

WORLD ENERGY OUTLOOK

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World Energy Outlook 2011

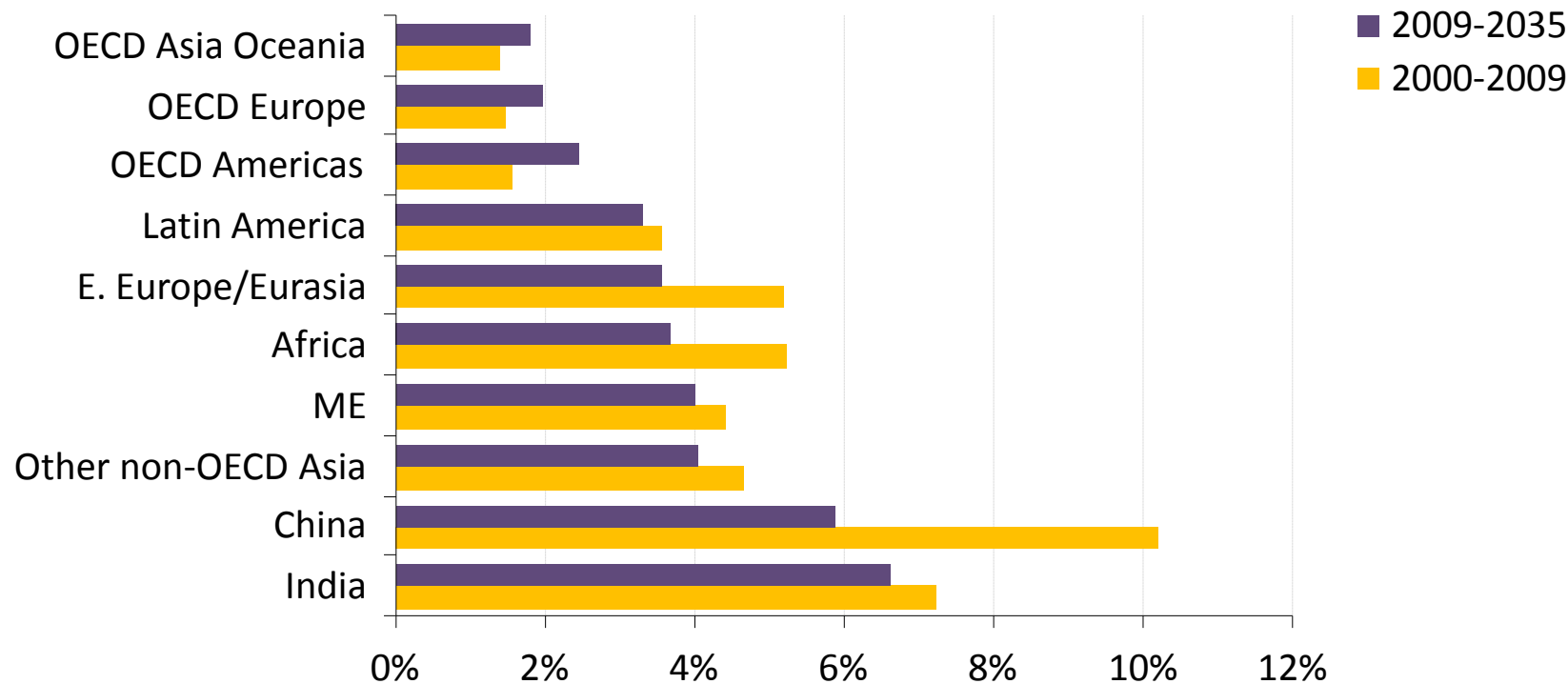
Amos Bromhead
Energy Analyst
Office of the Chief Economist
Riyadh, 24 January 2012

Overview of WEO-2011 scenarios

- New Policies Scenario is the central scenario in WEO-2011
 - *assumes cautious implementation of recently announced commitments & plans, even if yet to be formally adopted*
 - *provides benchmark to assess achievements & limitations of recent developments in climate & energy policy*
- Current Policies Scenario takes into consideration only those policies that had been formally adopted by mid-2011
 - *equivalent to the Reference Scenario of past Outlooks*
- The 450 Scenario sets out an energy pathway consistent with the goal of limiting increase in average temperature to 2°C

