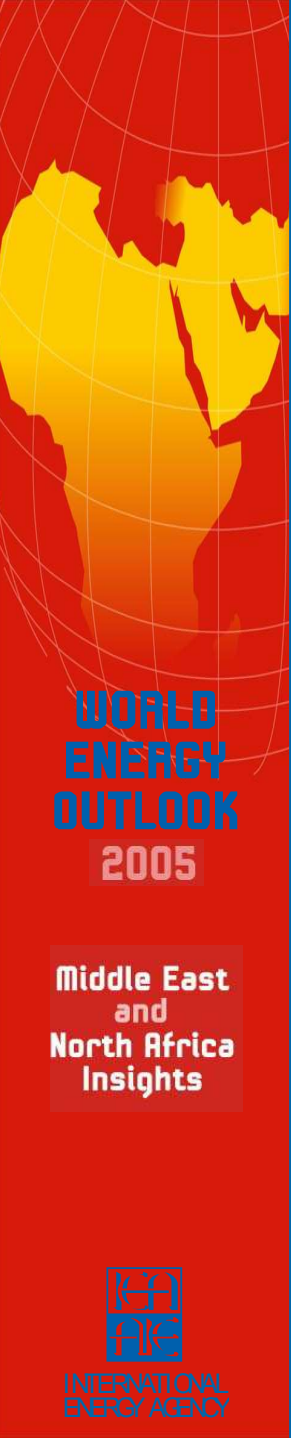




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**Chief Economist Dr. Fatih Birol**

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# **Global Energy Trends: Reference Scenario**

# International Energy Price Assumptions

- The assumed oil-price path in the Reference Scenario has been revised upwards from *WEO-2004*, in response to the results of detailed analysis of investment prospects:
  - ❑ International oil prices (WTI) assumed to ease from recent peaks to \$46 in 2010 rebounding to \$74 in 2030 in nominal terms
- In next few years, crude oil production capacity additions, new refinery investments & slower demand growth is expected to drive down prices
- But limited spare refining capacity, the rising cost of non-MENA crude projects and producer price targets/quotas could temper that decline
- Higher oil prices result in lower oil-demand, that reaches 115 mb/d in 2030 – 6 mb/d less than in *WEO-2004*

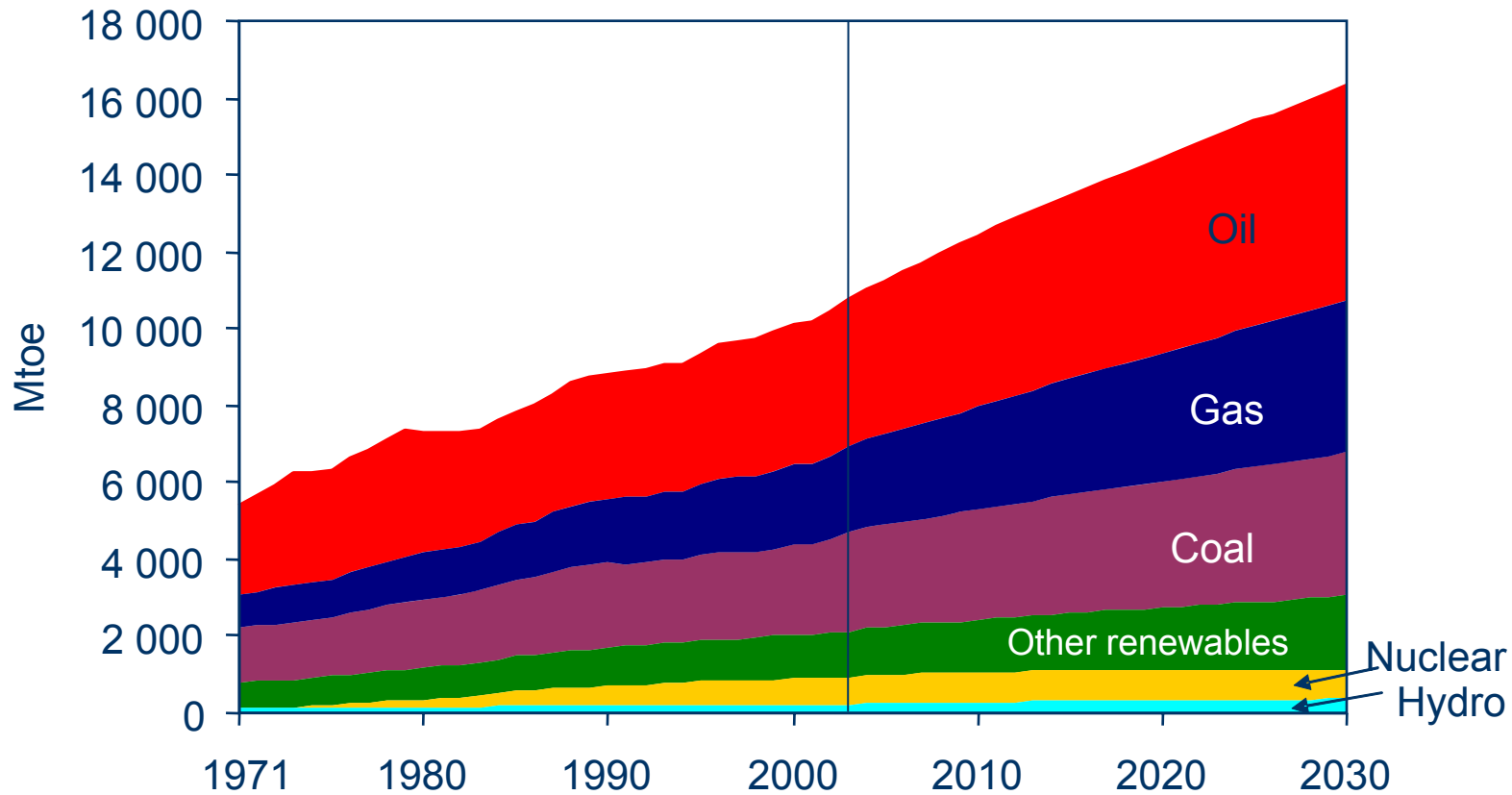
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# World Primary Energy Demand



***Oil and gas together account for more than 60% of the growth in energy demand between now and 2030 in the Reference Scenario***

