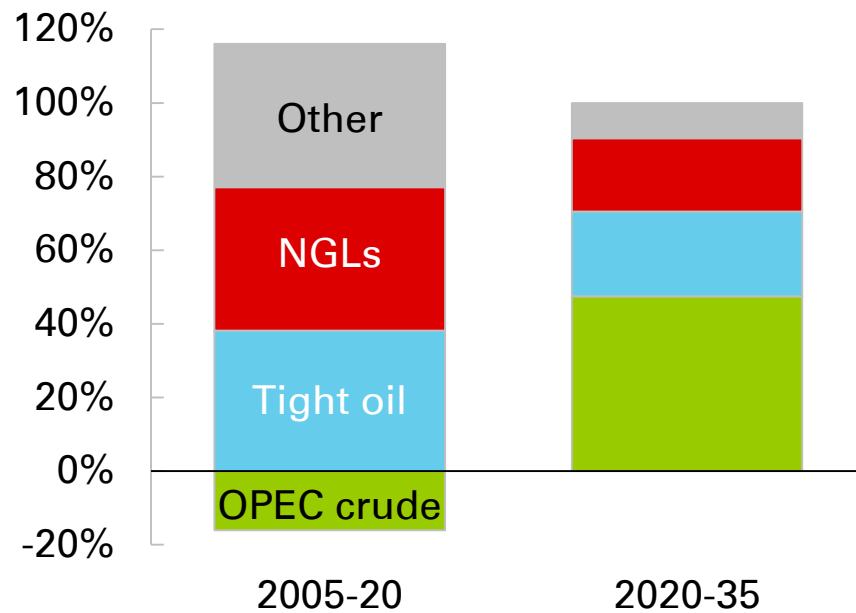


# Tight oil and OPEC balance

## Tight oil supply growth

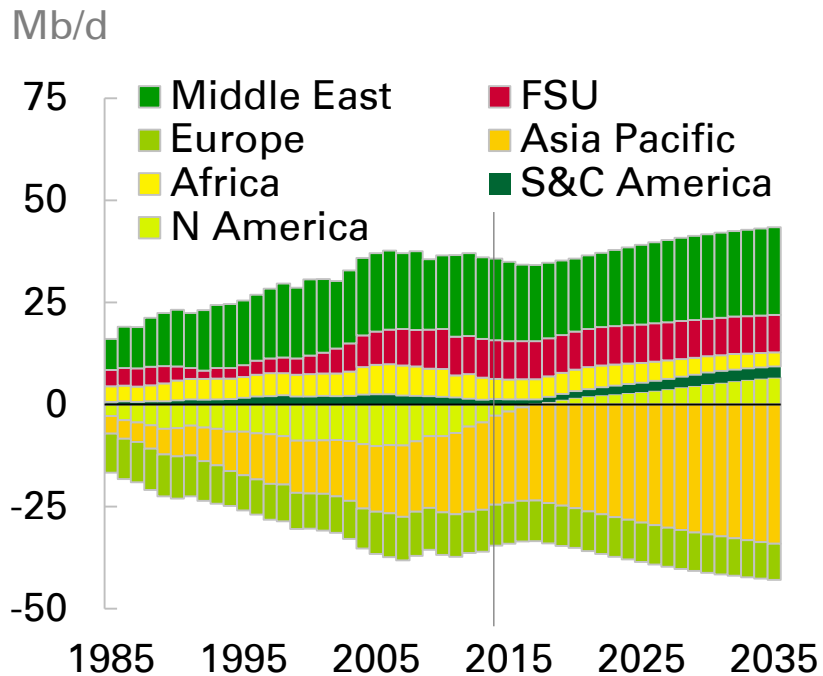


## Share of global liquids growth

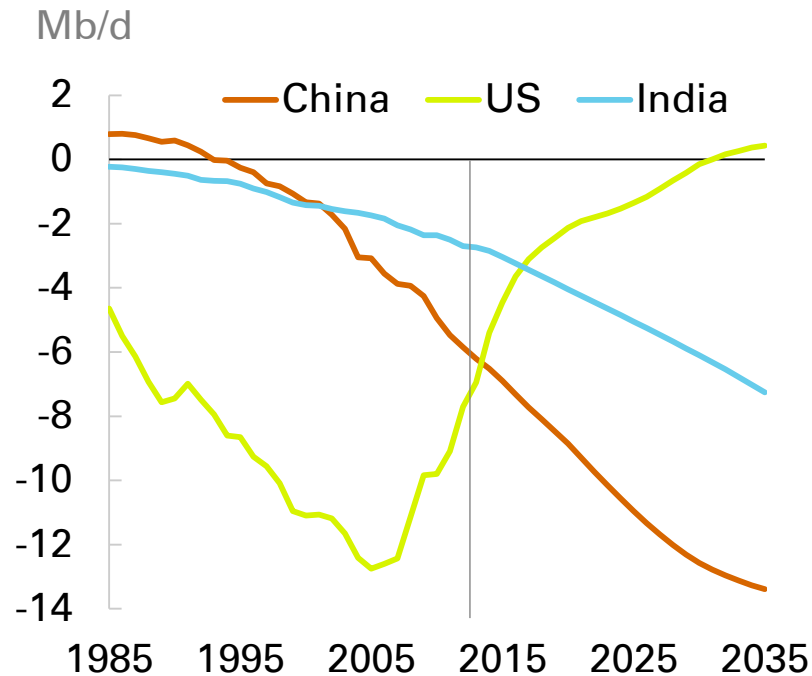


# Oil trade

## Regional imbalances



## Net exports

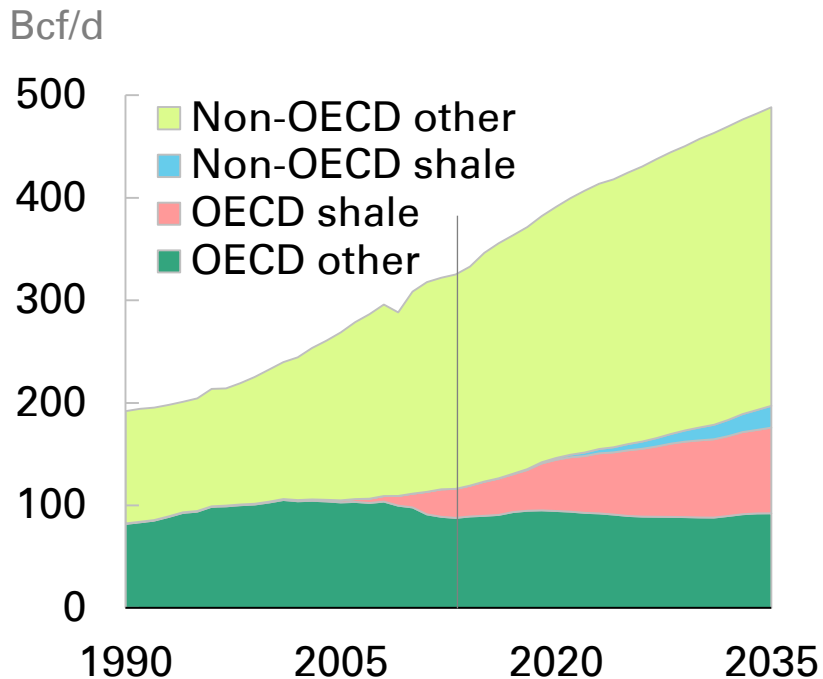




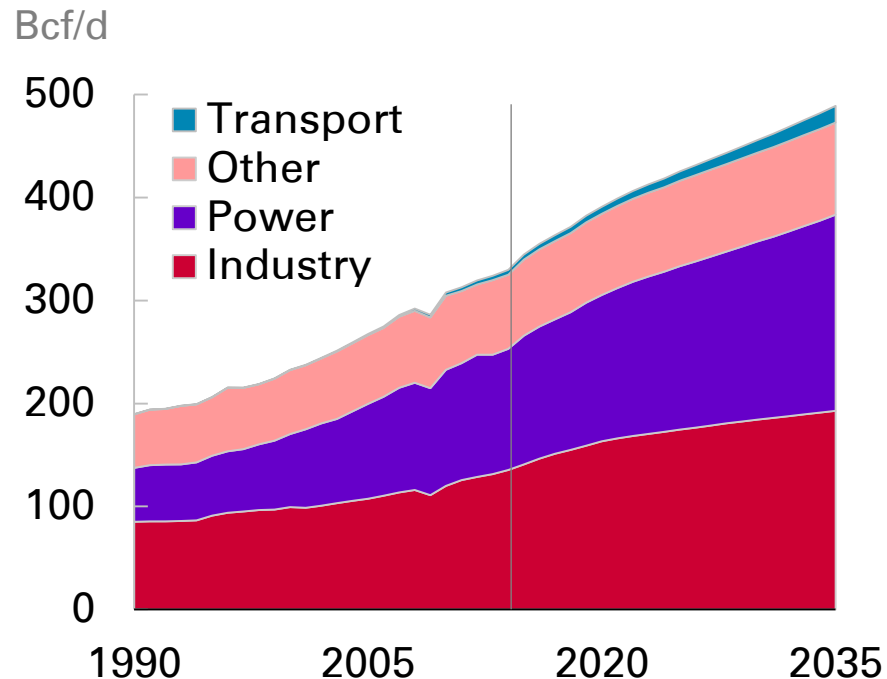
