

# The Global Energy Landscape



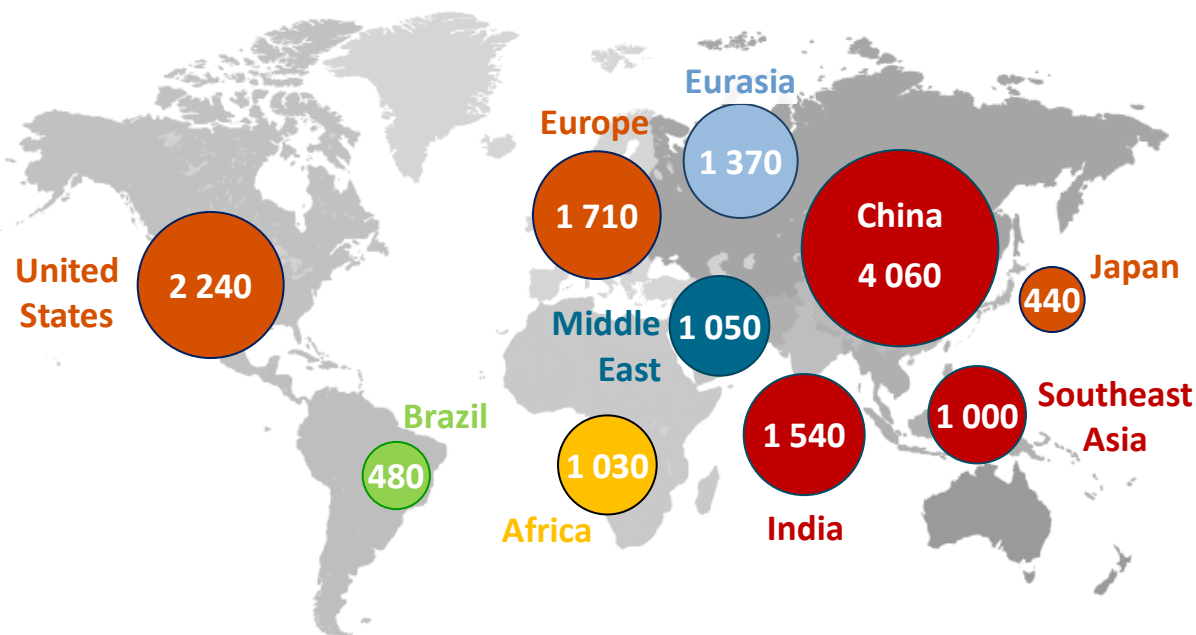
**Maria van der Hoeven**  
**Executive Director**  
**International Energy Agency**

**Monaco-ITER Fusion Energy Days**  
**2 December**

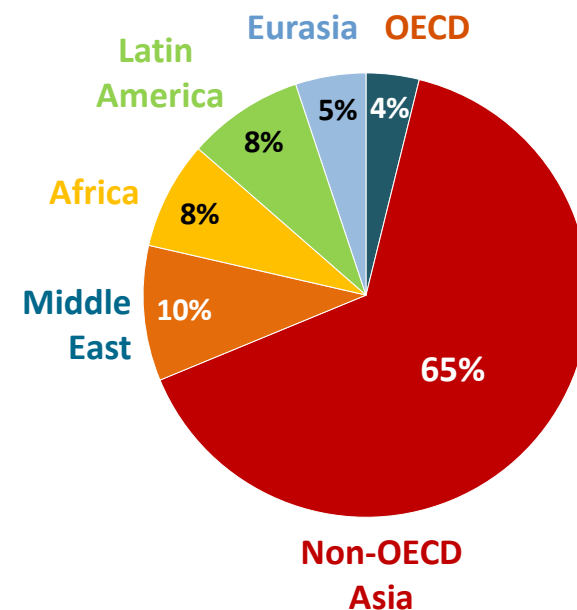
- Some long-held tenets of the energy sector are being rewritten
  - *Countries are switching roles: importers are becoming exporters...*
  - *... and exporters are among the major sources of growing demand*
  - *New supply options reshape ideas about distribution of resources*
  
- But long-term solutions to global challenges remain scarce
  - *Renewed focus on energy efficiency, but CO<sub>2</sub> emissions continue to rise*
  - *Fossil-fuel subsidies increased to \$544 billion in 2012*
  - *1.3 billion people lack electricity, 2.6 billion lack clean cooking facilities*
  
