



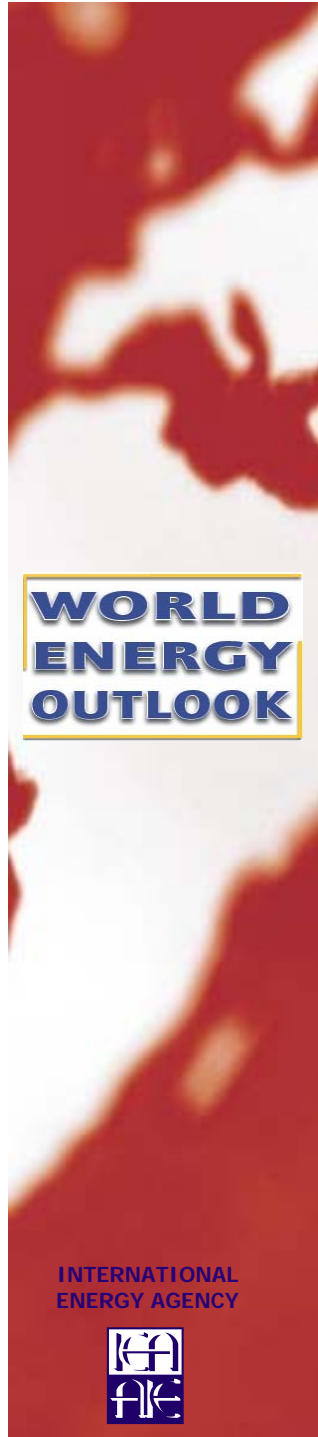
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World Energy Outlook Strategic Challenges

Noé van Hulst

Director, Long-Term Co-operation and Policy Analysis

Russia, Central Asia and the Caucasus: Energy and Security Conference
London, Tuesday 20 June 2006

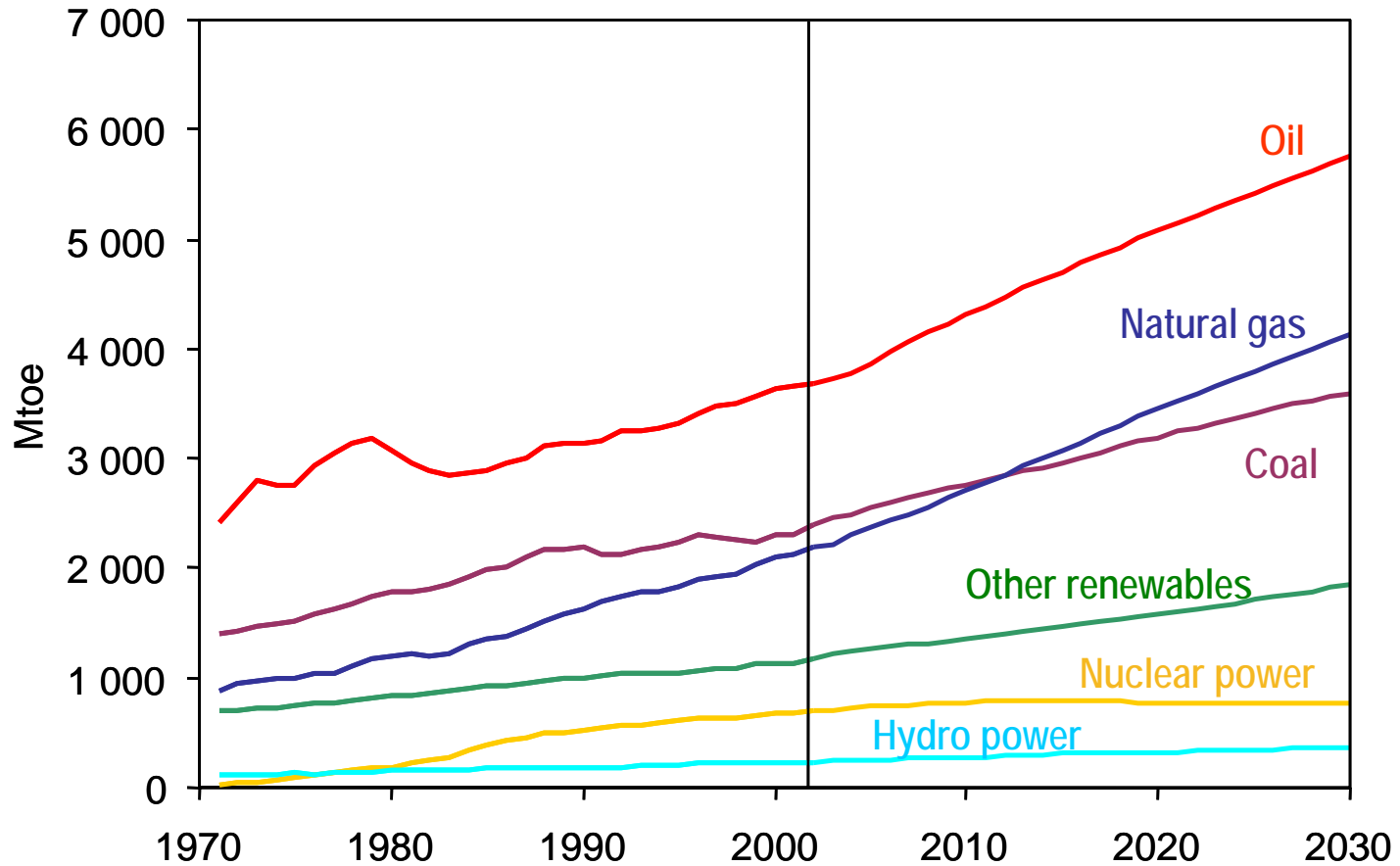


Energy Trends & Strategic Challenges Reference Scenario

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World Primary Energy Demand

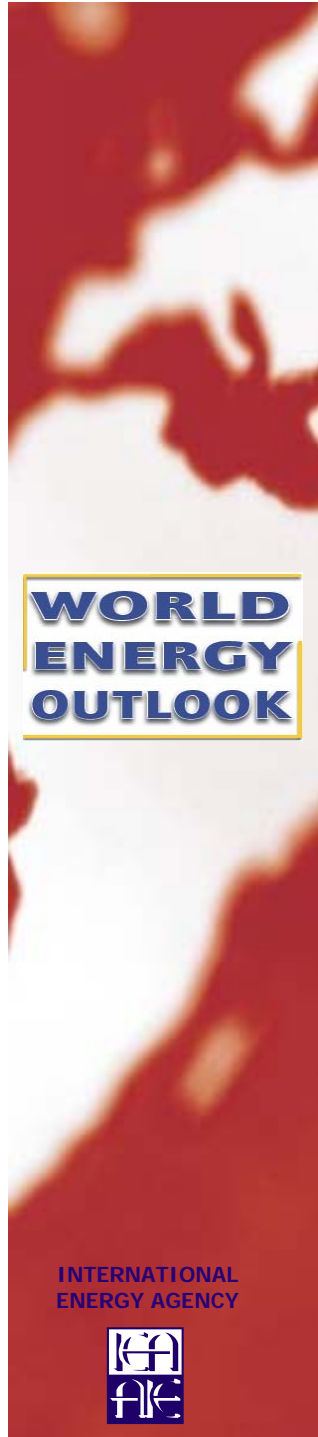


Fossil fuels account for almost 90% of the growth in energy demand between now and 2030

