A glimpse into the energy future

Dr. Fatih Birol
IEA Chief Economist
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Recent policy commitments, if implemented, would make a difference

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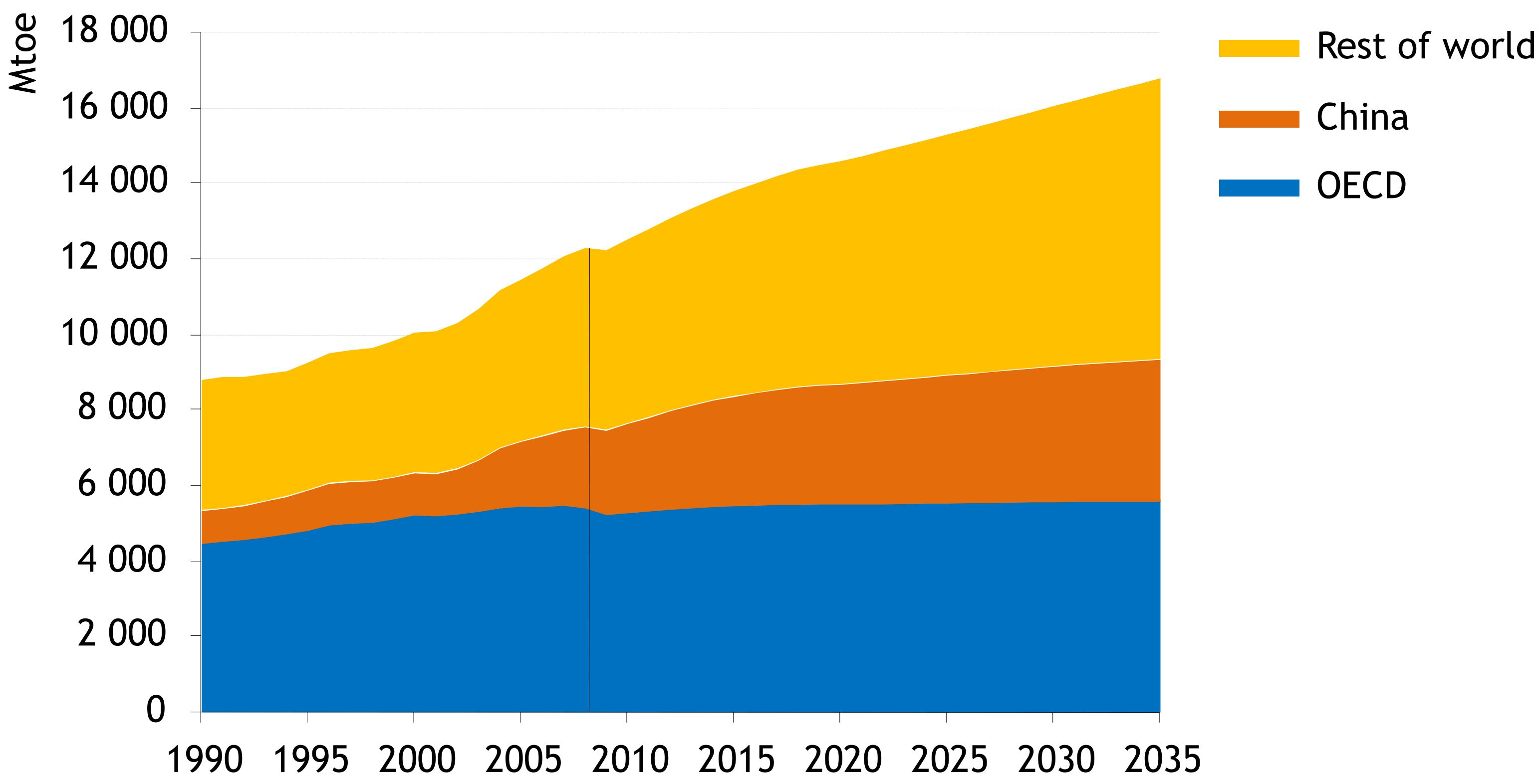
World primary energy demand by region in the New Policies Scenario



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

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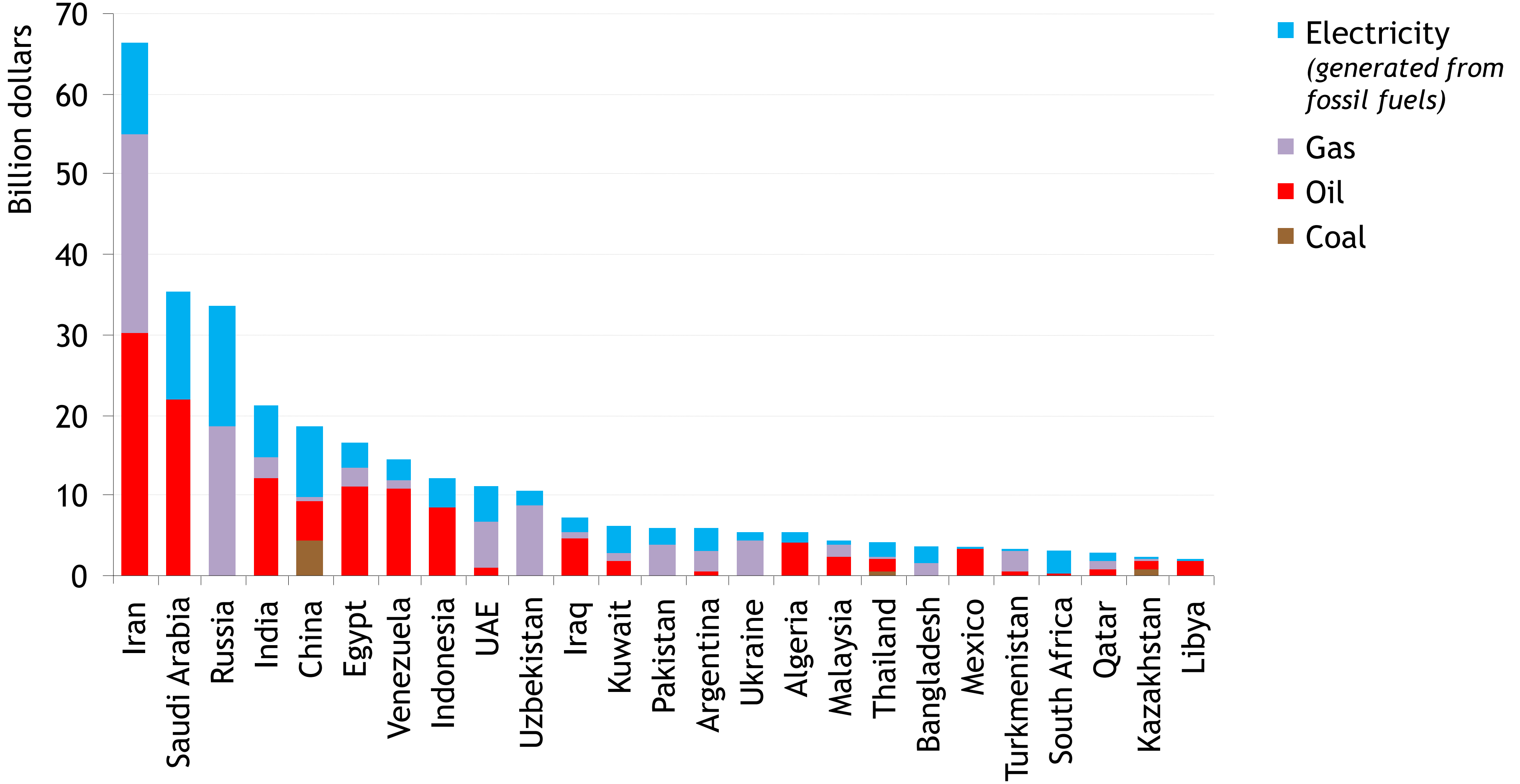
Economic value of fossil-fuel consumption subsidies by country, 2009



