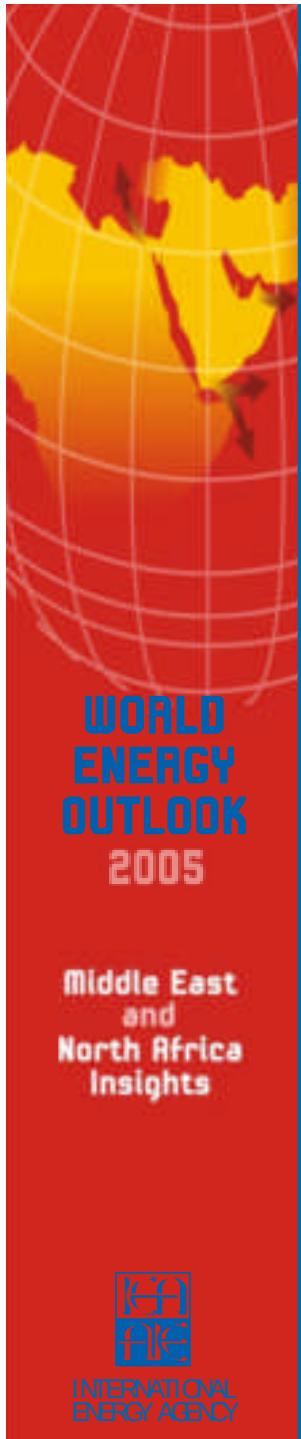




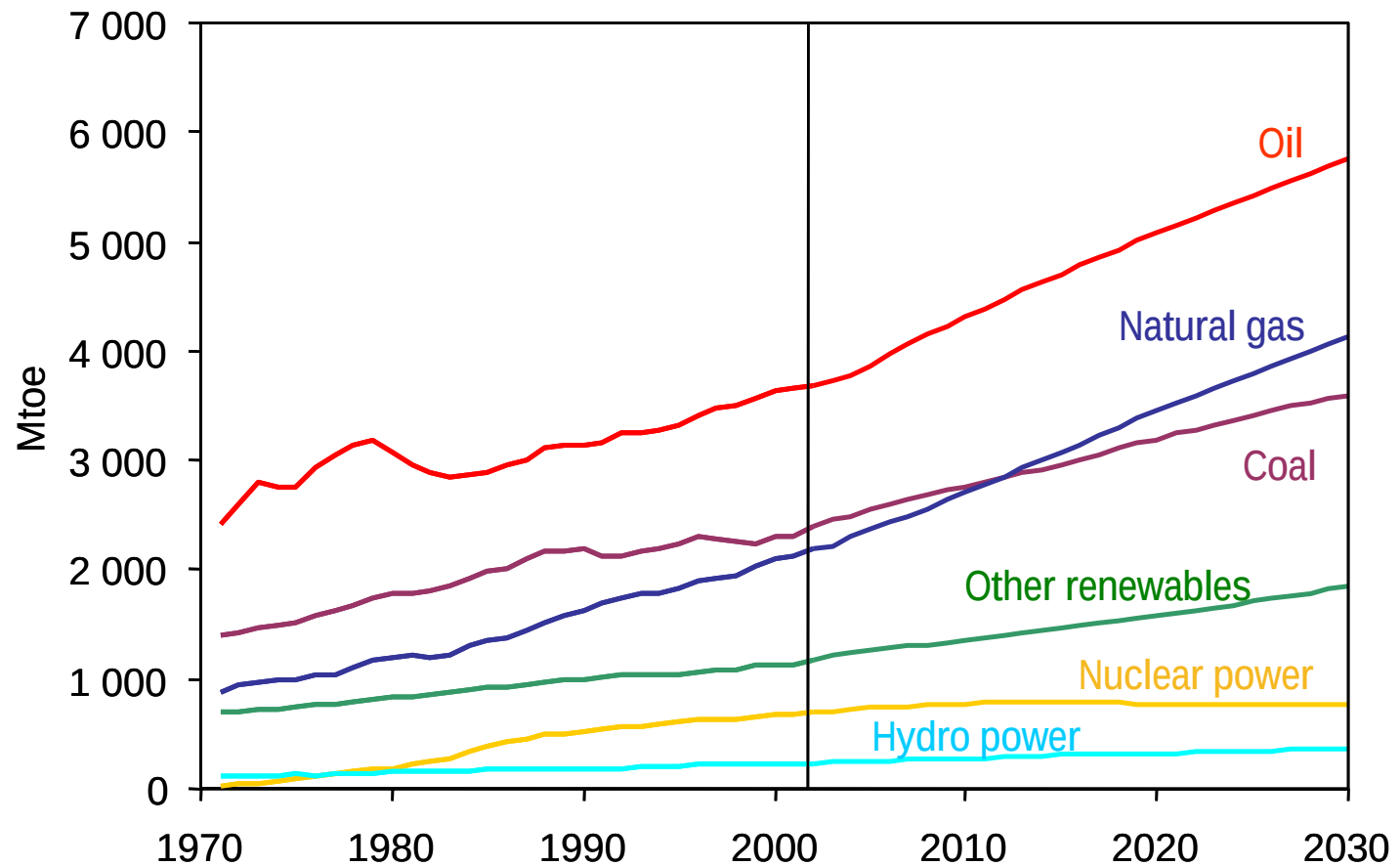
Increasing Global Energy Investment Needs