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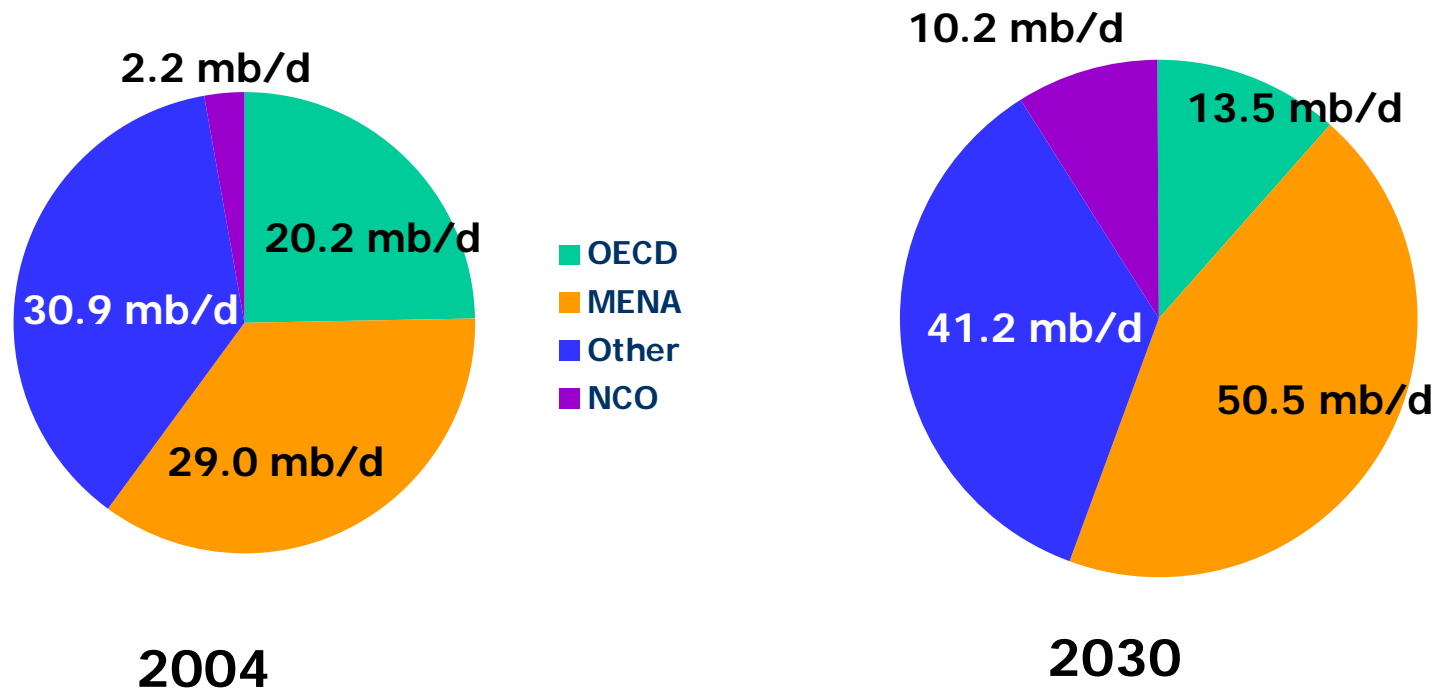
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Challenge 1: Security of Supply

World Oil Production Shifts Away from OECD



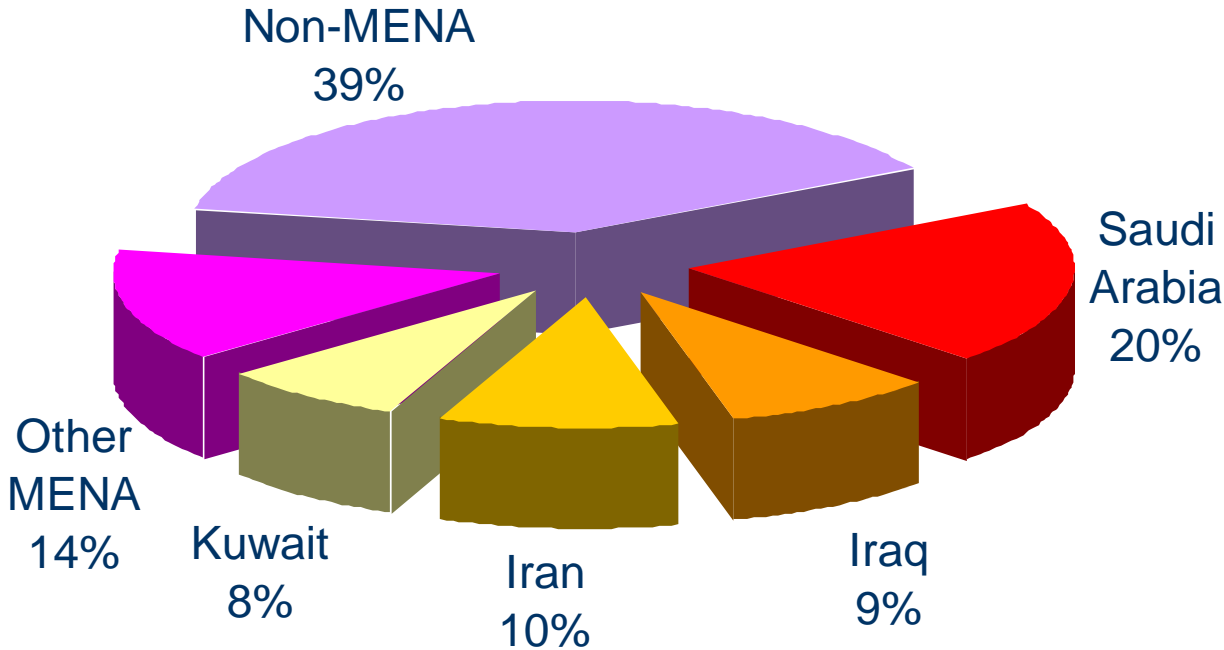
Global oil production climbs from 82 mb/d in 2004 to 115 mb/d in 2030; OECD share falls from 25% to 12%

