

A glimpse into the global energy future

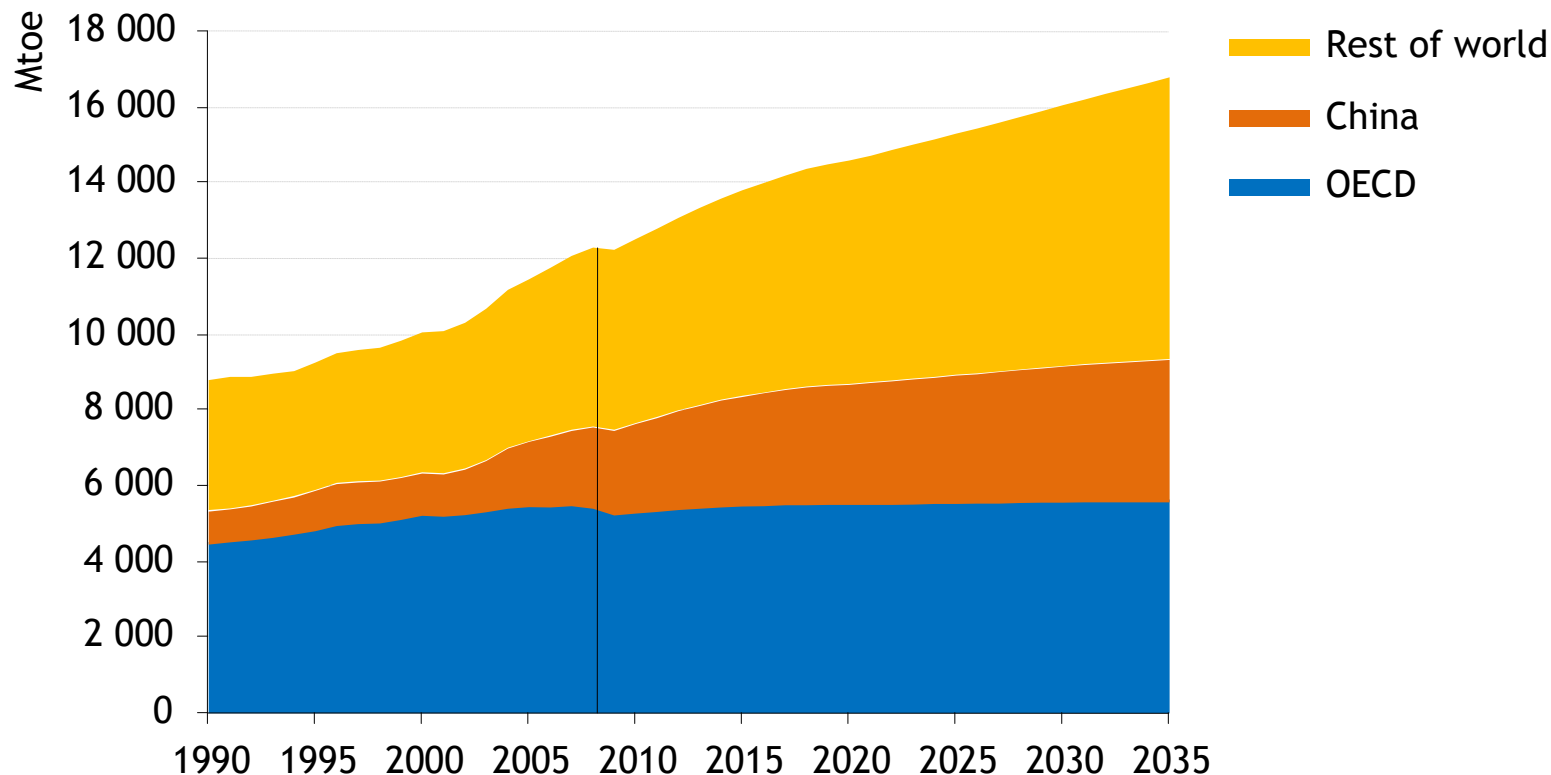
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Recent policy commitments, if implemented, would make a difference

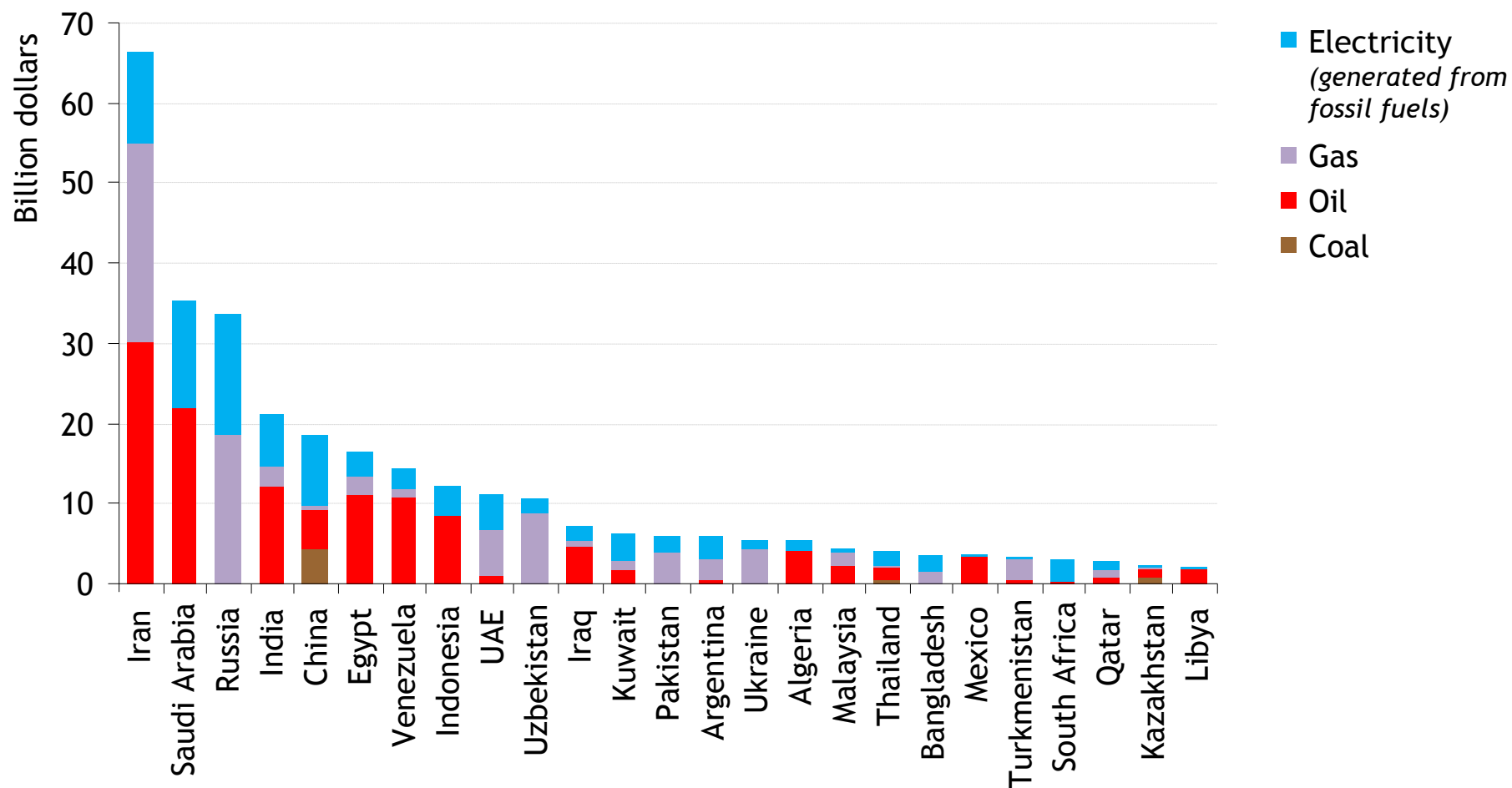
World primary energy demand by region in the New Policies Scenario