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

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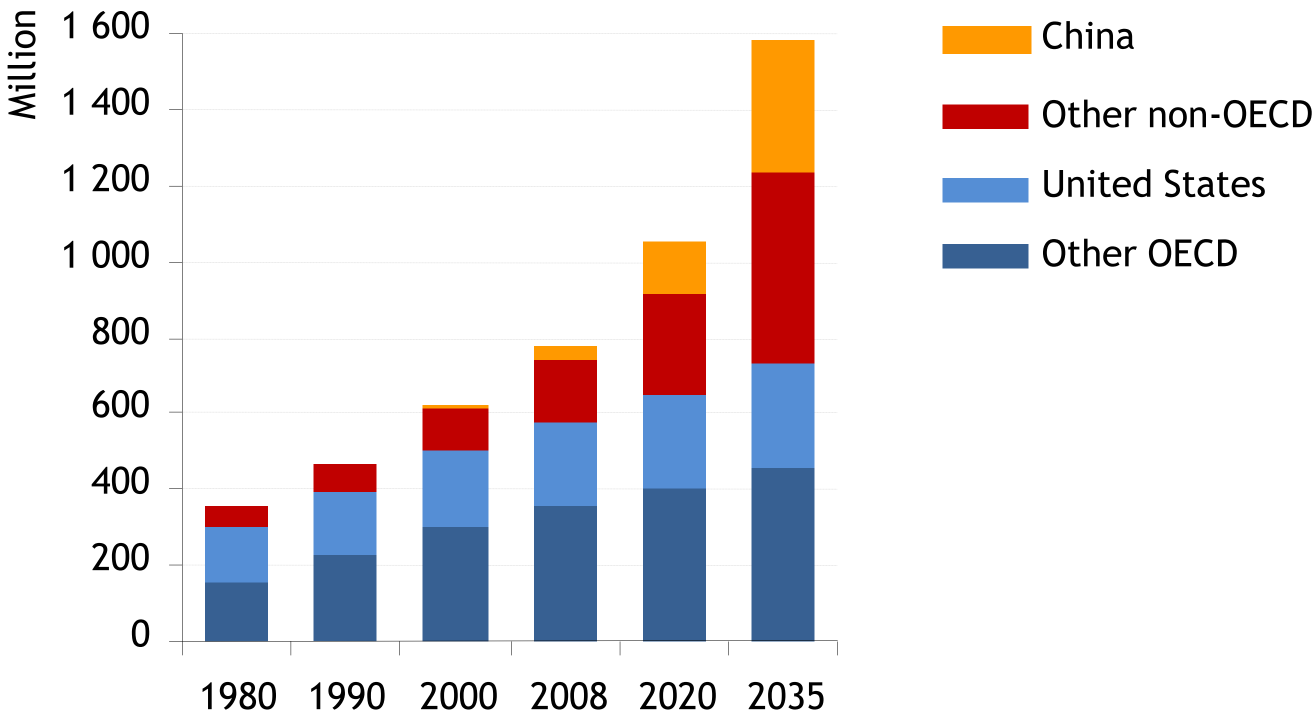
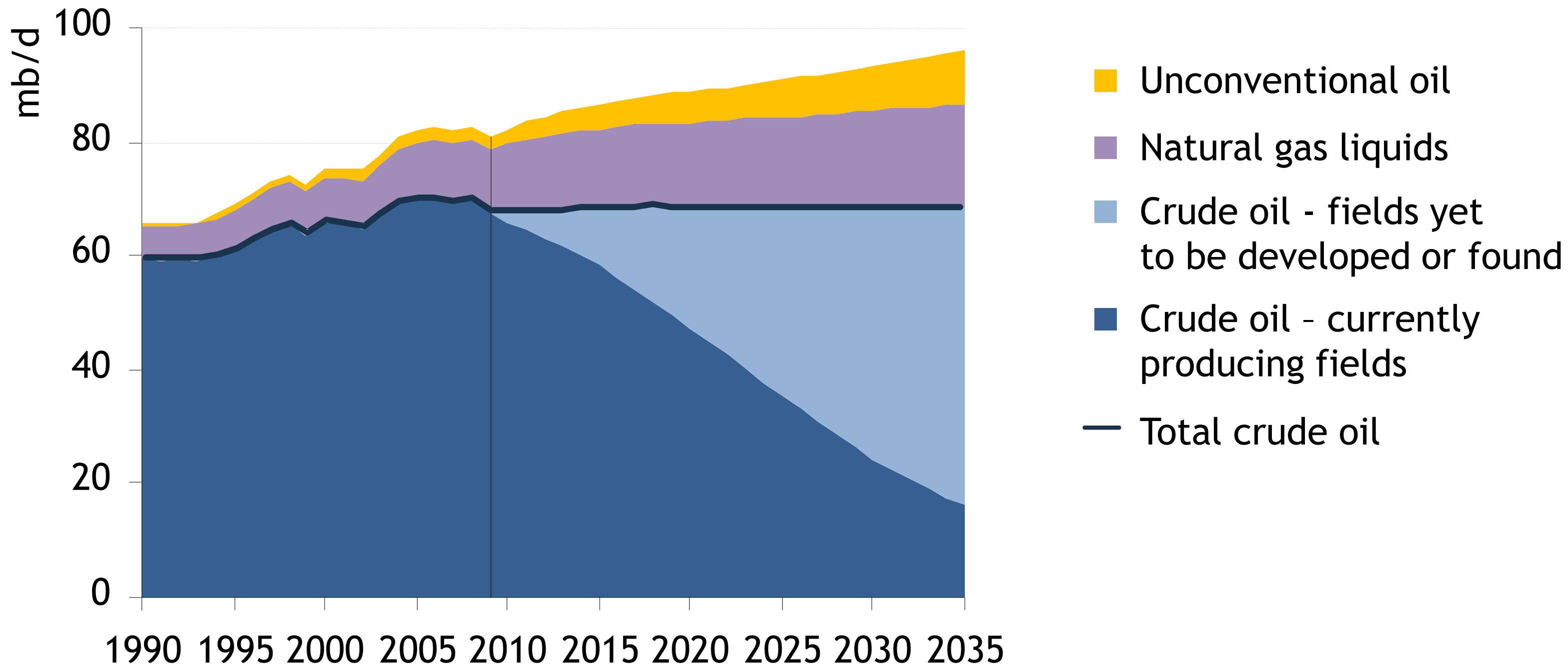
Passenger vehicles in the New Policies Scenario