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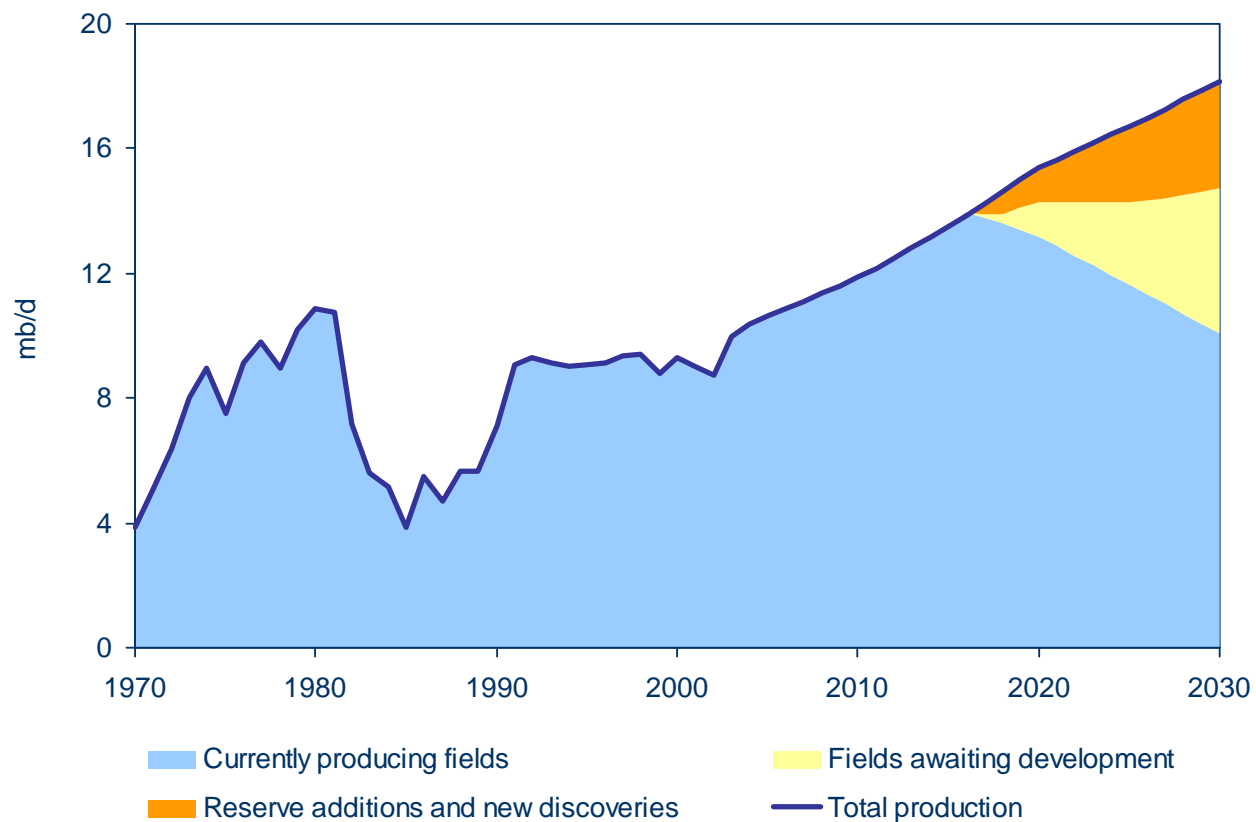


World Proven Oil Reserves



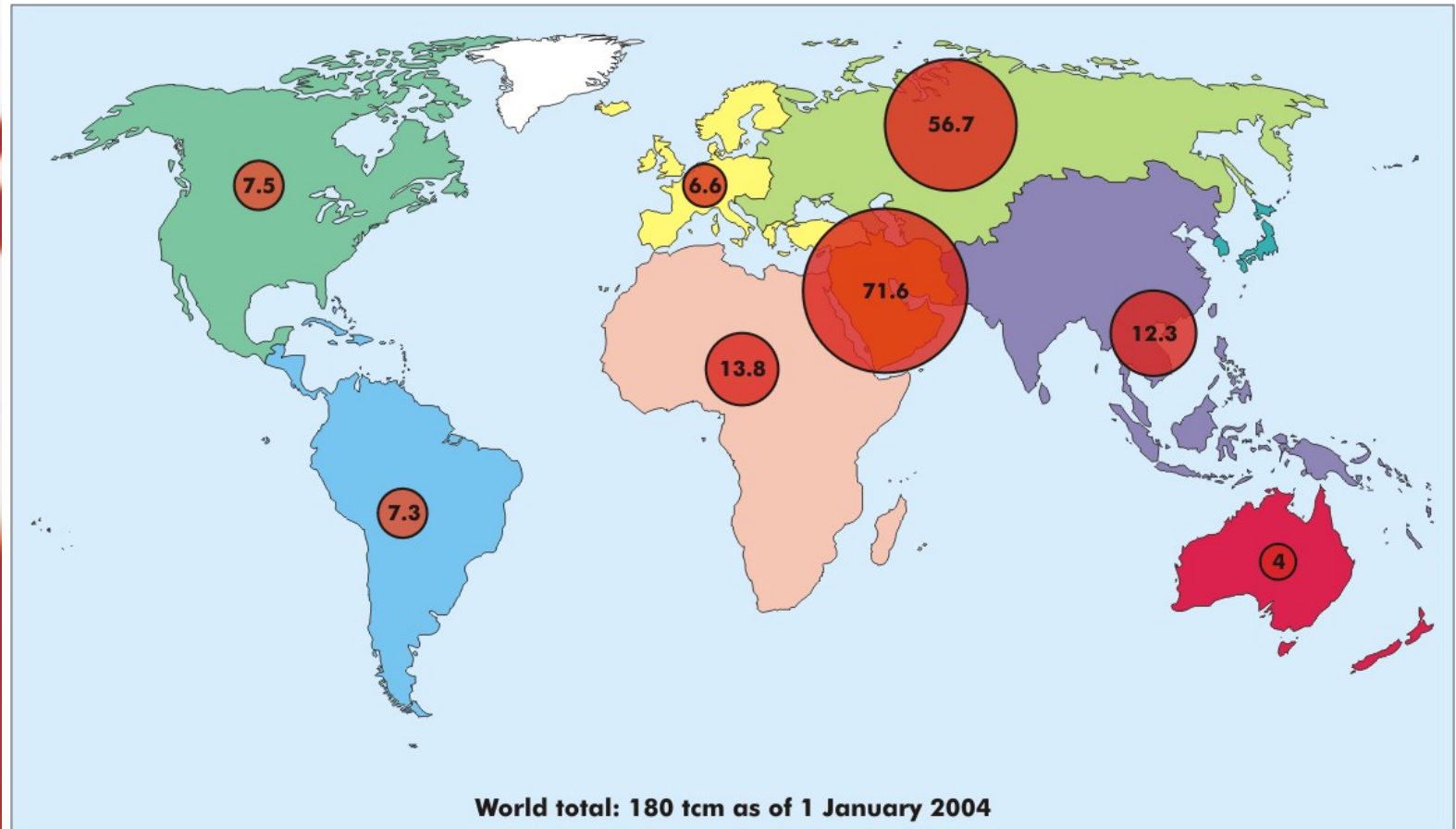
MENA share of global oil reserves is much higher than its share of current production, suggesting strong potential for growth