- Energy prices add to the pressure on policymakers
  - *Sustained period of high oil prices without parallel in market history*
  - *Large, persistent regional price differences for gas & electricity*

# The engine of energy demand growth moves to South Asia

## Primary energy demand, 2035 (Mtoe)



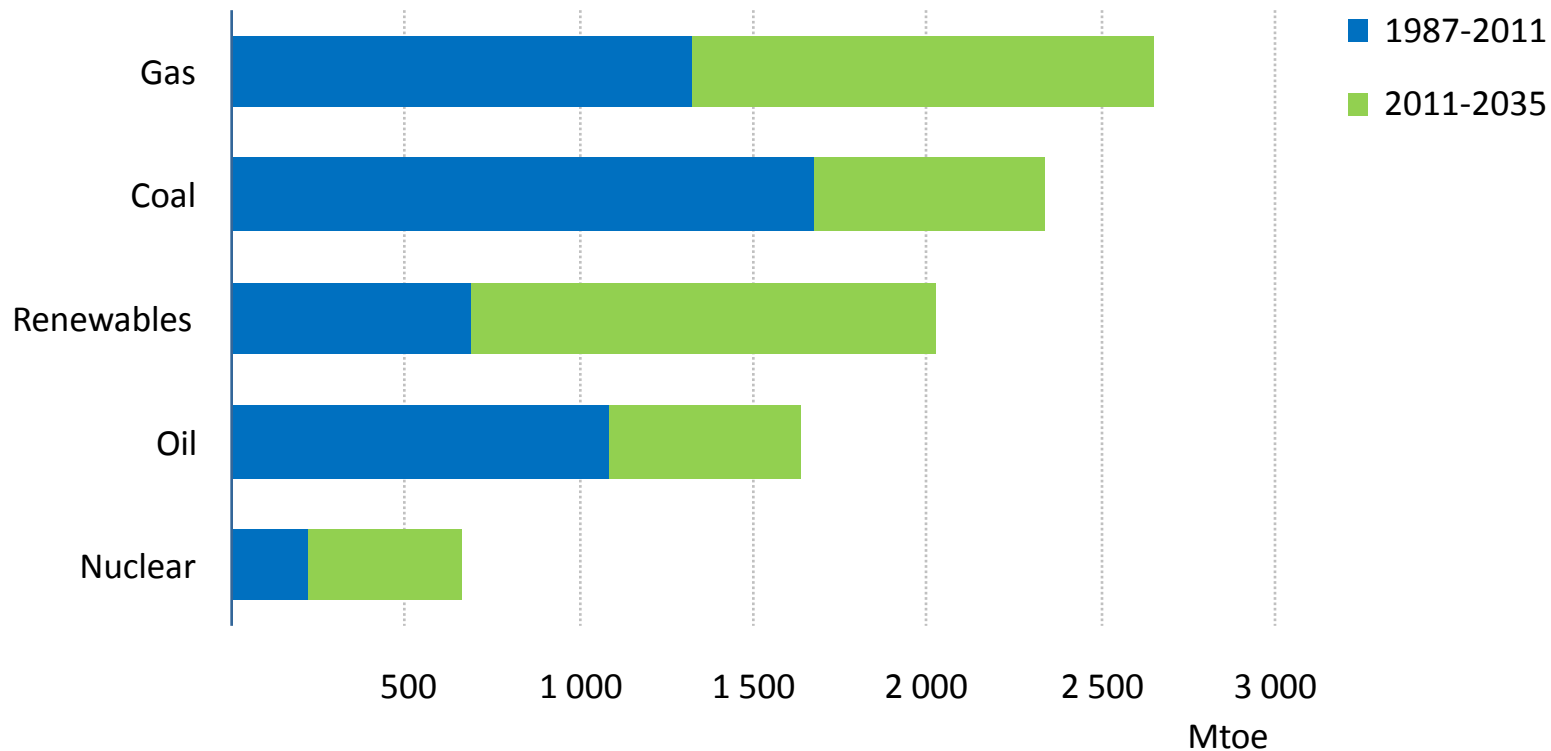
## Share of global growth 2012-2035



***China is the main driver of increasing energy demand in the current decade, but India takes over in the 2020s as the principal source of growth***