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

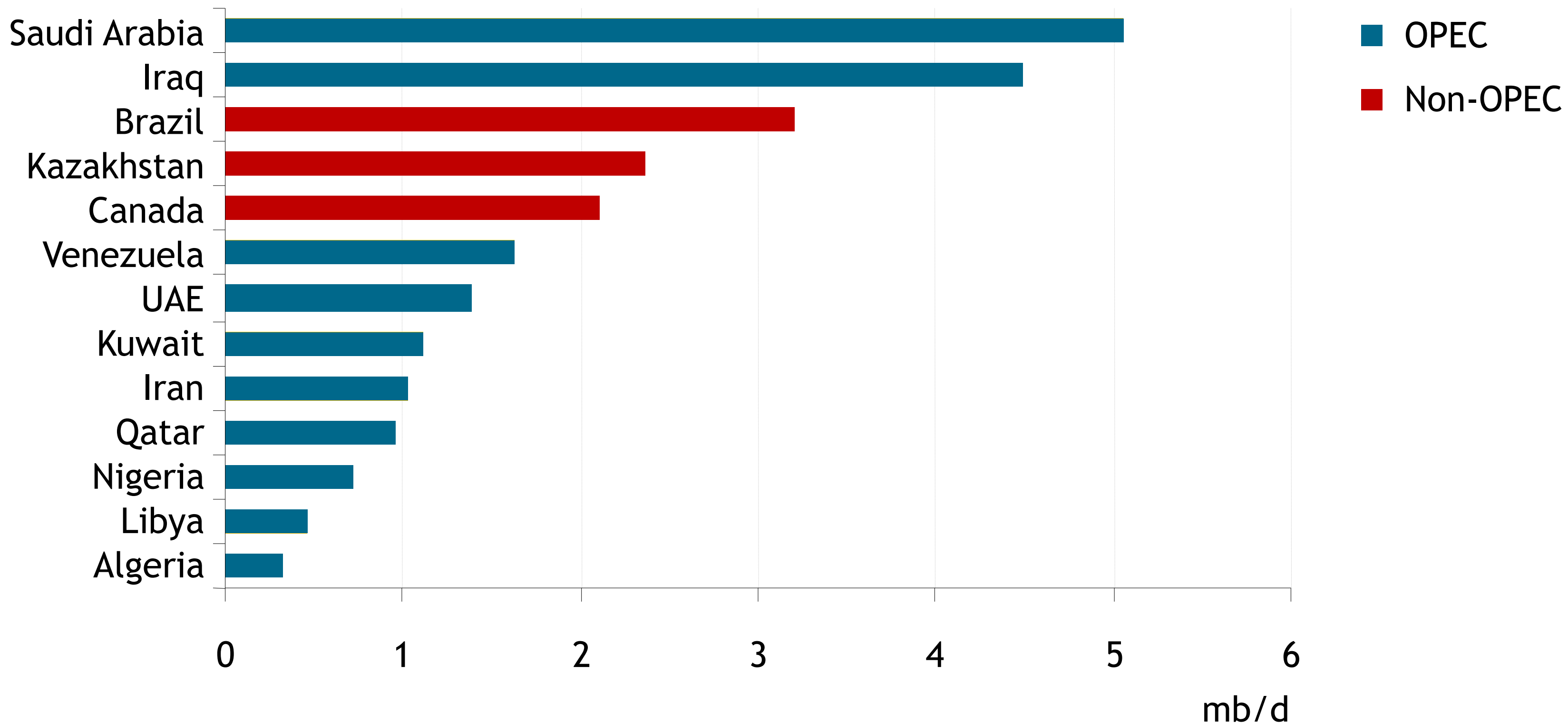
World oil production by type in the New Policies Scenario



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

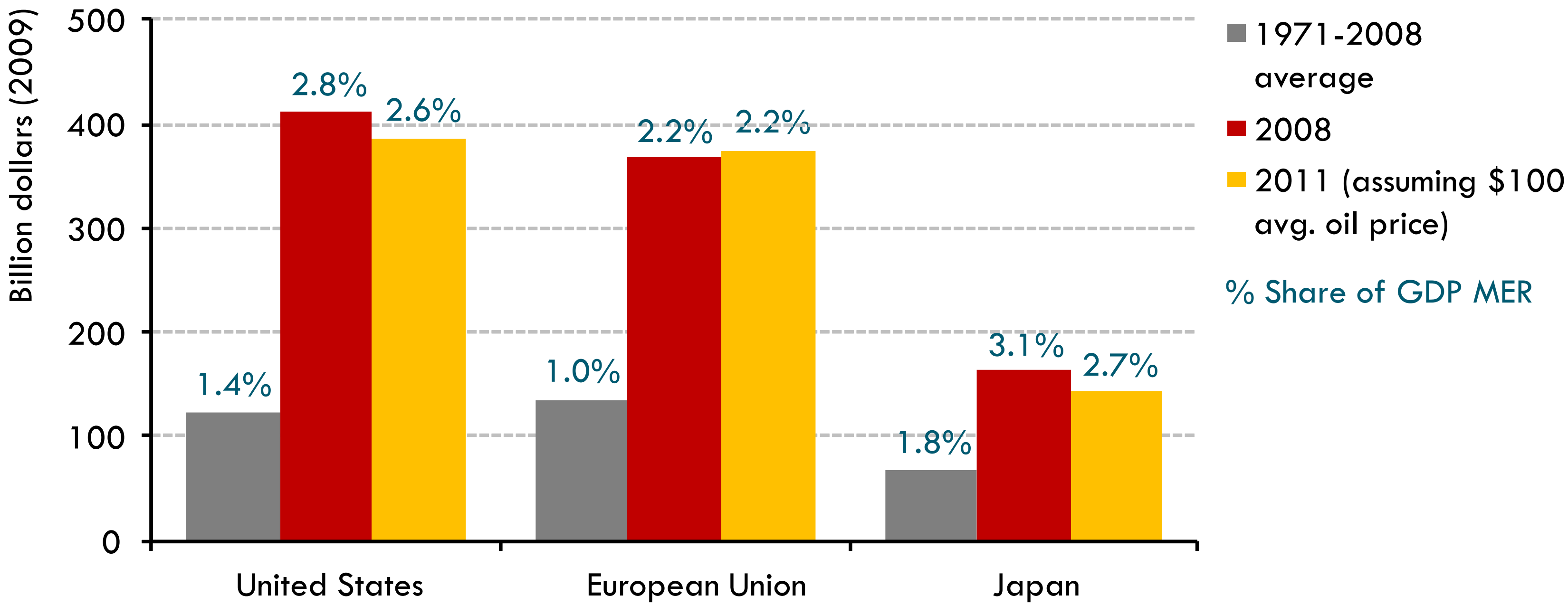
Incremental oil production by key country in the New Policies Scenario, 2009-2035