Marco Baroni

Economic Analysis Division
International Energy Agency

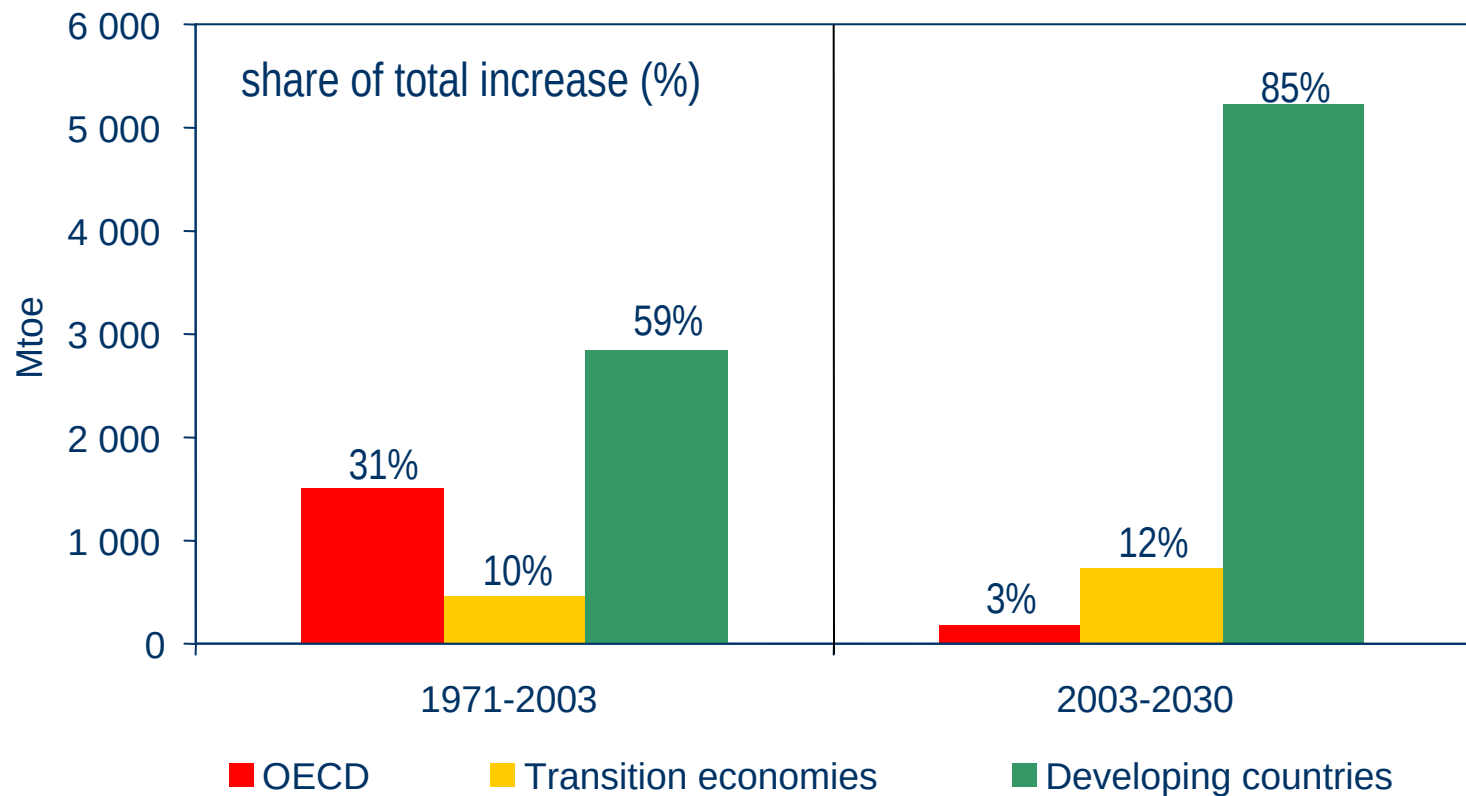


World Primary Energy Demand



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

Increase in World Primary Energy Production by Region