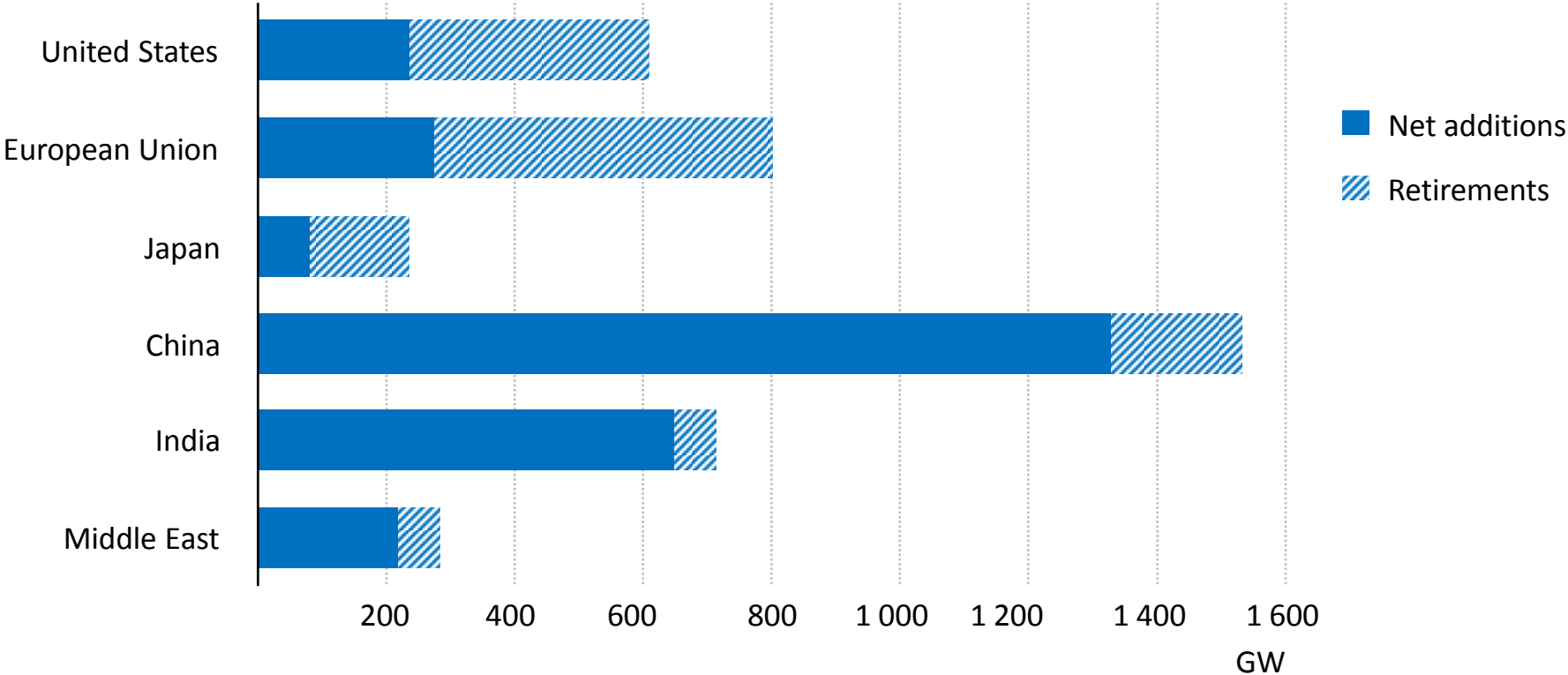
# A mix that is slow to change

## Growth in total primary energy demand



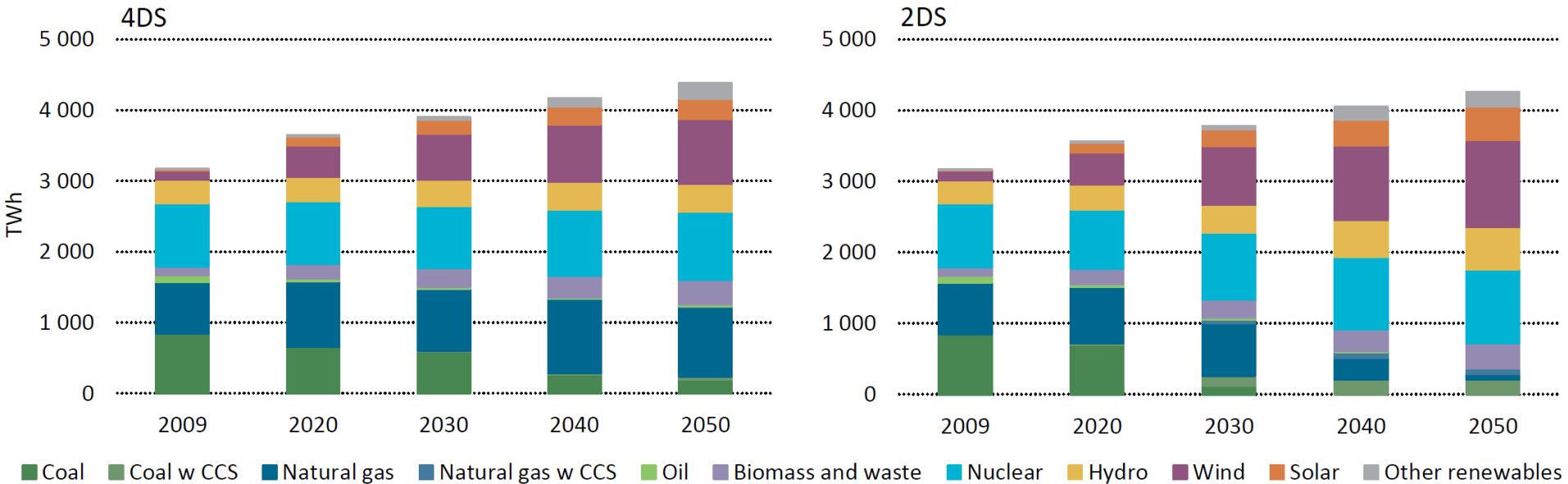
***Today's share of fossil fuels in the global mix, at 82%, is the same as it was 25 years ago; the strong rise of renewables only reduces this to around 75% in 2035***