# Natural gas

# Global supply and demand for natural gas

## Production by type and region

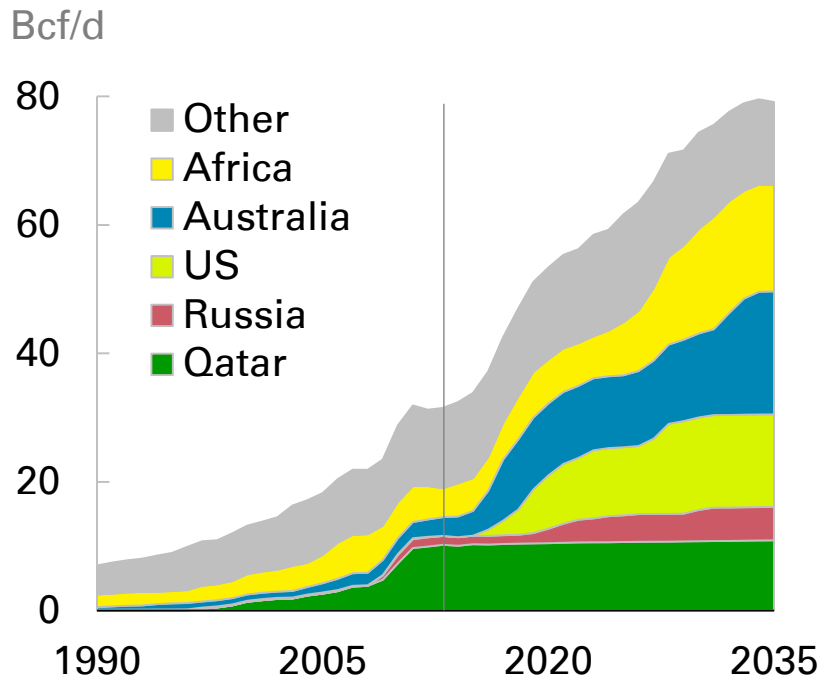


## Consumption by sector

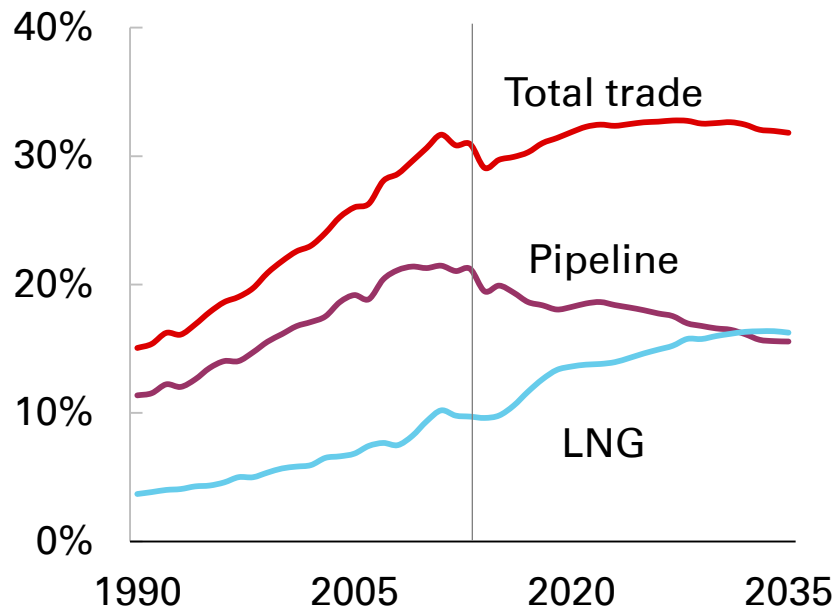


# Growth of LNG

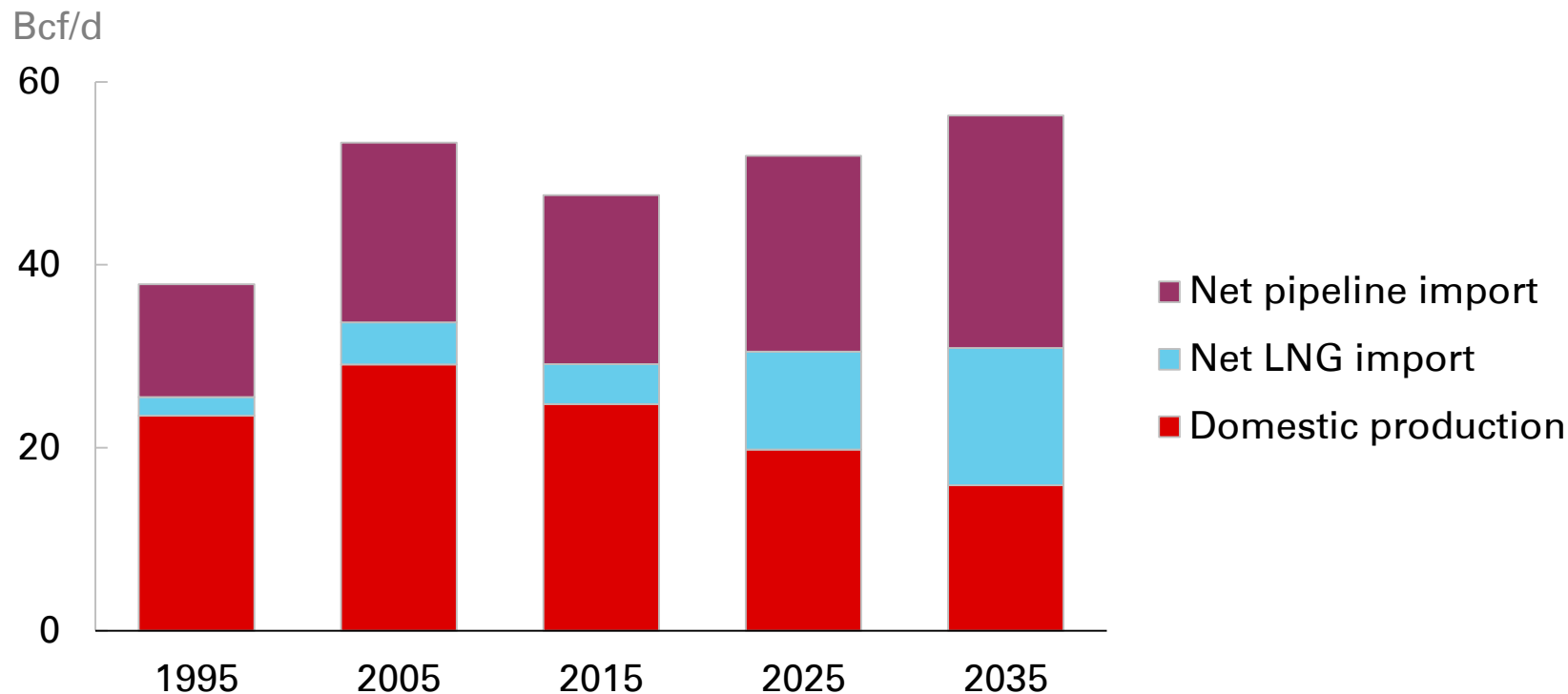
## LNG supply



## Shares of global gas consumption



## Sources of gas supply to Europe



# Key uncertainties

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## Low GDP growth

- what if growth in China and India slows more rapidly than assumed?

## Climate policies

- what if policymakers take more actions to reduce emissions?

## Geopolitics

- what are the implications of heightened geopolitical risks?

## China's electrification

- what if China's electricity use follows a different path?