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
- Asian LNG demand recovered quickly from economic crisis and set to be a key driver
- Growing pressure on "strict" oil-price indexation, notably in Europe
- Stronger demand for gas, can stand in the way of growth in new renewable & coal power generation capacity

Coal remains the backbone of global electricity generation

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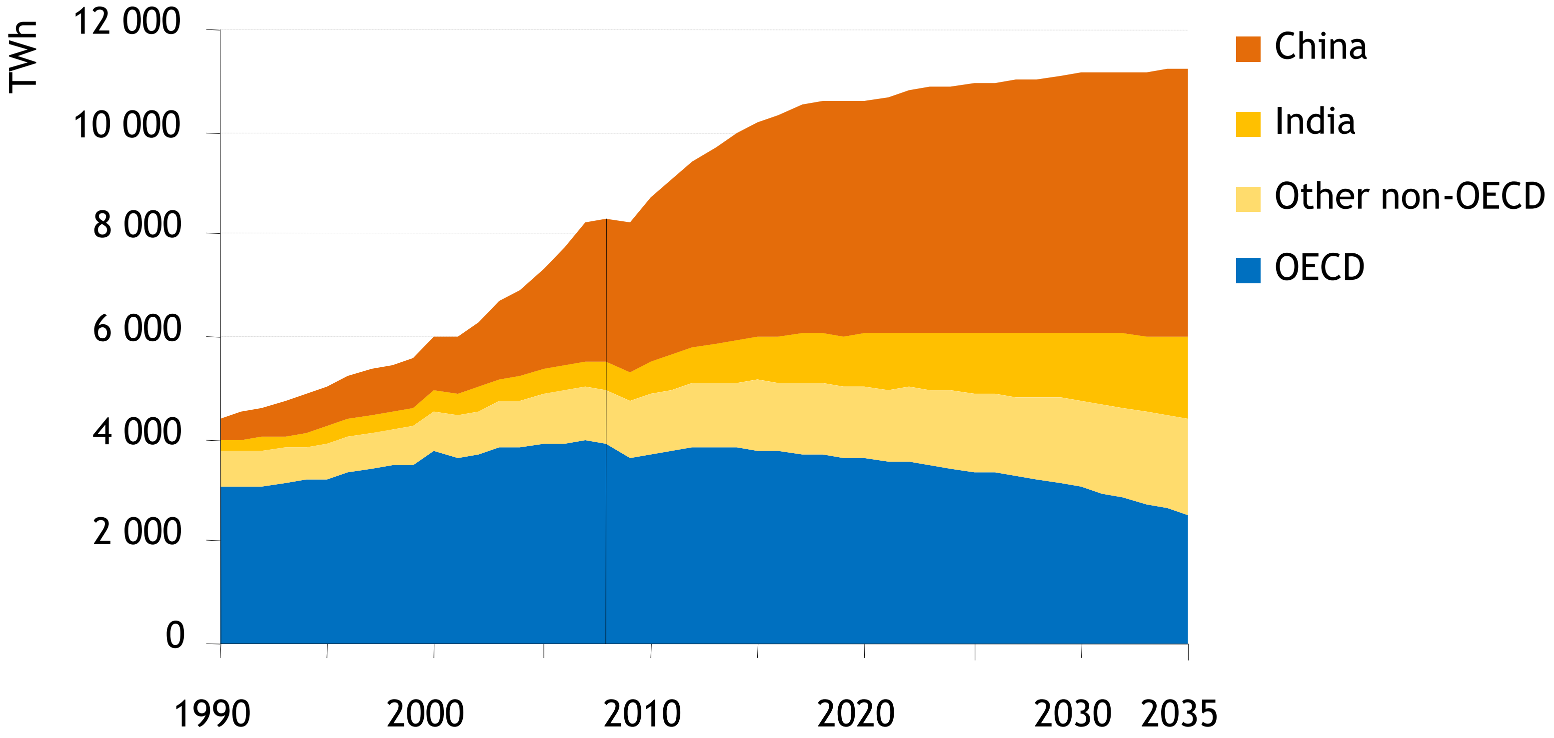
Coal-fired electricity generation by region in the New Policies Scenario



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….

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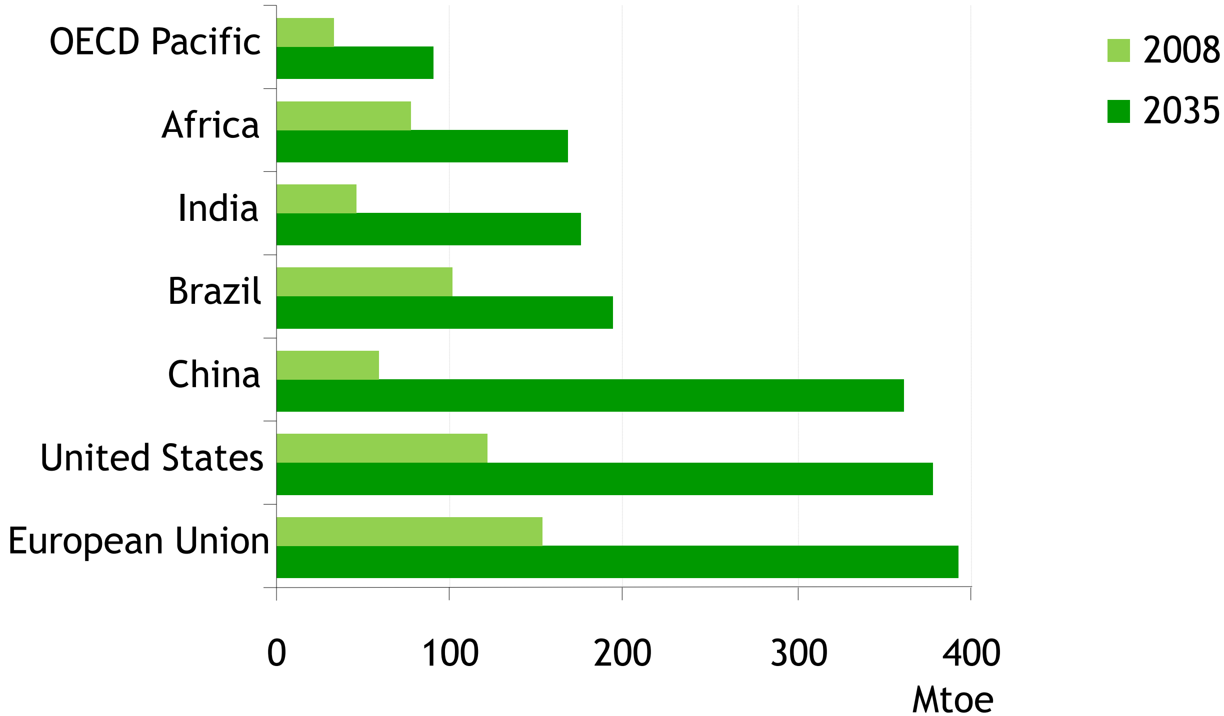
Renewable primary energy demand in the New Policies Scenario



