

# Global energy trends and gas in a decarbonising energy system

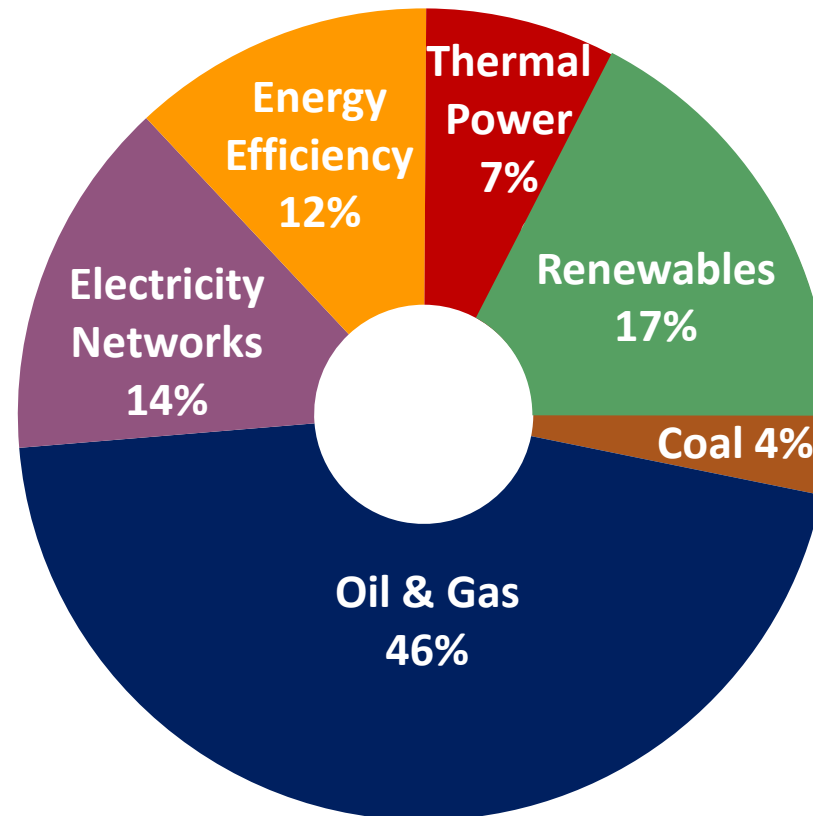
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- Investment is the lifeblood of the energy system, which determines long-term trends of supply, emissions and fuel demand
- Investors face new challenges and opportunities from recent trends
  - Macroeconomic uncertainty and structural change affects demand patterns
  - The energy sector faces accelerated technological change
  - Lower energy prices and increasing inter-fuel competition reshape investment
- Global energy investment declined in 2015, mainly due to lower oil and gas spending
- Share of renewables in investment boosted by technology progress, strong policy support and growth in good resource markets