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

Fossil-fuel subsidies are distorting price signals

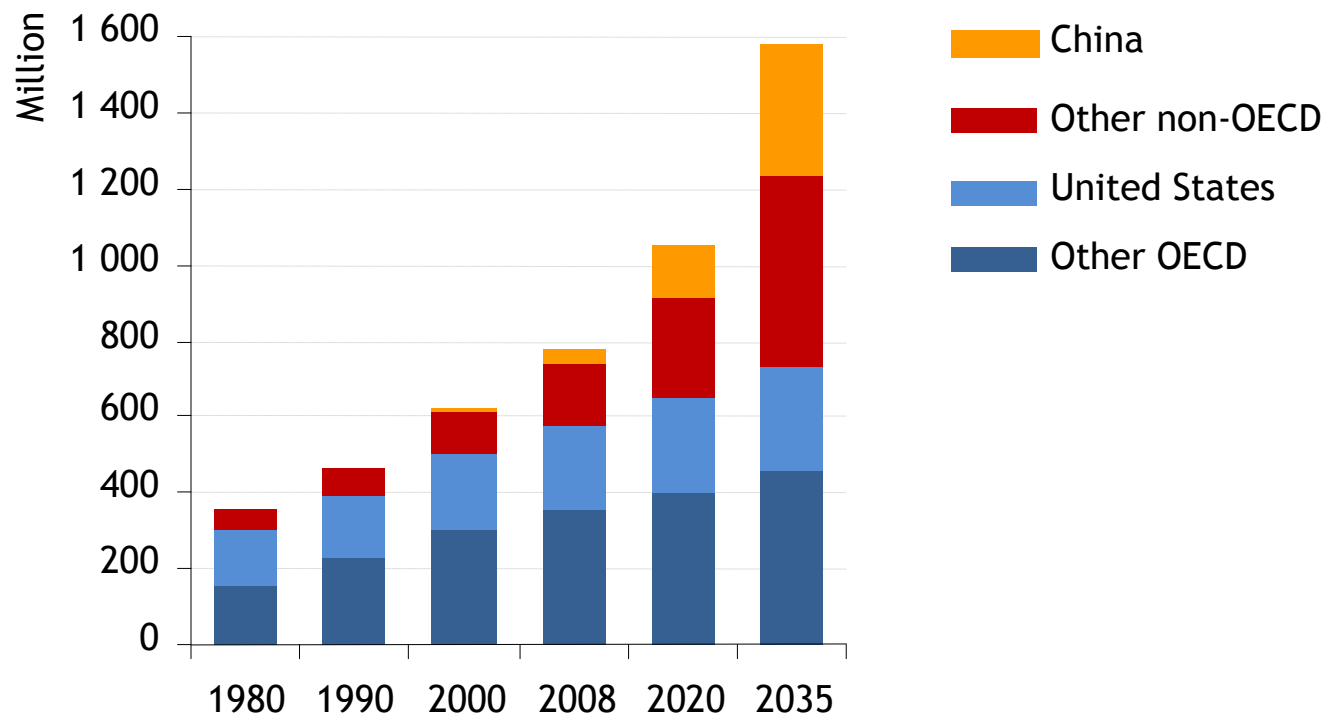
Economic value of fossil-fuel consumption subsidies by country, 2009