Almost all the increase in production to 2030 occurs outside the OECD

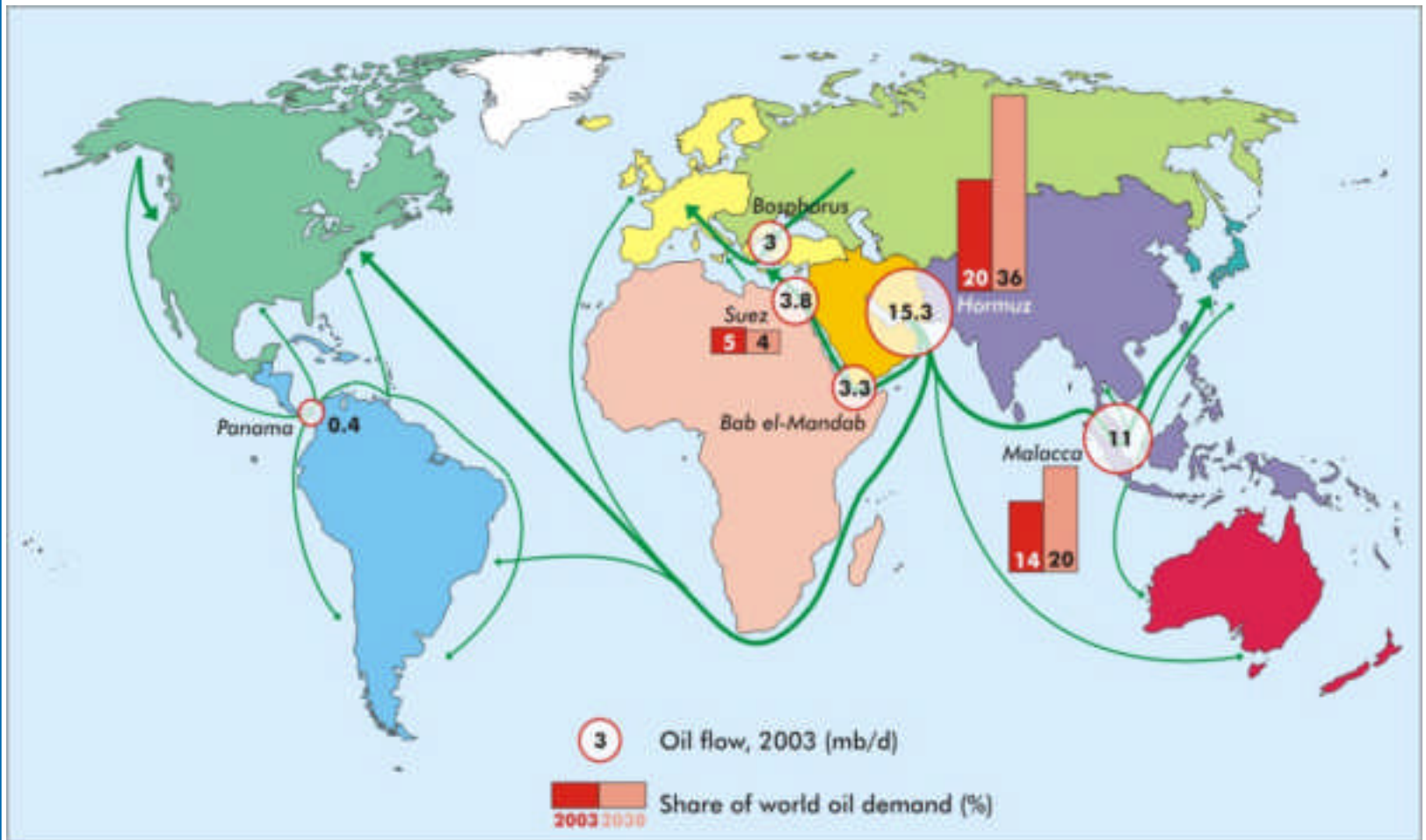
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Oil Flows & Major Chokepoints: The “Dire Straits”