# Investment flows signal a reorientation of the global energy system

## Global Energy Investment, 2015

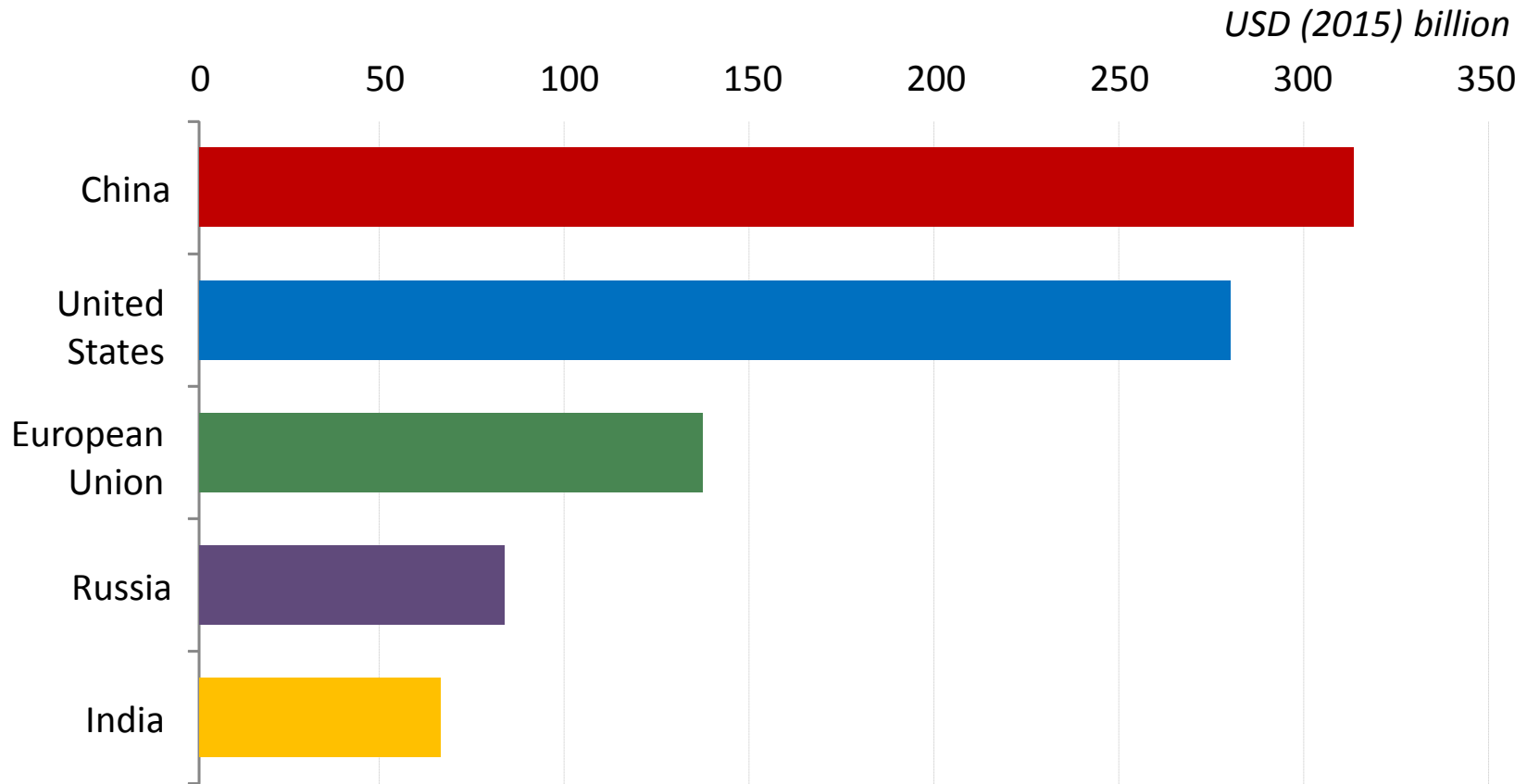
USD 1.8 trillion



*An 8% reduction in 2015 global energy investment results from a \$200 billion decline in fossil fuels, while the share of renewables, networks and efficiency expands*

# Top five markets comprised over half of global energy supply investment

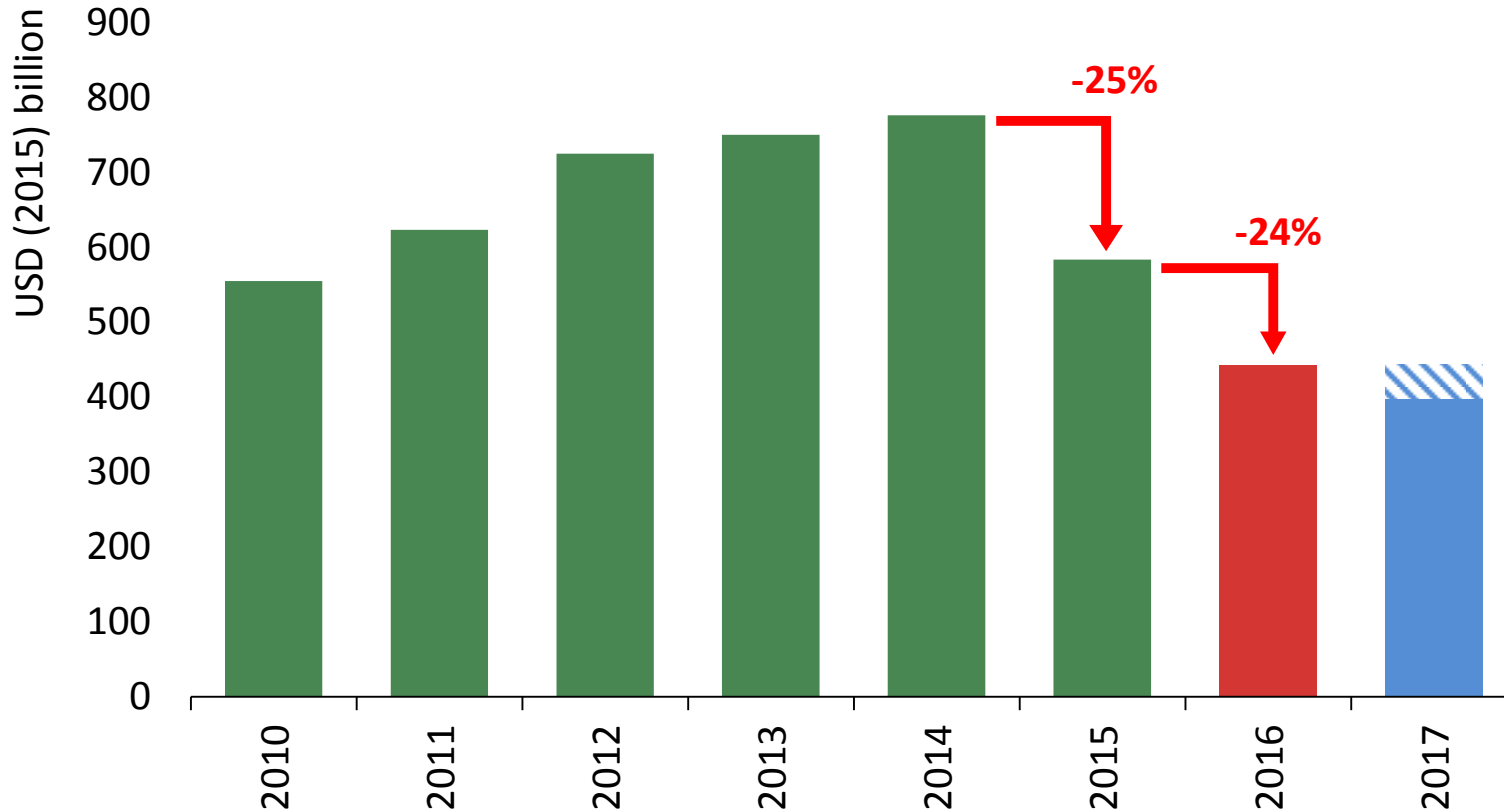
## Energy supply investment in 2015, selected markets