Saudi Arabia's Oil Production by Source in the Reference Scenario



***Based on its reserves and global demand trends,
Saudi oil production is projected to reach 18 mb/d in 2030***

Proven Natural Gas Reserves



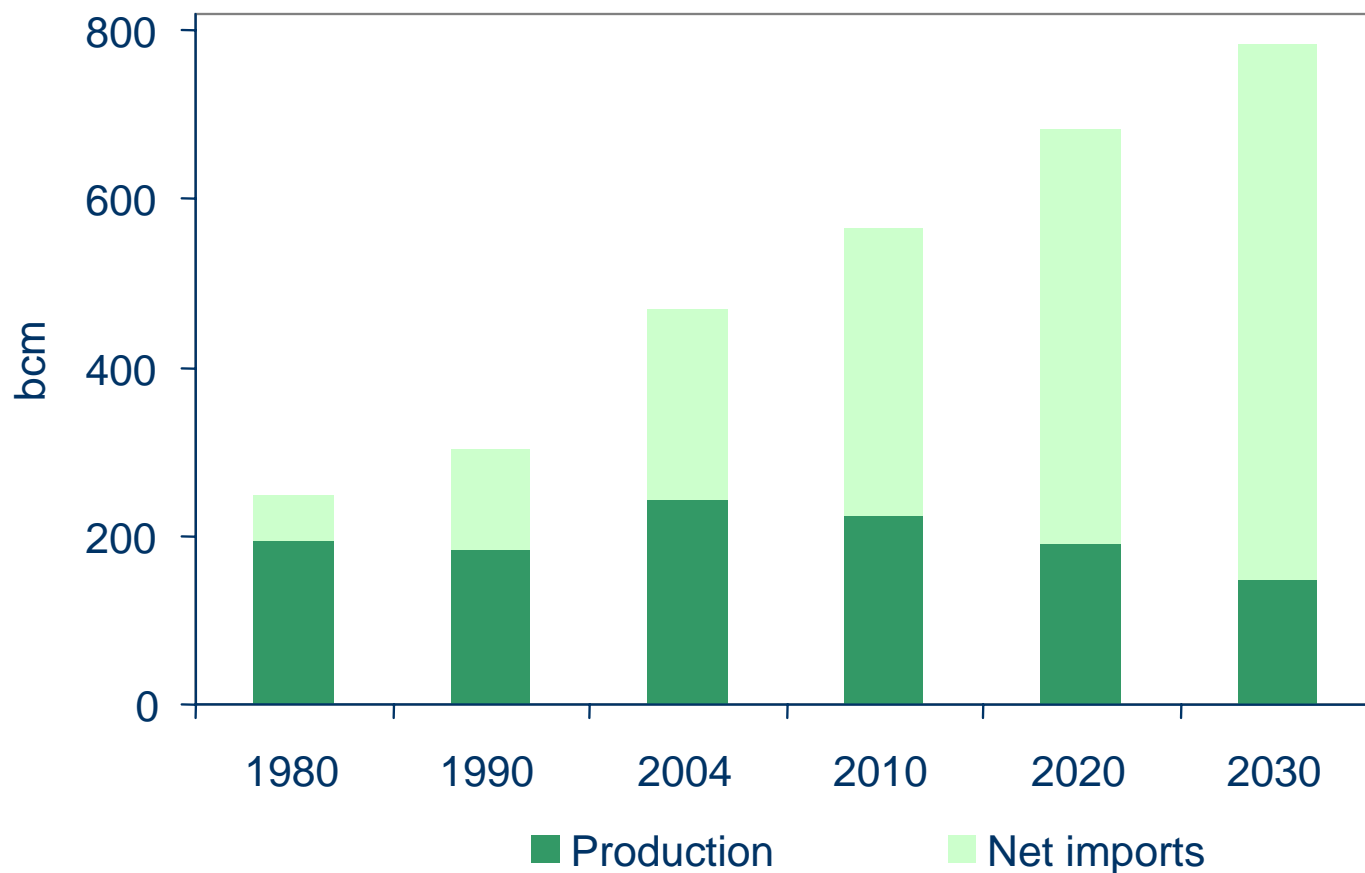
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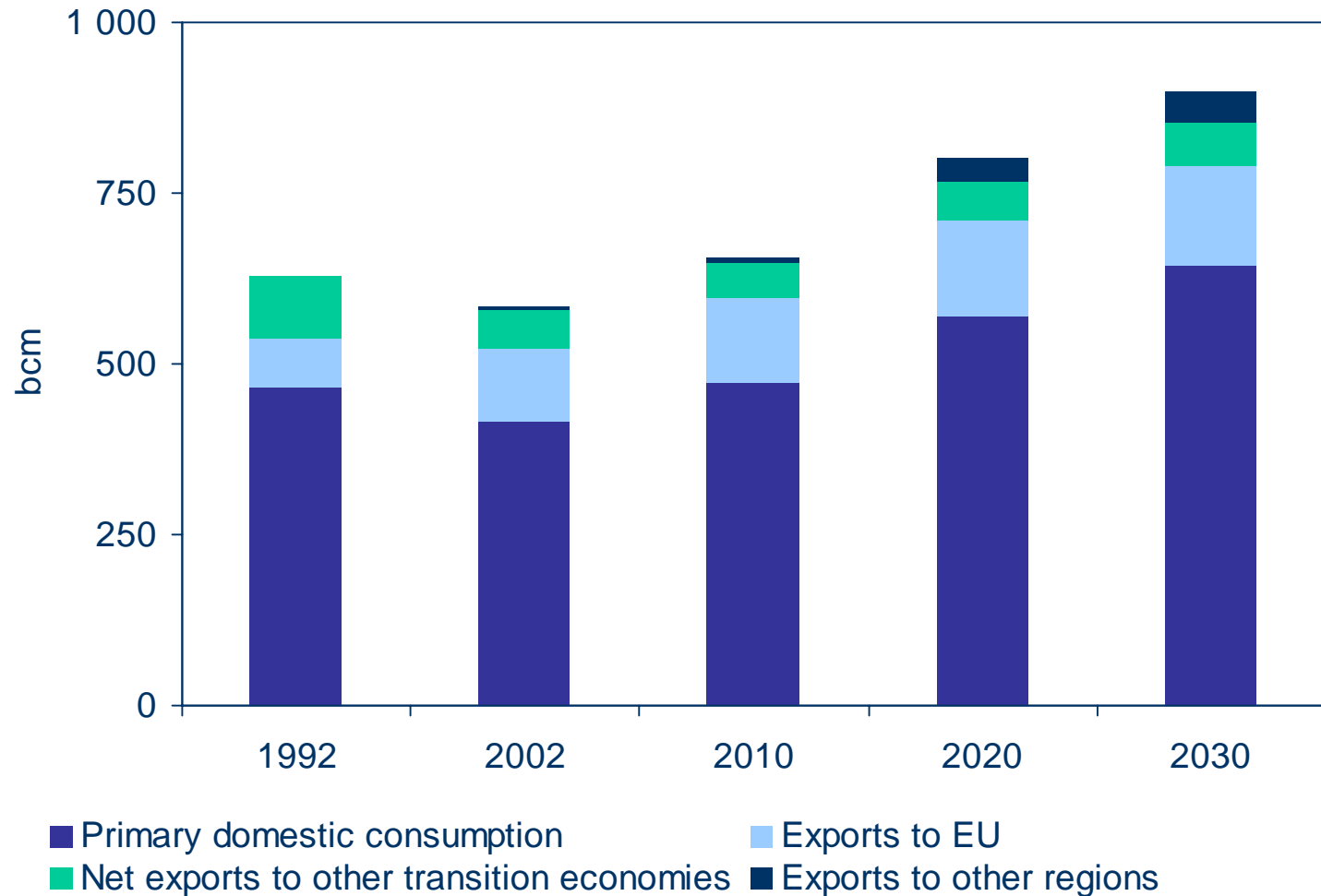
Gas reserves, concentrated in the Middle East & the transition economies, are equal to 66 years of current production

