

# ***World Energy Outlook 2010***

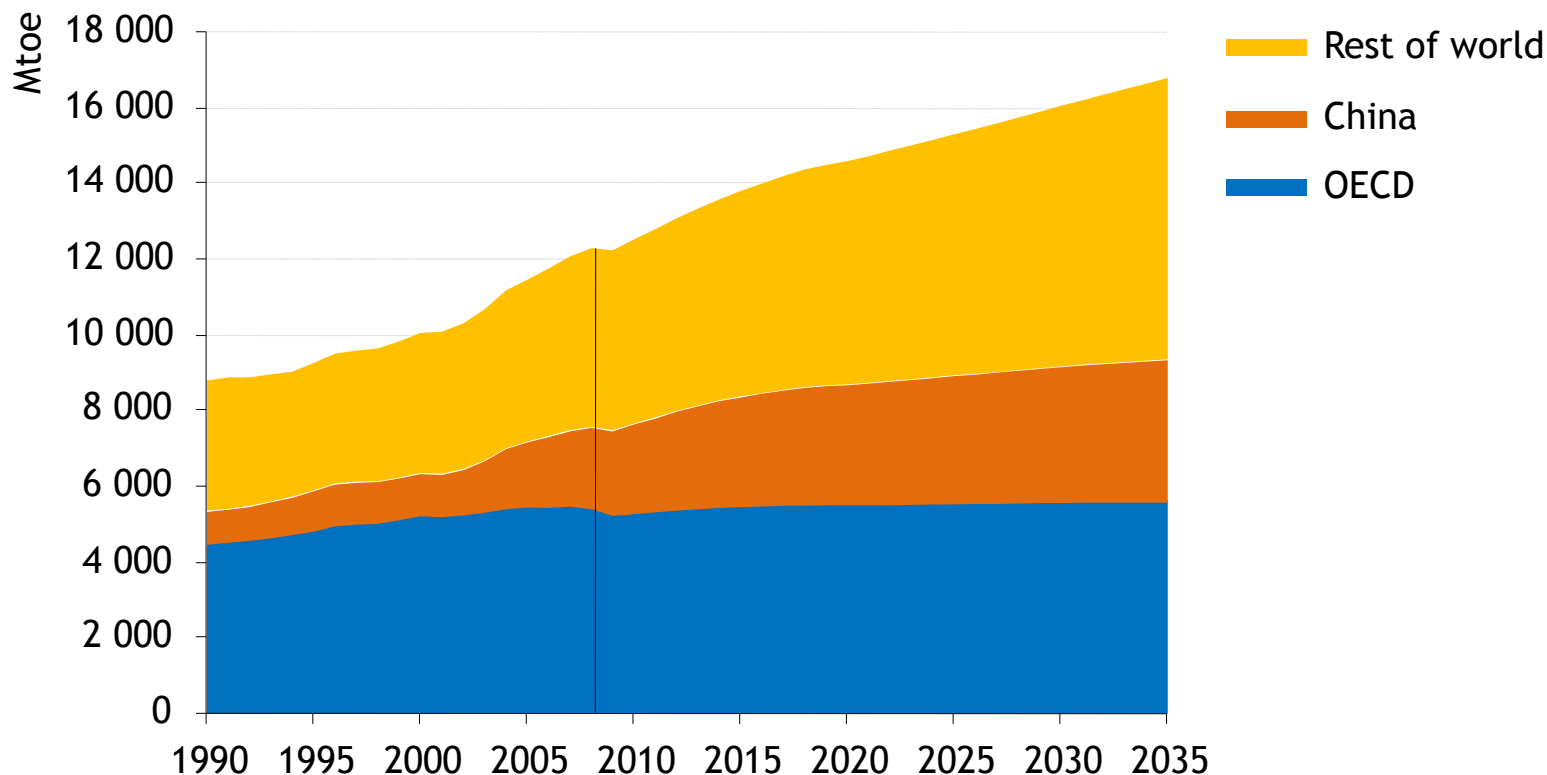
**Dr. Fatih Birol**  
**IEA Chief Economist**  
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# The context: *a time of unprecedented uncertainty*

- The worst of the global economic crisis appears to be over – *but is the recovery sustainable?*
- Oil demand & supply are becoming less sensitive to price – *what does this mean for future price movements?*
- Natural gas markets are in the midst of a revolution – *will it herald a golden era for gas?*
- Copenhagen Accord & G-20 subsidy reforms are key advances – *but do they go far enough & will they be fully implemented?*
- China & other emerging economies will shape the global energy future – *where will their policy decisions lead us?*

# Recent policy commitments, if implemented, would make a difference

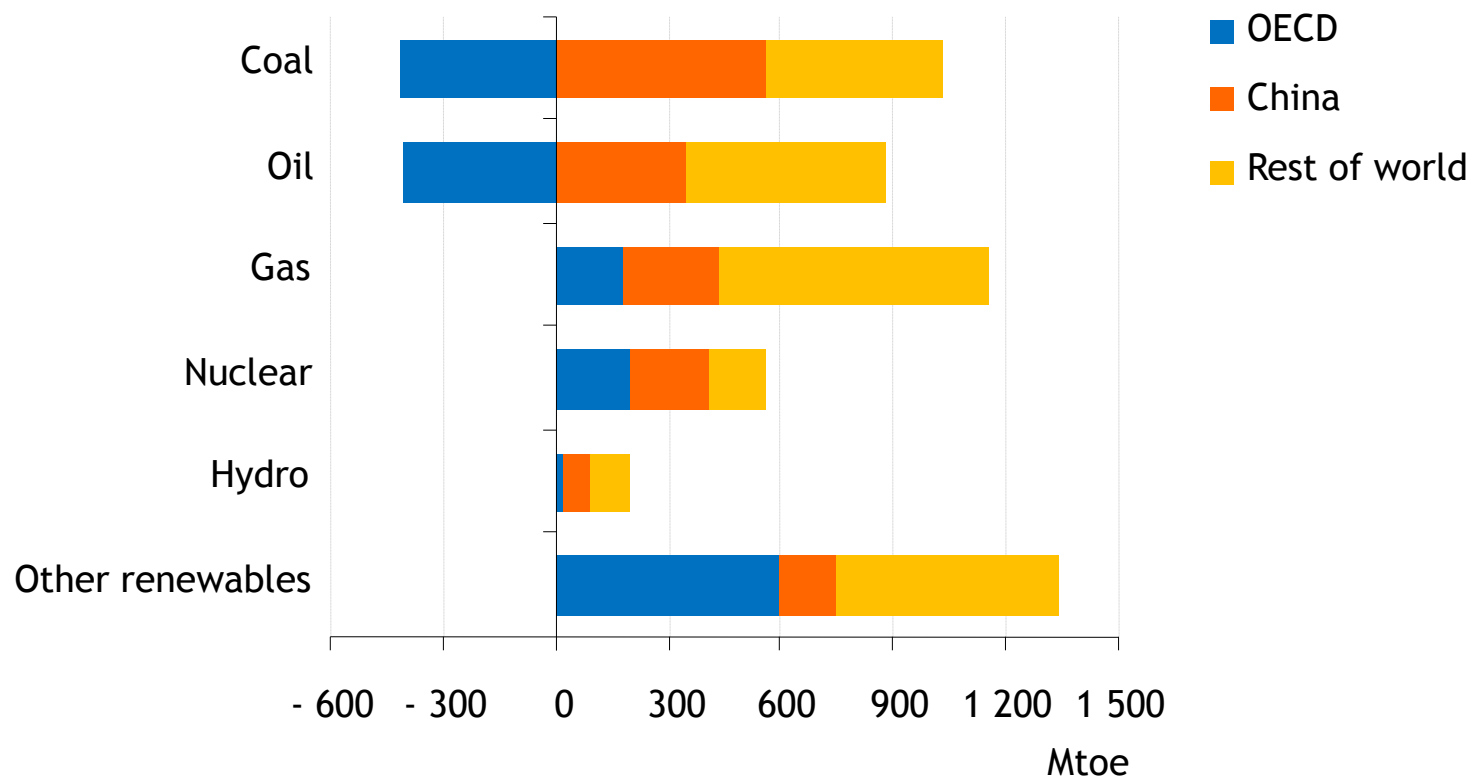
World primary energy demand by region in the New Policies Scenario