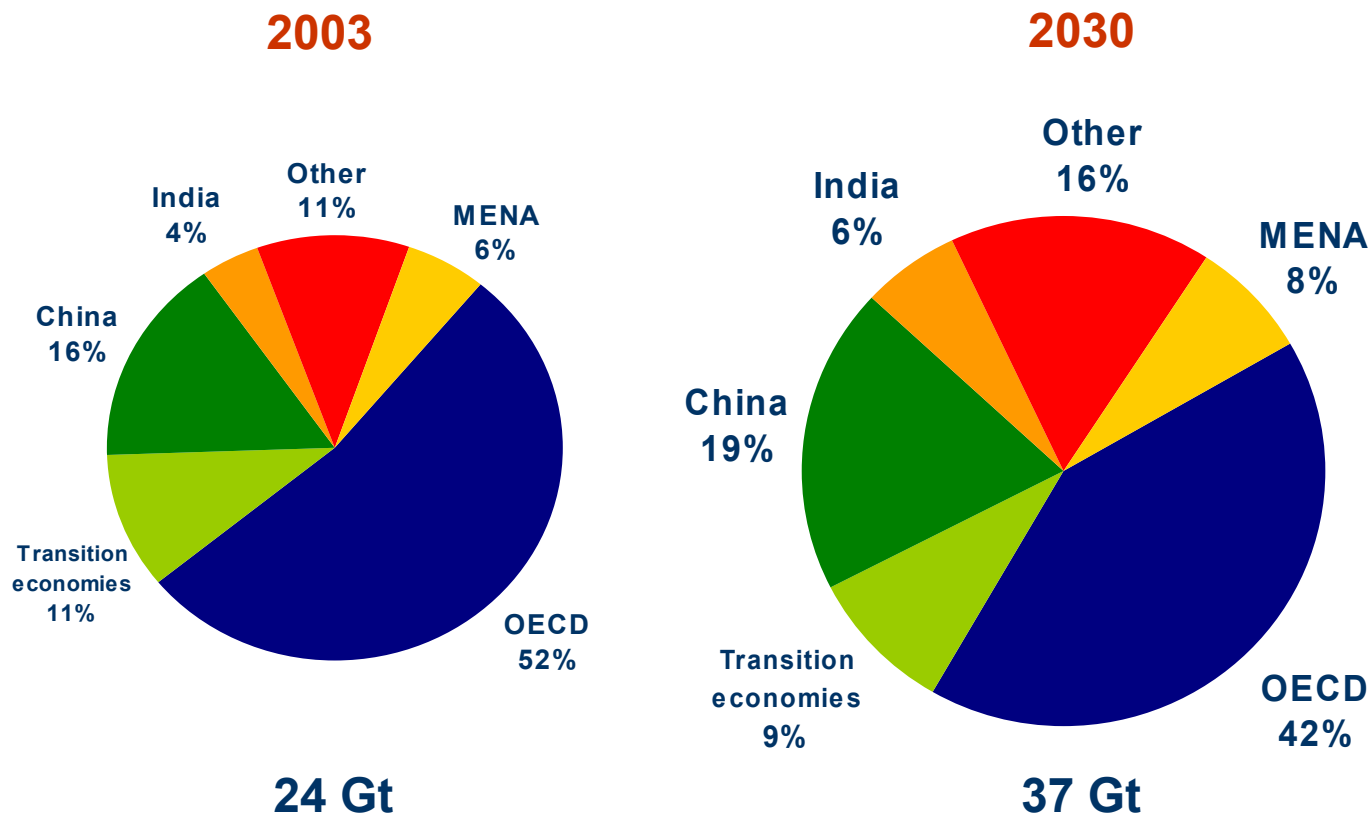
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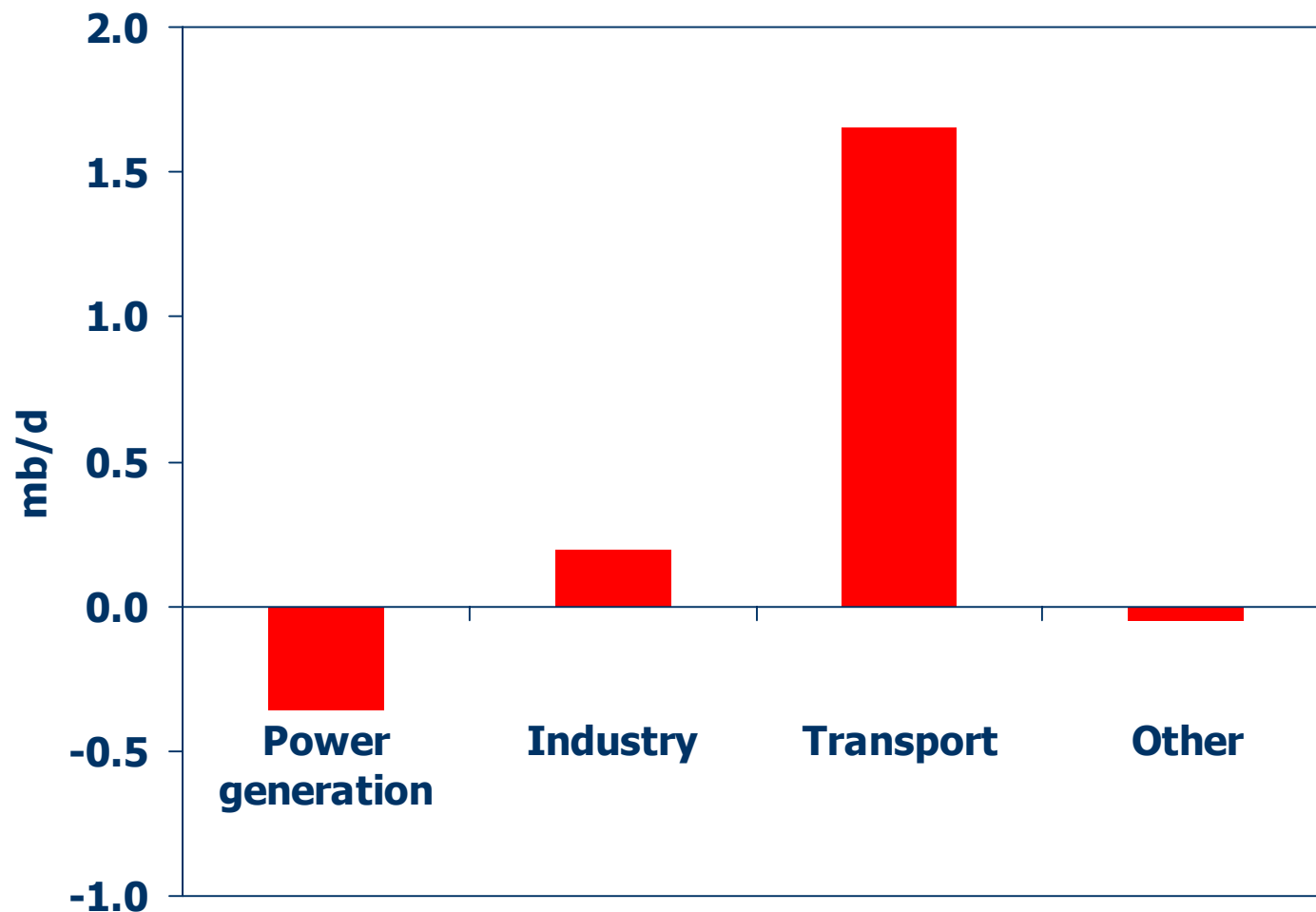
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# Energy-Related CO<sub>2</sub> Emissions by Region



***Global emissions grow by just over half between now and 2030, with the bulk of the increase coming from developing countries***

# OECD Oil Demand Growth by Sector, 1999-2004



**In the OECD, the transport sector accounted for almost all the oil demand growth**

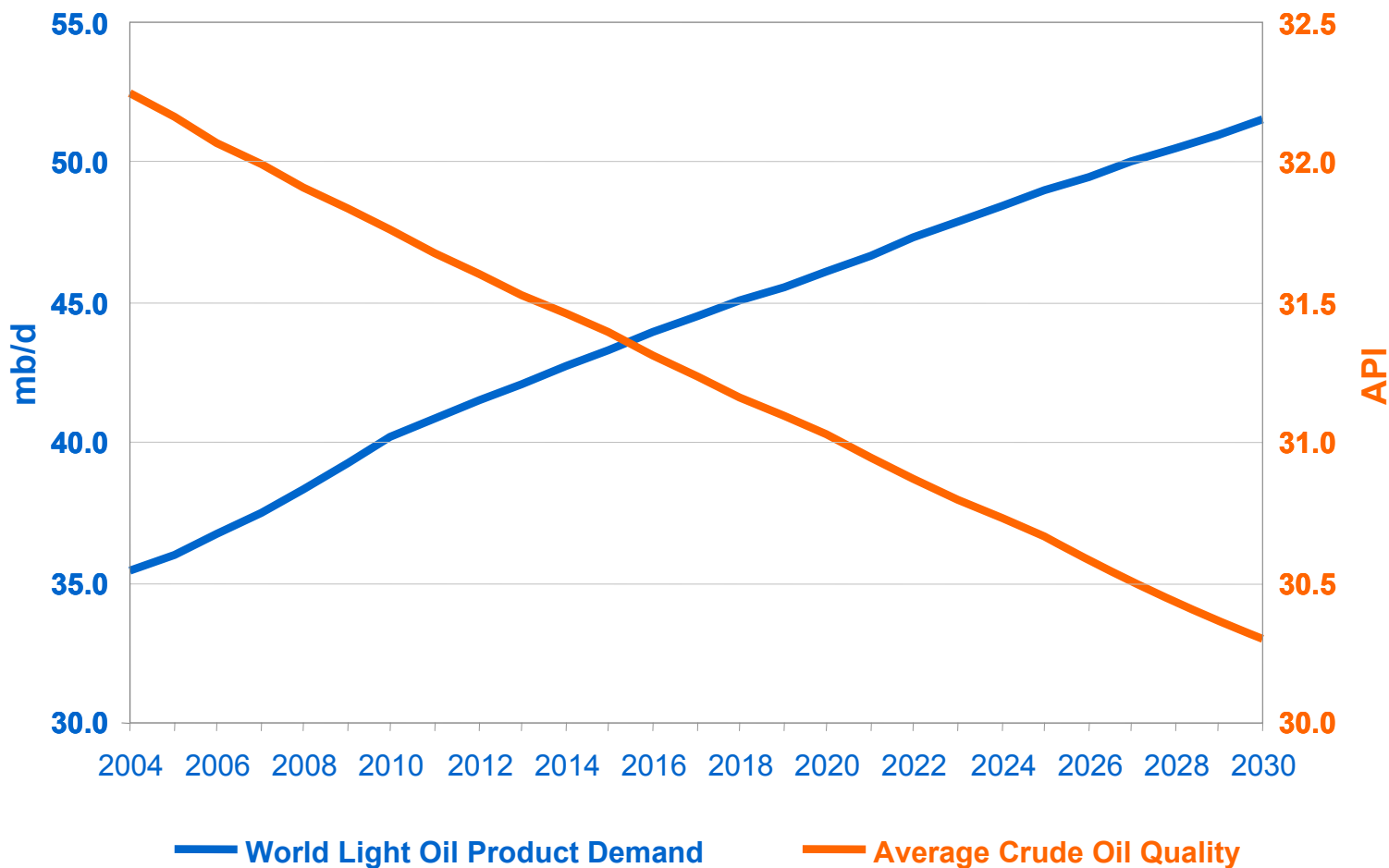
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# World Light Oil Product Demand & Crude Oil Quality