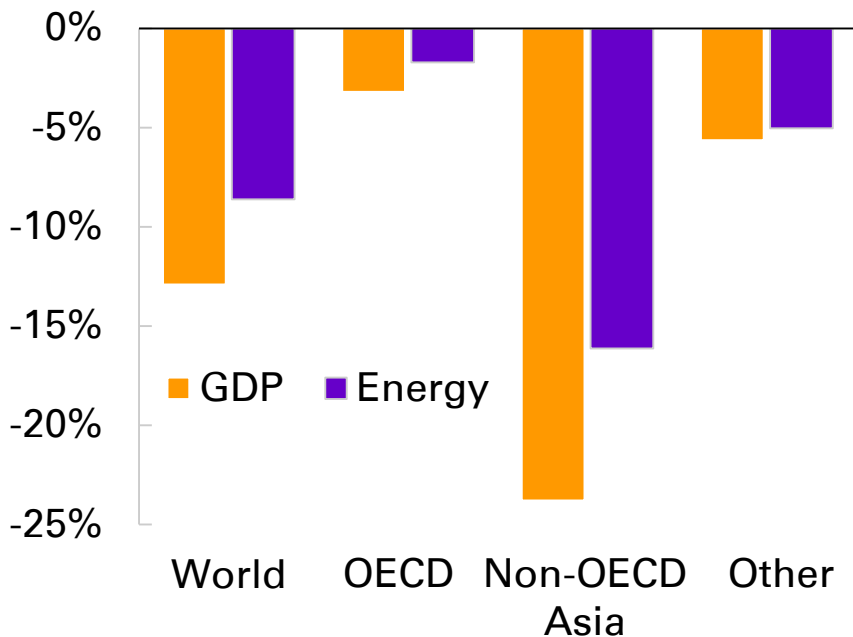
## Low GDP growth

what if growth in China and India  
slows more rapidly than assumed?