***Boosted by record power sector spending, China regains its position as top investment market, while the US declines due to sharply lower oil and gas investment***

# Unprecedented wave of investment cuts in the upstream oil and gas industry

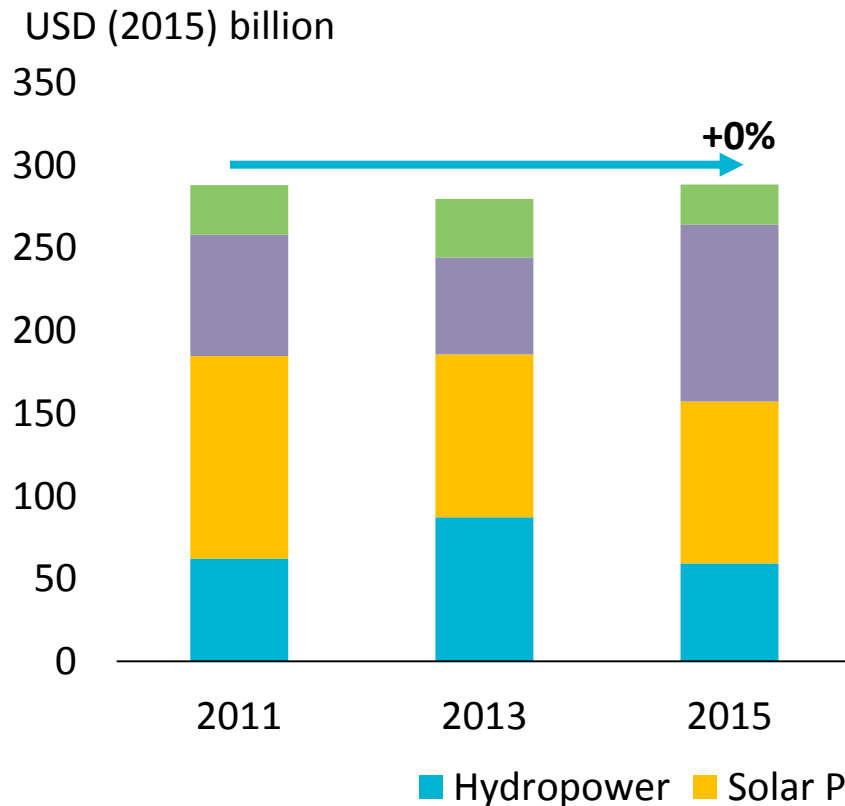
## Global upstream capital spending 2010-2017



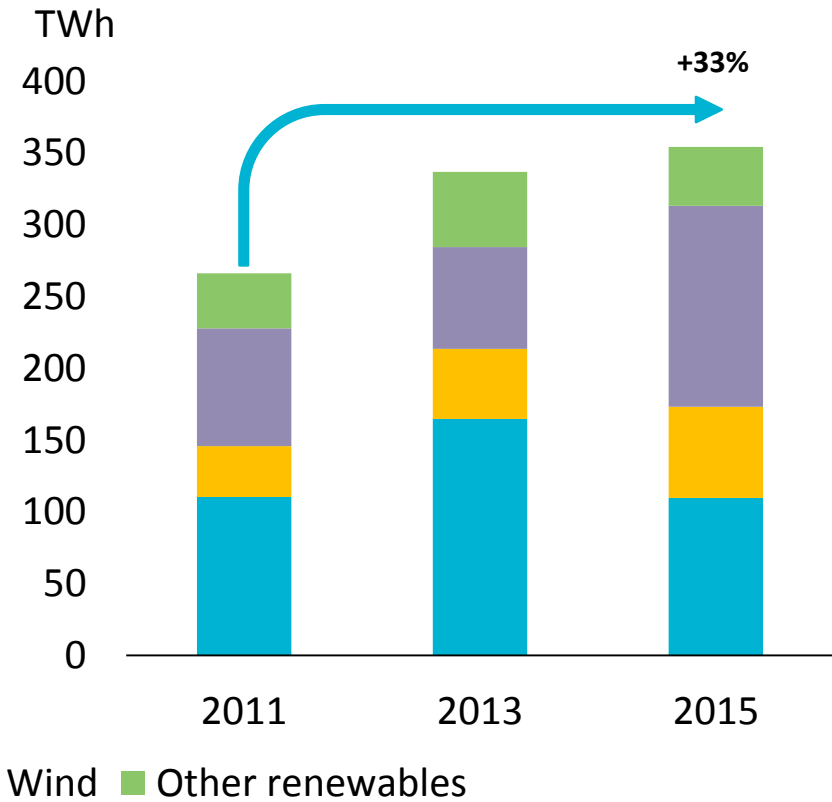
***Cost deflation, efficiency improvements and reduced activity levels might lead for the first time to three consecutive years of investment decline***