EU Gas Supply Balance



Rising demand – mainly for power generation – and declining output will cause net imports to surge

Russian Gas Production



Russia will remain the single largest supplier to the EU, assuming investment in developing new fields is forthcoming

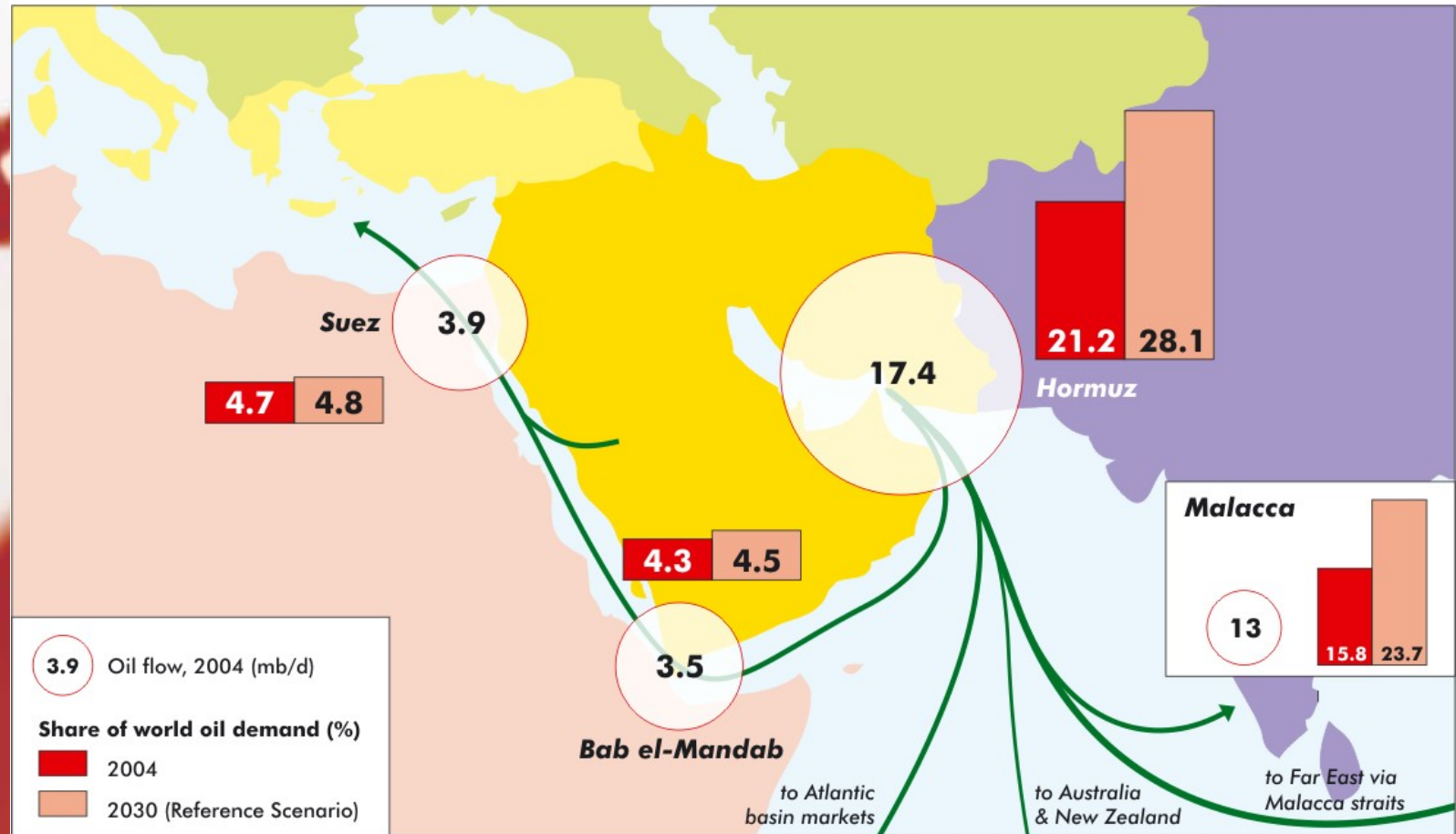
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MENA Oil Exports through the "Dire Straits"