*Global energy use grows by 36%, with non-OECD countries – led by China, where demand surges by 75% – accounting for almost all of the increase*

# Emerging economies dominate the growth in demand for all fuels

## Incremental primary energy demand in the New Policies Scenario, 2008-2035

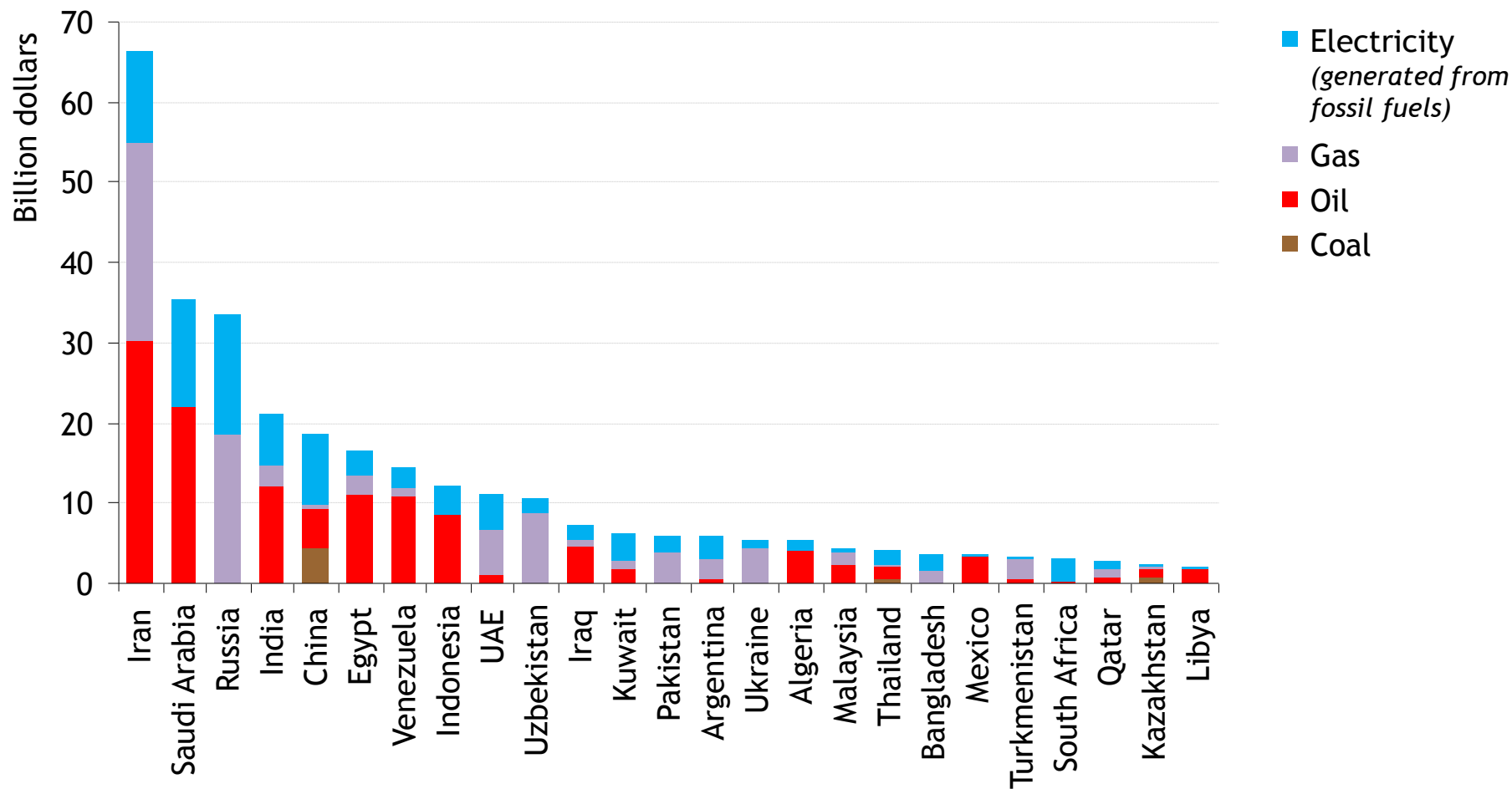


*Demand for all types of energy increases in non-OECD countries, while demand for coal & oil declines in the OECD*