GDP – a fundamental driver of energy demand

GDP growth assumptions by region

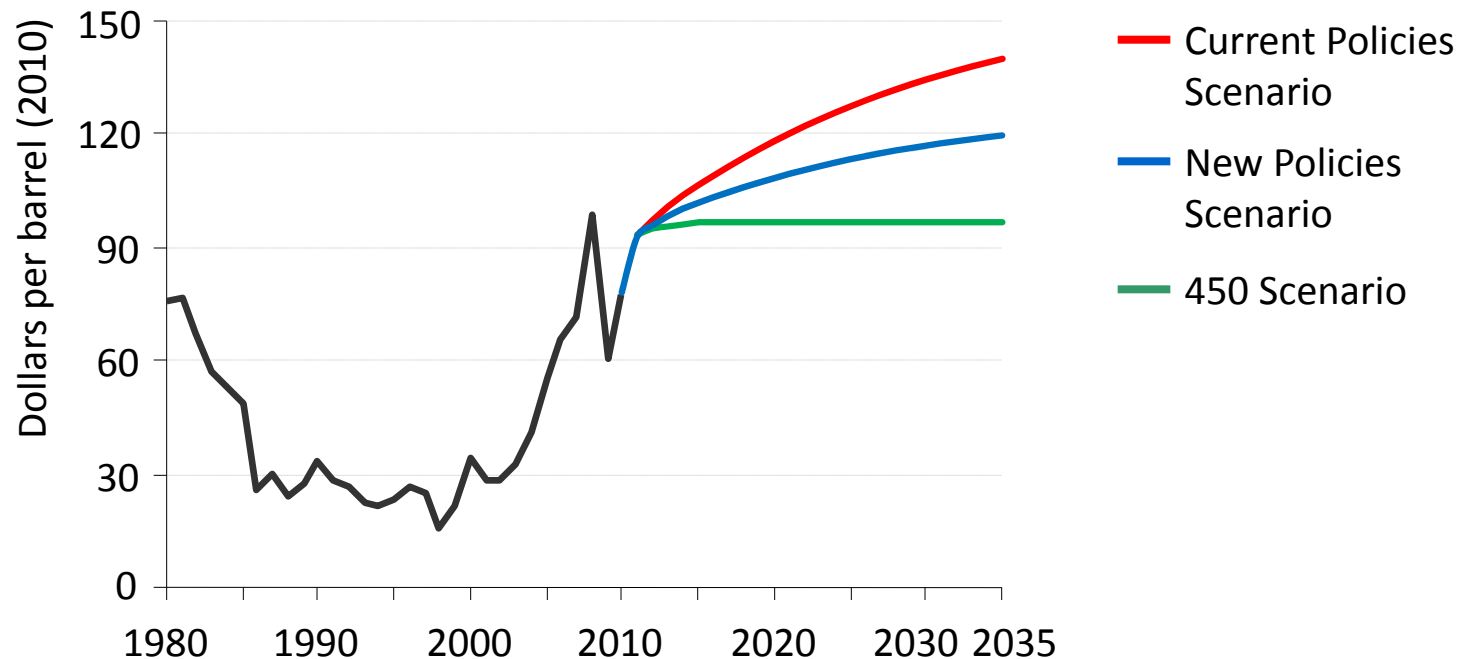


The rate of growth in world GDP is assumed to average 3.6% per year over the period 2009-2035 in all scenarios

Demand for mobility and rising cost of supply keep pressure on prices

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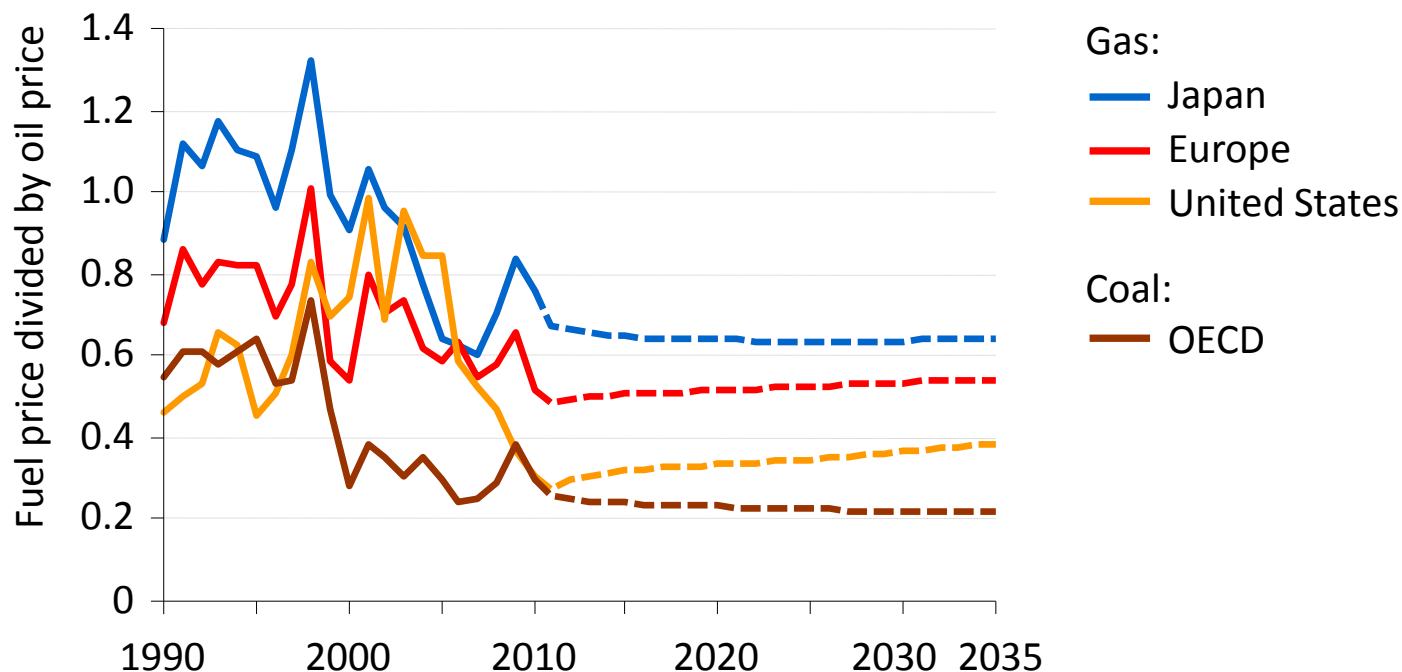
Average IEA crude oil import price



In the New Policies Scenario, the oil price in real terms is assumed to rise to \$109/barrel in 2020 & \$120 in 2035 (over \$210 in nominal terms)