***Oil quality will fall while light product demand will rise - a key challenge for the refining industry***

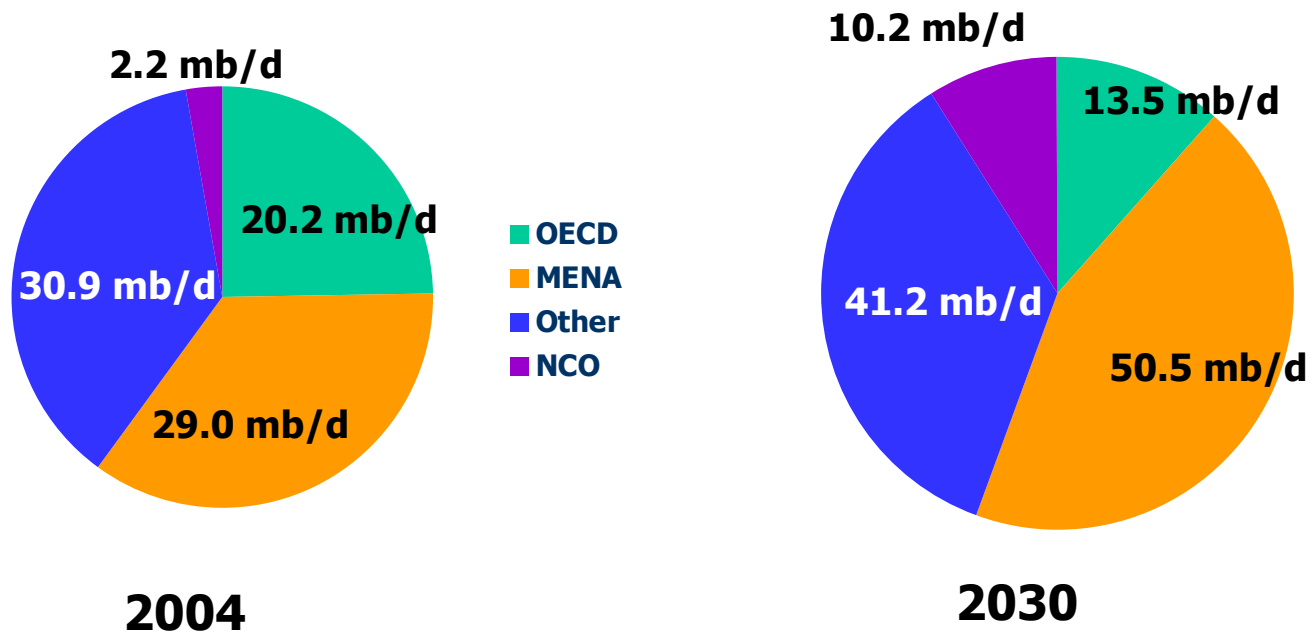
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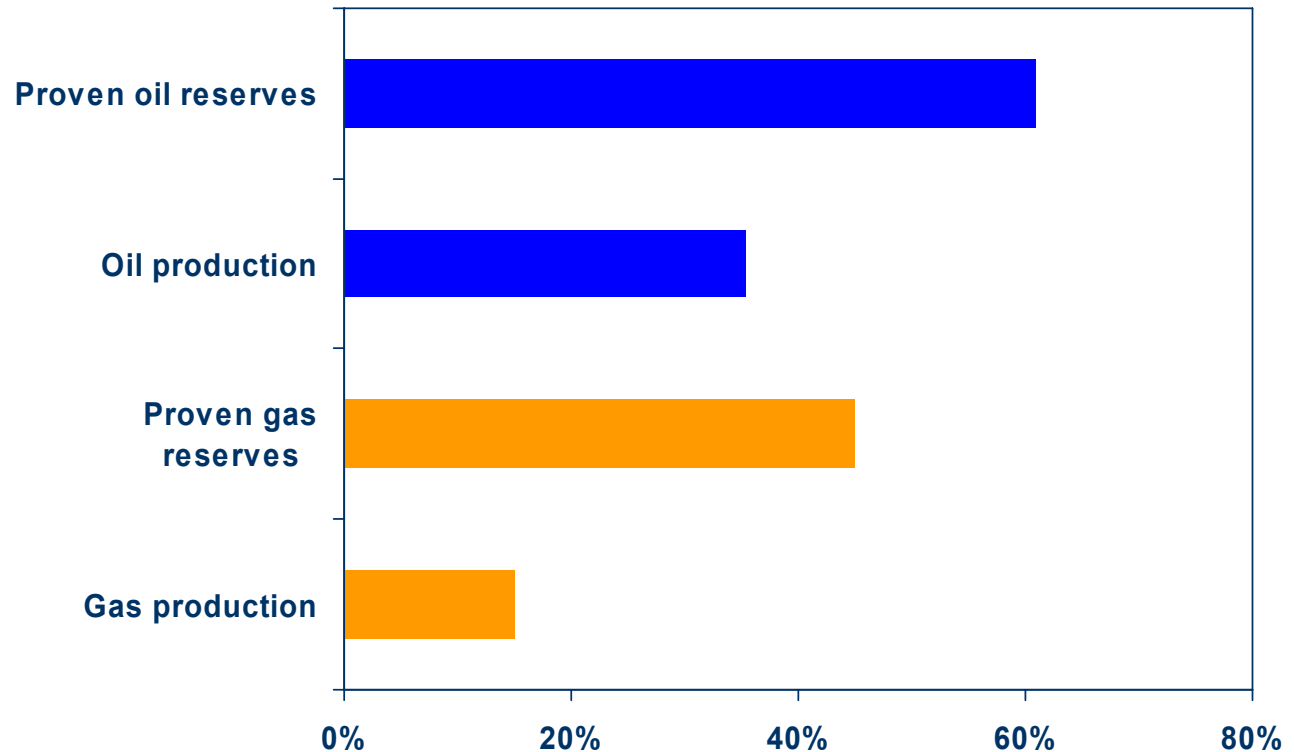
# World Oil Production Shifts Away from OECD



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



# MENA Share in World Oil and Gas Reserves & Production, 2004



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

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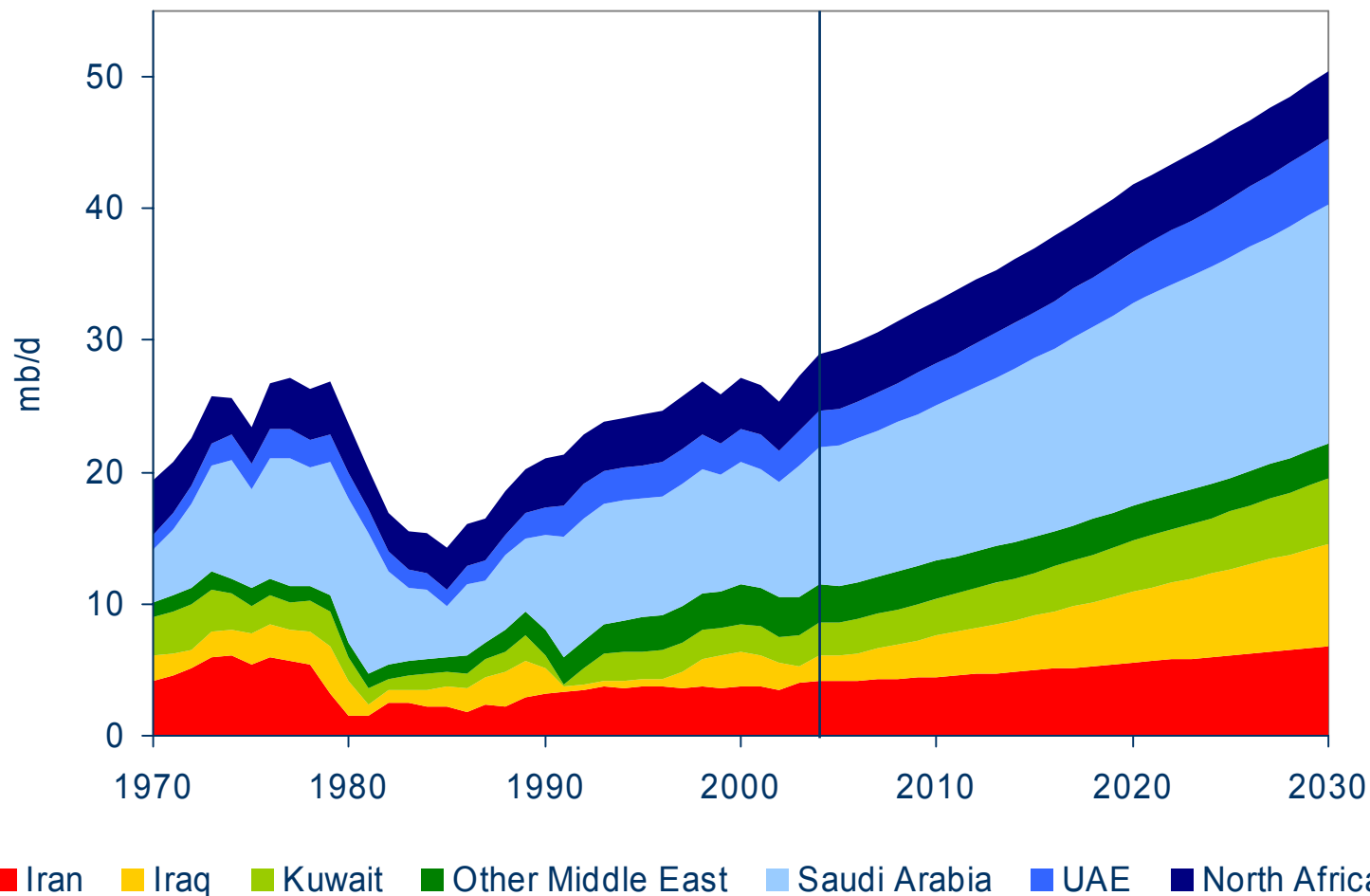
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# **MENA Energy Trends**

# MENA Crude Oil & NGL Production by Country



***MENA's share of world oil production rises from 35% in 2004 to 44% in 2030 in the RS, with Saudi production rising to over 18 mb/d***