# Fossil-fuel subsidies are distorting price signals

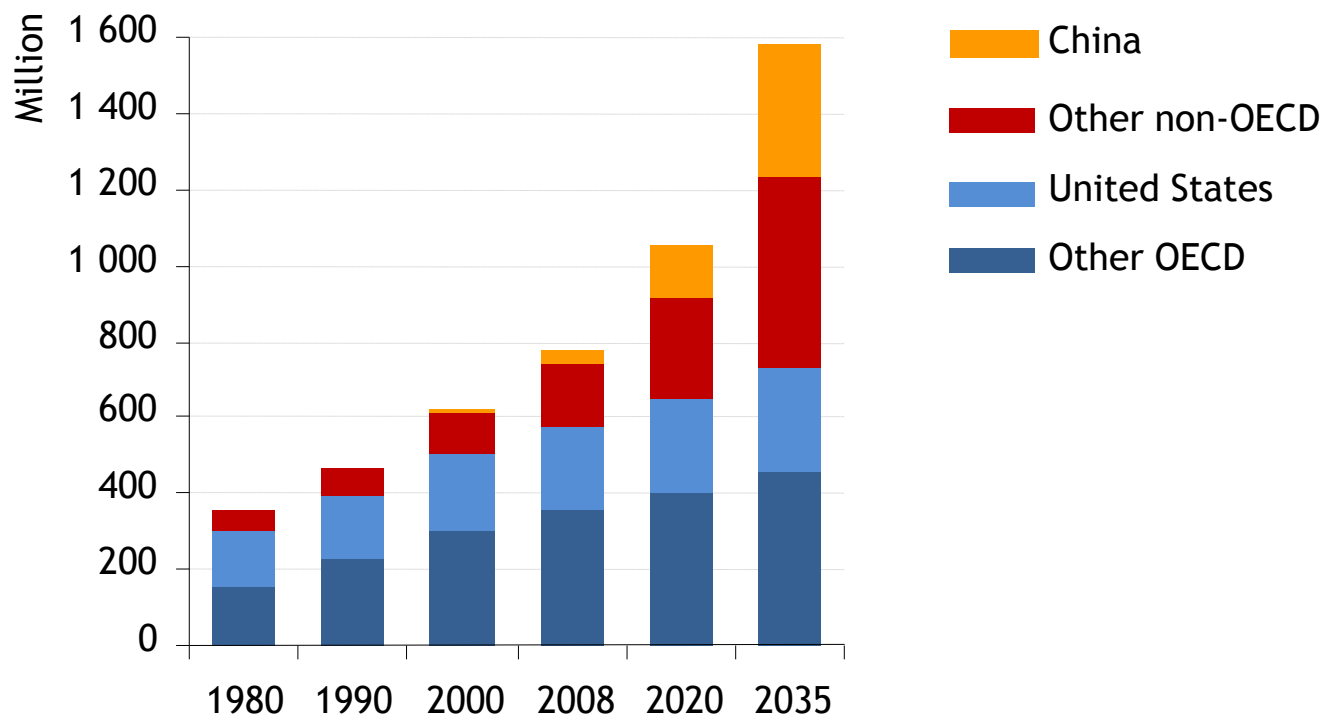
Economic value of fossil-fuel consumption subsidies by country, 2009



*Fossil-fuel consumption subsidies amounted to \$312 billion in 2009, down from \$558 billion in 2008, with the bulk of the fall due to lower international prices*

# Booming demand for mobility in the emerging economies drives up oil use

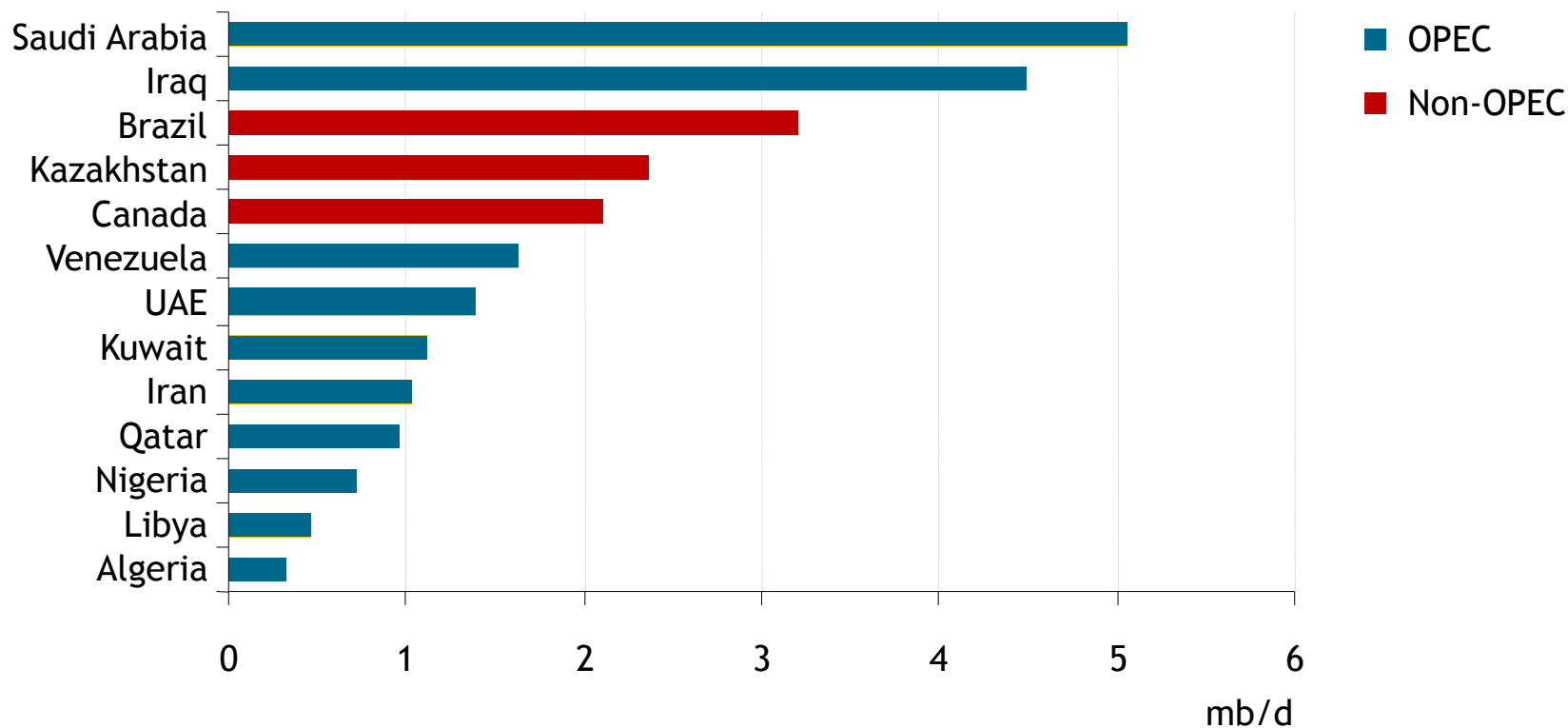
## Passenger vehicles in the New Policies Scenario



*The global car fleet will continue to surge as more & more people in China & other emerging economies buy a car, overshadowing modest growth in the OECD*

# More oil from fewer producers

## Incremental oil production by key country in the New Policies Scenario, 2009-2035



*Production rises most in Saudi Arabia & Iraq, helping to push OPEC's market share from 41% today to 52% by 2035, a level last seen prior to the first oil shock of 1973-1974*