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

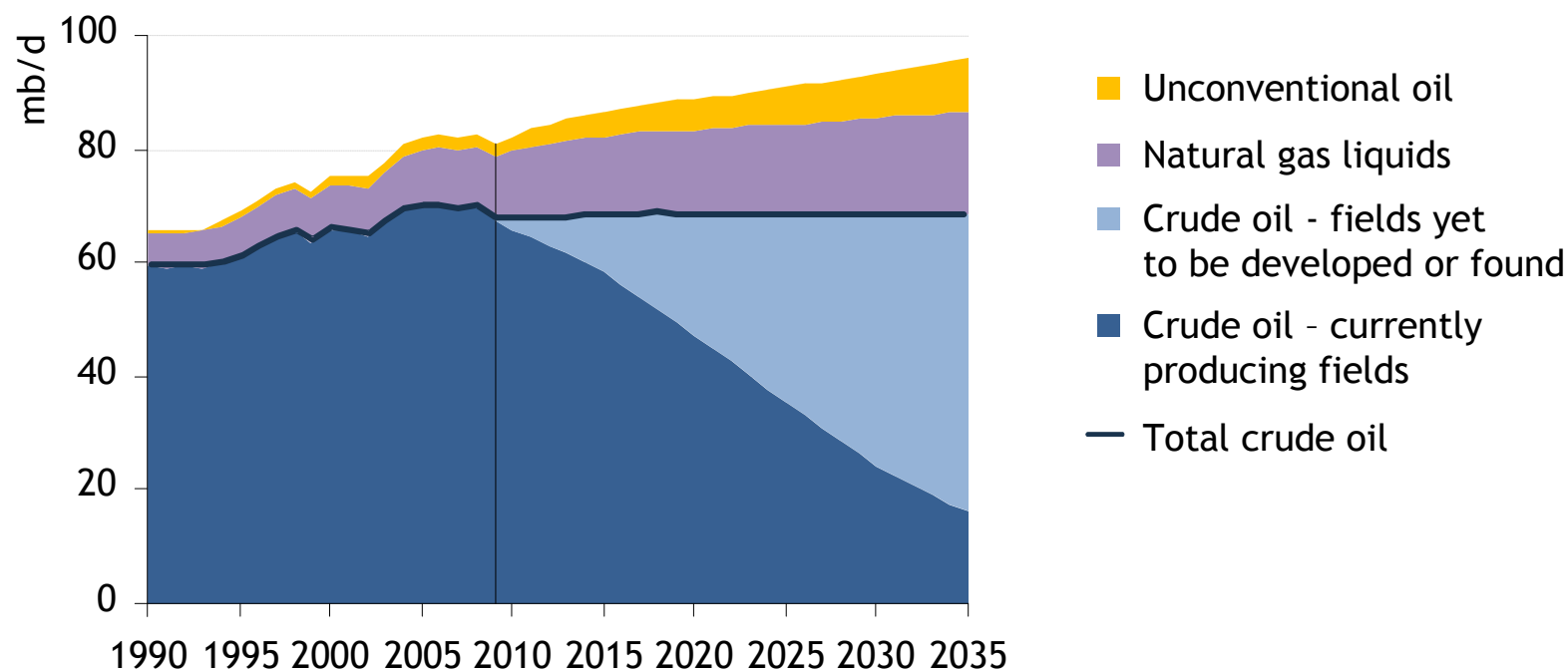
Passenger vehicles in the New Policies Scenario



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

Oil production becomes less crude

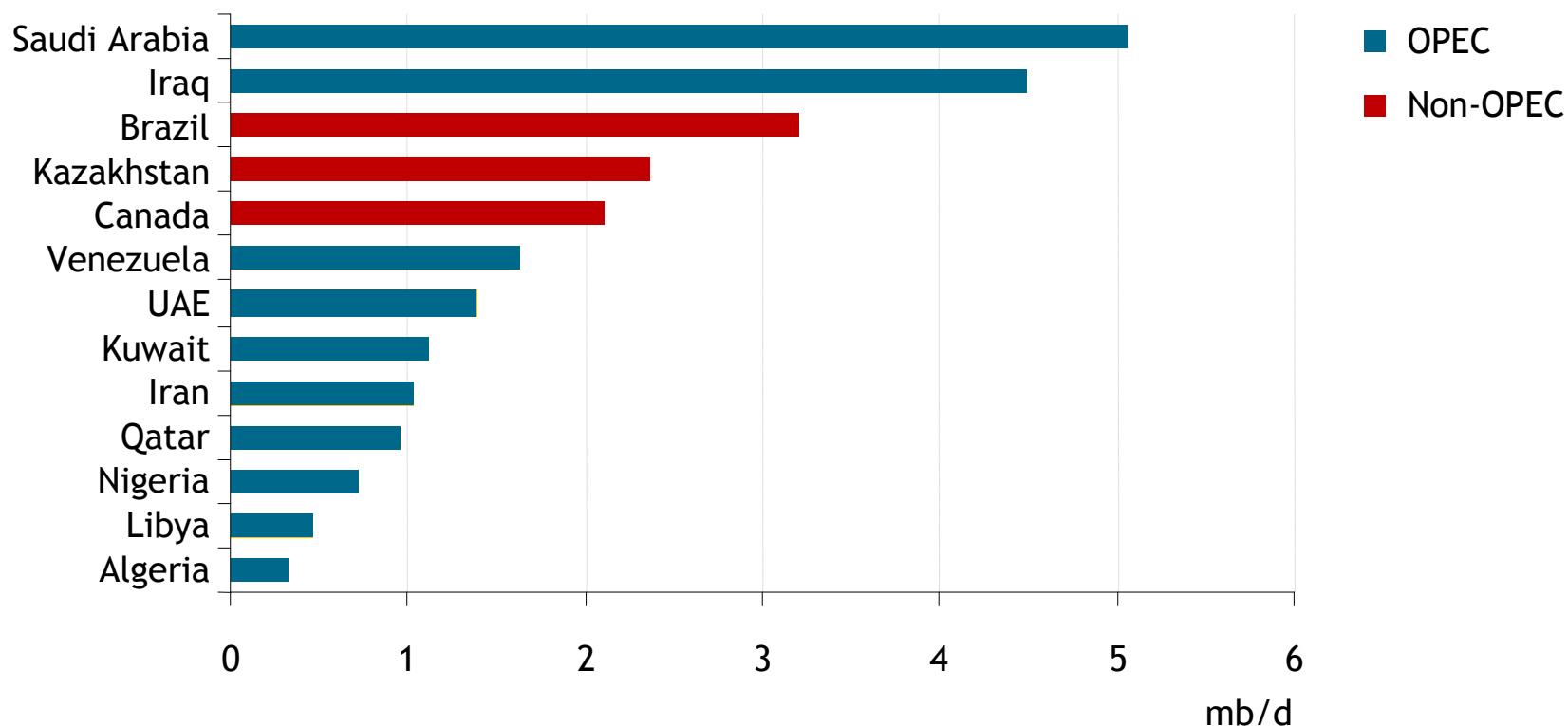
World oil production by type in the New Policies Scenario