# Renewables investment buys much more electricity

## Global renewable power investment



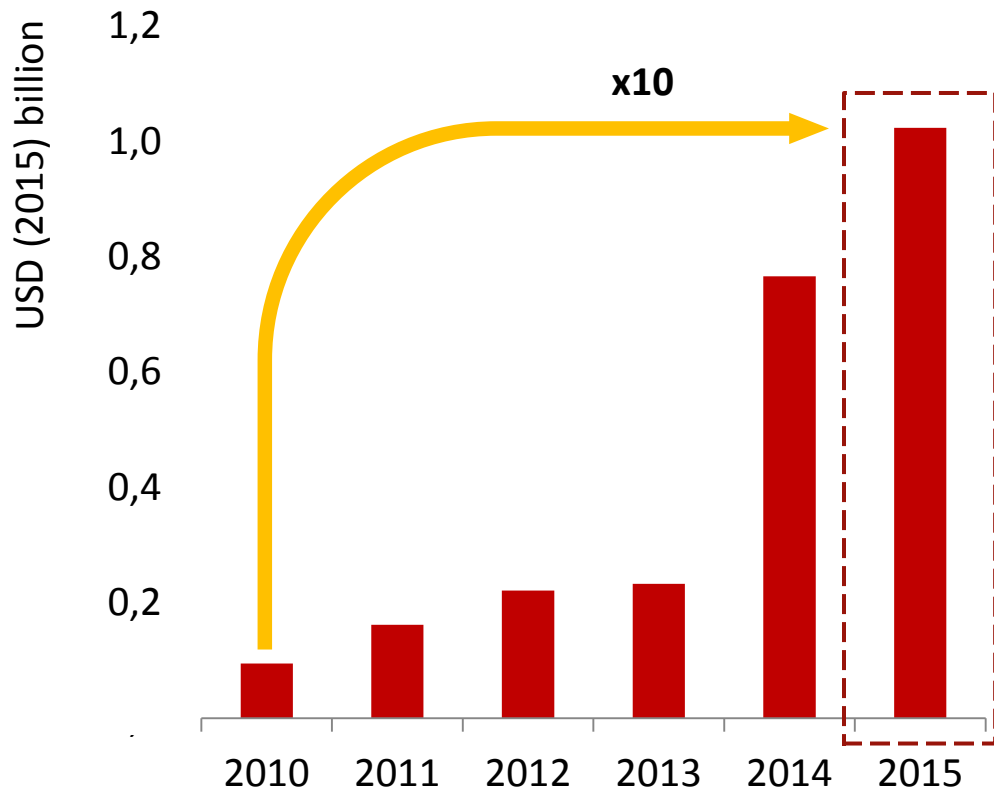
## Expected generation from investment



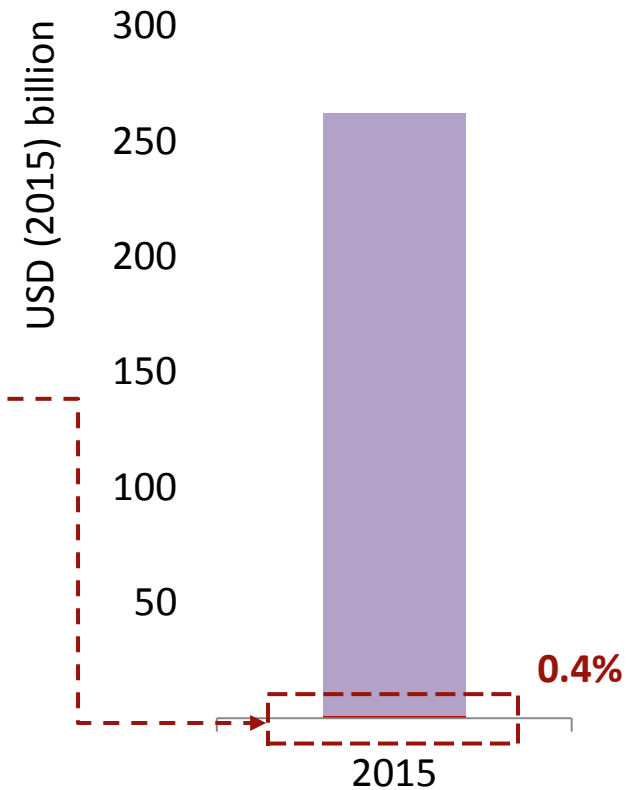
***Investment in renewables-based capacity more than covers 2015 global electricity growth. Wind leads, surging 35% in 2015 on economics and record offshore growth***