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

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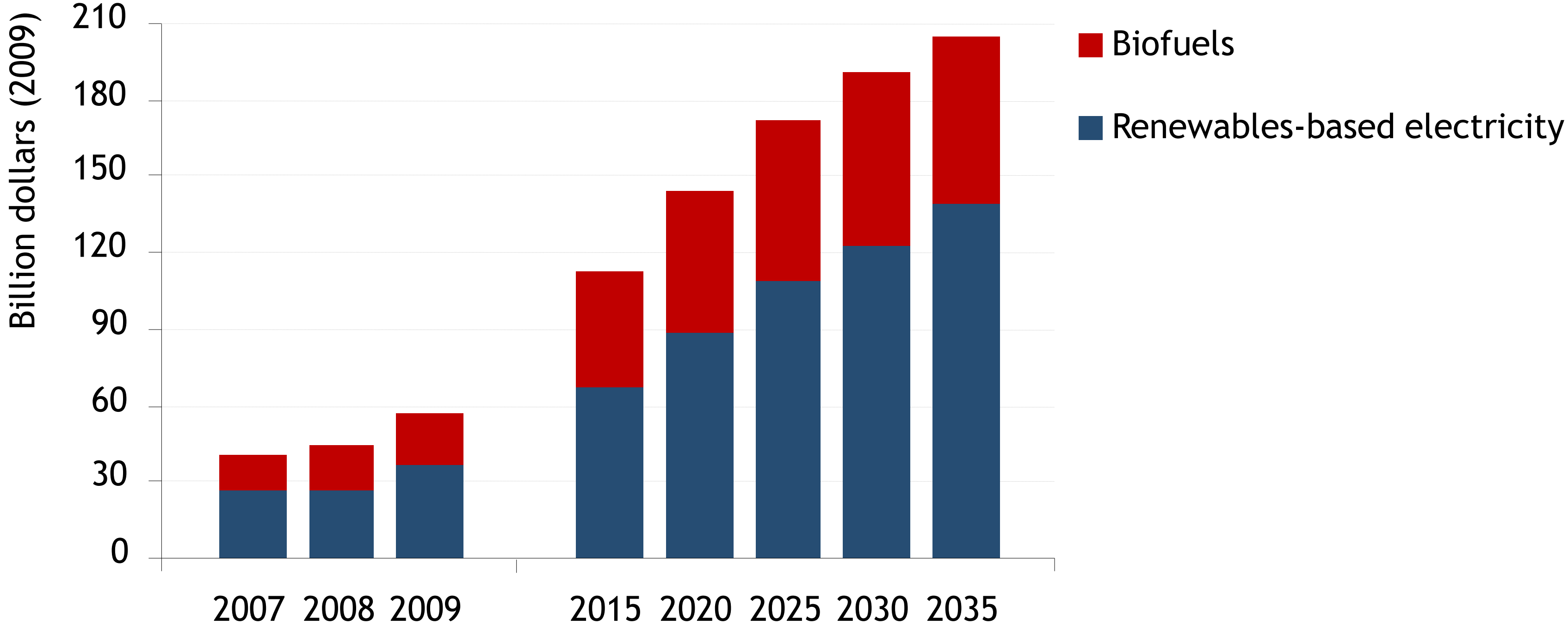
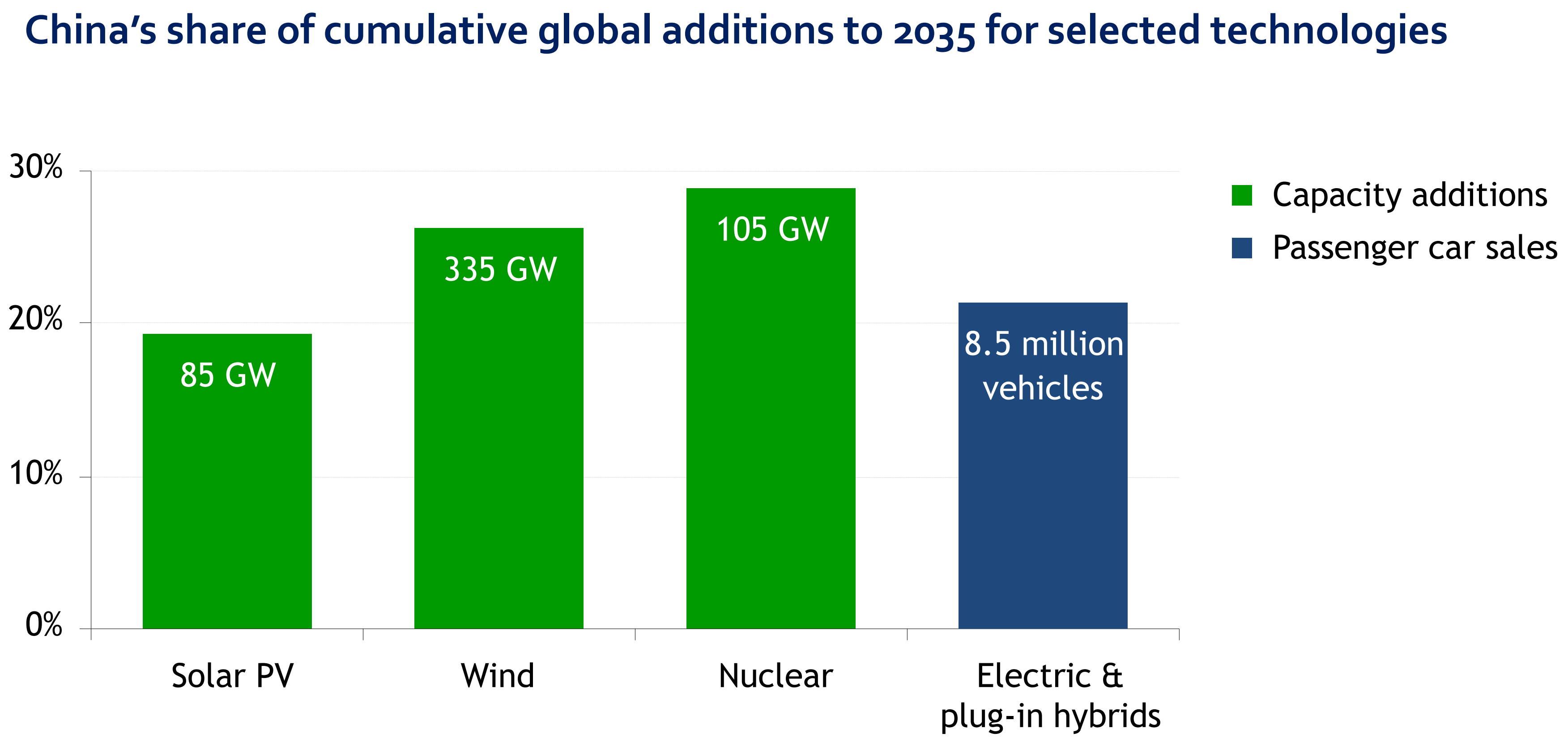
Annual global support for renewables in the New Policies Scenario