Global oil production reaches 96 mb/d in 2035 on the back of rising output of natural gas liquids & unconventional oil, as crude oil production plateaus

More oil from fewer producers

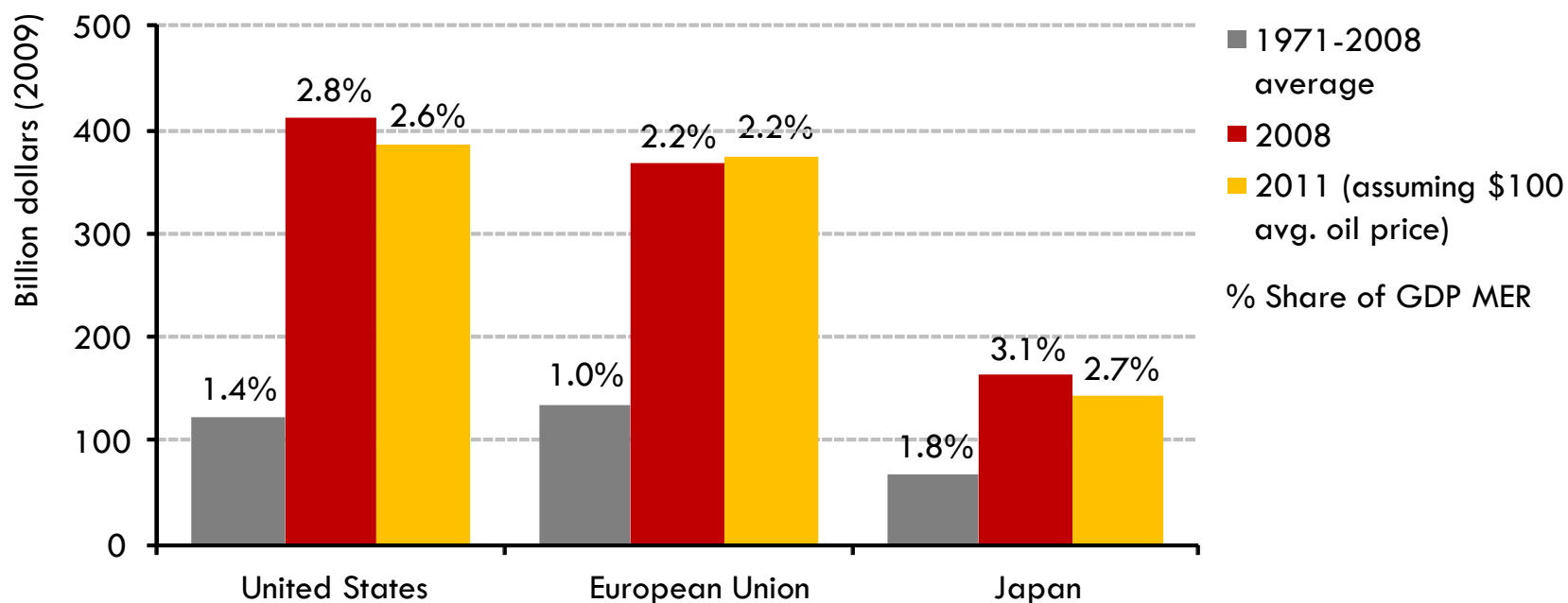
Incremental oil production by key country in the New Policies Scenario, 2009-2035



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

The implications of rising oil prices on the economy

Annual expenditure on net imports of oil



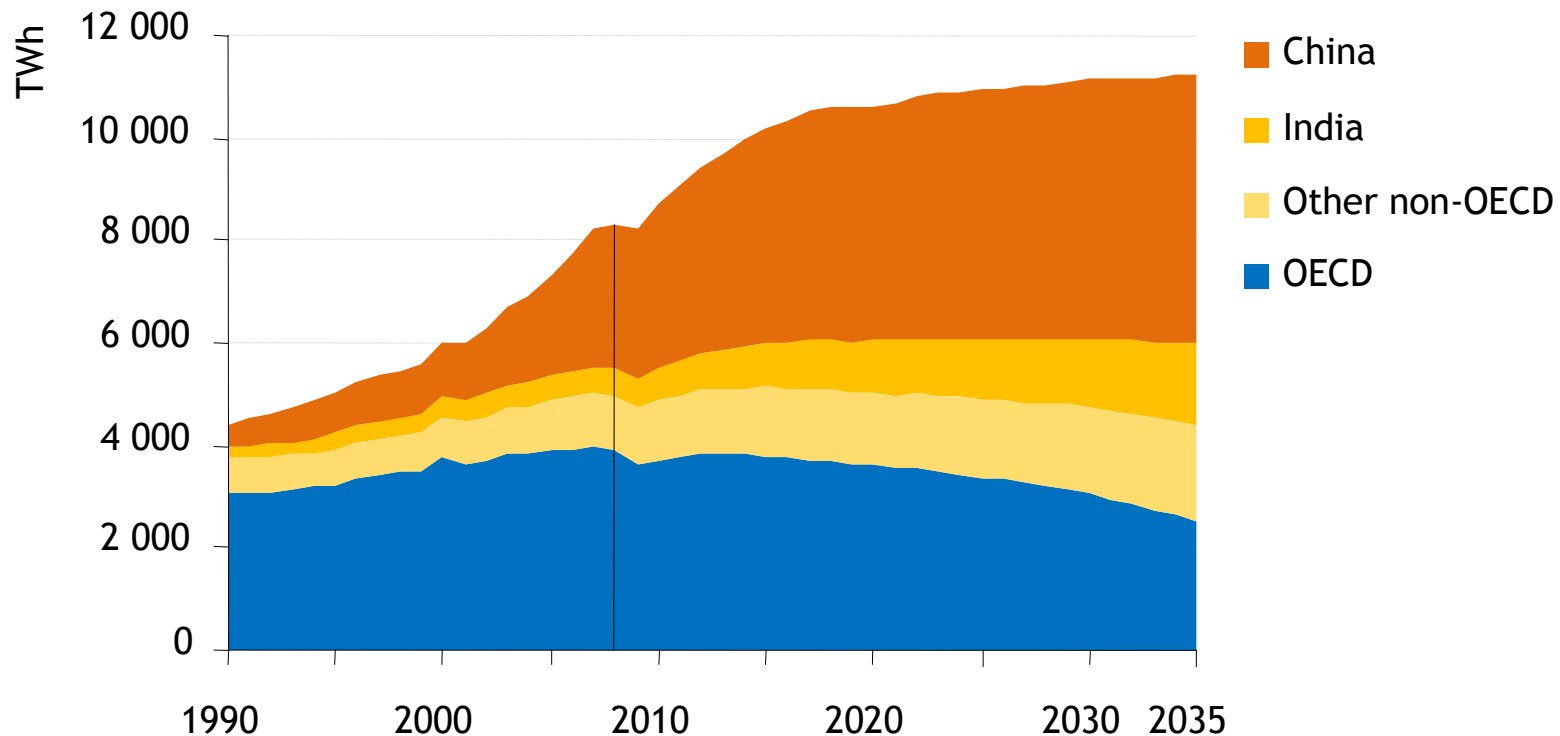
High oil prices are a key risk to derail the fragile economic recovery among developed nations – both consumers and producers suffer under such a scenario.