Signs of convergence but no global price for natural gas

**Ratio of average natural gas and coal import prices
to crude oil in the New Policies Scenario**

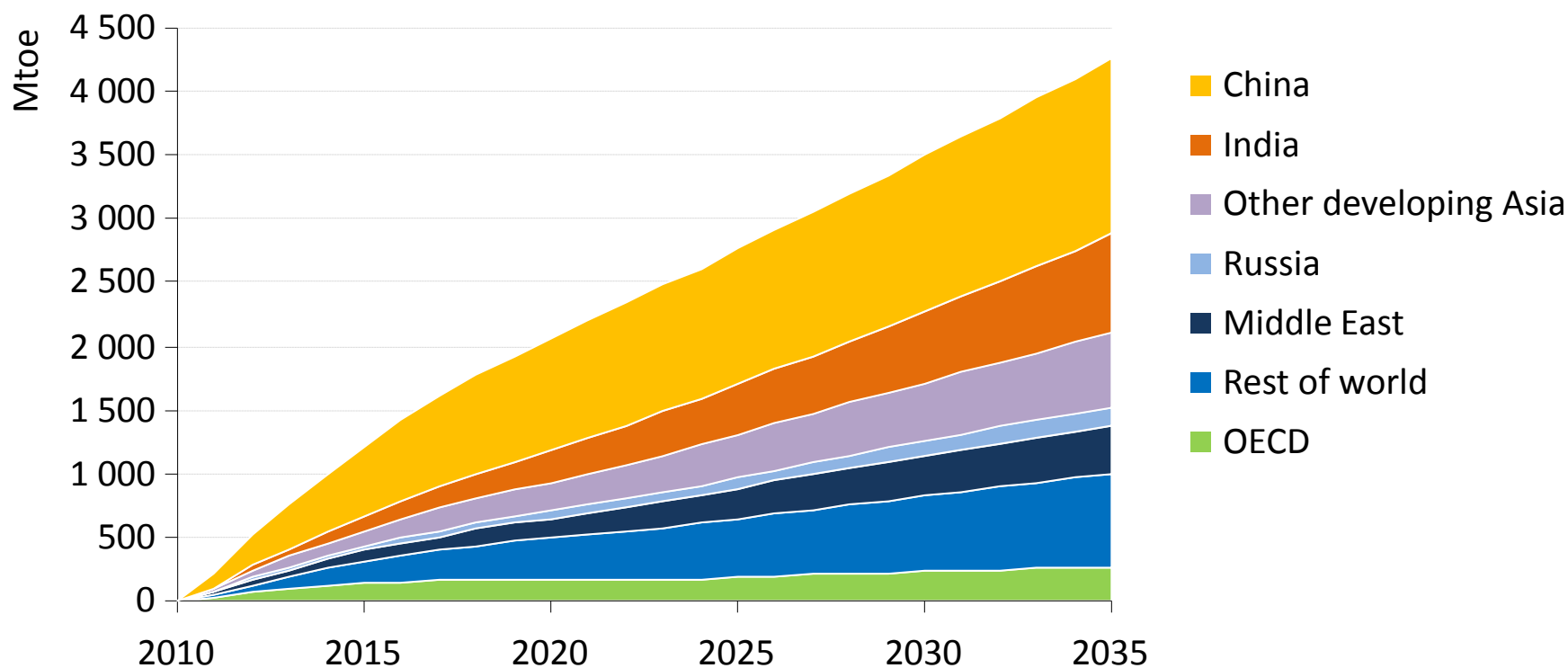


Natural gas prices are assumed to remain low relative to oil prices, while coal prices rise much less than those of both oil & gas

Emerging economies continue to drive global energy demand

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Growth in primary energy demand