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



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

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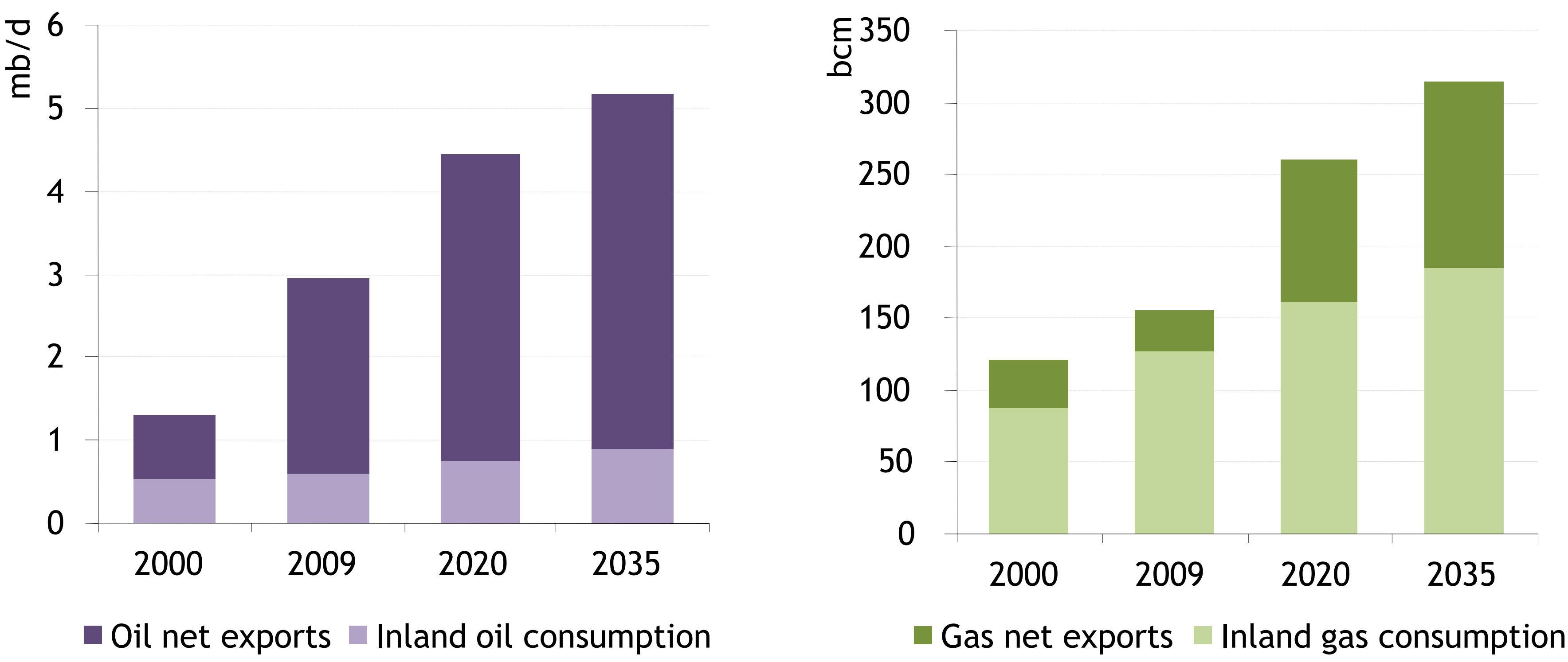
Caspian oil & gas outlook in the New Policies Scenario



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*

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- 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 CO_2 emissions peak before 2020

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

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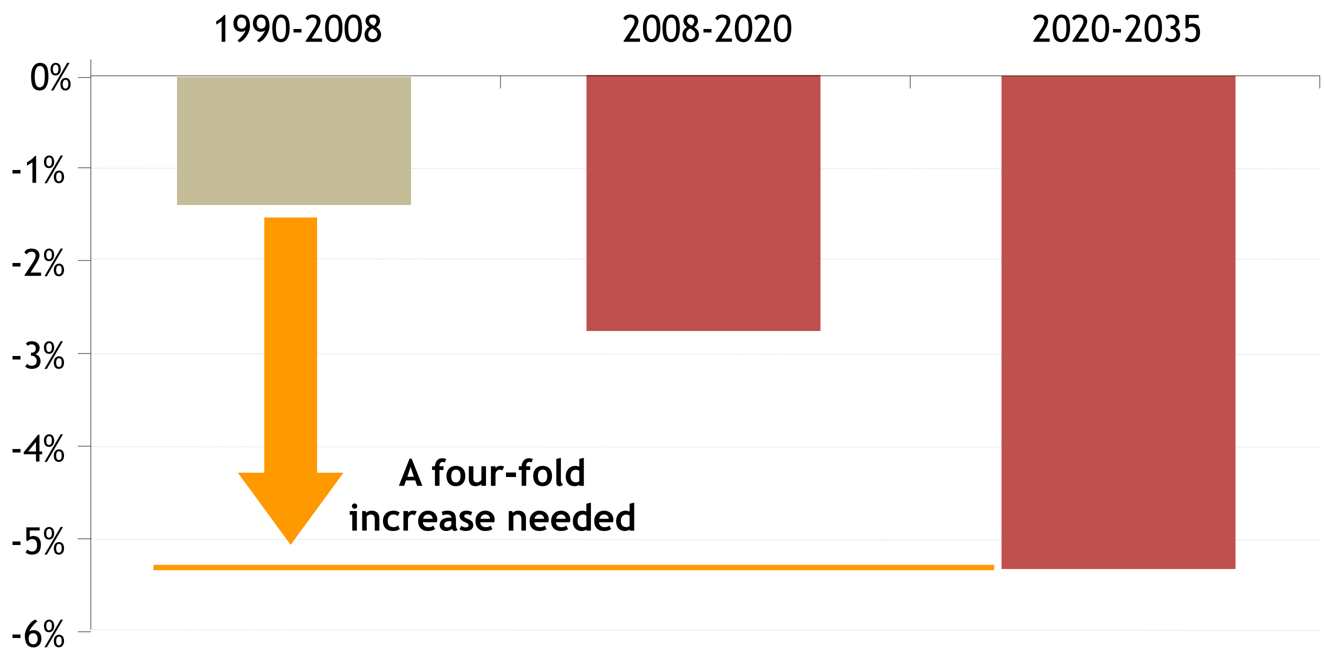
Average annual change in CO_2 intensity in the 450 scenario