# In electricity networks, batteries accelerate though grids comprise most investment growth

## Global grid-scale battery storage investment



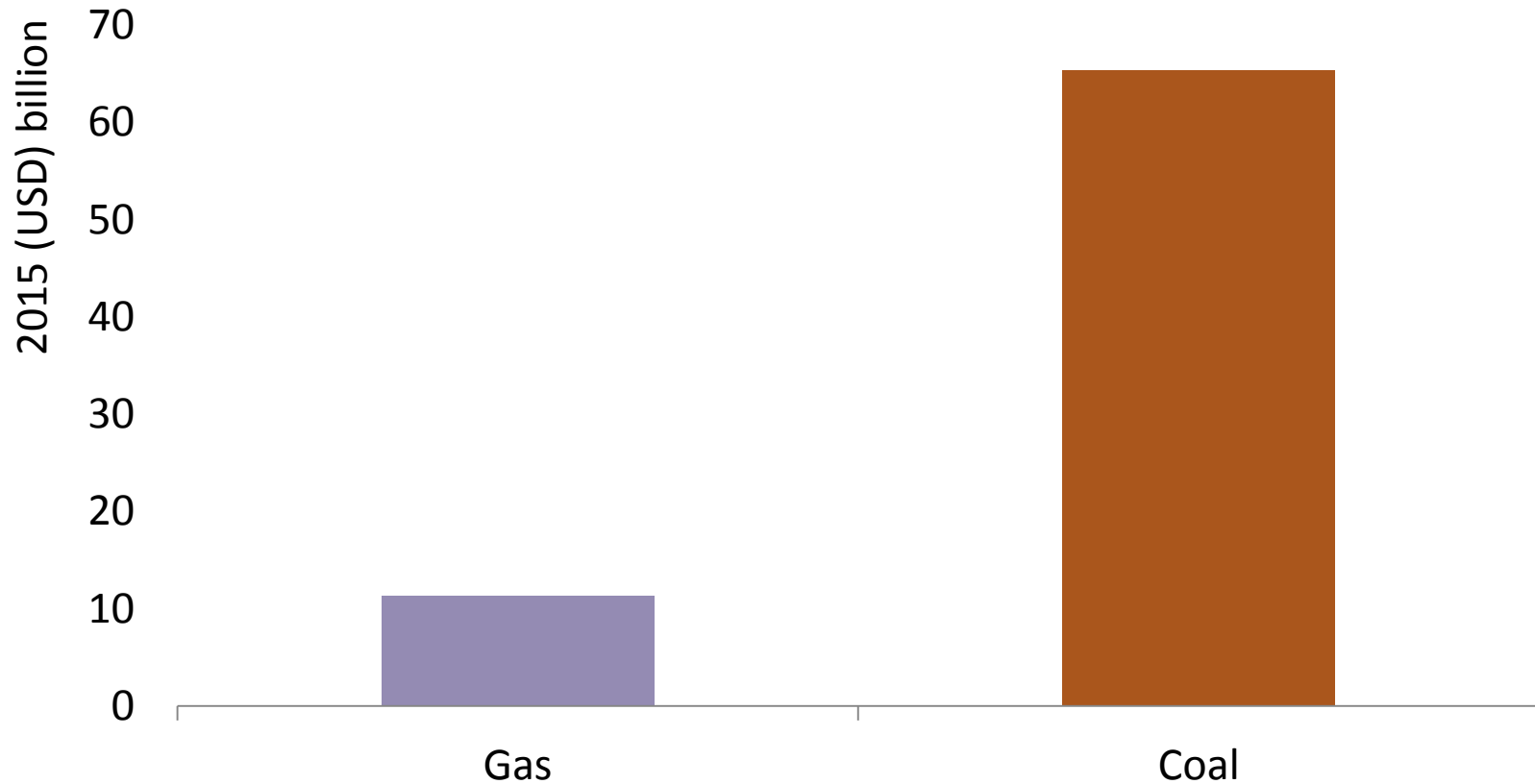
## Total networks investment



***Grid-scale battery storage spending has expanded tenfold since 2010. Their value lies most in complementing grids that constitute the bulk of investment***

# Infrastructure costs favour coal power over gas in Asian energy importers

## Coal and gas-fired power investment in Asian markets (2015)



***Asian markets comprised 85% of global coal power investment, while N. America and Middle East, with robust infrastructure, favoured gas for new fossil fuel power***