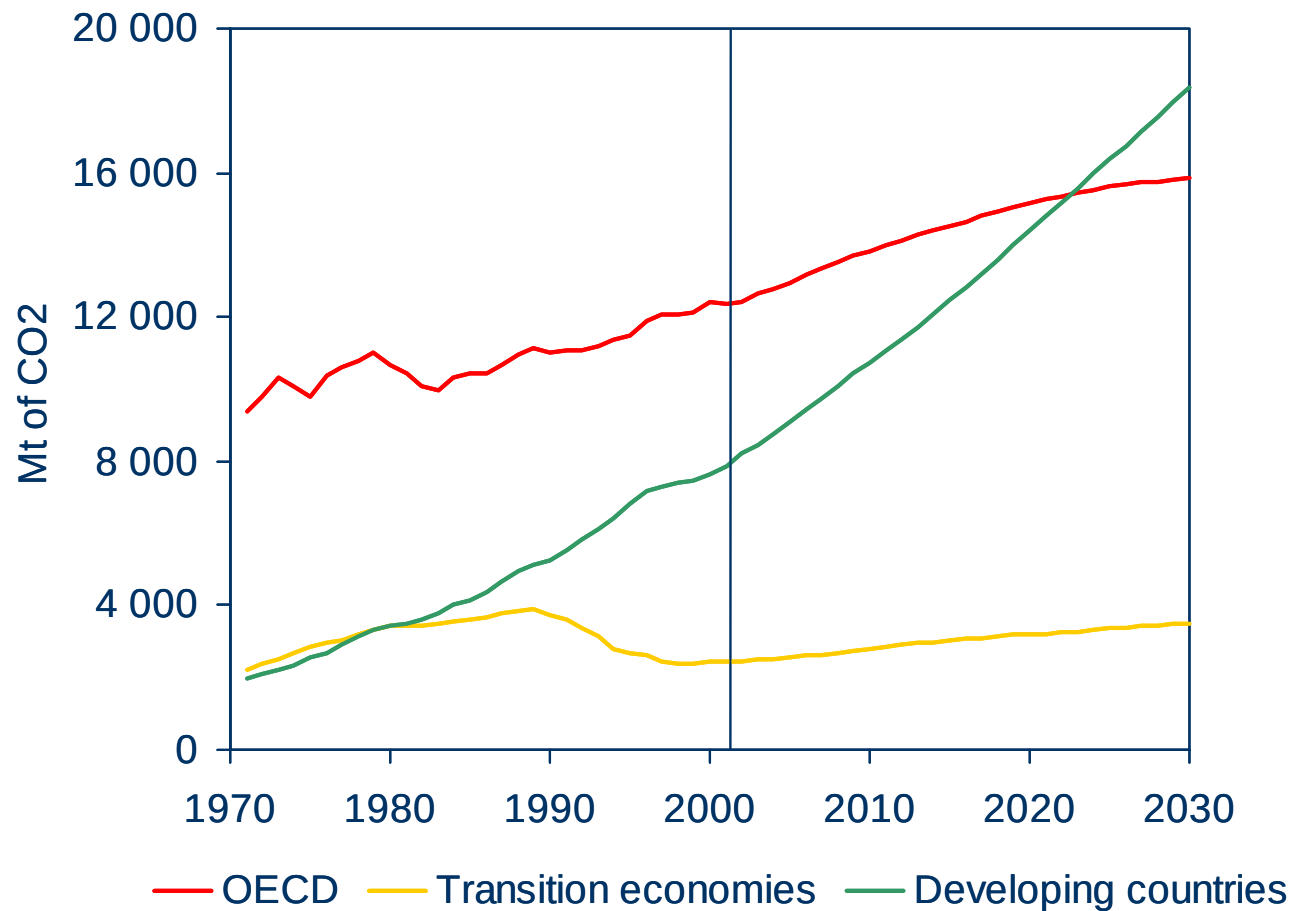


The risk of an oil-supply disruption will grow as trade and flows through key maritime and pipeline chokepoints expand