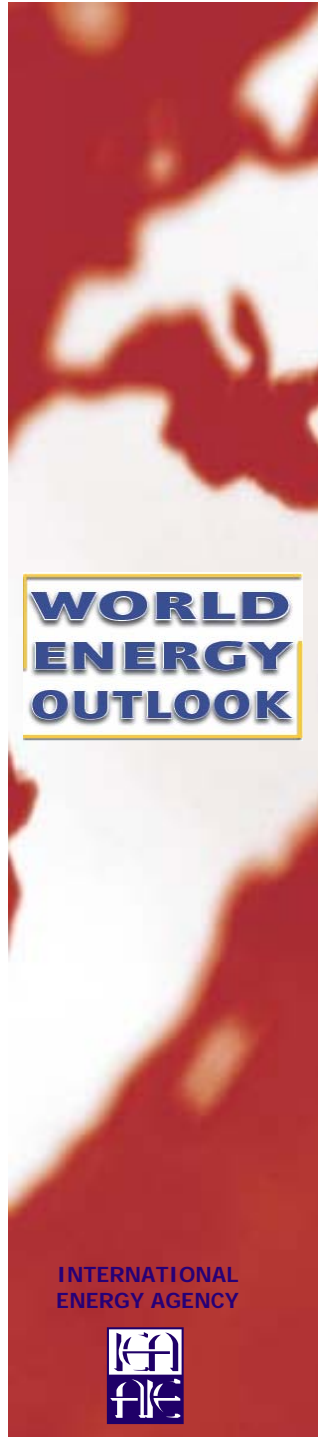
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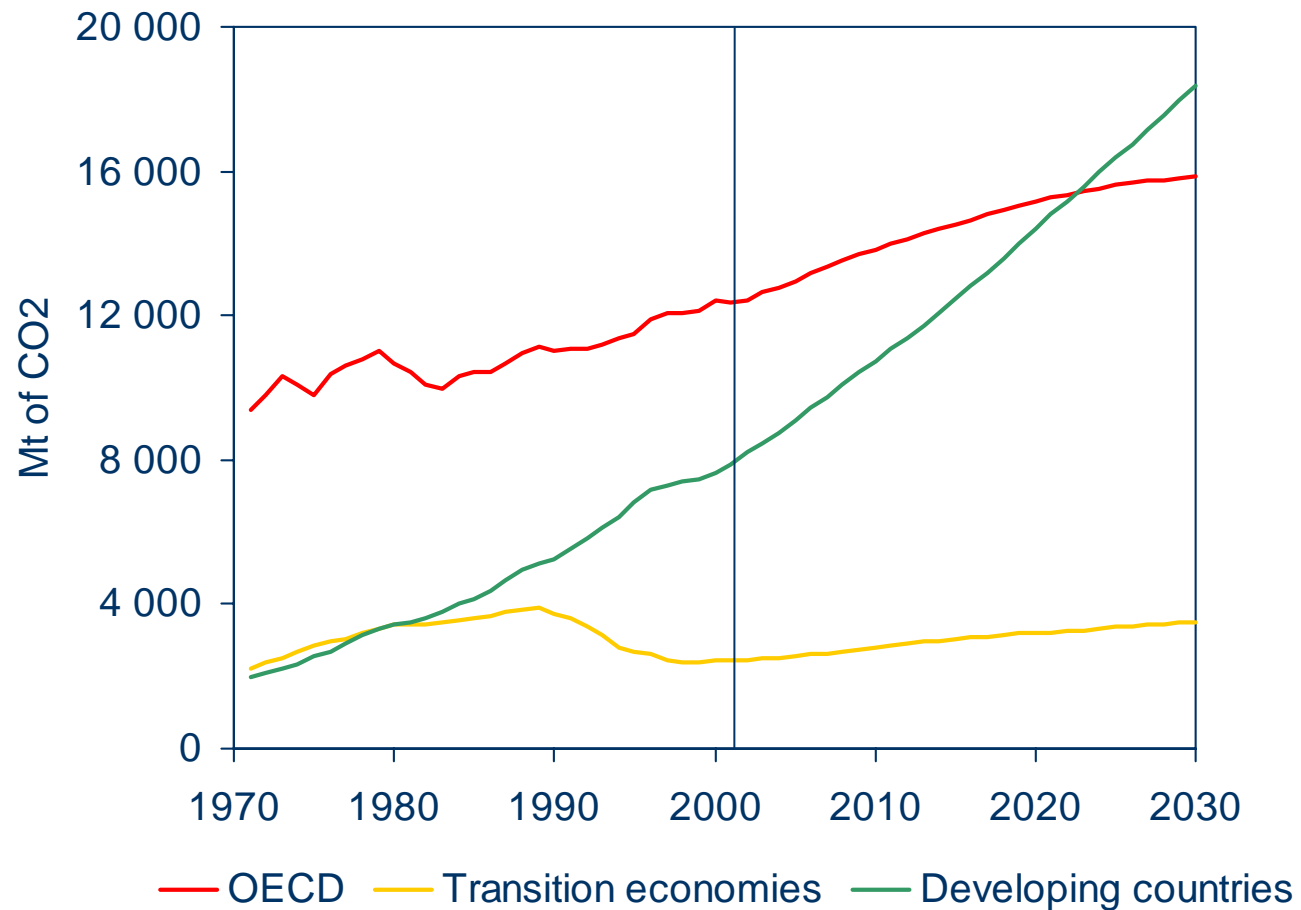


Much of the additional oil and LNG exports from MENA in the future will be shipped through just three maritime routes



Challenge 2: Carbon Dioxide Emissions

World Energy-Related CO₂ Emissions



Global emissions grow 50% between now and 2030, and developing countries' emissions will overtake OECD's in the 2020s

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Challenge 3: Energy and Poverty