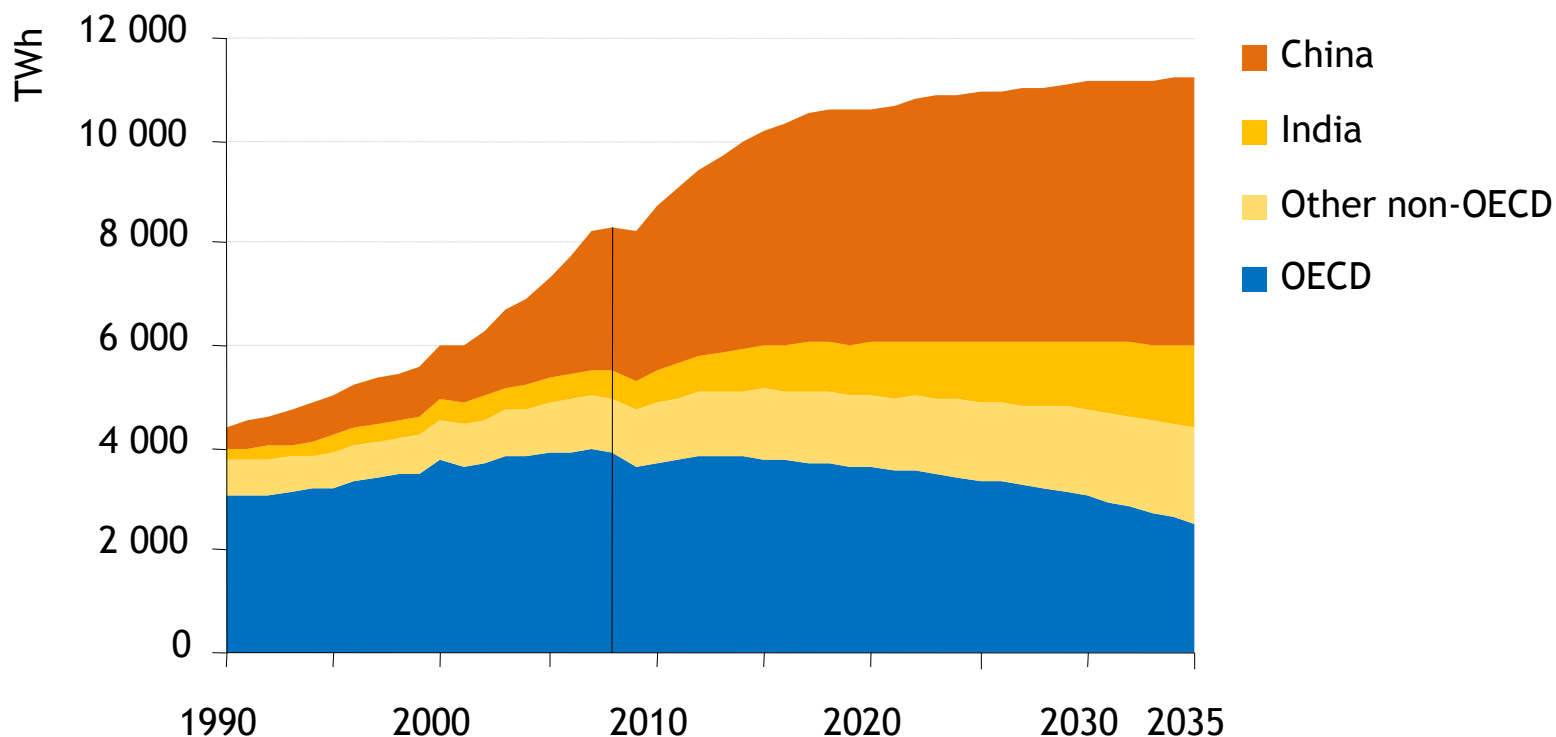
# A golden age for gas?

- Gas is set to play a key role in meeting the world's energy needs
  - > *demand rises by 44% to 2035, led by China & Middle East*
- Unconventional gas accounts for 35% of the increase in global supply to 2035, with new non-US producers emerging
- Gas glut will peak soon, but may dissipate only very slowly
- The glut will keep pressure on gas exporters to move away from oil-price indexation, notably in Europe
- Lower prices could lead to stronger demand for gas, backing out renewables & coal in power generation



# Coal remains the backbone of global electricity generation

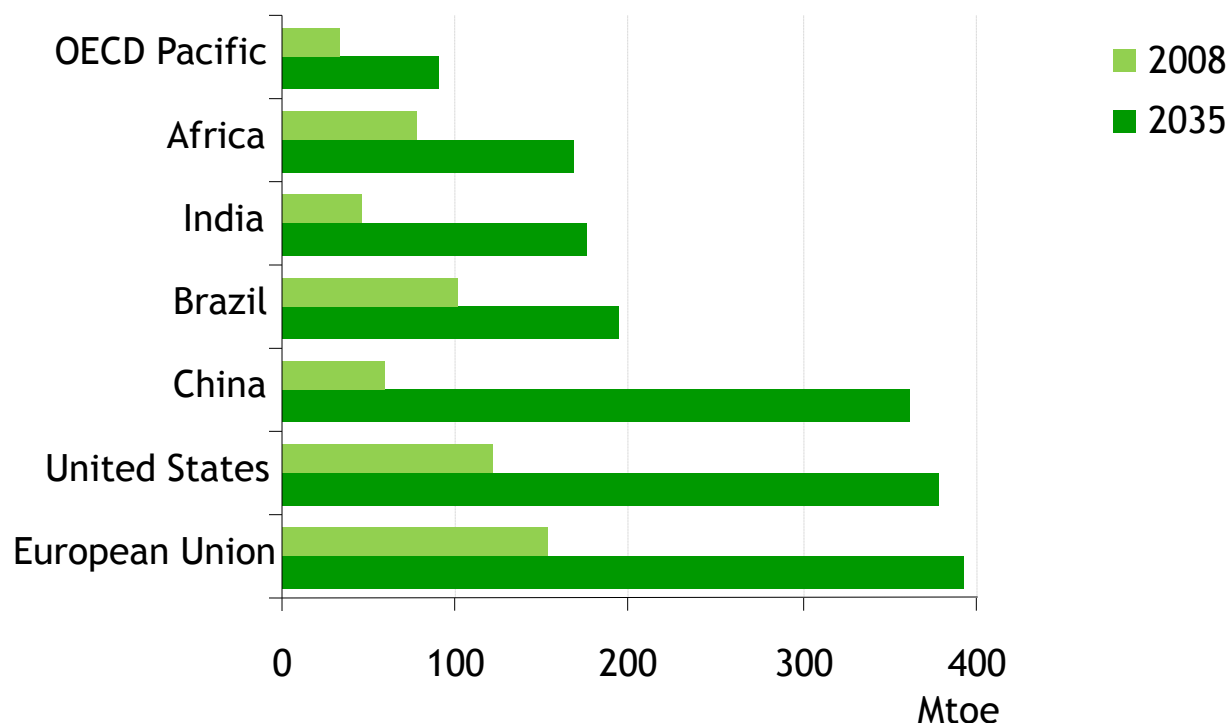
Coal-fired electricity generation by region in the New Policies Scenario