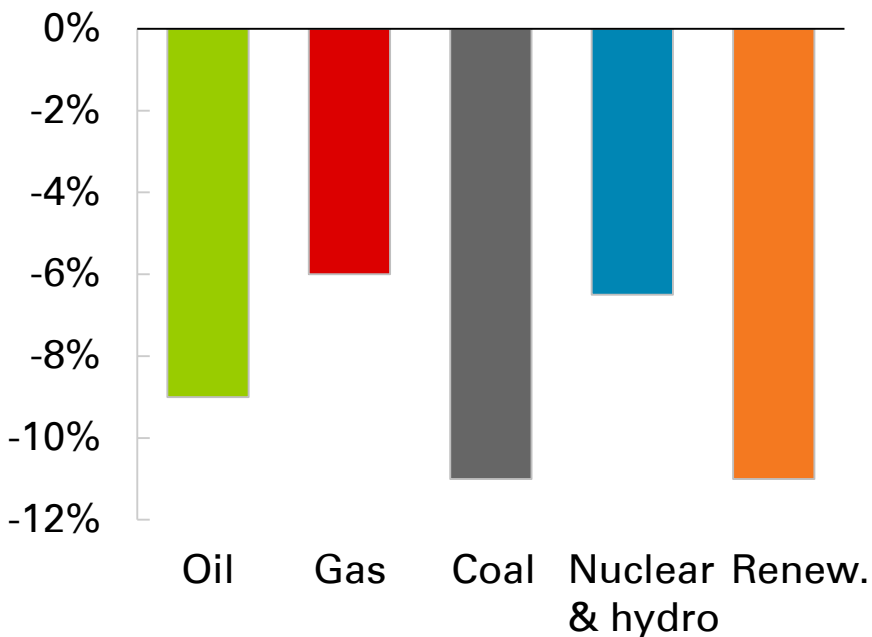
# Low GDP growth alternative

Differences from base case in 2035

GDP and energy demand



Energy demand by fuel



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