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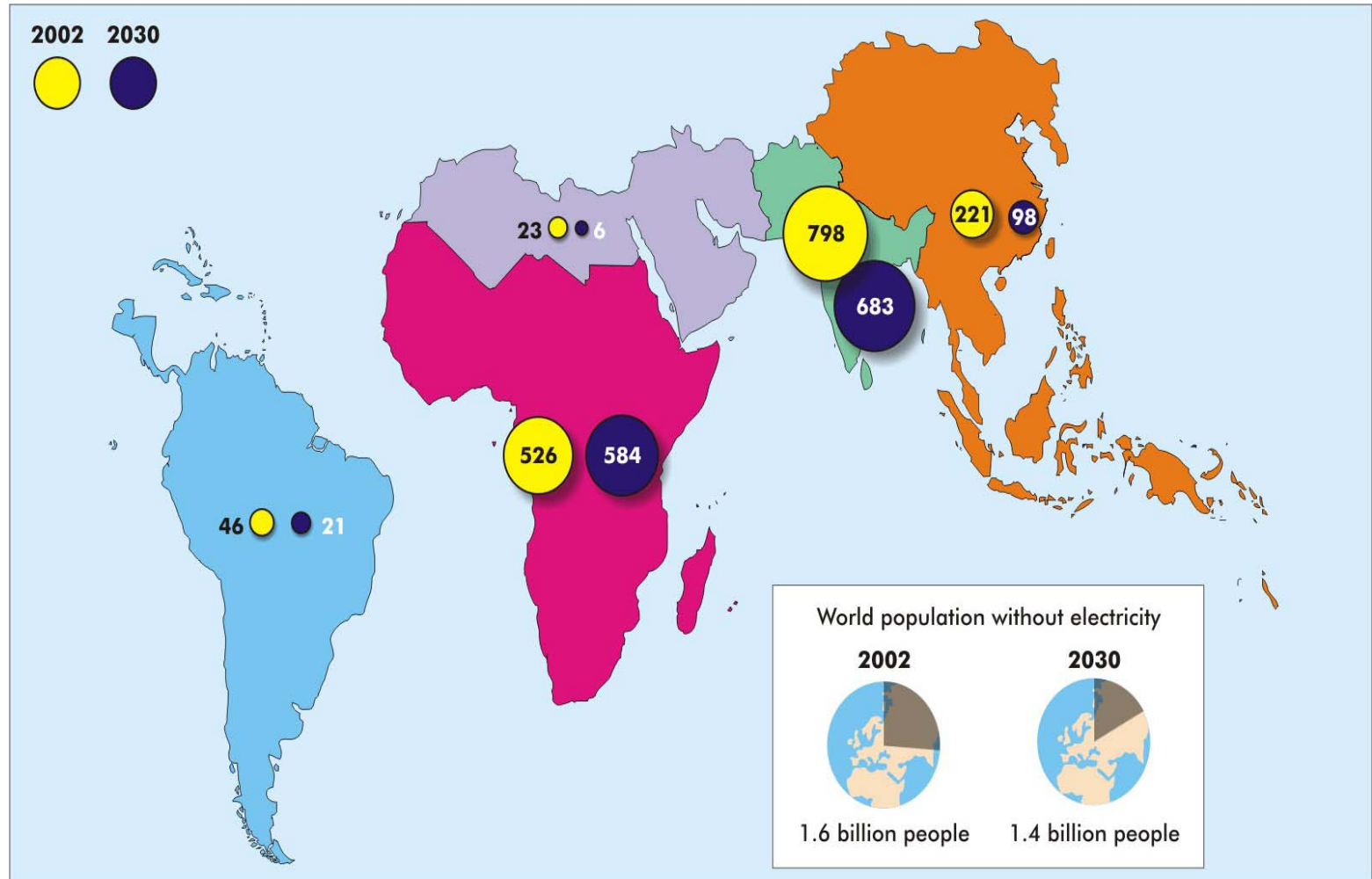
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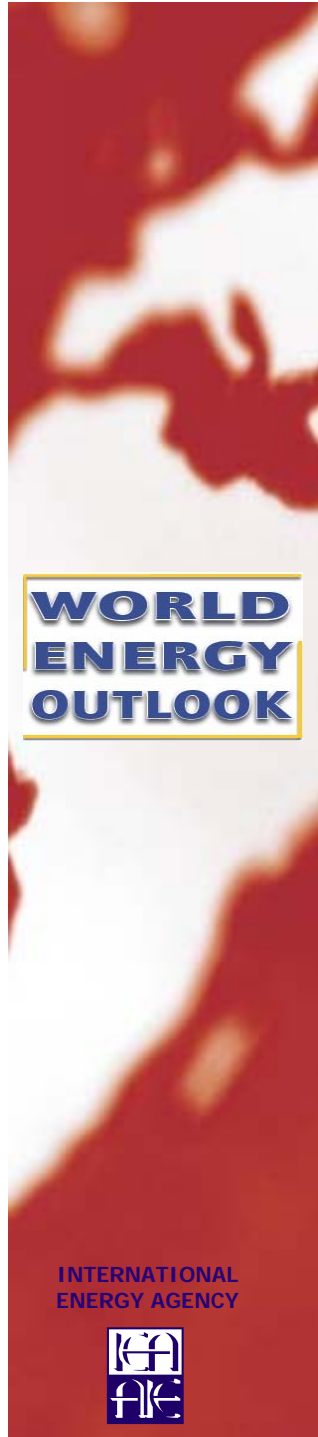
Electricity Deprivation

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In 2030, if no new policies are implemented, there will still be 1.4 billion people without electricity



World Alternative Policy Scenario

Key Policies in Alternative Scenario for European Union

Power generation

- Renewable energy directive
- CHP directive
- Extension of reactor lifetime

● Transport sector

- Prolongation and tightening of Voluntary Agreement with car manufacturers
- Biofuels target