*A drop in coal-fired generation in the OECD is offset by big increases elsewhere, especially China, where 600 GW of new capacity exceeds the current capacity of the US, EU & Japan*

# Renewables enter the mainstream....

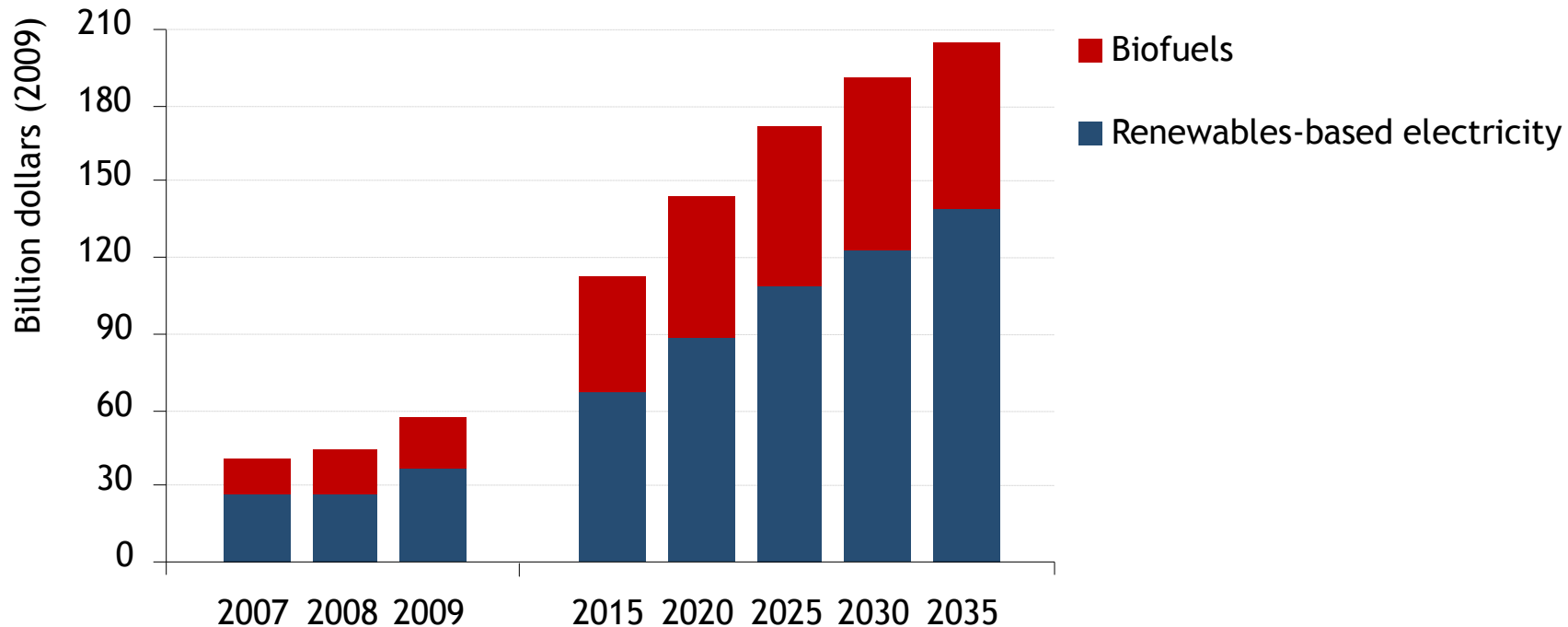
## Renewable primary energy demand in the New Policies Scenario



*The use of renewable energy triples between 2008 & 2035, driven by the power sector where their share in electricity supply rises from 19% in 2008 to 32% in 2035*

....but only if there is enough government support

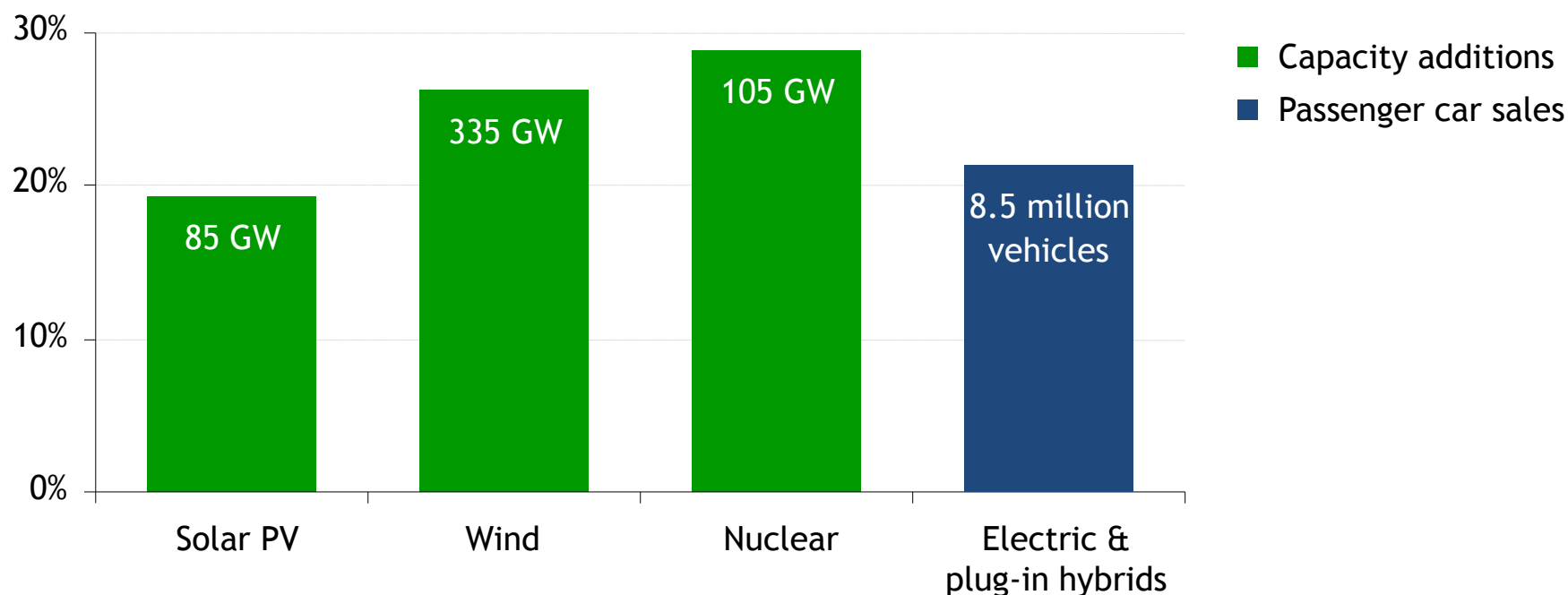
### Annual global support for renewables in the New Policies Scenario