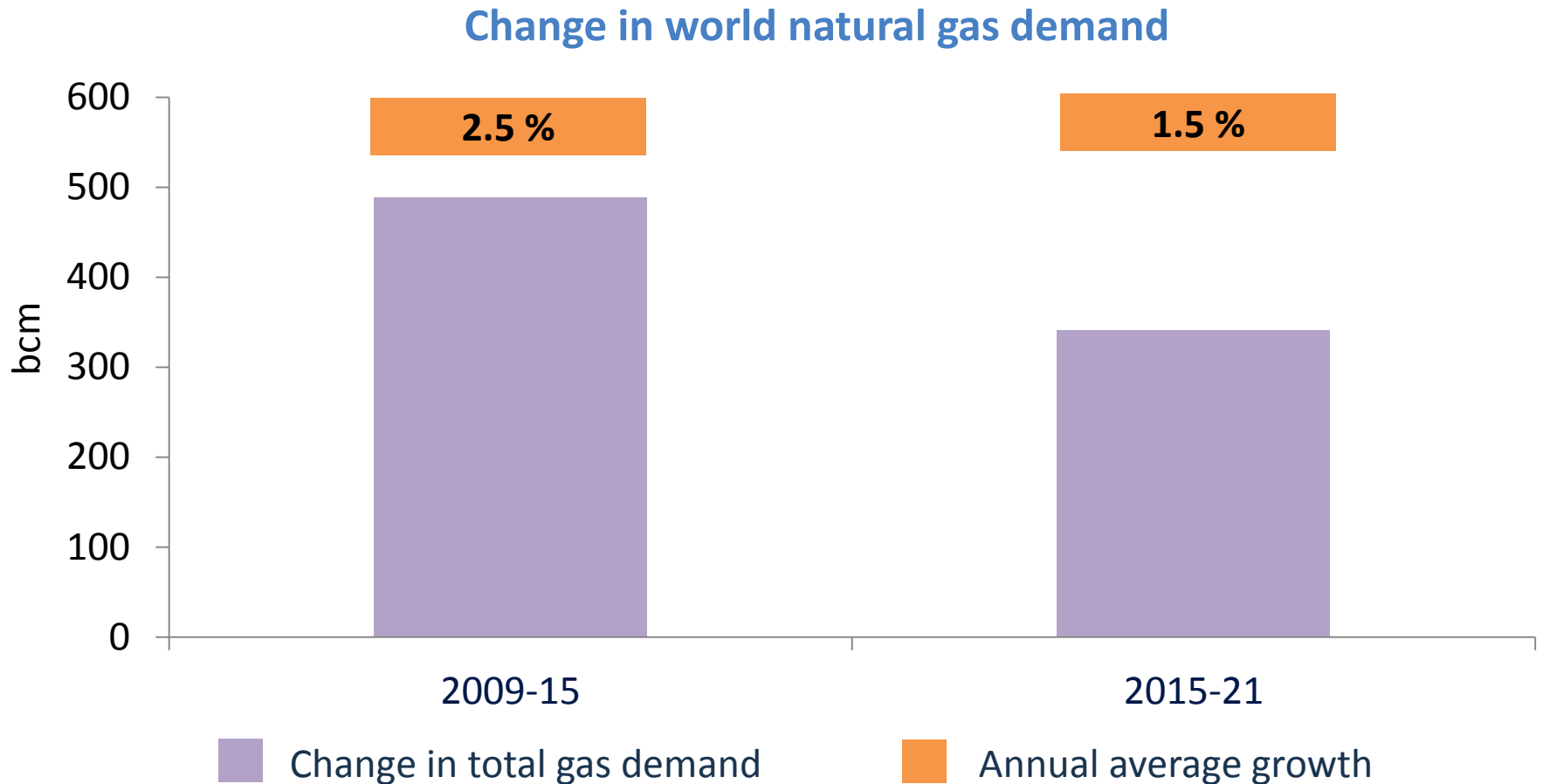


... but there's a tough climb still ahead



*We made it to the base camp...*

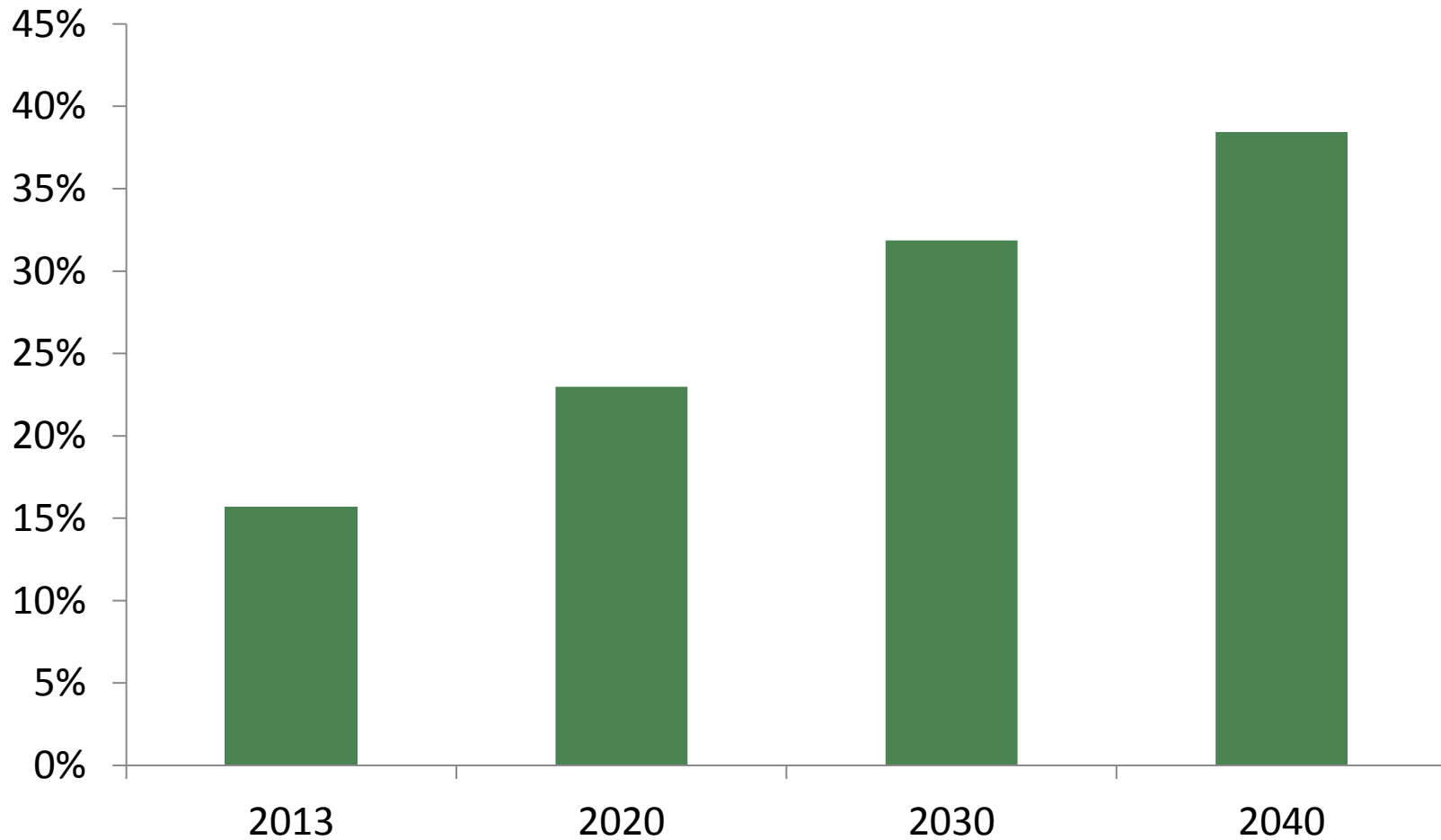
# Growth in global gas demand slows



***Growth in gas demand slows as it