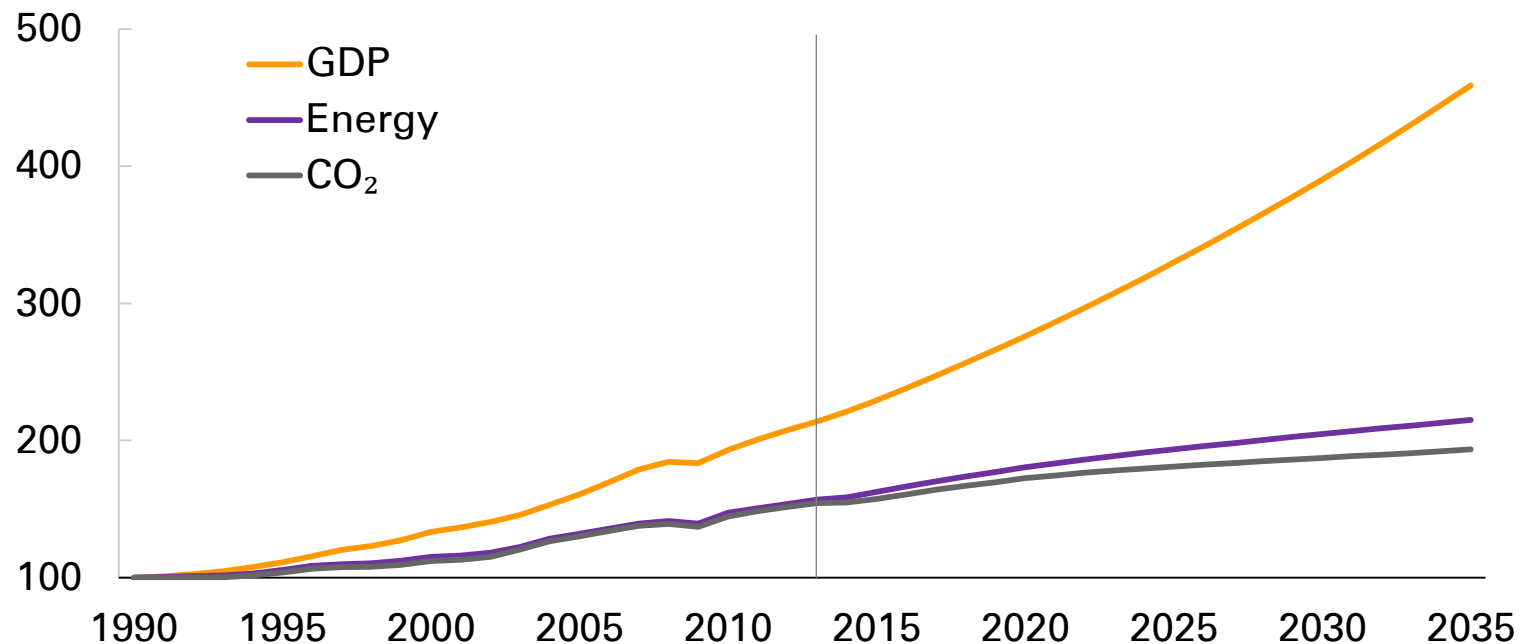
## Climate policies

what if policymakers take more  
actions to reduce emissions?



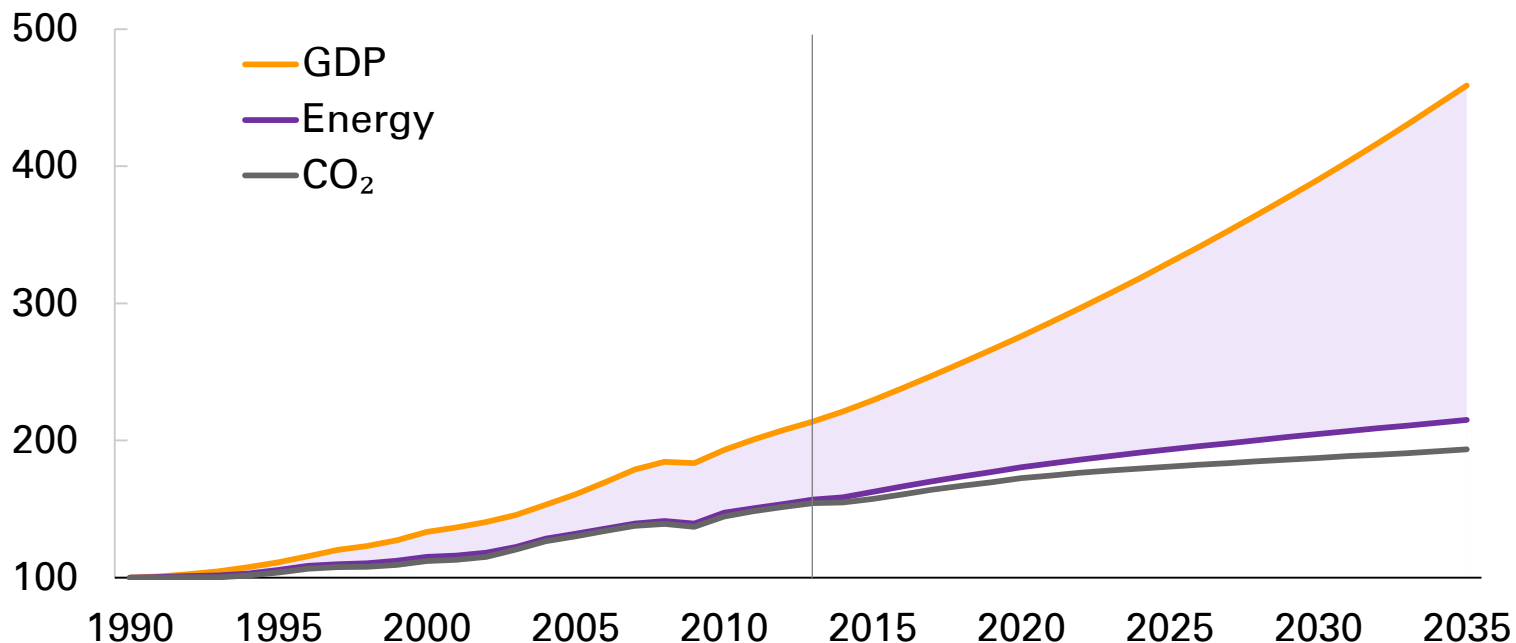
# GDP, energy demand and carbon emissions