*Government support remains the key driver – rising from \$57 billion in 2009 to \$205 billion in 2035 – but higher fossil-fuel prices & declining investment costs also spur growth*

# China becomes the market leader in low-carbon technologies

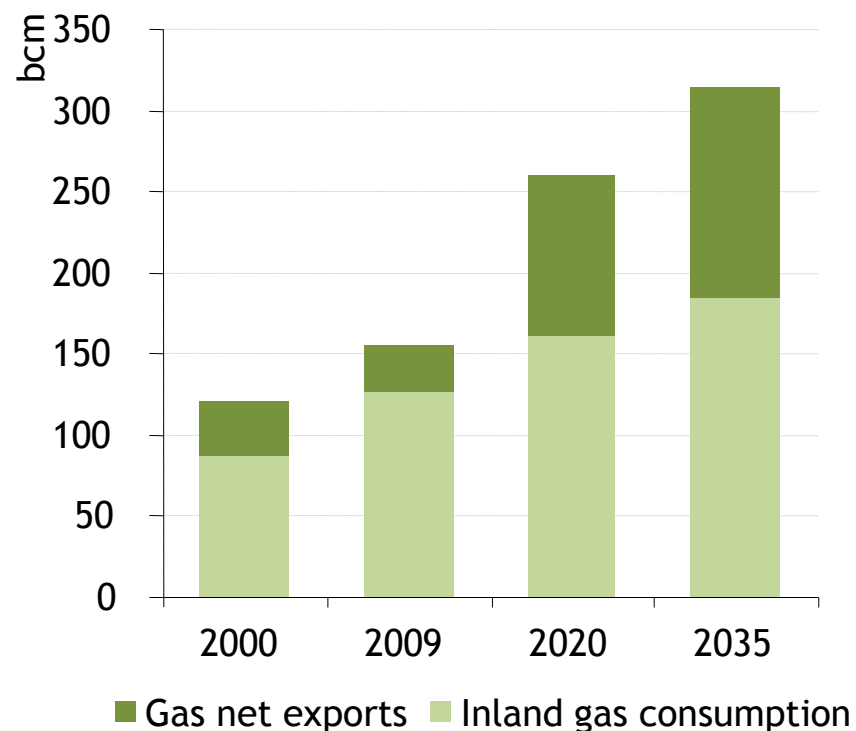
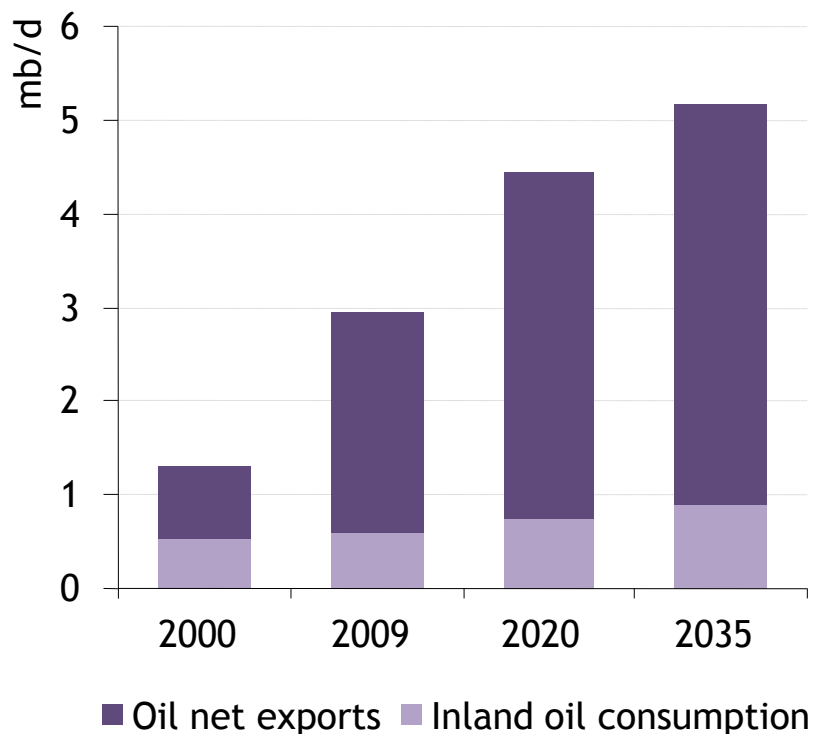
## China's share of cumulative global additions to 2035 for selected technologies



*Given the sheer scale of China's market, its push to expand the role of low-carbon energy technologies is poised to play a key role in driving down costs, to the benefit of all countries*

# Caspian energy riches could enhance global energy security

## Caspian oil & gas outlook in the New Policies Scenario



***Kazakhstan drives an increase in Caspian oil production to 5.2 mb/d by 2035, while Turkmenistan & Azerbaijan push up gas production to over 310 bcm***