faces greater competition in the power sector; yet it is the only fossil fuel that does not suffer a decline in its share of the energy mix***

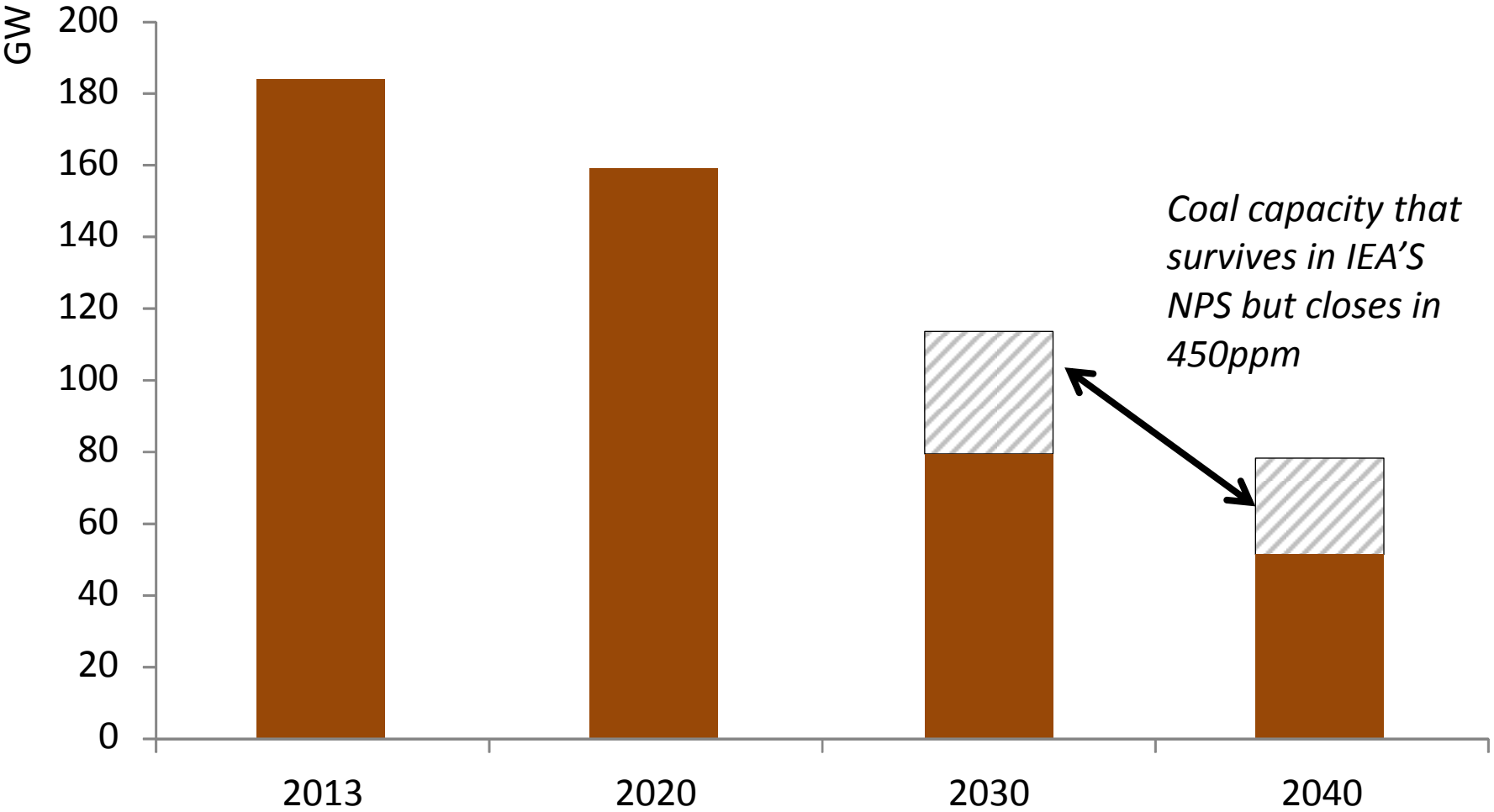
# Growth of renewables: a taste of things to come