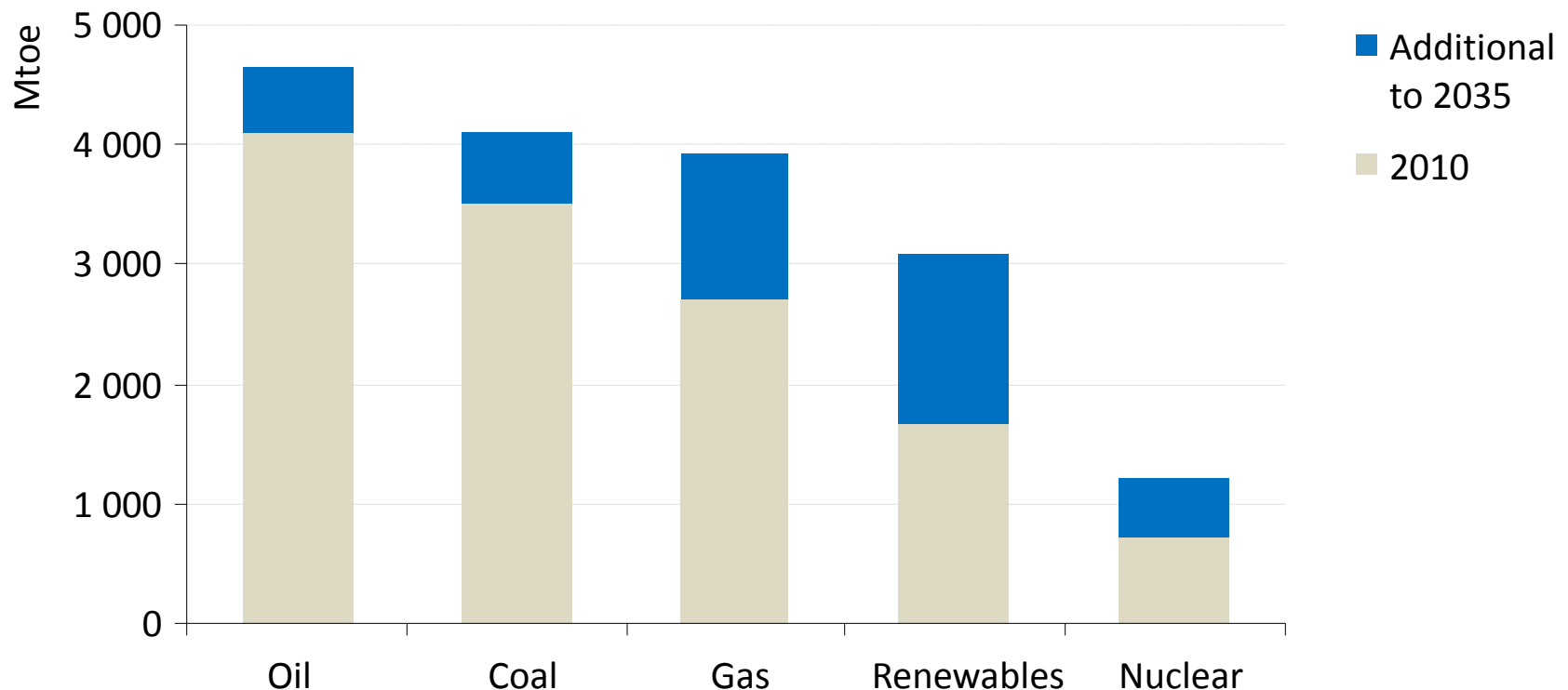


**Global energy demand increases by one-third from 2010 to 2035,
with China & India accounting for 50% of the growth**

Natural gas & renewables become increasingly important

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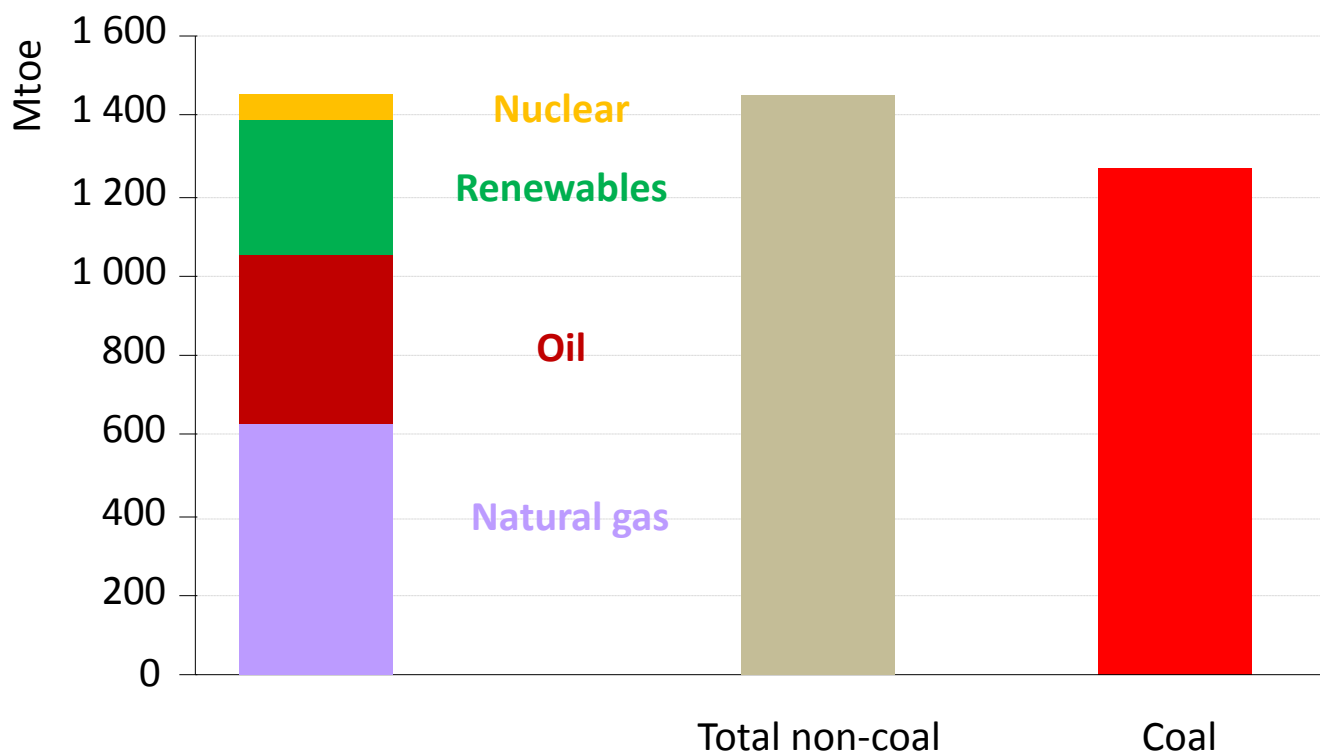
World primary energy demand



Renewables & natural gas collectively meet almost two-thirds of incremental energy demand in 2010-2035

Coal won the energy race in the first decade of the 21st century

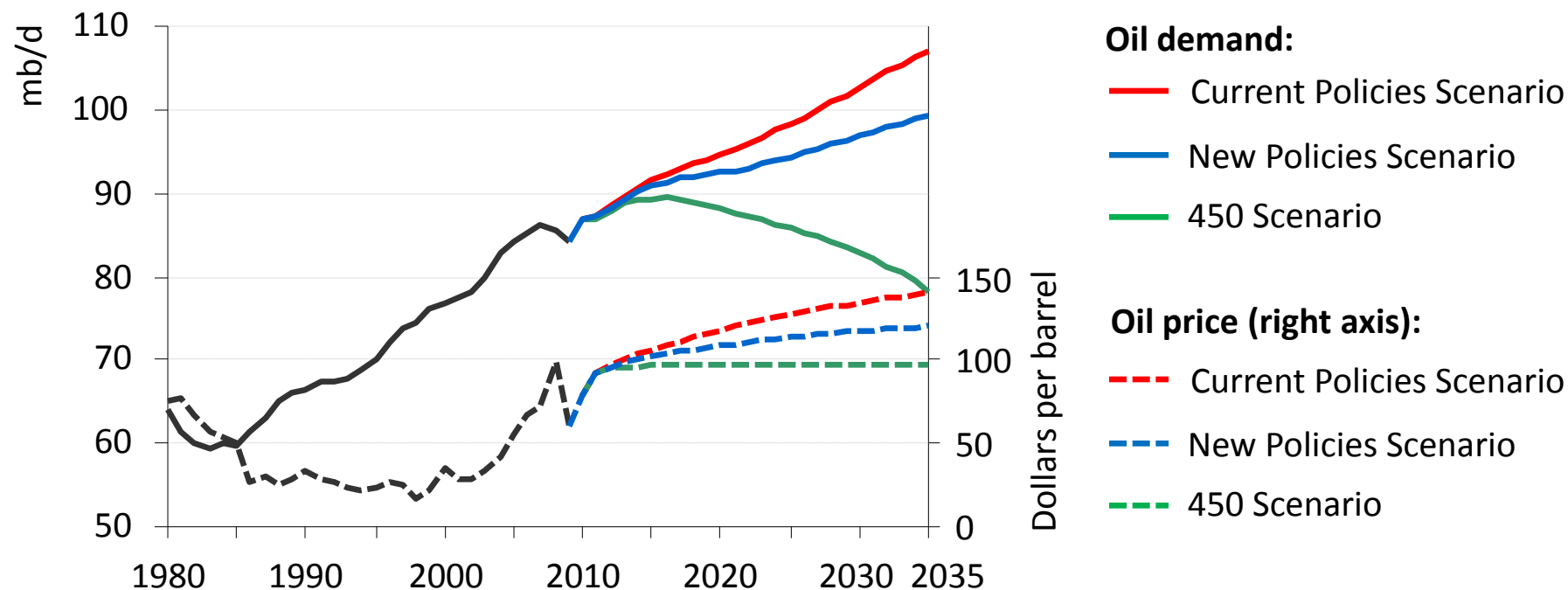
Growth in global energy demand, 2000-2010



Coal accounted for nearly half of the increase in global energy use over the past decade, with the bulk of the growth coming from the power sector in emerging economies