## Power generation capacity additions and retirements, 2013-2035



**Together, China and India build almost 40% of the world's new capacity; 60% of capacity additions in the OECD replace retired plants**

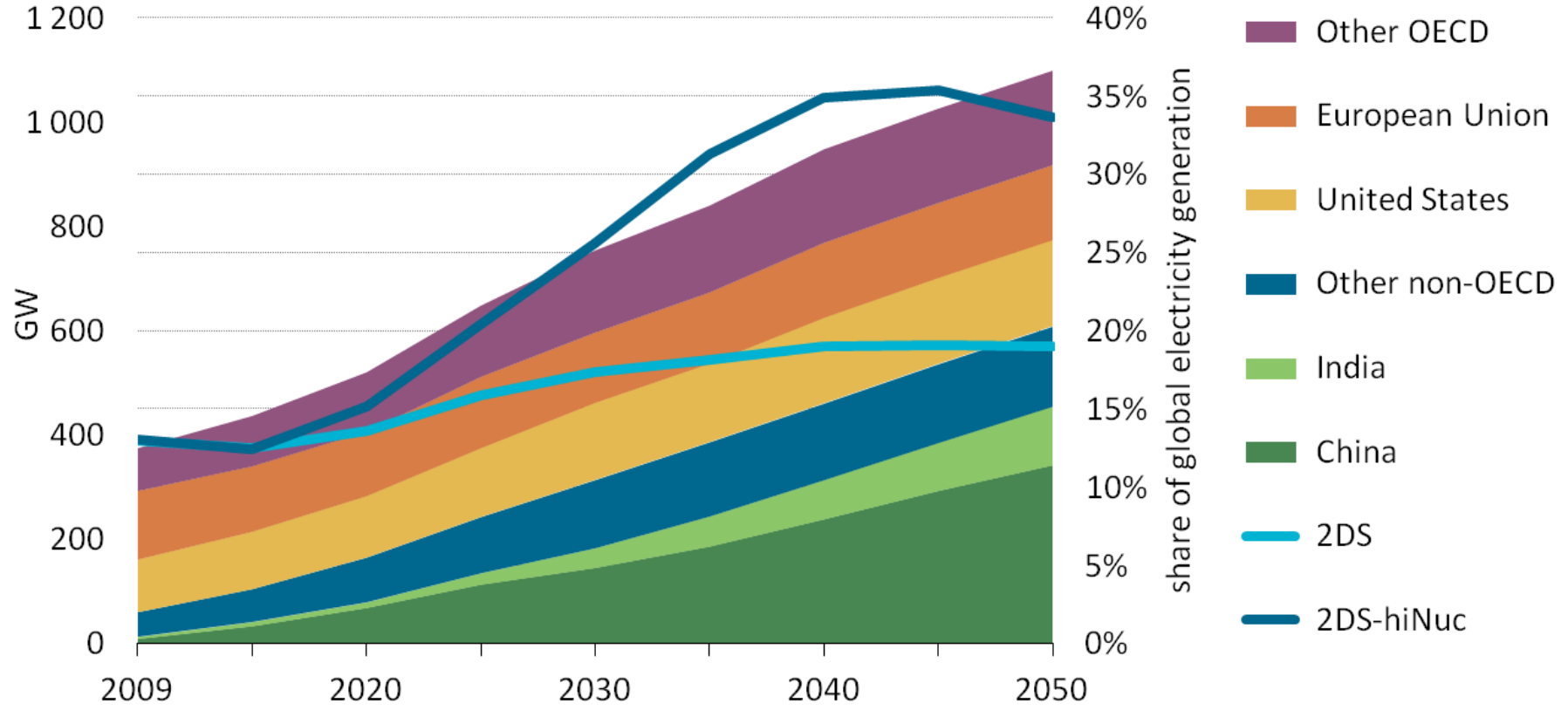
# Renewables dominate growth and nuclear holds its position in Europe