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

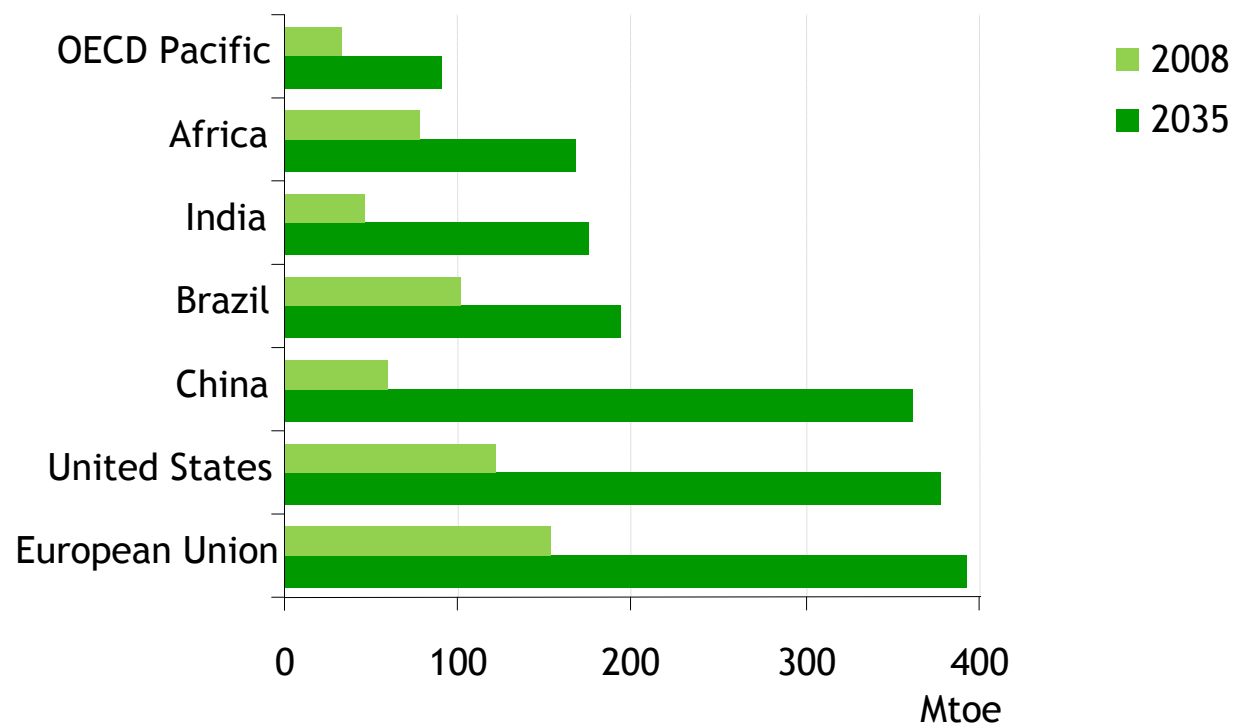
Coal-fired electricity generation by region in the New Policies Scenario



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....

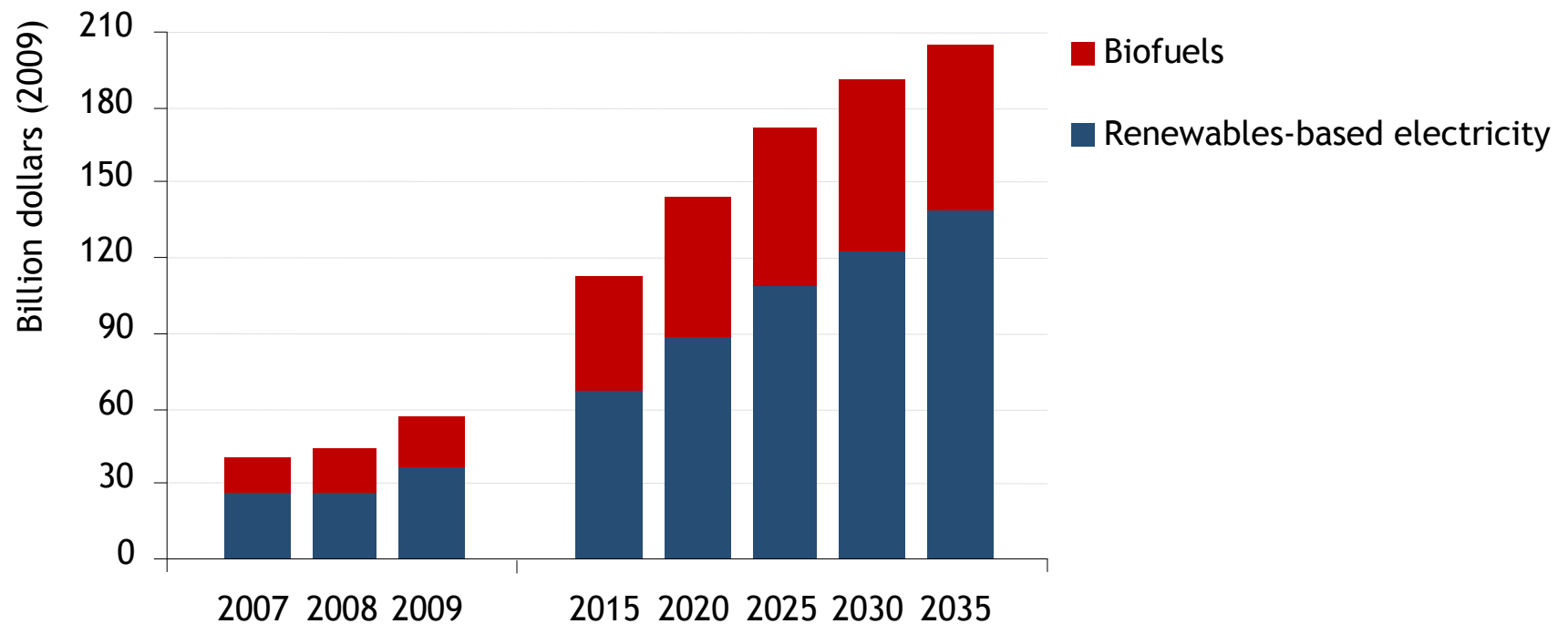
Renewable primary energy demand in the New Policies Scenario