World primary oil demand and oil price by scenario

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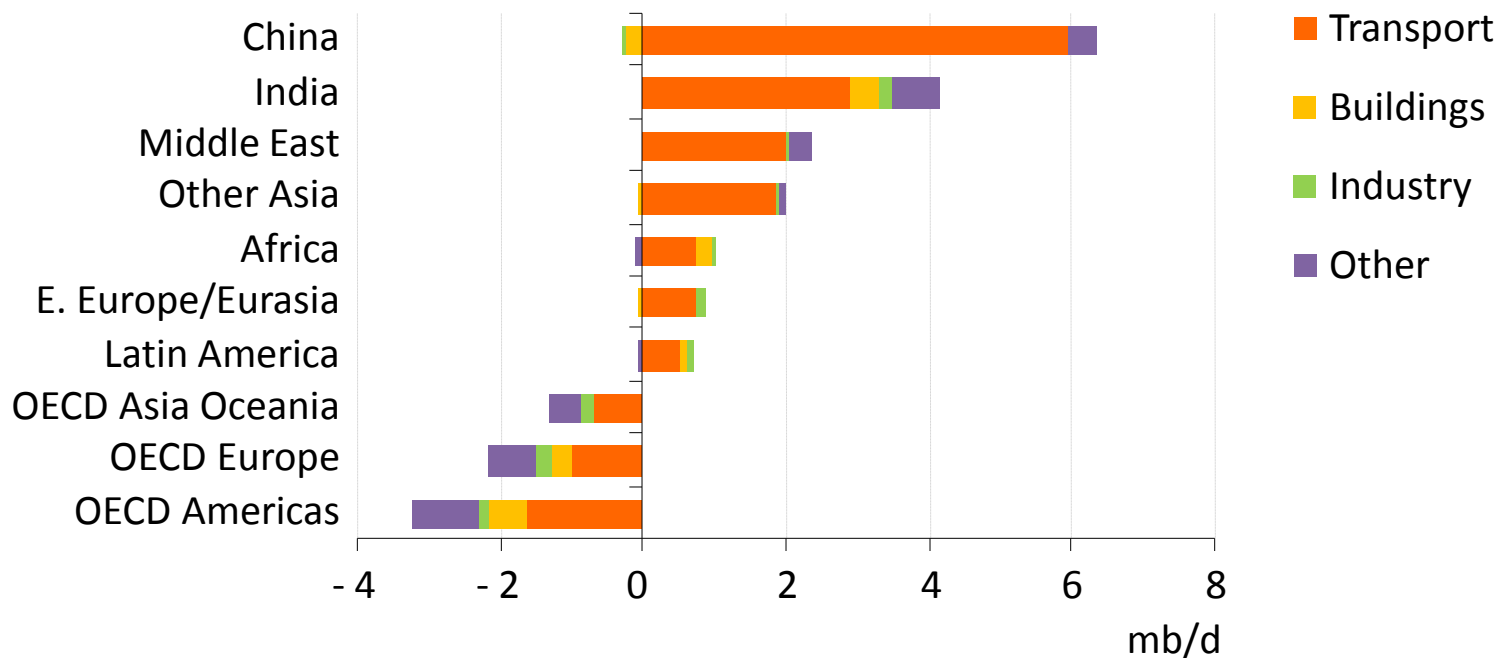


Global oil use continues to expand on planned policies, reaching 99 mb/d by 2035, but would need to use less than 80 mb/d to achieve the 2-degree climate goal

Transport drives oil demand

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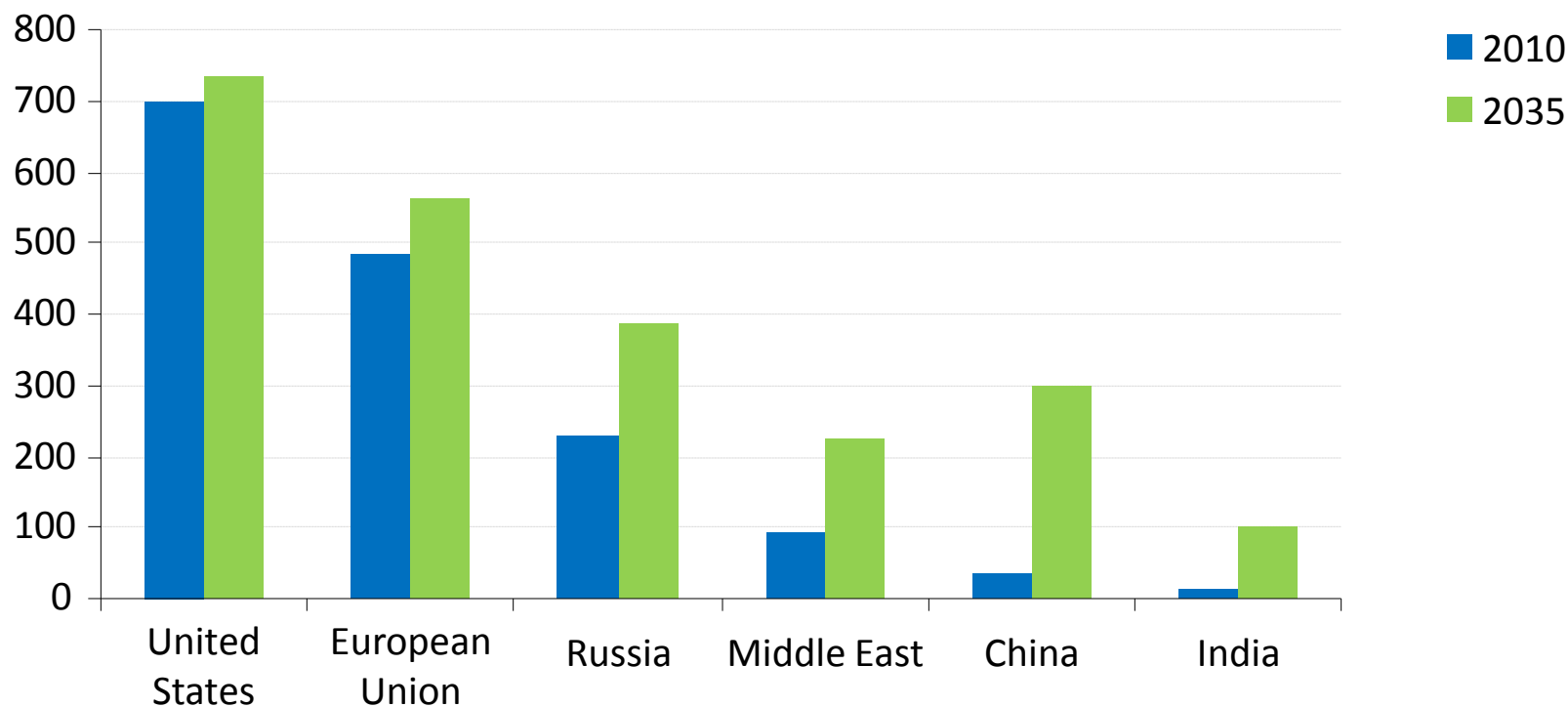
Change in primary oil demand by sector & region, 2010-2035



Transport net demand expands by 14 mb/d between 2010 & 2035, outweighing a net fall in demand of more than 1 mb/d in other sectors