*Renewables cover two-thirds of the electricity mix in 2050 in the 2DS, with wind power alone reaching a share of 30% in the mix*

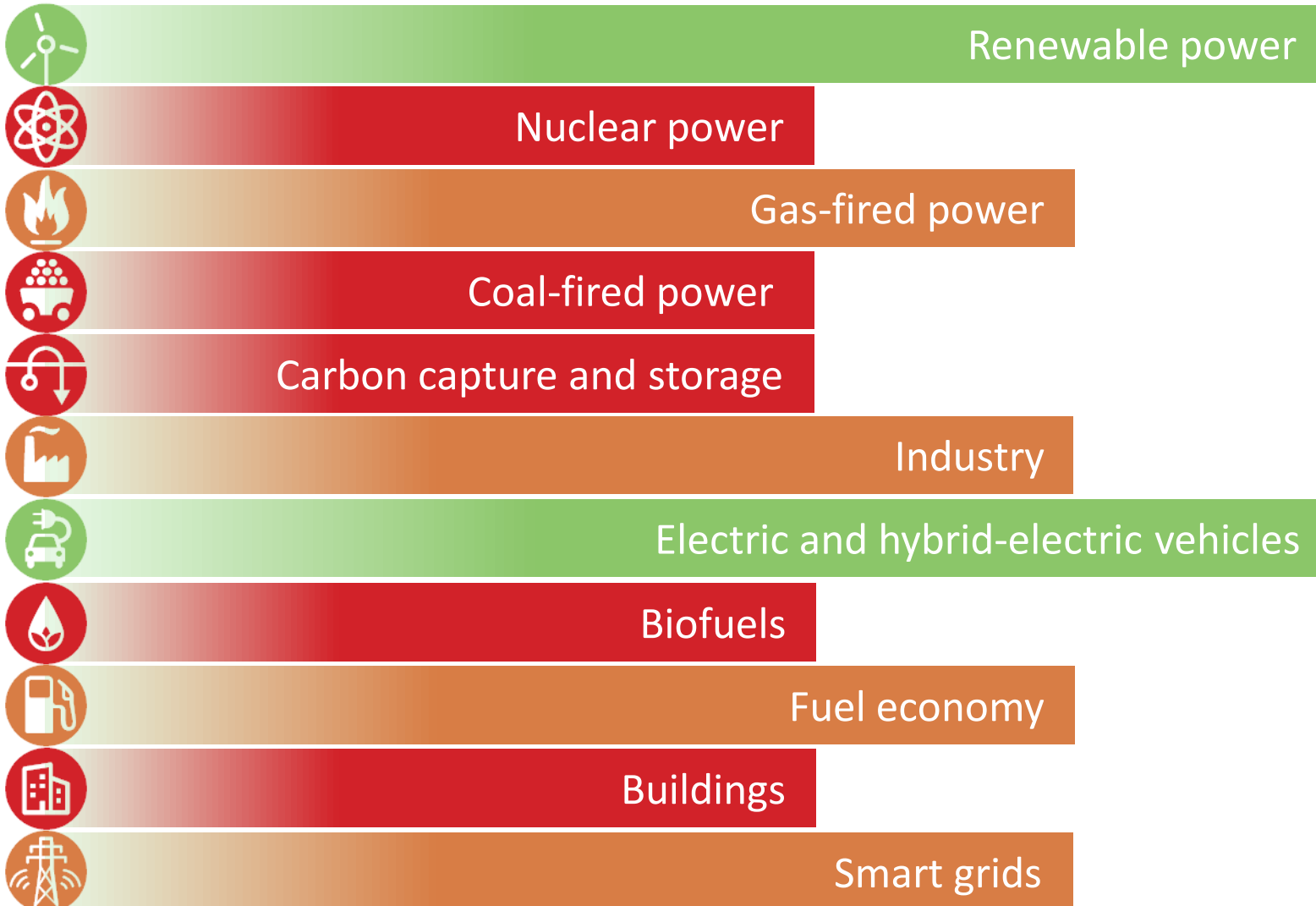
# Nuclear remains important worldwide

## Nuclear capacity and electricity generation



*Capital cost inflation and project management hurdles will make mobilization of investment challenging*