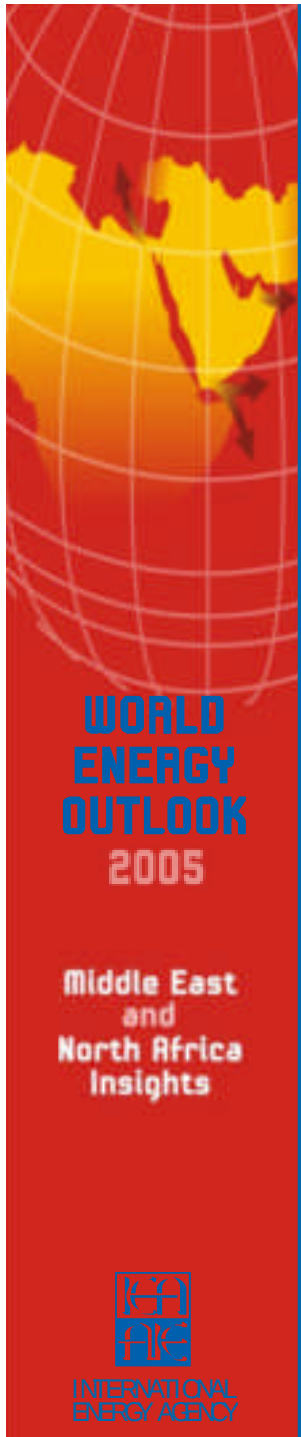
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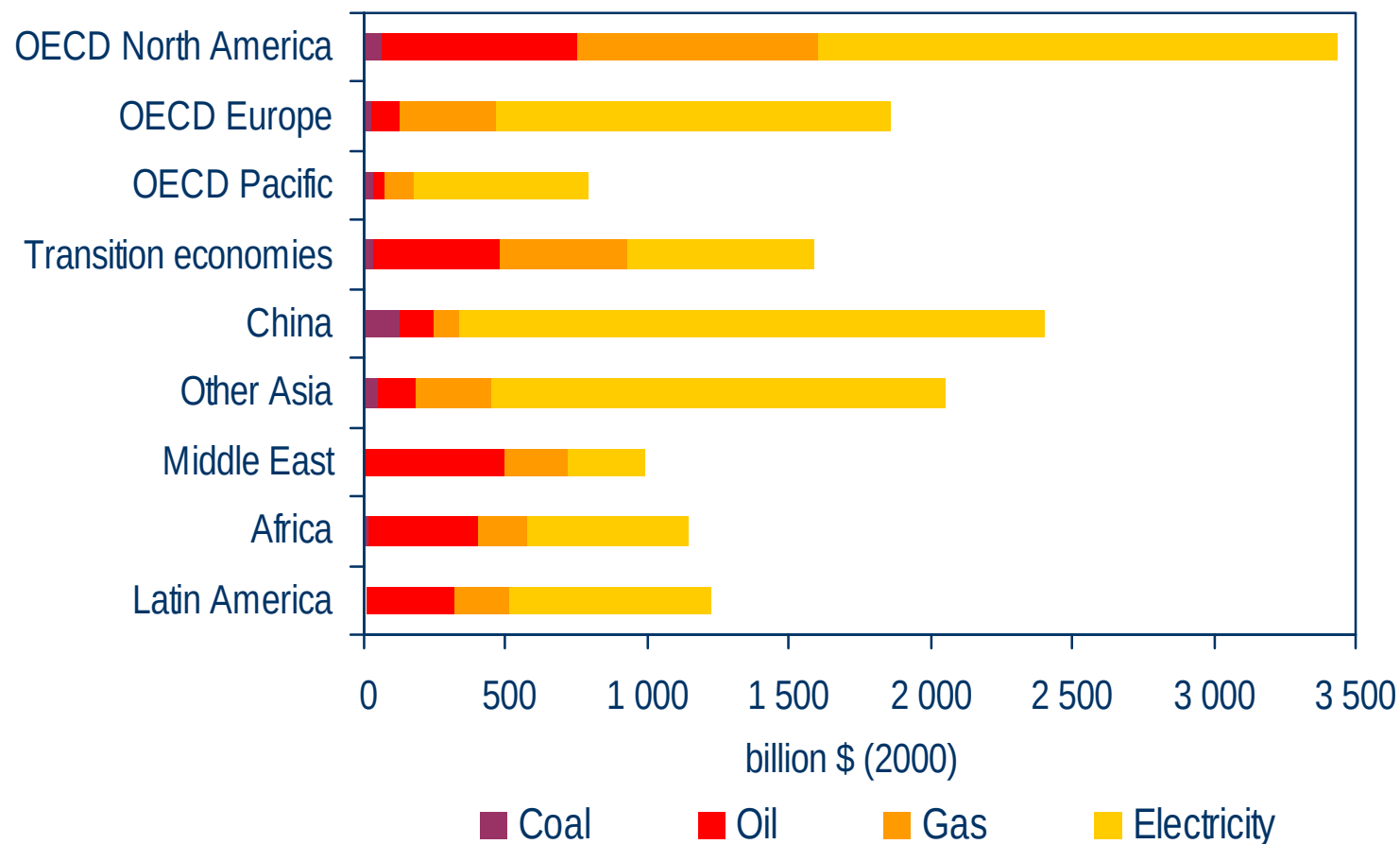
World Energy-Related CO₂ Emissions