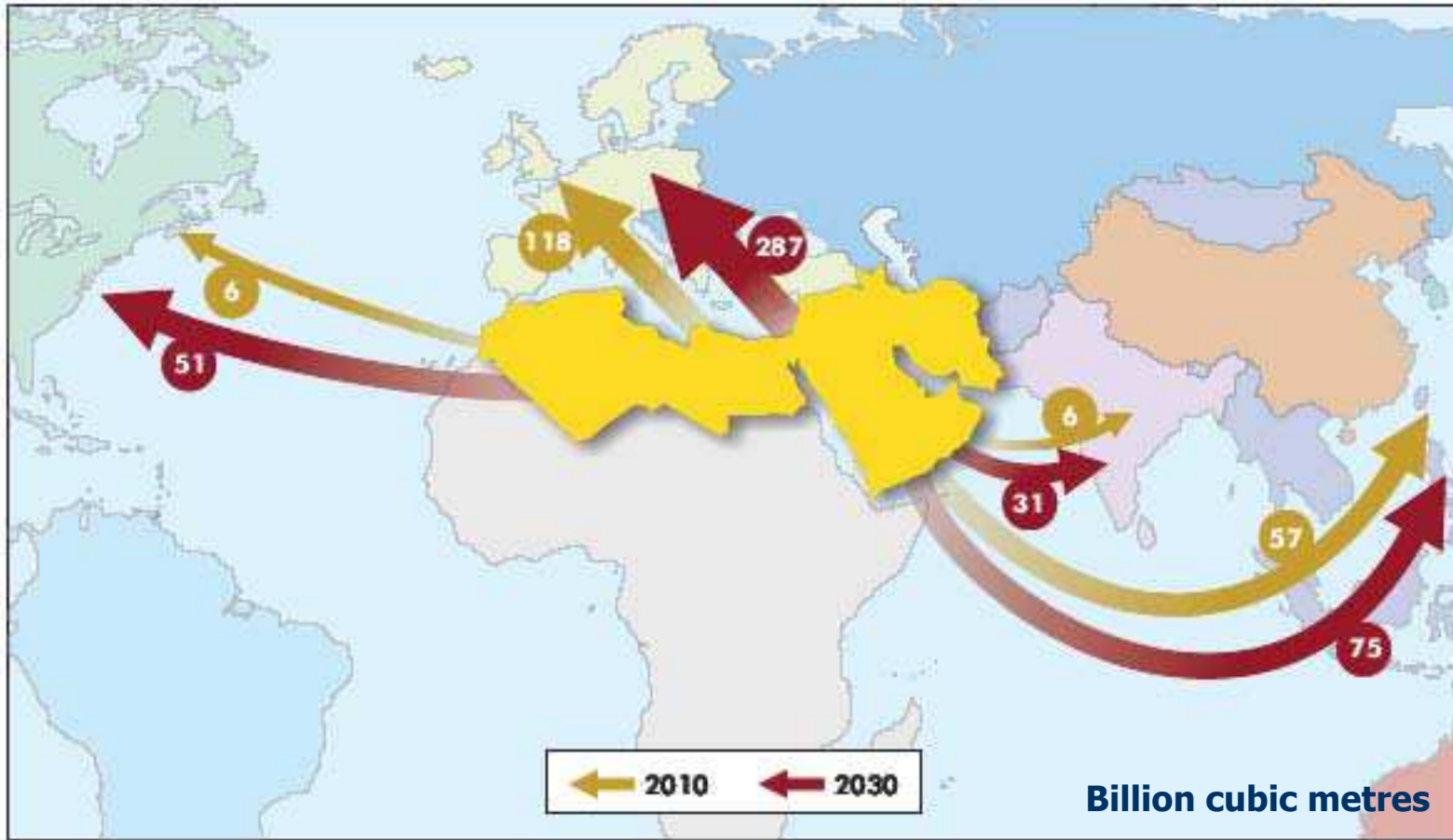
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# MENA Natural Gas Exports

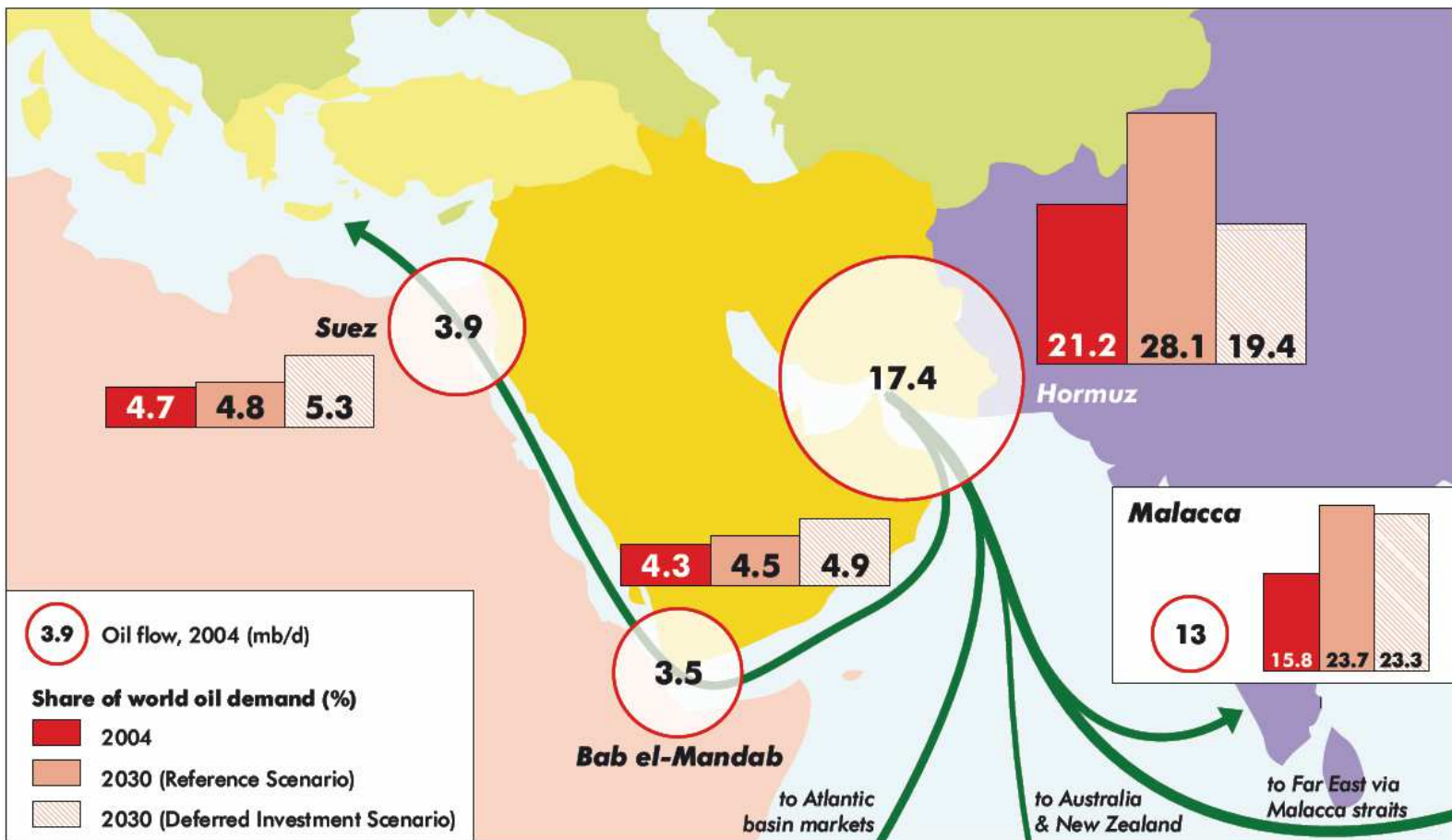


***MENA becomes the world's leading gas exporter, with most of the increase in exports meeting surging European & US LNG demand***

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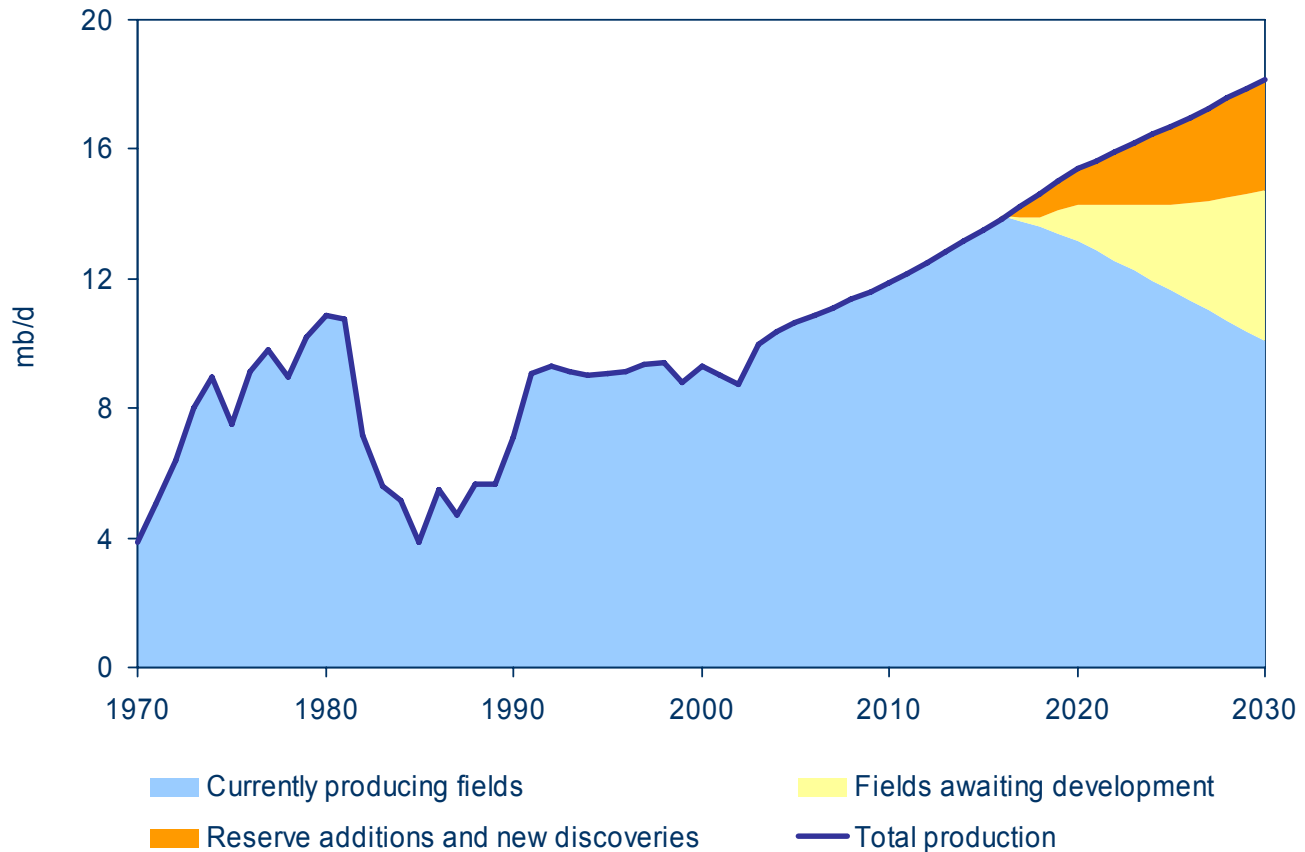
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# MENA Oil Exports through the "Dire Straits"