Oil demand is driven higher by soaring car ownership

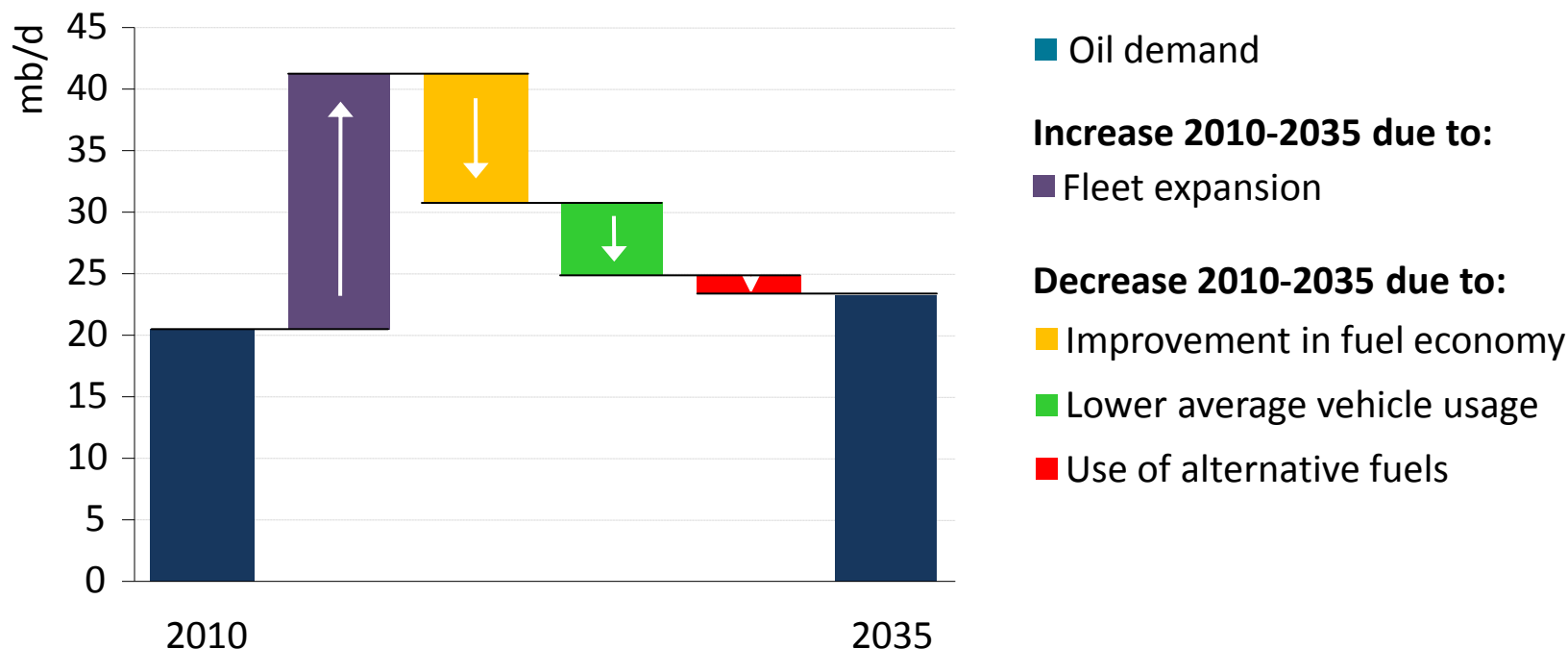
Vehicles per 1000 people in selected markets



The passenger vehicle fleet doubles to 1.7 billion in 2035; most cars are sold outside the OECD by 2020, making non-OECD policies key to global oil demand

Oil use in cars grows much less than the number of cars

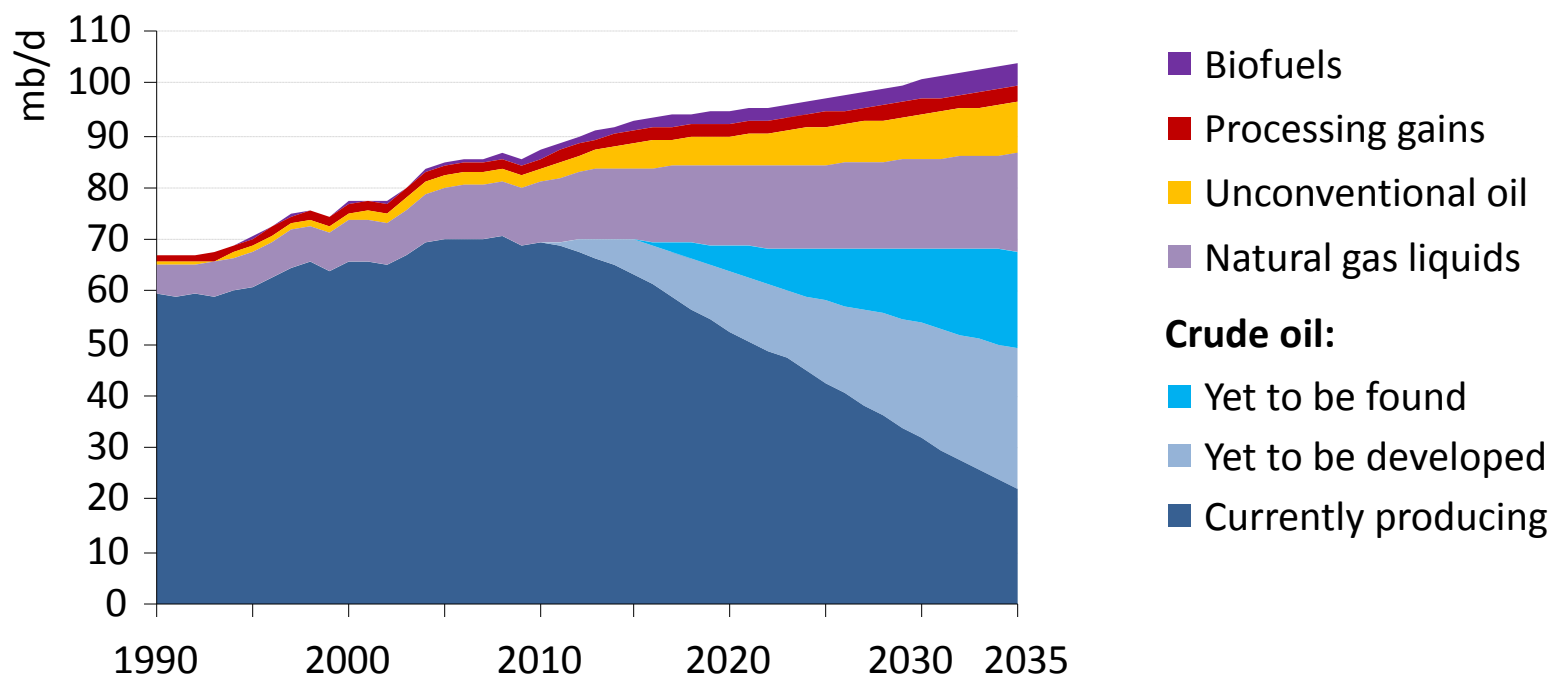
World PLDV oil demand in the New Policies Scenario