Residential and commercial sectors

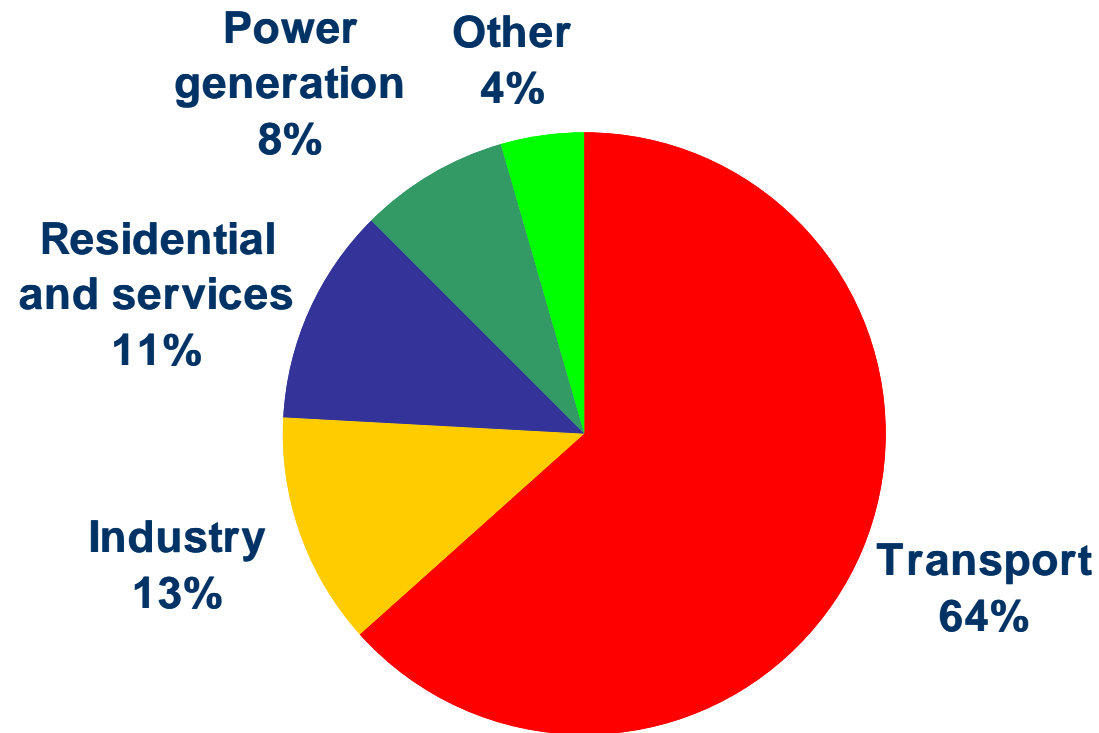
- Energy performance in buildings directive
- Energy labelling

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Reduction in Oil Demand in the Alternative vs. Reference Scenario, 2030



Oil savings = 12.8 mb/d

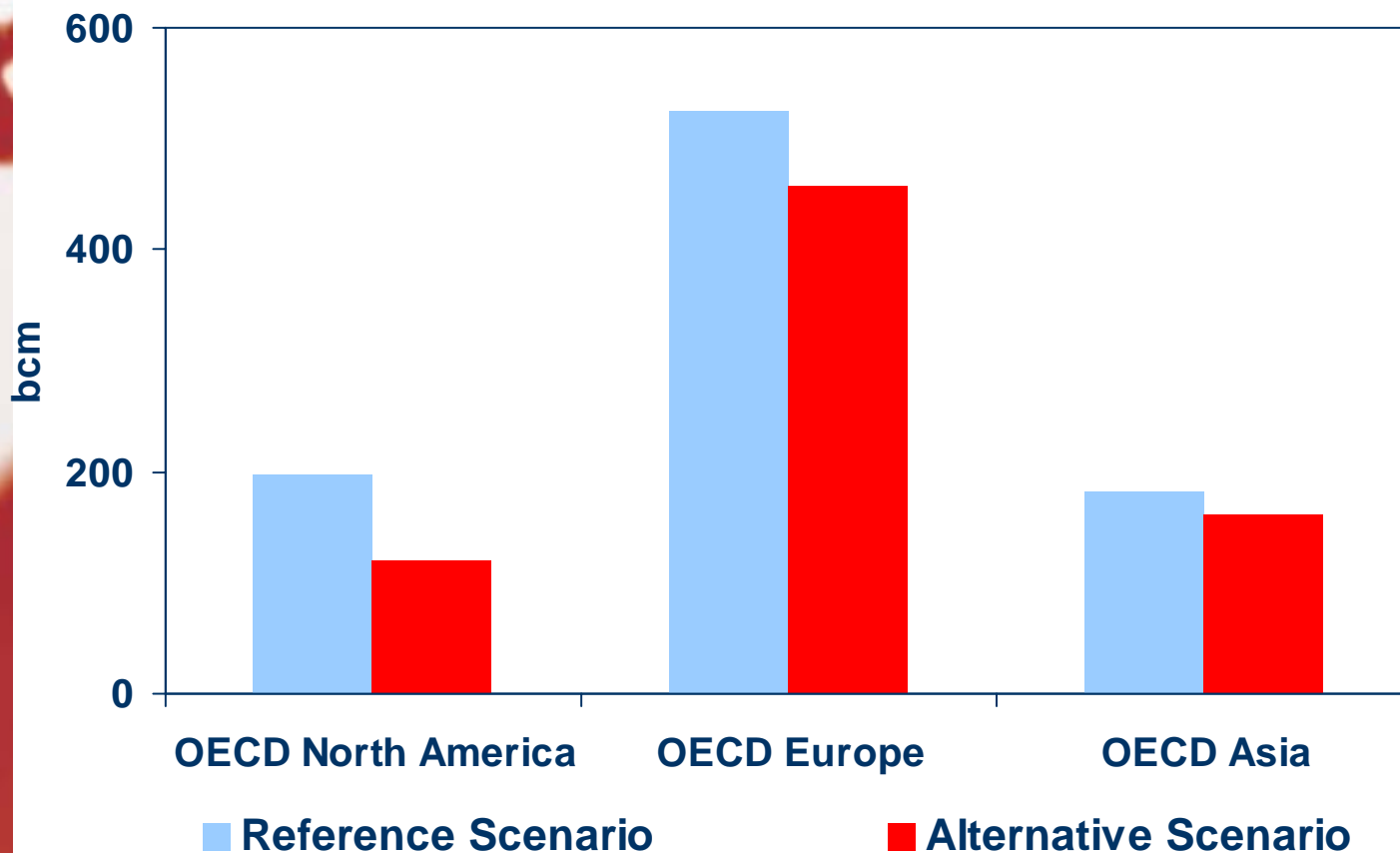
Oil savings in 2030 would be equivalent to the combined current production of Saudi Arabia, UAE and Nigeria

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Net Gas Imports in the Alternative & Reference Scenarios, 2030



Net gas imports are lower in all major importing regions

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Summary & Conclusions

- Projected market trends raise serious concerns
 - Increased risk for energy security
 - Rising environmental concerns
 - Persistent energy poverty
- More vigorous policies would curb rate of increase in energy demand and emission significantly
- Increased efficiency, renewables and nuclear power can largely contribute toward meeting these challenges
- Urgent and decisive government action needed

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