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

# 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***

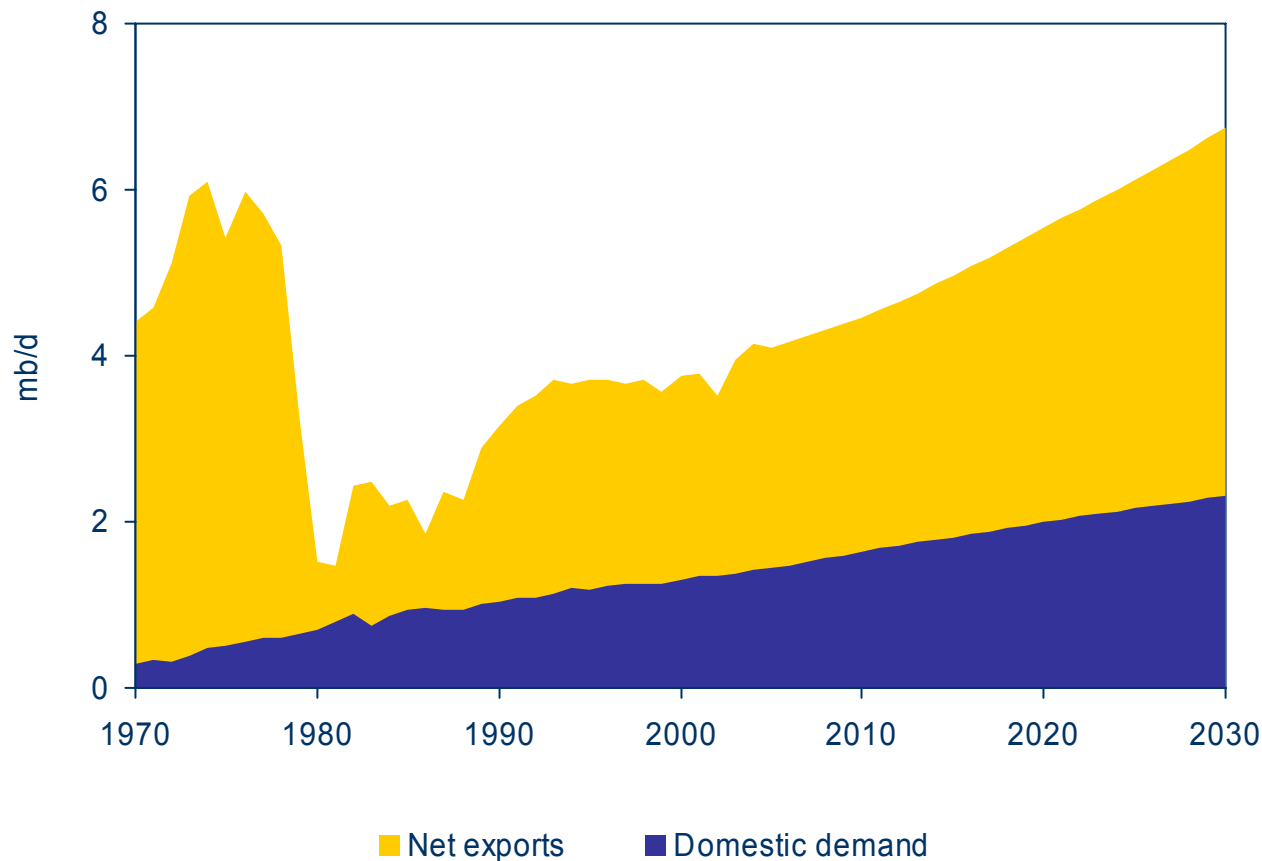
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## Iran's Oil Balance in the Reference Scenario



***Iran oil production reaches 6.8 mb/d in 2030, but exports increase less rapidly due to strong growth in domestic demand***

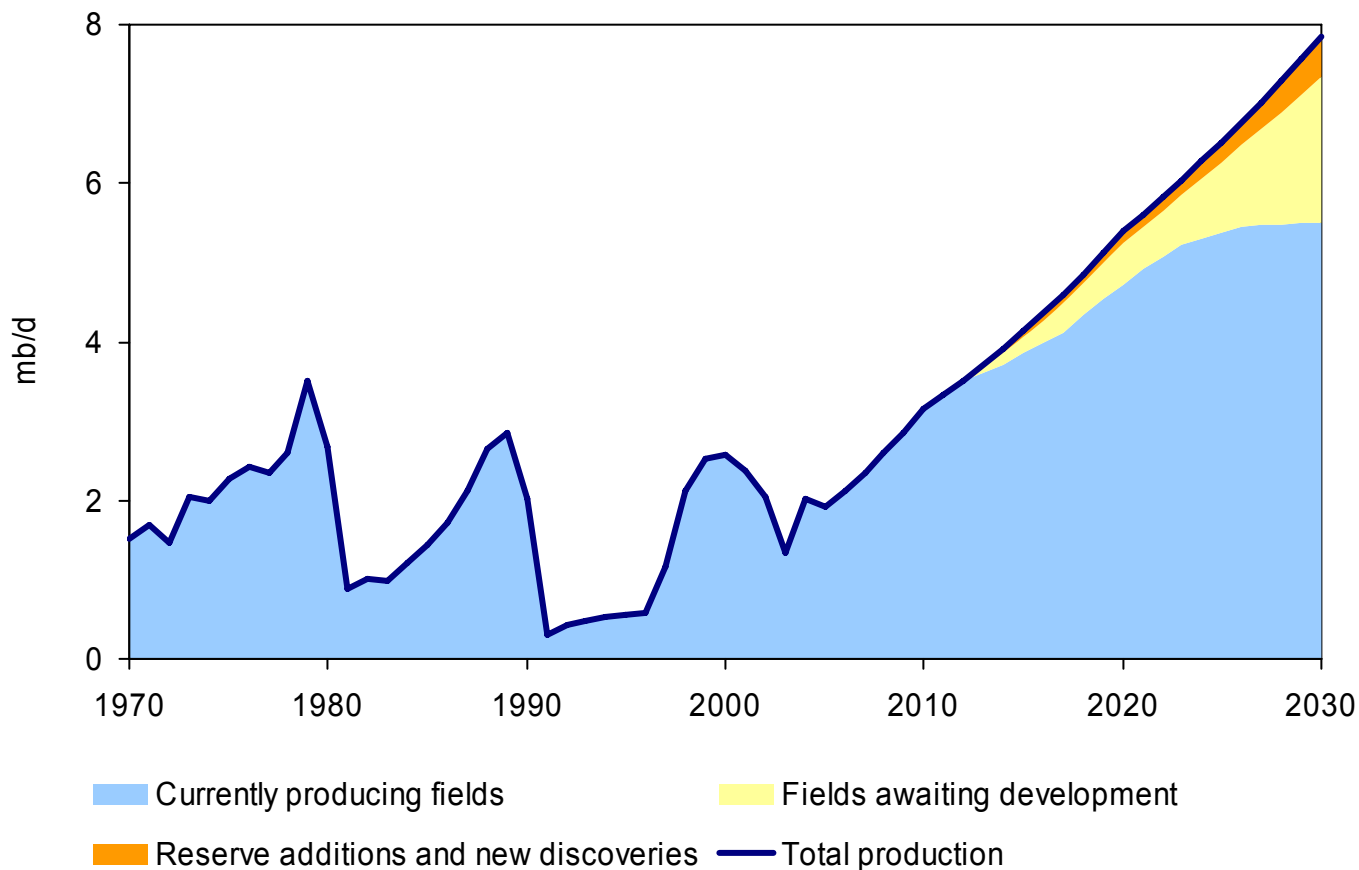
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# Oil Production Outlook in Iraq in the Reference Scenario



***Oil production in Iraq is expected to reach around 3 mb/d in 2010 and 8 mb/d in 2030, provided that stability and security are restored***

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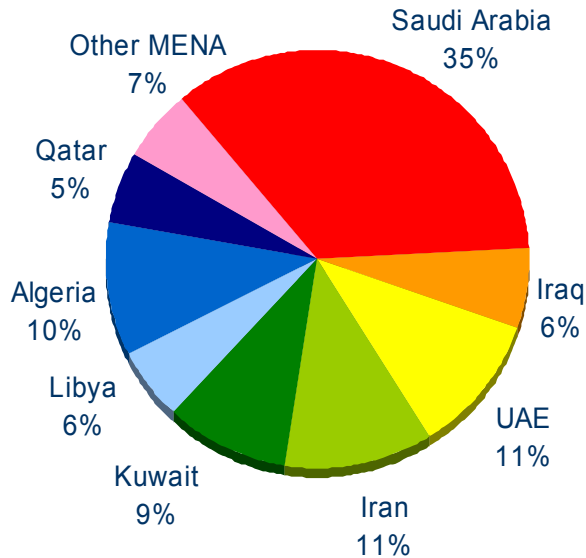