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

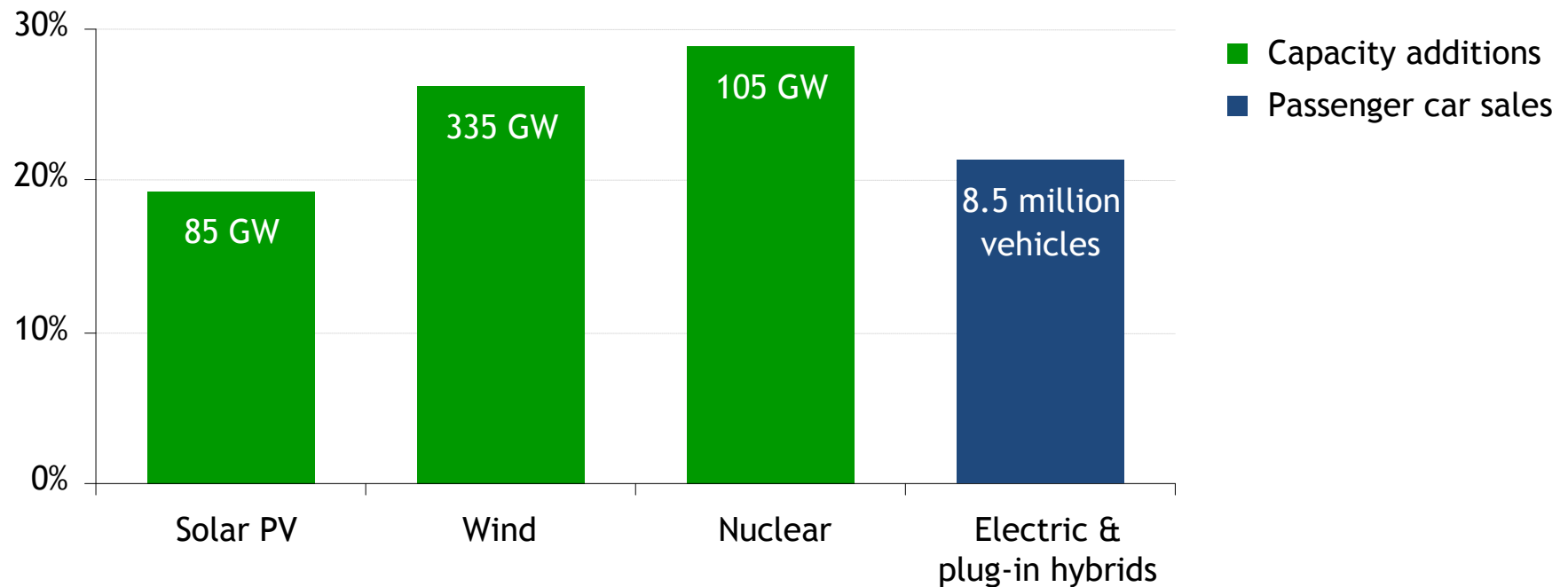
Annual global support for renewables in the New Policies Scenario



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



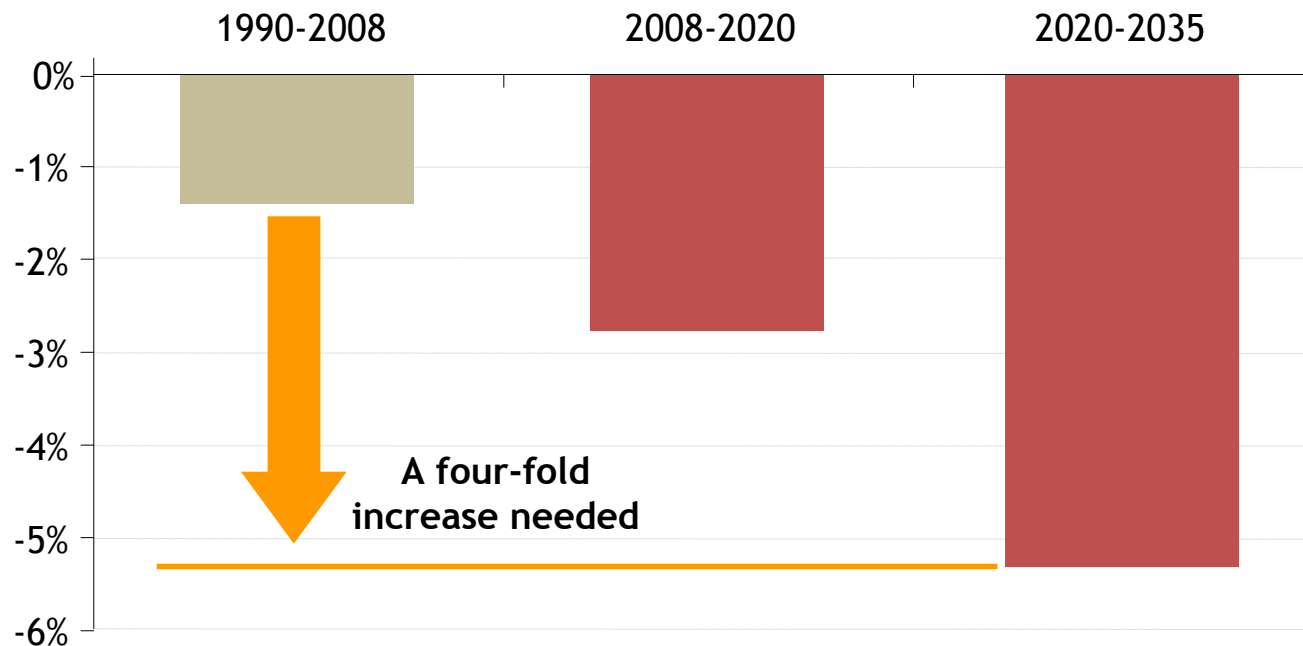
Given the sheer scale of China's market, its push to expand the role of low-carbon energy technologies is poised to play a key role in driving down costs, to the benefit of all countries