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

The effect of "lock-in" in the power generation sector

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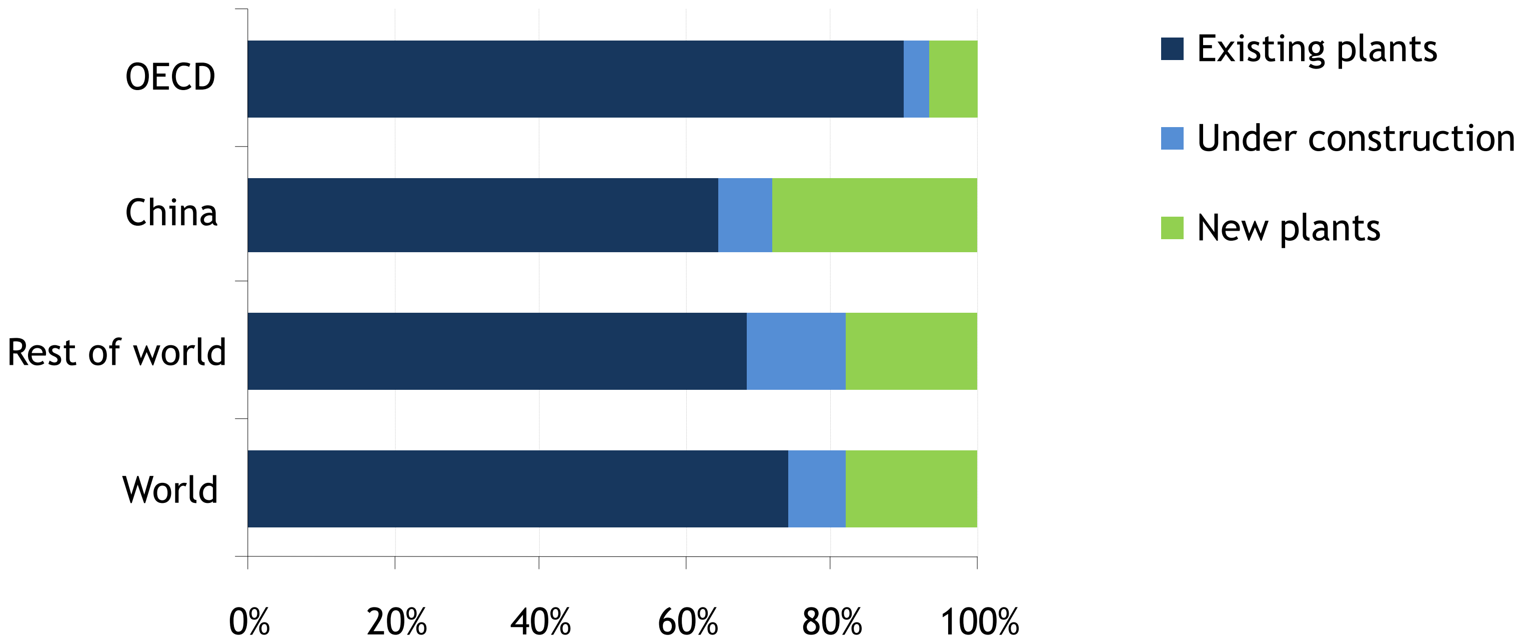
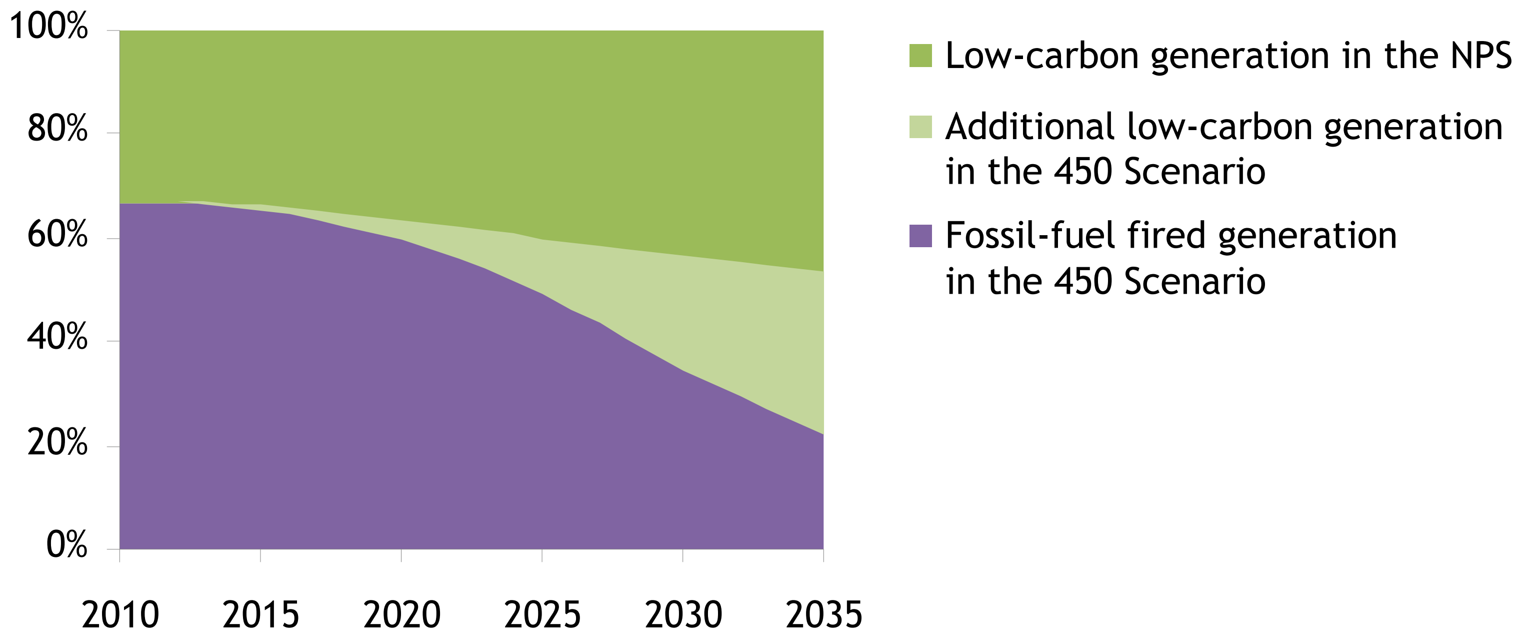
Percentage of CO_2 emissions from fossil-fuel fired power plants in 2020 in the New Policies Scenario



More than 80% of the 2020 global power generation emissions are "locked-in" due to plants already existing or under construction and to around 60% in 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