Oil use by cars expands by only 15% between 2010 & 2035, with more efficient vehicles, less usage & switching to non-oil fuels offsetting most of the impact of a doubling of the fleet

Most new oil production capacity is needed to offset decline

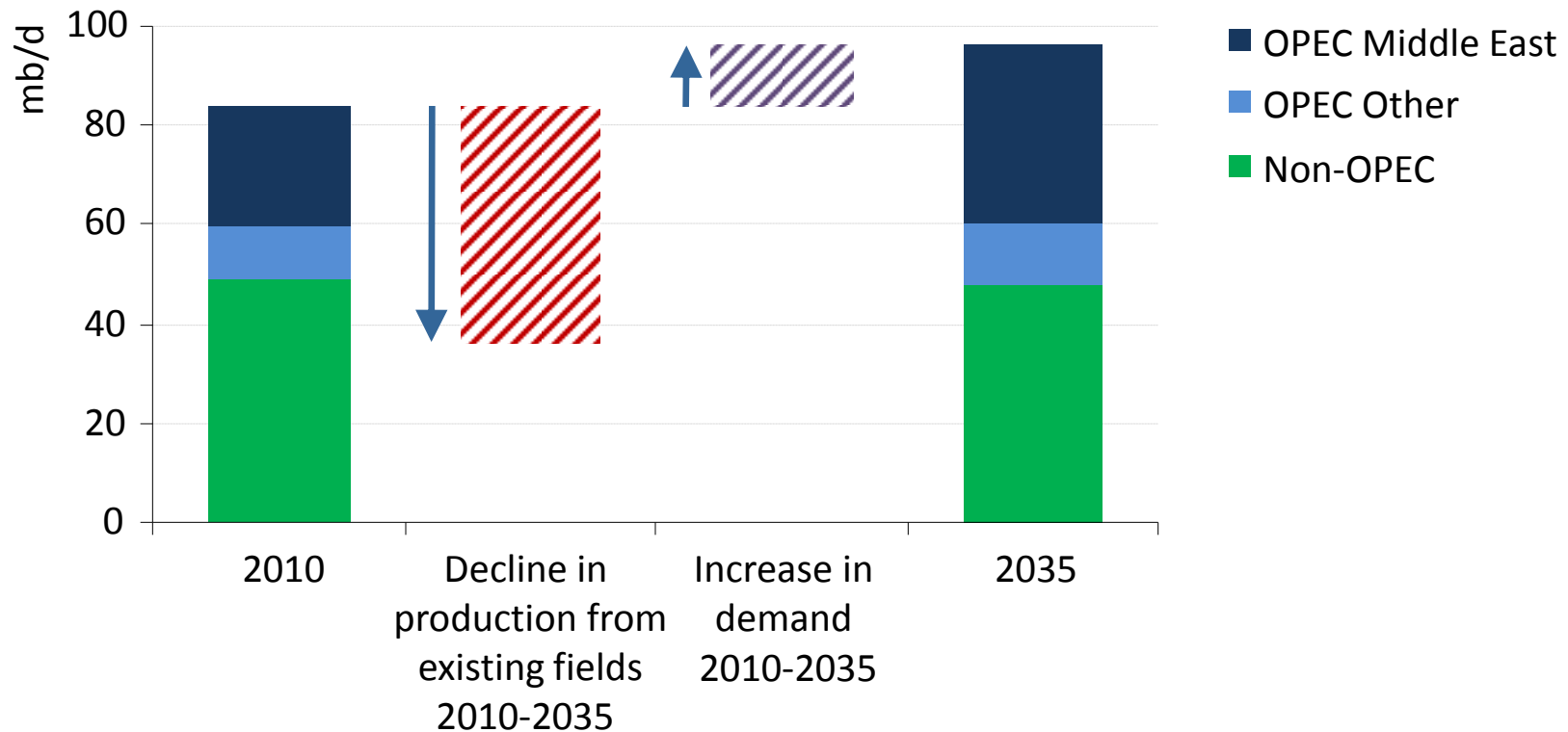
World liquids supply by type in the New Policies Scenario



Decline at existing conventional fields amounts to 47 mb/d, twice current OPEC Middle East production; NGLs and unconventional production are the main sources of growth