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

- The 450 Scenario assumes vigorous implementation of Copenhagen Accord/ Cancun Agreement pledges to 2020 & much stronger action thereafter
- Cancun Agreement commits countries to reducing emissions - a step forward from Copenhagen – but much deeper cuts are needed in 2020 to meet goal of 2°C increase
- Countries emission reductions pledges result in an uncertainty of 3.9 Gt over the level of abatement pledged to 2020
- In the 450 Scenario energy-related CO₂ emissions peak before 2020

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

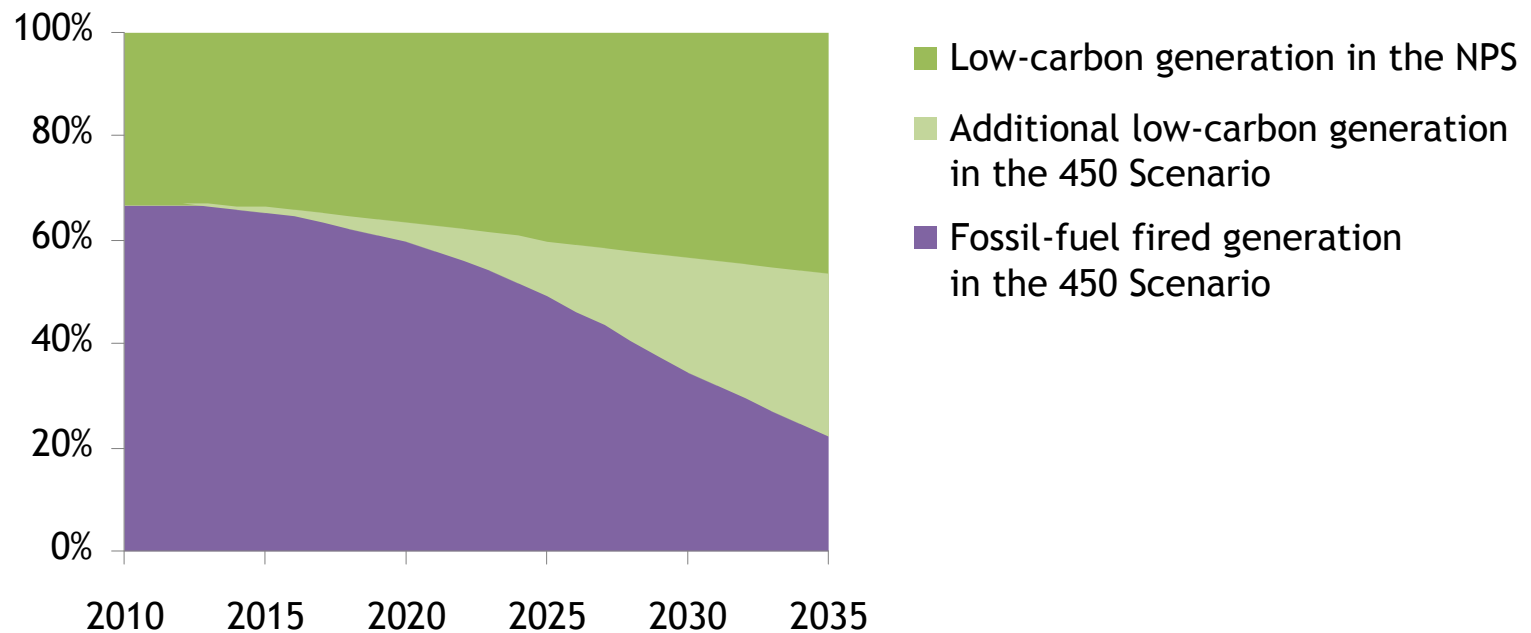
Average annual change in CO₂ intensity in the 450 scenario