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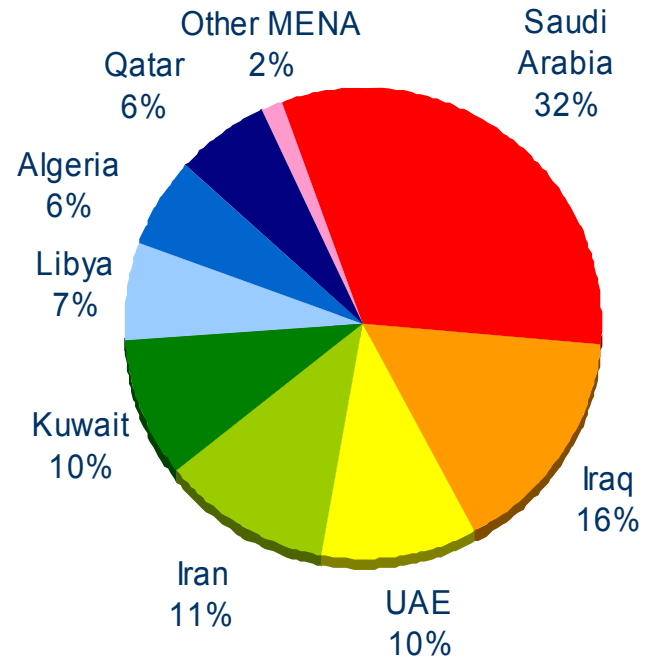
# MENA Oil & Gas Export Revenues

2004



\$313 billion (2004)

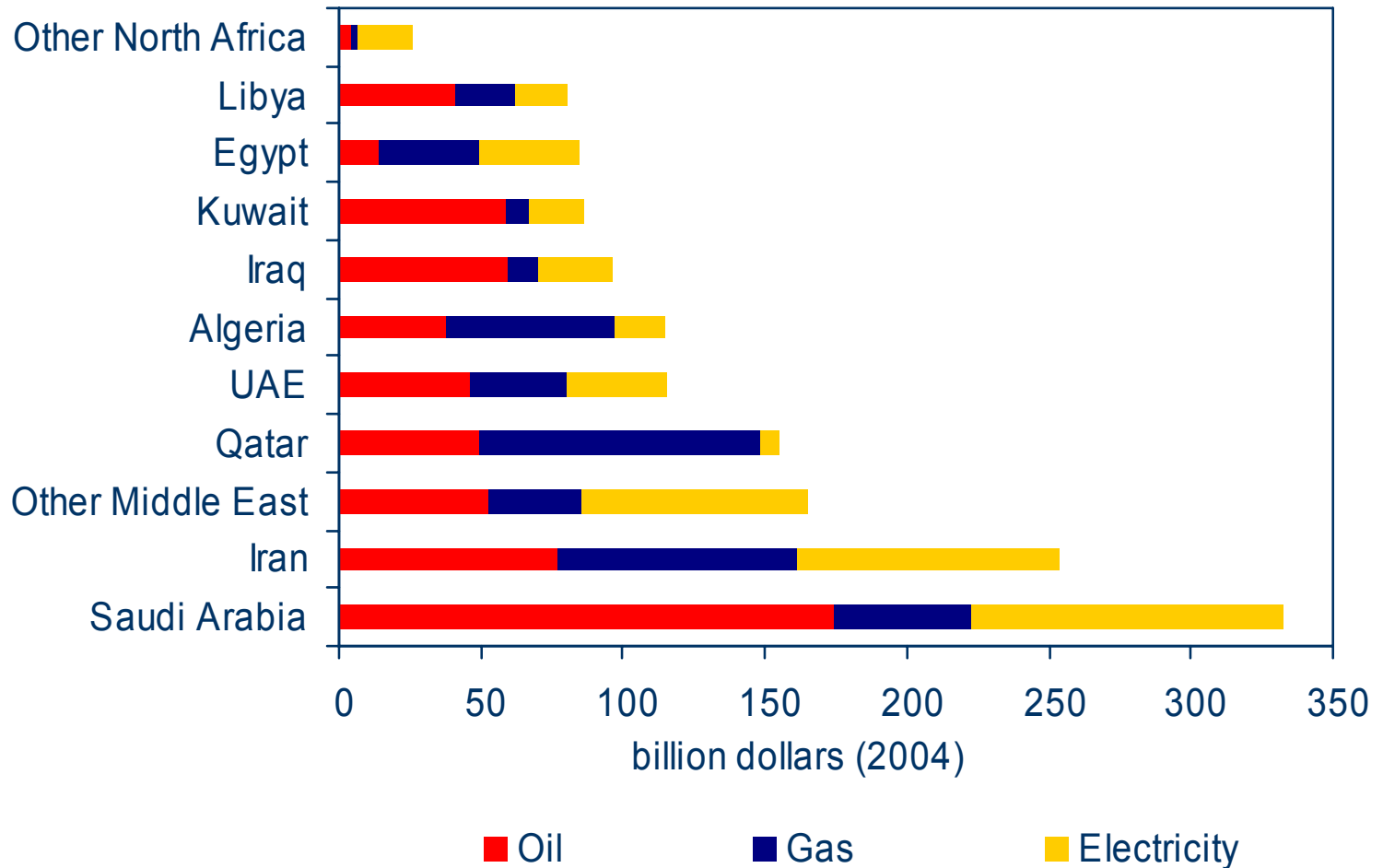
2030



\$635 billion (2030)

***MENA hydrocarbon revenues double by 2030 - the share from gas almost triples to 13%***

# Total MENA Energy Investment, 2004-2030



***About \$1.5 trillion, or \$56 billion per year, of investment are needed to expand capacity & replace facilities that are retired***



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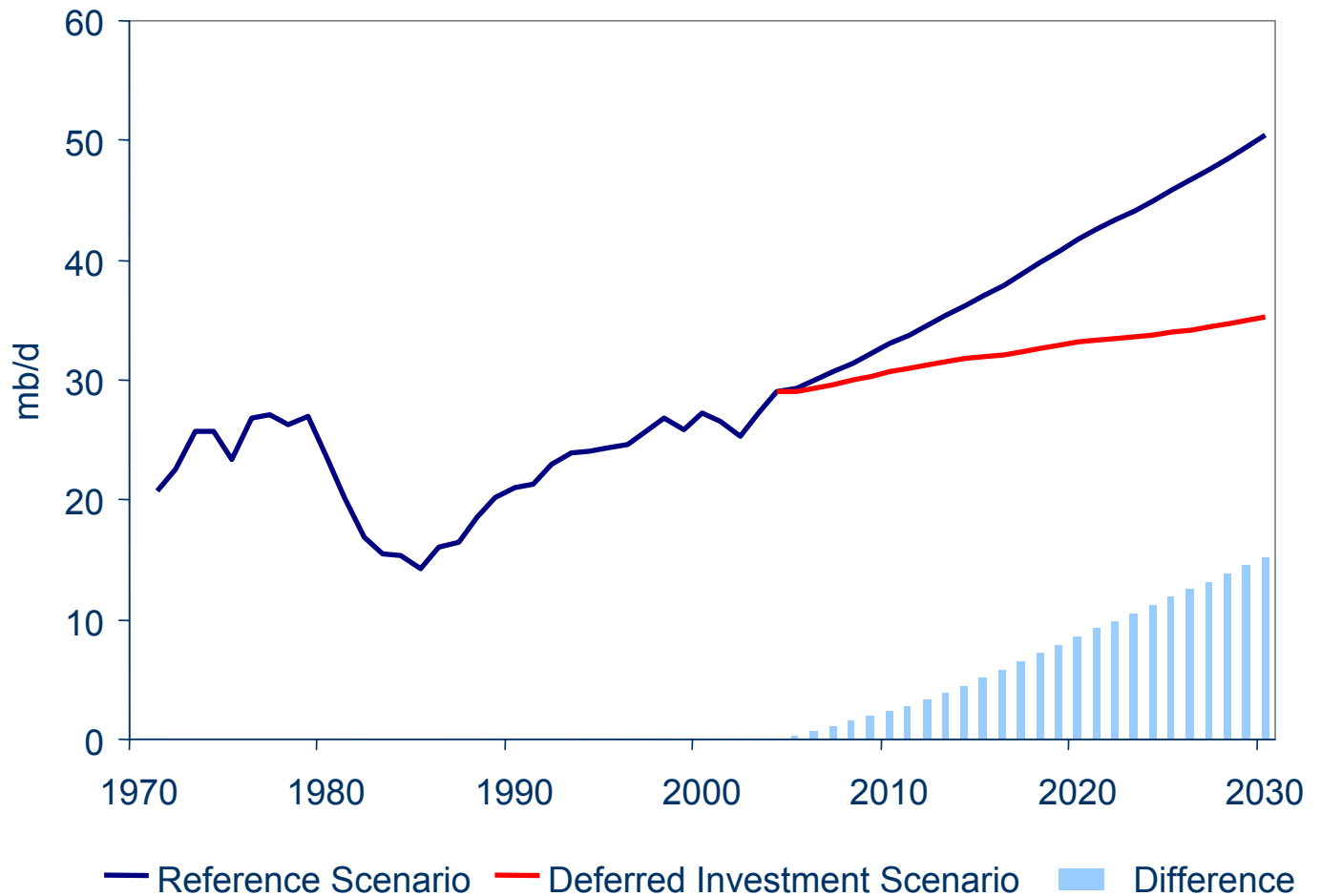
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# **Implications of Deferred Investment**