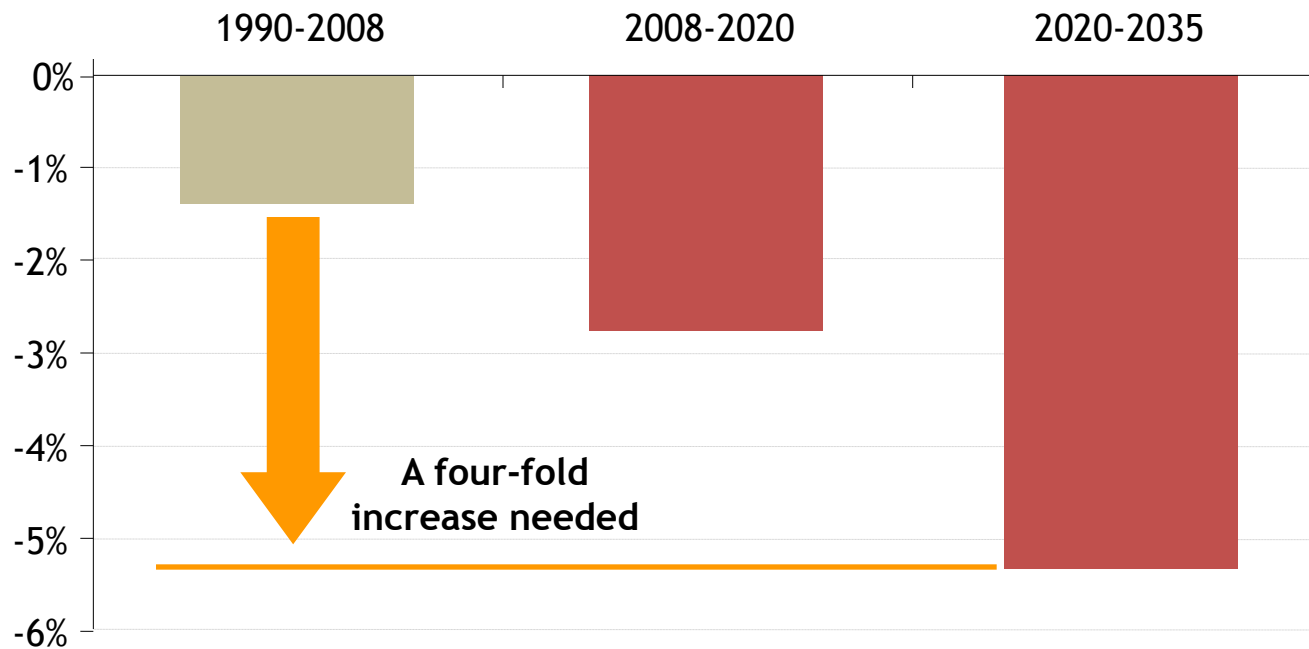


# The 450 Scenario: *a roadmap from 3.5°C to 2°C*

- The 450 Scenario sets out an energy pathway consistent with limiting the increase in temperature to 2°C
- Assumes vigorous implementation of Copenhagen Accord pledges to 2020 & much stronger action thereafter
- The failure of the Copenhagen Accord pledges:
  - > *As many lack transparency, there is 3.9 Gt of uncertainty over the level of abatement pledged to 2020*
  - > *As many lack ambition, the cost of achieving the 2 °C goal has increased by \$1 trillion in 2010-2030 compared with WEO-2009*

# Achieving the 2°C goal will require rapid decarbonisation of global energy

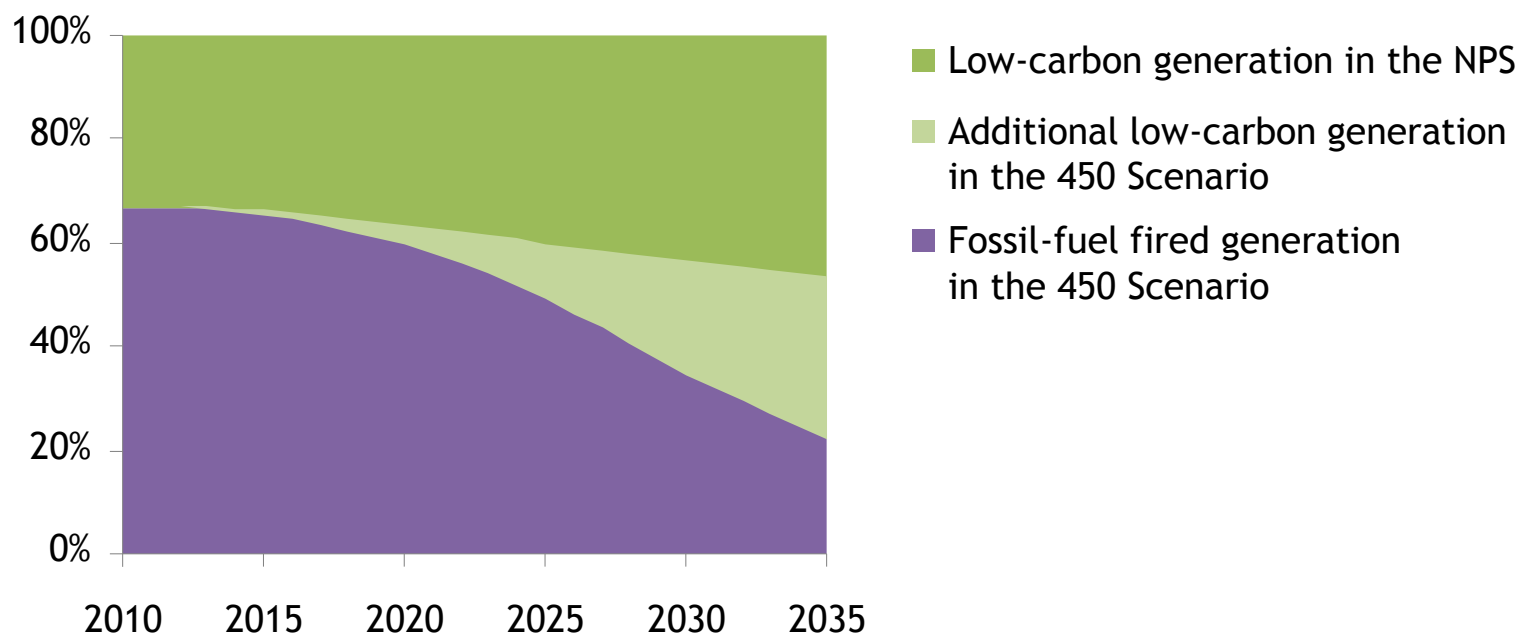
Average annual change in CO<sub>2</sub> intensity in the 450 scenario



*Carbon intensity would have to fall at twice the rate of 1990-2008 in the period 2008-2020 & almost four times faster in 2020-2035*