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

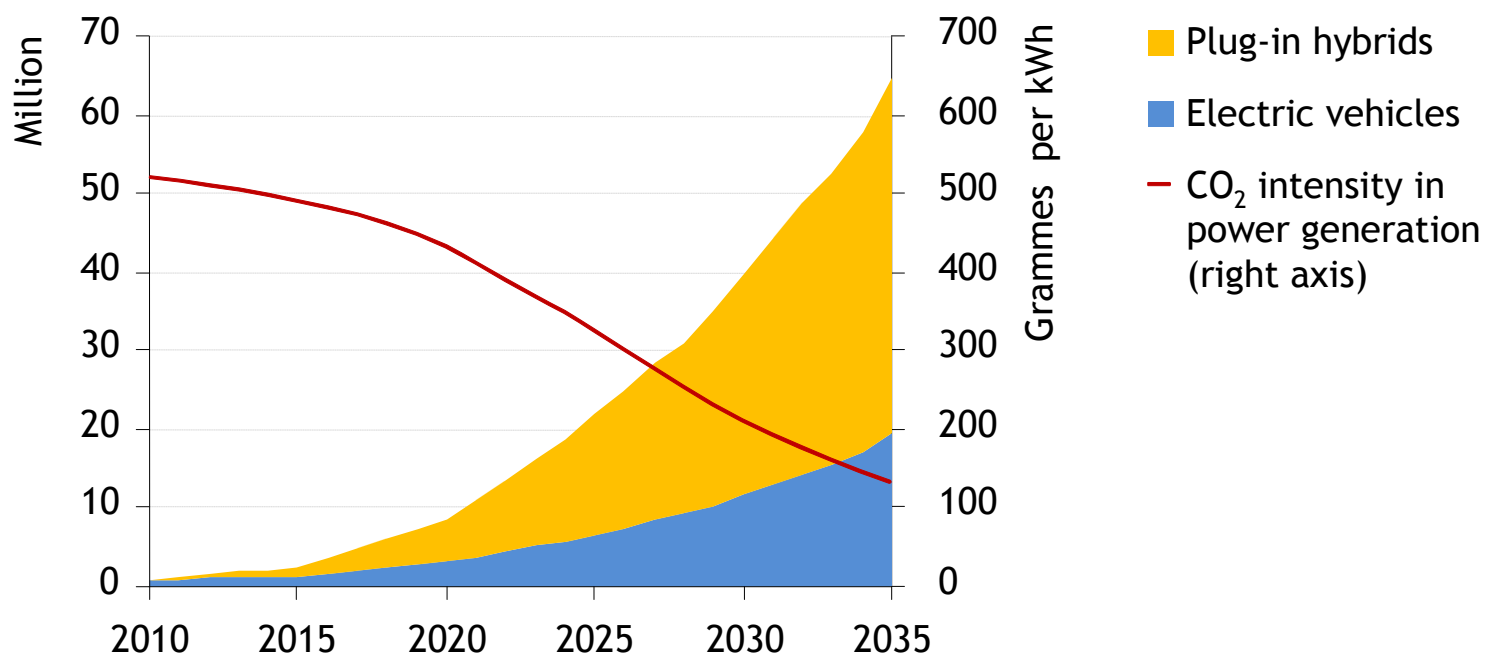
Share of world electricity generation by type and scenario



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

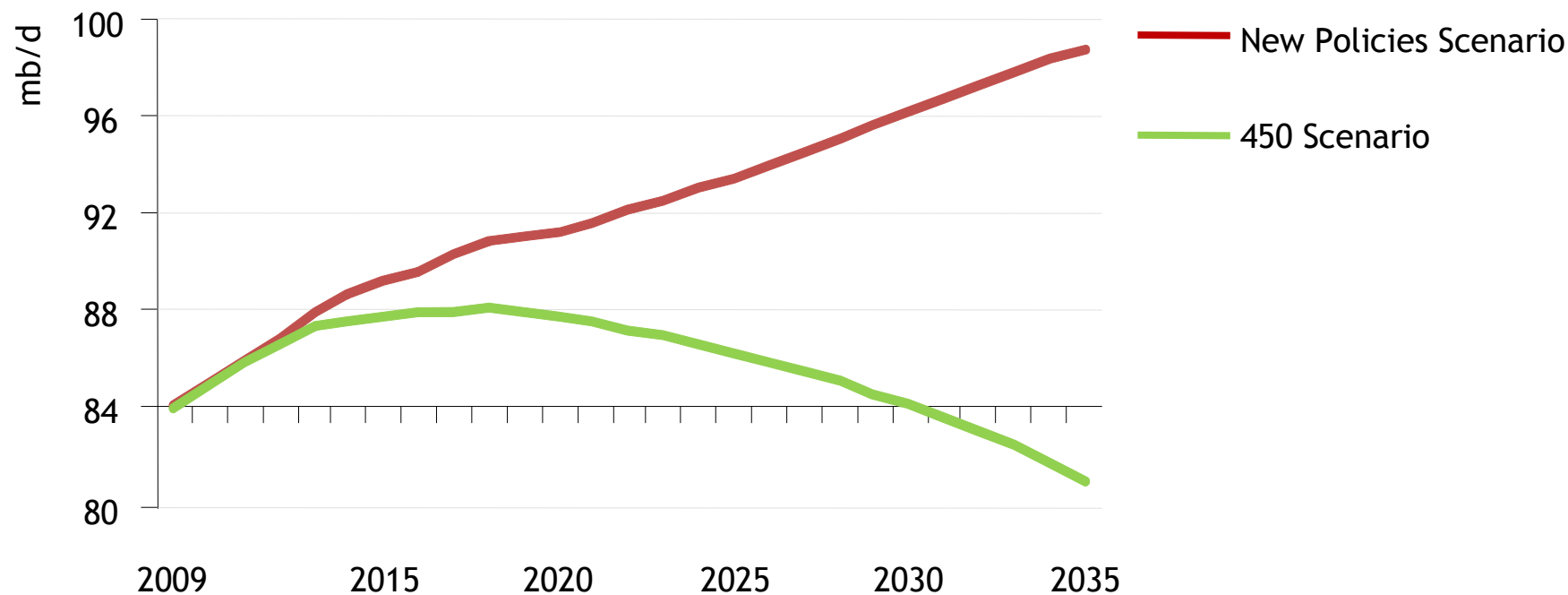
Sales of plug-in hybrid and electric vehicles in the 450 Scenario & CO₂ intensity of the power sector



Plug-in hybrids & electric vehicles reach 39% of new sales by 2035, making a big contribution to emissions abatement, thanks to a major decarbonisation of the power sector

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

Concluding remarks

- 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
- Stronger penetration of natural gas can have profound implications for energy markets and environment
- Renewables are entering the mainstream, but long-term support is needed to boost their competitiveness
- Lack of ambition in Copenhagen/Cancun has increased the cost of achieving the 2°C goal & made it less likely to happen