Index: 1990 = 100



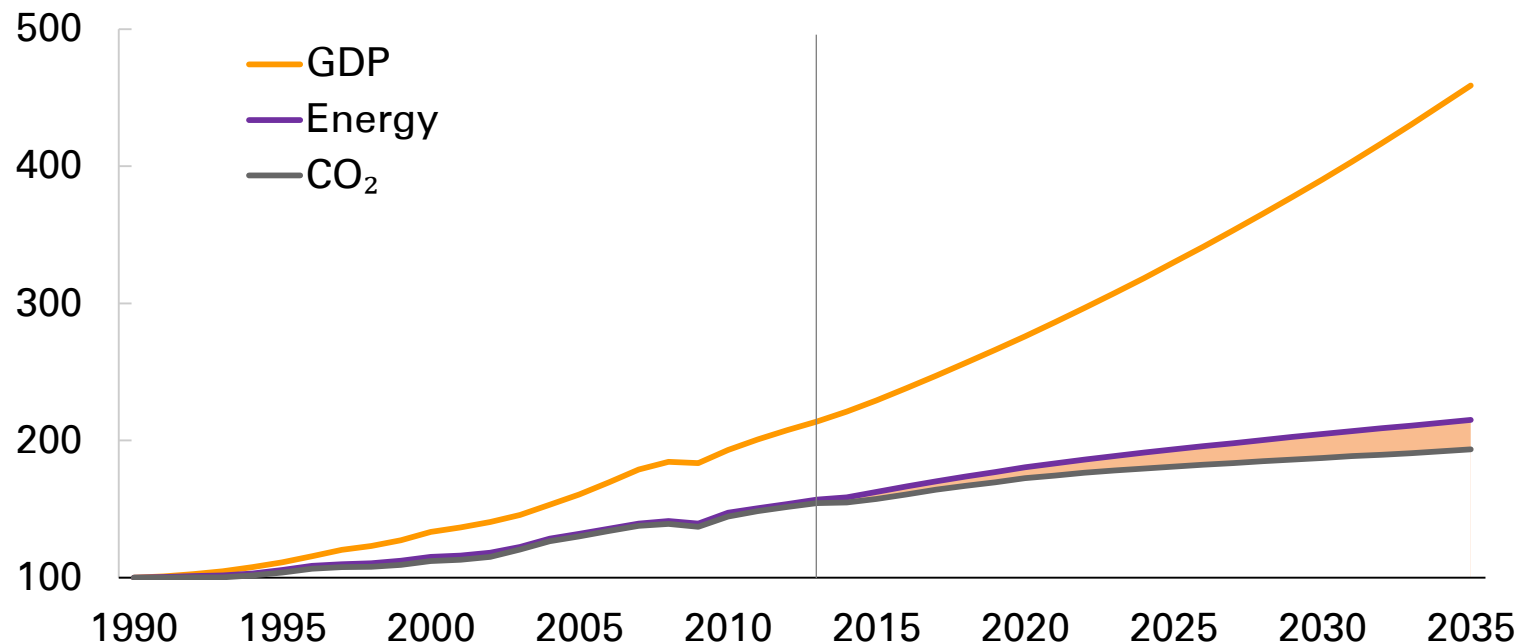
# GDP, energy demand and carbon emissions