## Share of non-hydro renewables in Europe's power generation

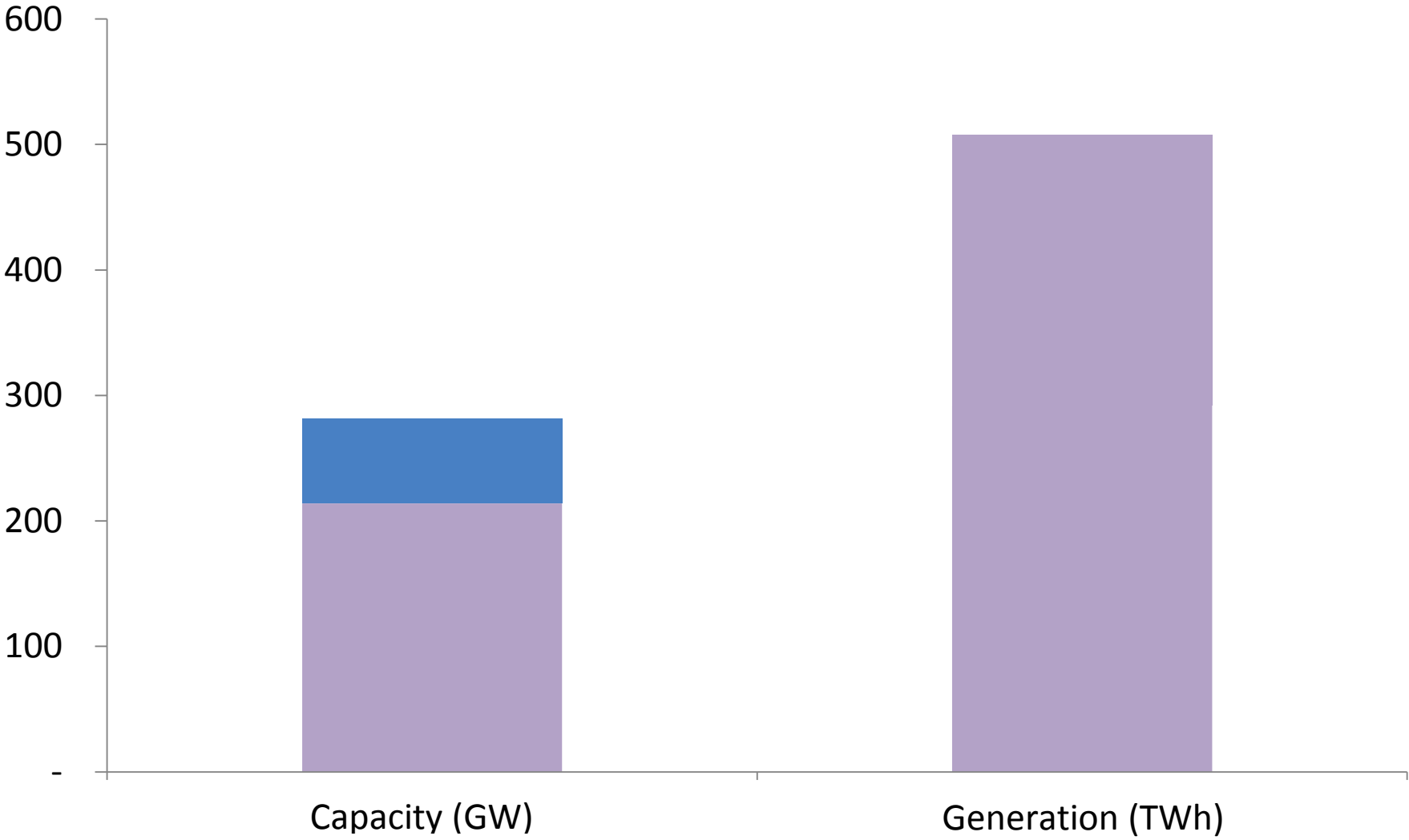


# Capacity to burn cheap coal is slowly disappearing

### Coal capacity in Europe to 2040



# Gas is needed for around 1,000 hours a year in a 450ppm system ... but then it is really needed!





**Thank you for your attention**