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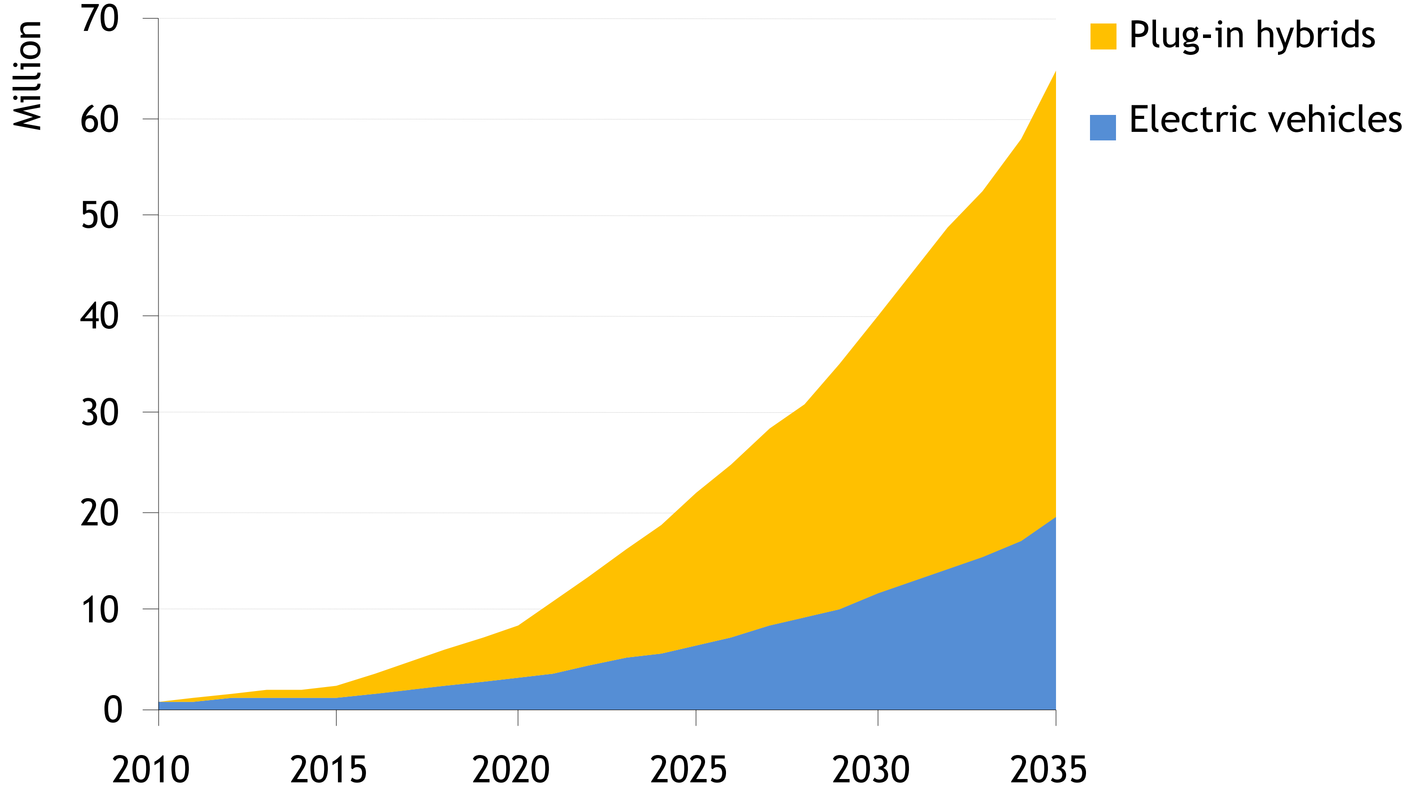
Sales of plug-in hybrid and electric vehicles in the 450 Scenario



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

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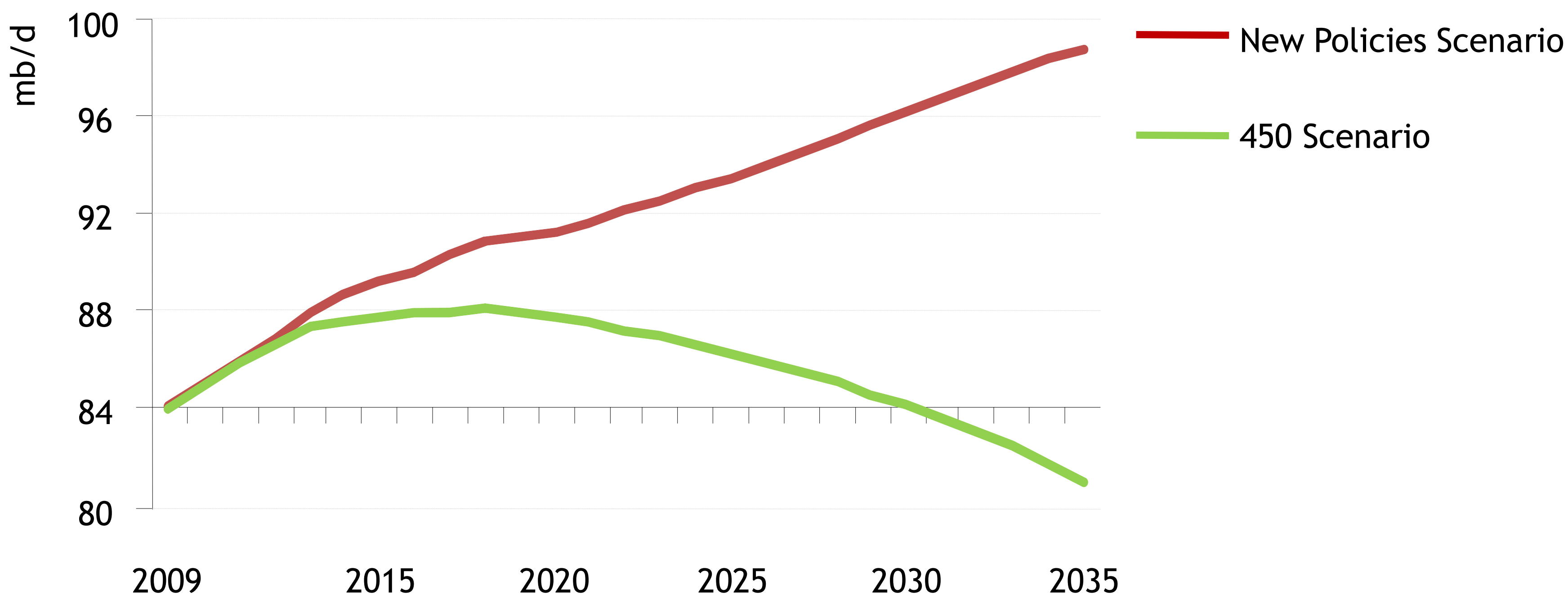
World oil demand by scenario



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

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- 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