OPEC's market share is set to expand

**World oil production by source
in the New Policies Scenario**

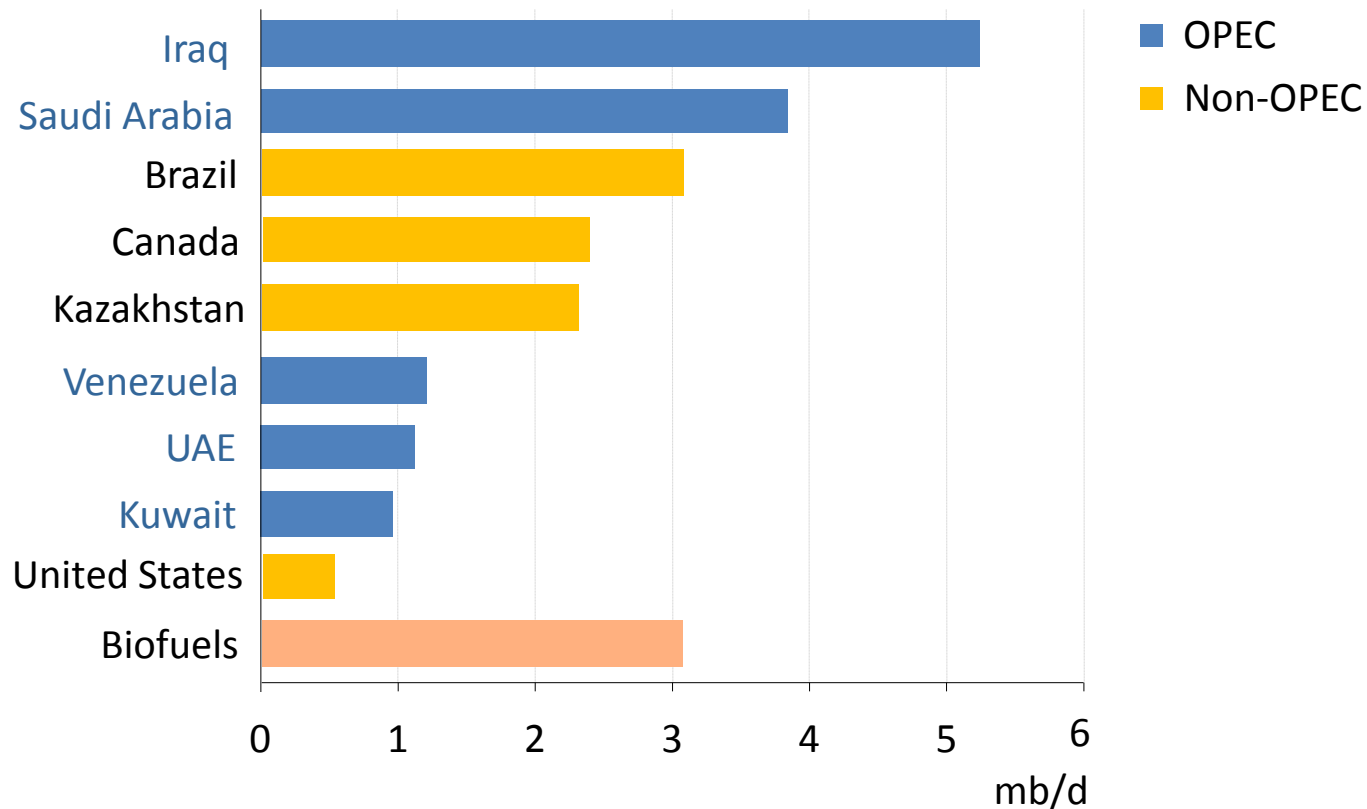


Oil production grows by 13 mb/d, or 15%, reaching 96.4 mb/d in 2035, with all of the net increase coming from OPEC countries, mainly in the Middle East

Iraq and Saudi Arabia the largest sources of supply growth

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Major changes in supply in the New Policies Scenario, 2010-2035

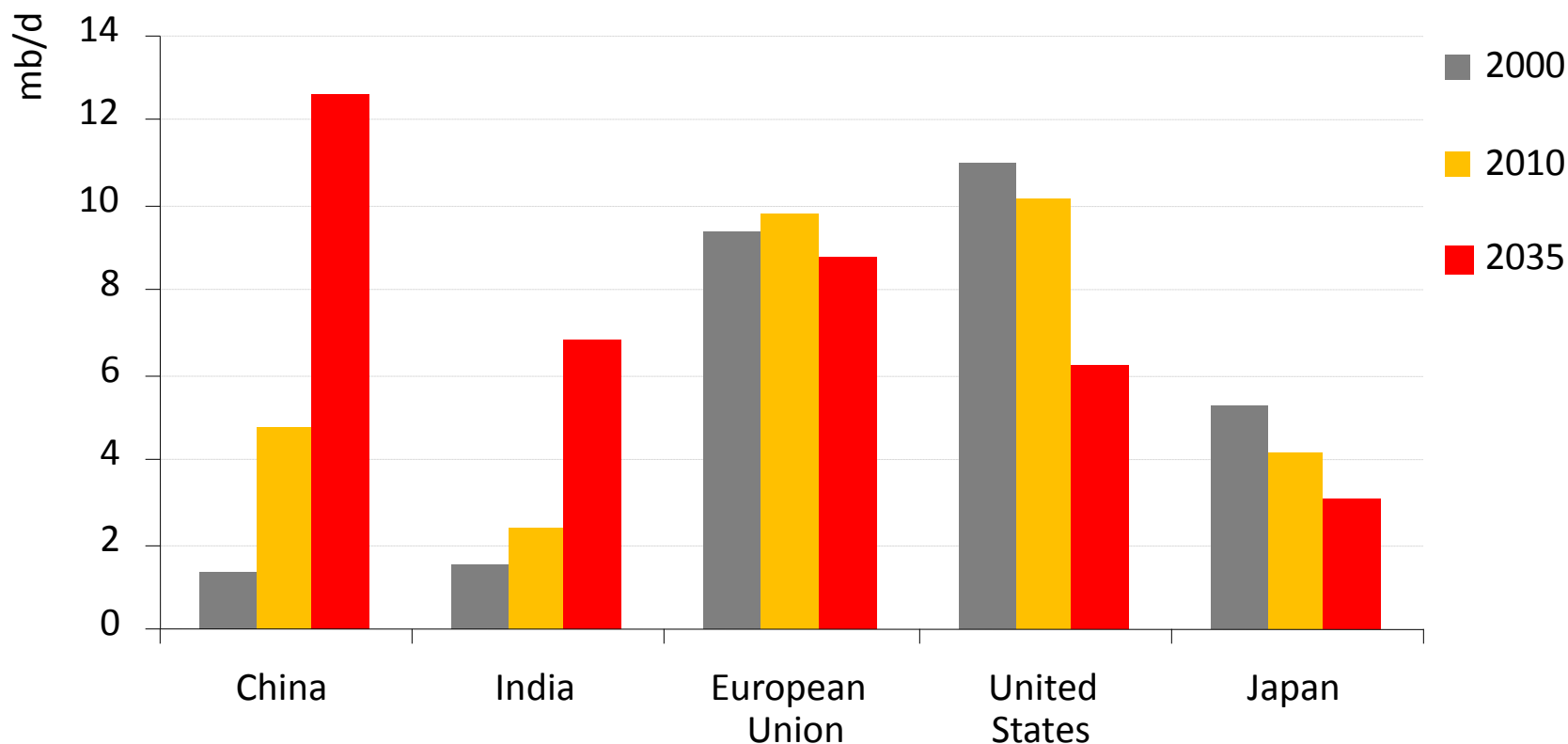


The rise in MENA production is over 90% of the growth in global oil output to 2035 while companies operating elsewhere turn increasingly to more difficult & costly sources

Oil import needs are changing

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Net imports of oil



US oil imports drop due to rising domestic output & improved transport efficiency: EU imports overtake those of the US around 2015; China becomes the largest importer around 2020

- In a world full of uncertainty, one thing is sure: rising incomes & population will push energy needs higher
- Non-OECD countries, China in particular, will be instrumental in shaping all energy markets.
- Rising demand for mobility and reliance on more difficult and costly sources of supply keep pressure on oil prices
- Stronger penetration of natural gas could have profound implications for global energy markets.
- Much stronger policy action is required to move us to a secure and sustainable energy future and to provide energy for all