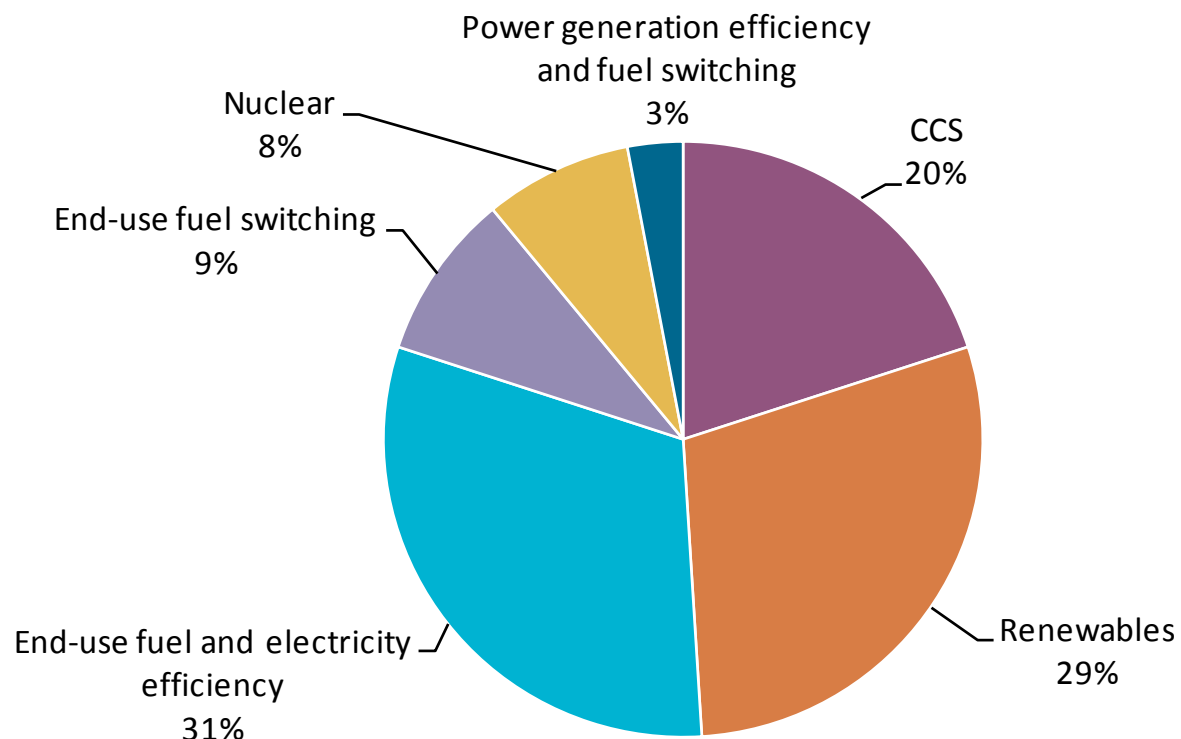
# Tracking technology progress





# A portfolio of technologies is needed

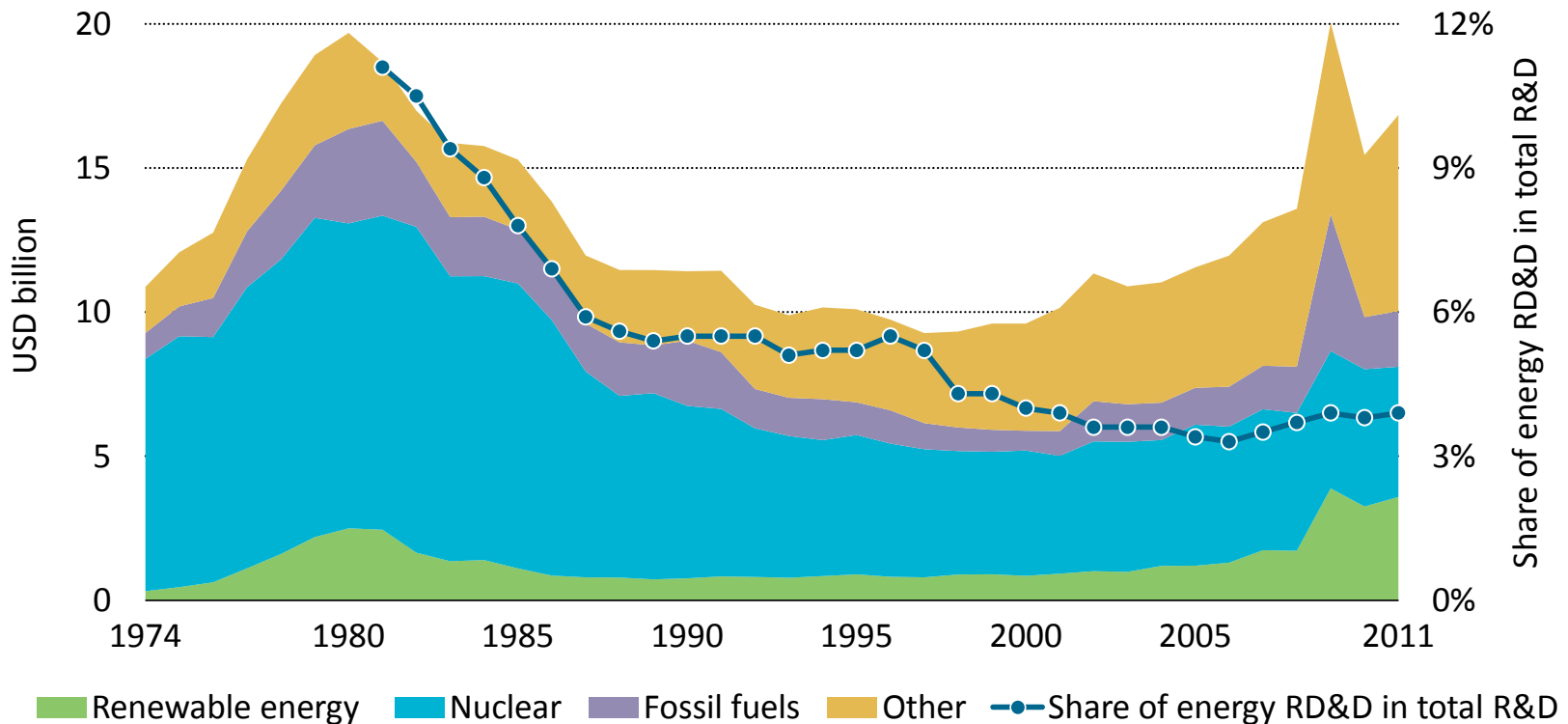
## Technology contributions to reaching the 2DS vs 4DS



*Energy policy needs to maintain an open, flexible approach to all decarbonization options*