Global emissions grow 62 % between now & 2030, with developing countries' emissions overtaking OECD's in the 2020s

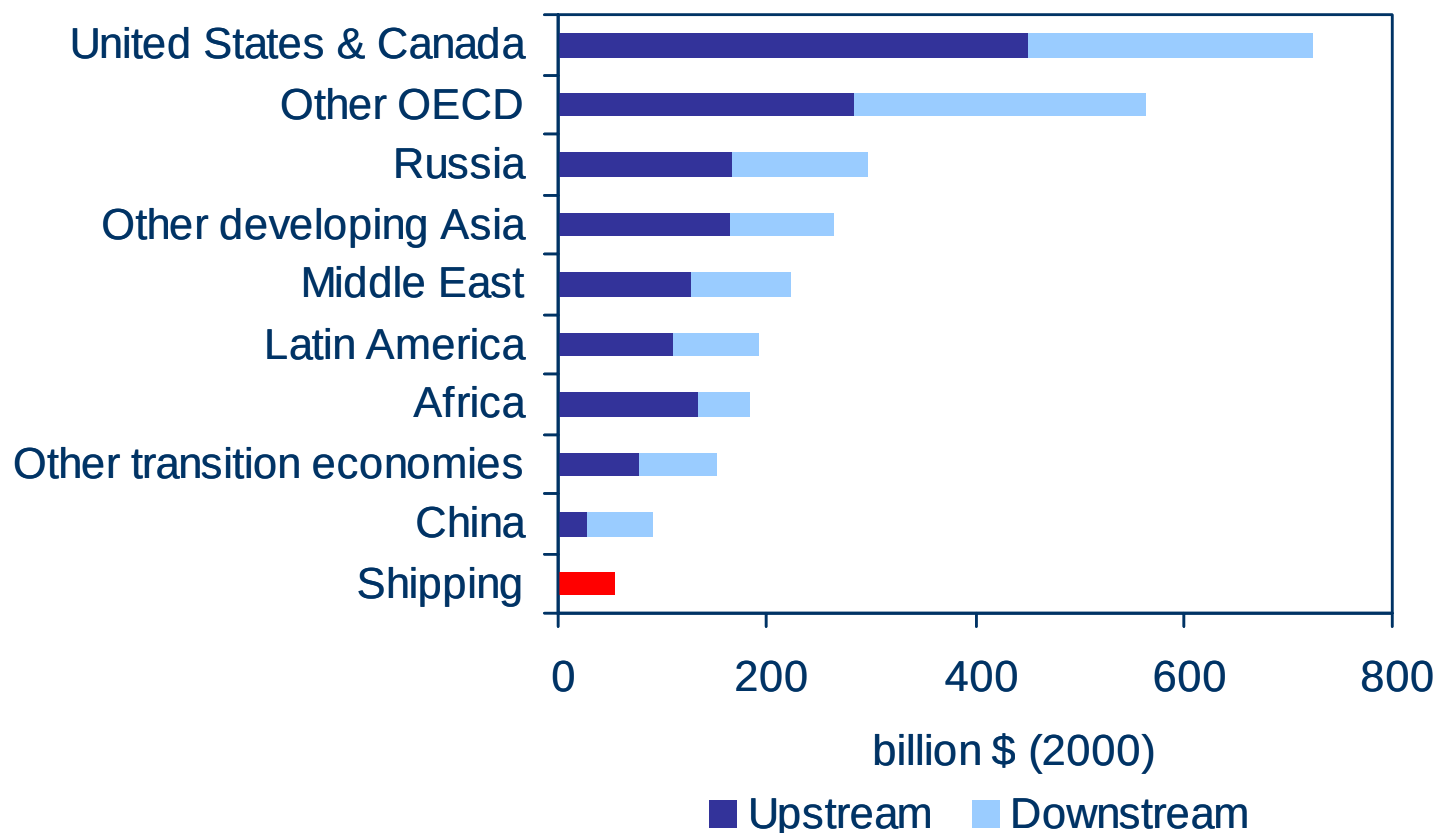


Cumulative Energy Investment 2003-2030



The power sector absorbs more than 60 % of developing countries' investment needs

Cumulative Global Gas Investment 2003-2030



The gas industry will require \$2.7 trillion of investment, or about \$100 billion per year – over half for the upstream sector

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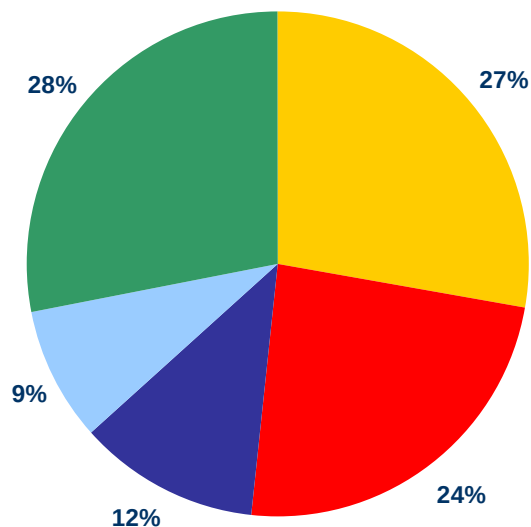