## Deferred Investment Scenario

- How would global energy markets evolve if investment MENA upstream oil industry grew slower than in the Reference Scenario?
- Investment is assumed to remain constant at its share of historical GDP in each country
- MENA oil production is lower compared to the Reference Scenario, and the gap is widening over time
- Oil prices are driven higher - an increase of 32% over the Reference Scenario in 2030 - dragging up gas, coal and electricity prices
- MENA gas production is also lower compared to the Reference Scenario due to
  - ❑ Reduced global gas demand & call on MENA gas
  - ❑ Lower associated oil/gas output

# MENA Crude Oil Production (including NGLs)



***MENA's share of global oil production falls from 35% in 2004 to 33% in the DIS. Saudi production reaches 14 mb/d in 2030***

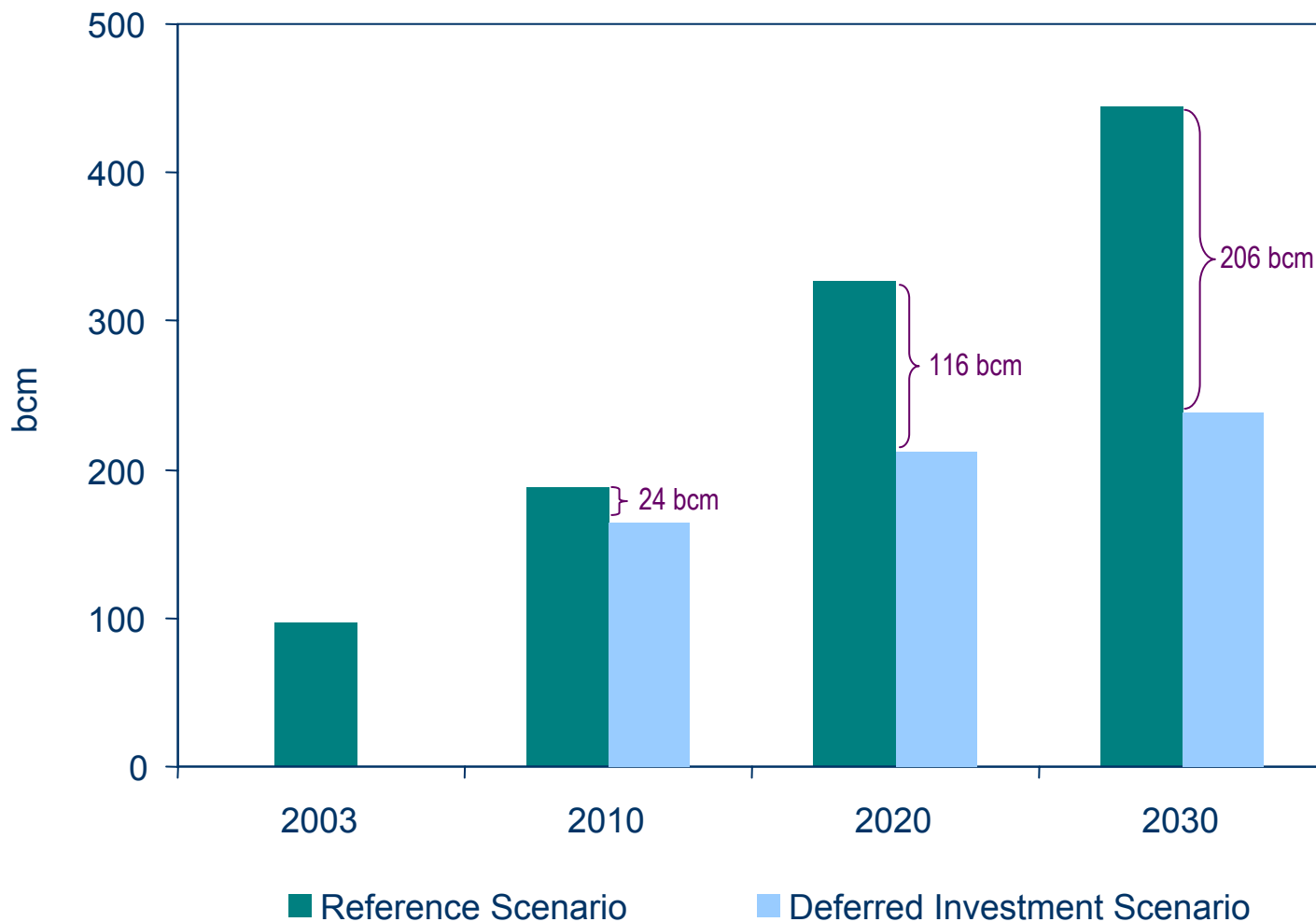
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# MENA Net Natural Gas Exports



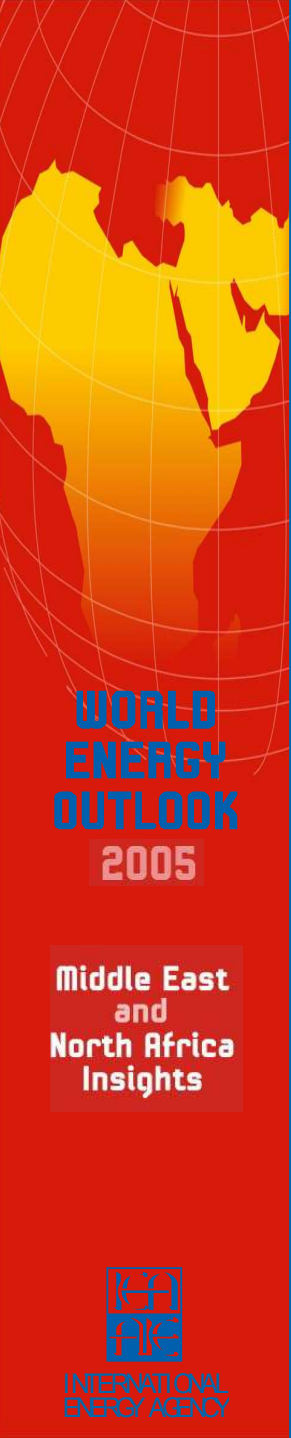
***MENA gas exports are much lower in the DIS, as higher gas prices & lower GDP choke off demand in the main importing regions***

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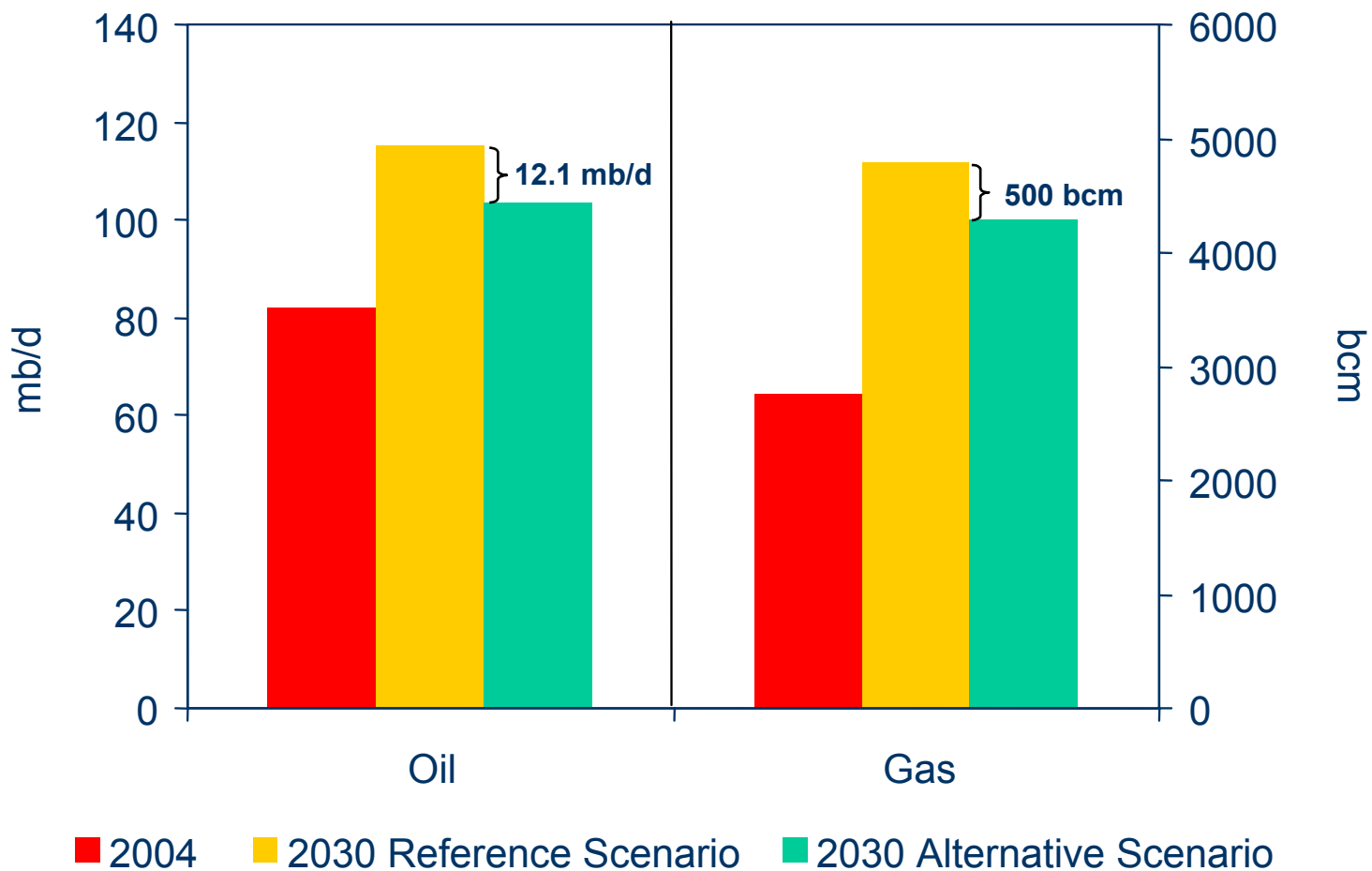
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# **World Alternative Policy Scenario**