# A fundamental change is needed in power generation

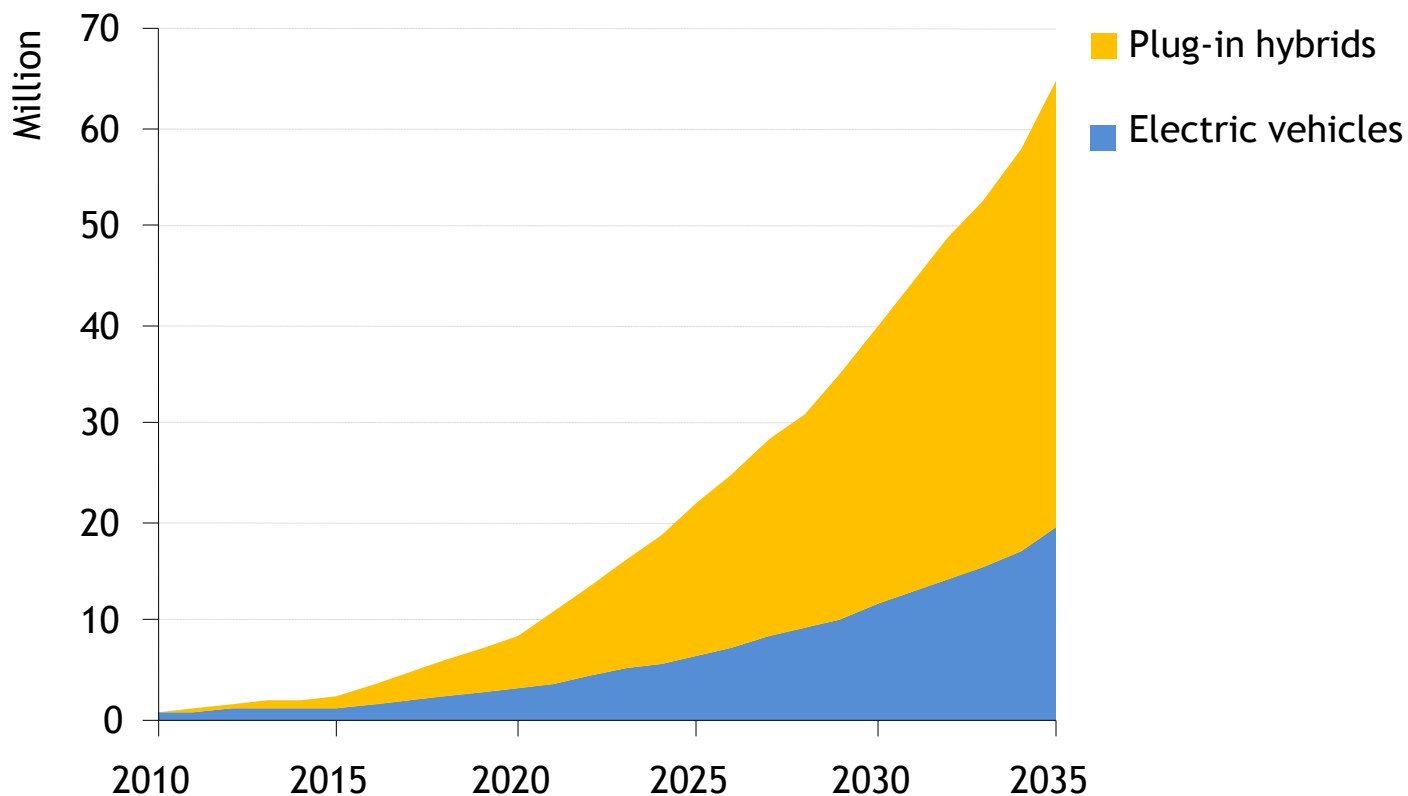
Share of world electricity generation by type and scenario



***Low-carbon technologies account for over three-quarters of global power generation by 2035 in the 450 Scenario, a four-fold increase on today***

... and also in transport

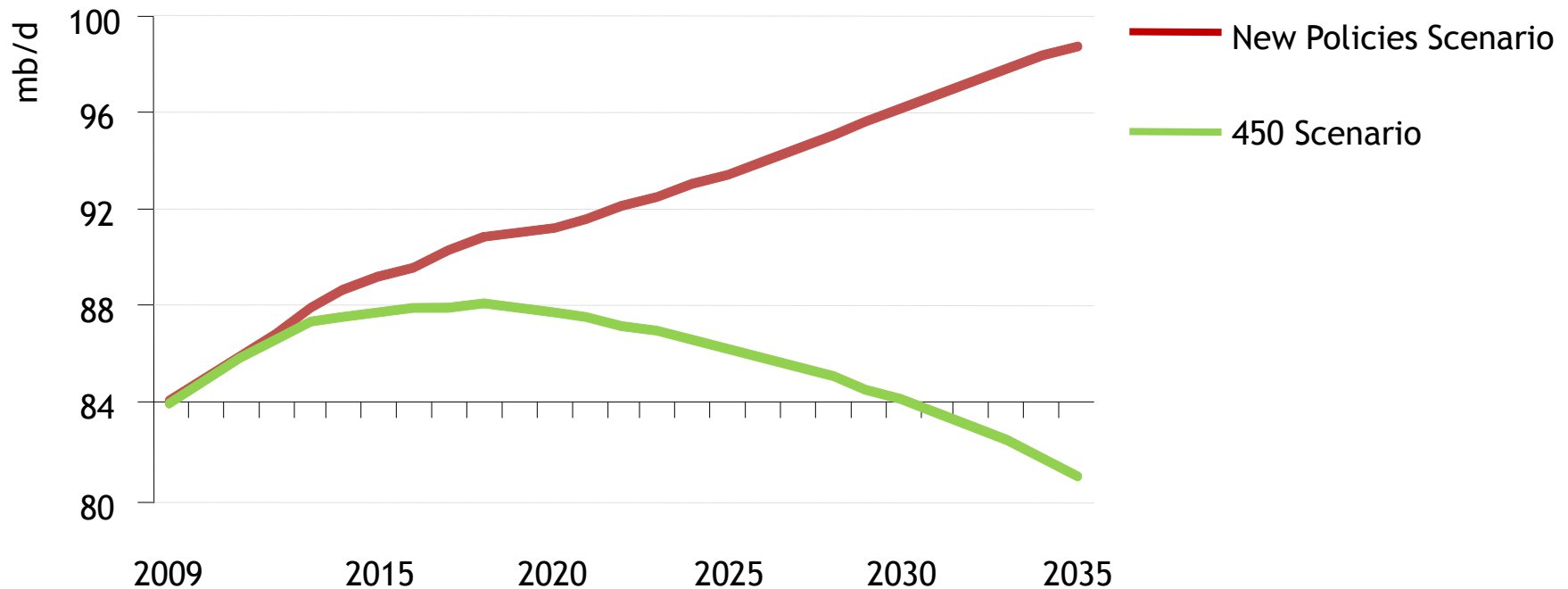
### Sales of plug-in hybrid and electric vehicles in the 450 Scenario



***Plug-in hybrids & electric vehicles reach 39% of new sales by 2035, making a big contribution to emissions abatement – China becomes the top advanced car manufacturer***

# Climate policies can improve oil security

World oil demand by scenario



***Oil demand peaks at 88 mb/d before 2020 & falls to 81 mb/d in 2035, with a plunge in OECD demand more than offsetting continuing growth in non-OECD demand***



- Recently announced policies can make a difference, but fall well short of what is needed for a secure & sustainable energy future
- The age of cheap oil is over, though policy action could bring lower international prices than would otherwise be the case
- Renewables are entering the mainstream, but long-term support is needed to boost their competitiveness
- Stronger penetration of natural gas can have profound implications for energy markets and environment.
- Lack of ambition in Copenhagen has increased the cost of achieving the 2°C goal & made it less likely to happen