Index: 1990 = 100



# GDP, energy demand and carbon emissions

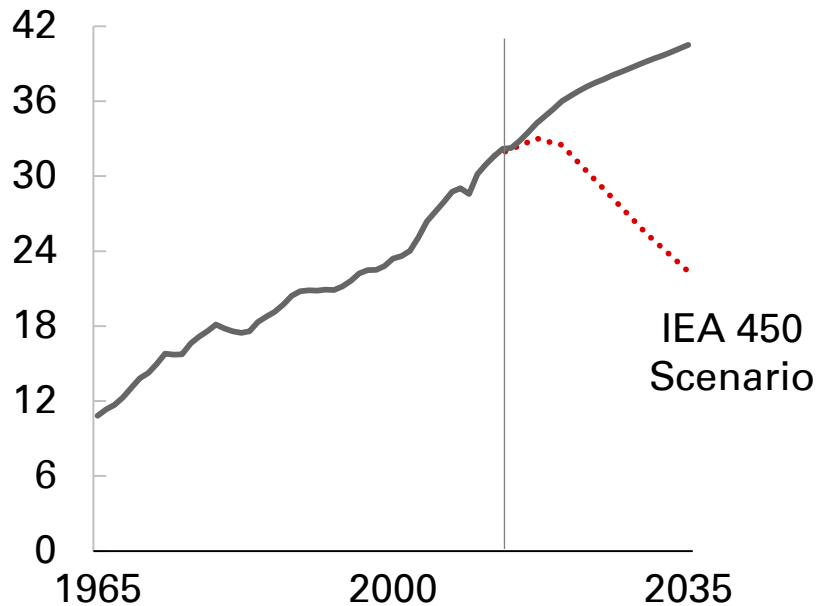
Index: 1990 = 100



# Carbon emissions

## Global emissions

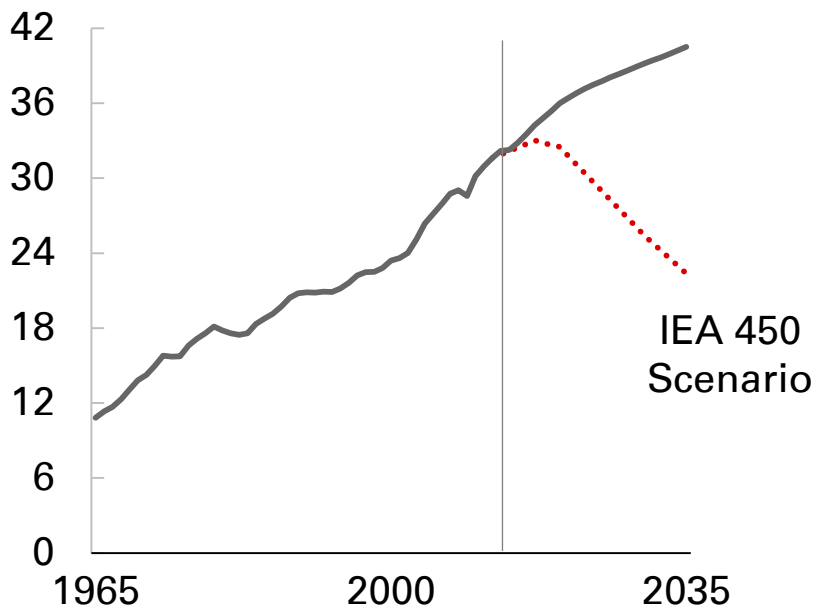
Billion tonnes CO<sub>2</sub>



# Carbon emissions: some possible options

## Global emissions

Billion tonnes CO<sub>2</sub>



## Options that achieve equal CO<sub>2</sub> emissions reductions

Abatement option	Change required
Replace coal with gas in power (% of total power)	1%
Add CCS to coal power plants (% of total power)	0.7%
Increase renewables power generation	11%
Increase nuclear power generation	6%
Improve vehicle efficiency	2%
Improve 'other sector' energy efficiency	1%
Improve efficiency of power production	1%

# Conclusion

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## Continuous change is the norm for energy markets

- Changing energy mix

- gas fastest growing fossil fuel, coal the slowest
- continued rapid growth in renewables



- Changing energy trade patterns

- increasingly flowing from West to East

- Changing the carbon emissions path?

- no silver bullet, need action on many fronts
- let the market pick the winners



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