# Energy RD&D: declining share but more wisely spent

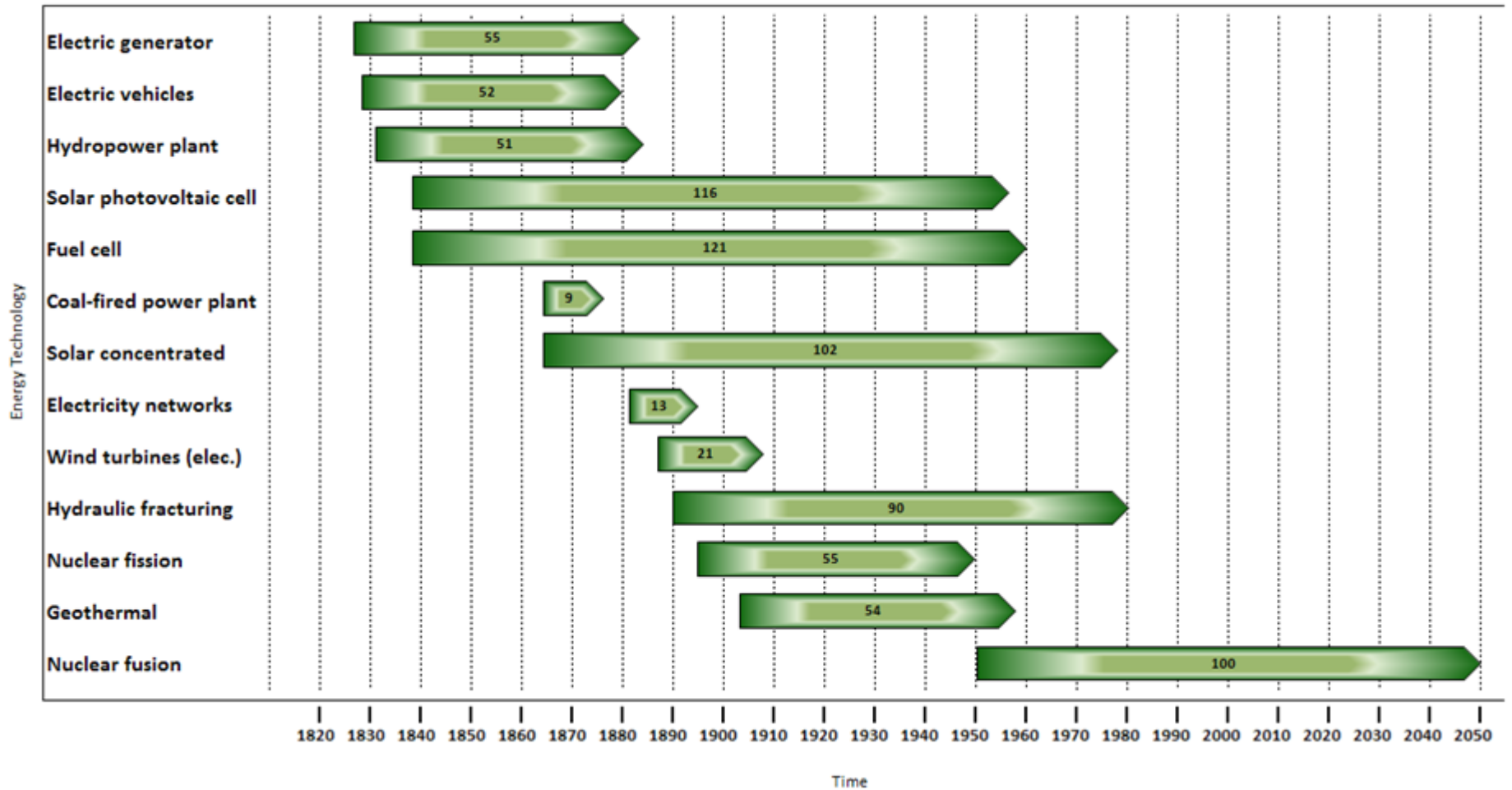
## IEA government RD&D expenditure



*Energy RD&D has slipped in priority in IEA member countries.*

- **Fusion is a potential game-changer for the next generation**
- **International research increases national resources and capacities**
- **The IEA supports fusion research worldwide through its collaborative network of technology initiatives (Implementing Agreements)**
- **Earning public acceptance will be key**

# Timeline – from discovery to initial deployment



Source: Based on IEA analysis.

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