# Oil/Gas Demand in the Reference and Alternative Policy Scenarios



***Oil & gas demand in the Alternative Scenario are both 10% lower in 2030 due to significant energy savings and a shift in the energy mix***

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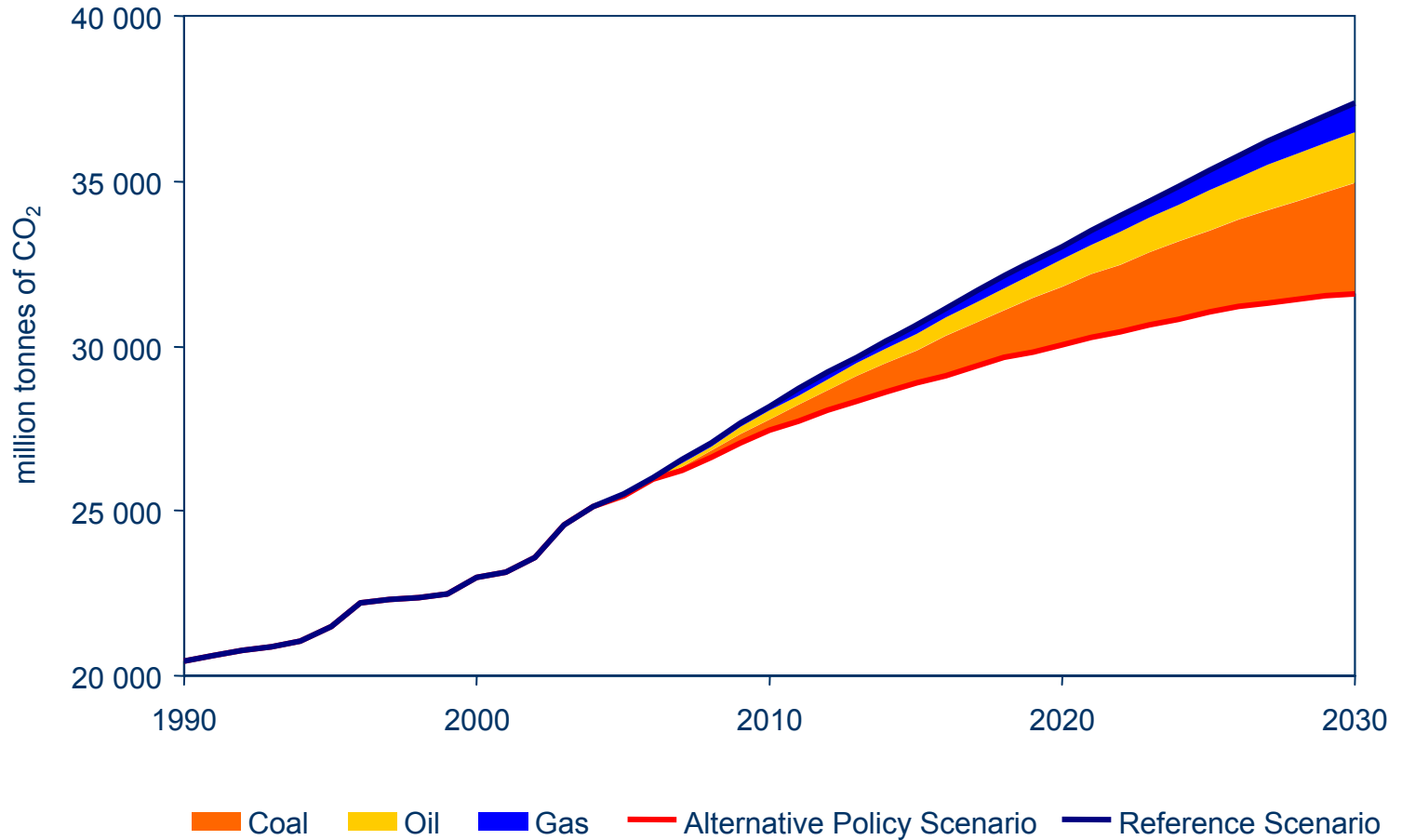
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# Global Energy-Related CO<sub>2</sub> Emissions in the Reference and Alternative Policy Scenarios



***In 2030, CO<sub>2</sub> emissions are 16% lower than in the Reference Scenario, but are still more than 50% higher than 1990***

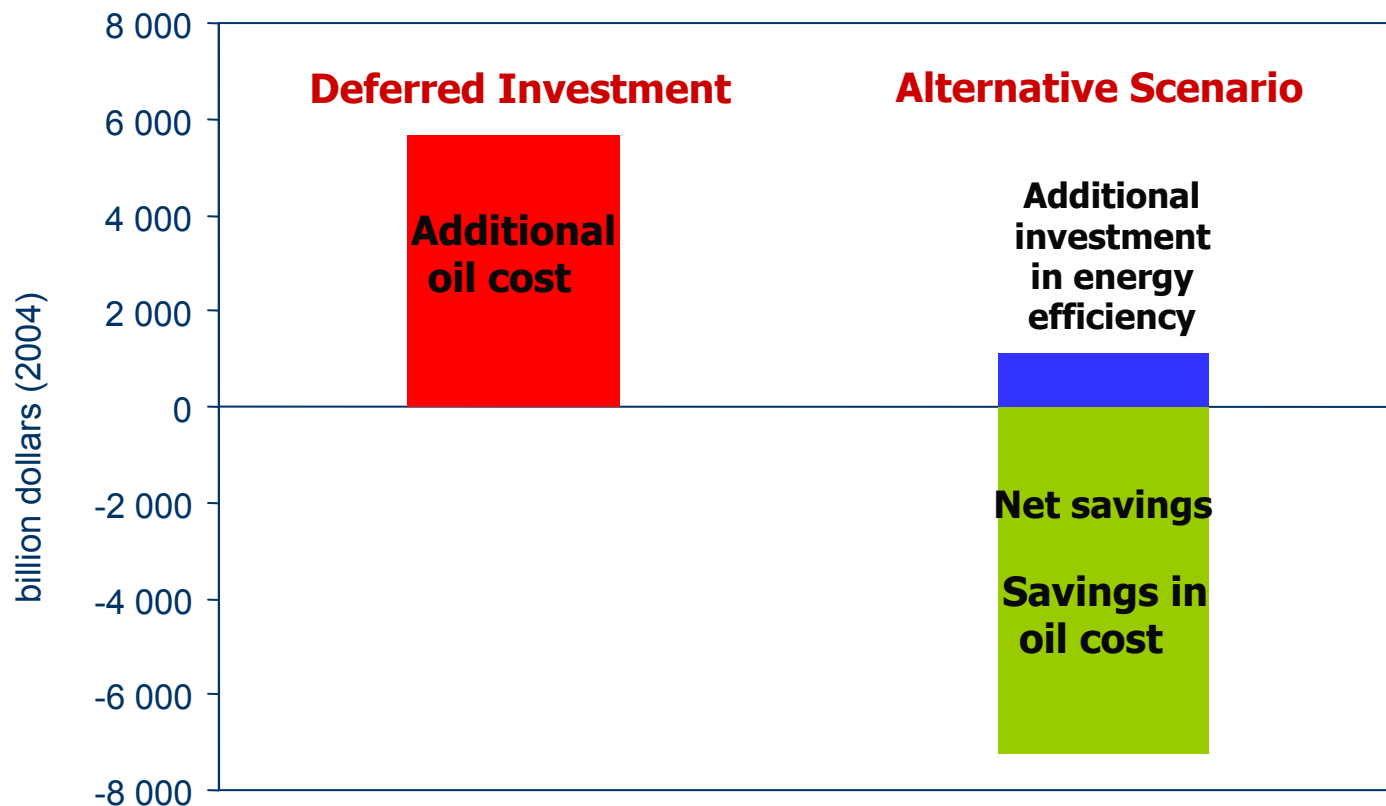
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# Difference in Cost of Oil Consumption in the Alternative and Deferred Investment vs. Reference Scenario, 2005-2030



***In the Alternative Scenario, the cost of additional investments in energy efficiency are more than offset by savings in fuel cost***

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# Key Messages

- If governments stick with current policies, global energy needs will be more than 50% higher in 2030 than today
- In any plausible scenario, MENA oil & gas resources will be critical to meeting the world's growing appetite for energy
  - ❑ Countries like Saudi Arabia, Iran, Iraq, Qatar and Algeria will play key roles
- Further underinvestment in oil and gas would drive up prices & depress global GDP growth, eventually harming producers too
- Major importing countries are already considering more vigorous policies to curb demand growth & reduce reliance on oil and gas
- Continued need for dialogue between producers and consumers to find mutually beneficial outcomes

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