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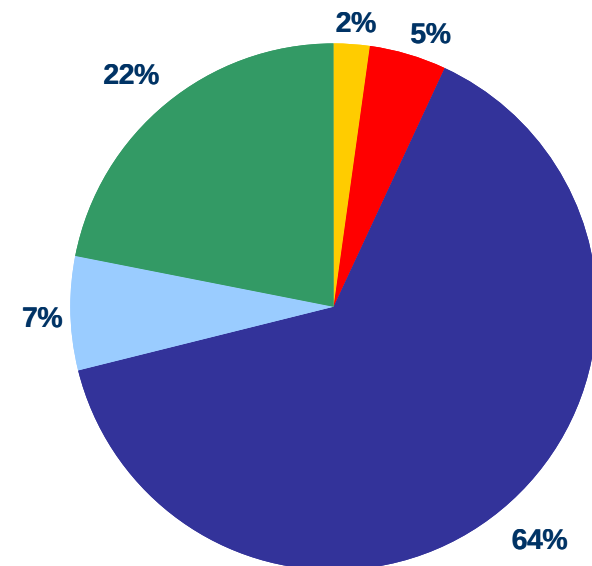
Undiscovered Oil & Gas Resources & Exploration Wells Drilled, 1995-2003

Undiscovered Oil & Gas
Resources



1.9 trillion boe

Number of New Wells Drilled
in 1995-2003



24 500 fields

■ Middle East ■ Former Soviet Union ■ North America
■ Europe ■ Africa, Latin America and Asia

**Discoveries have fallen in recent years, mainly because
exploration has shifted to less prospective regions**

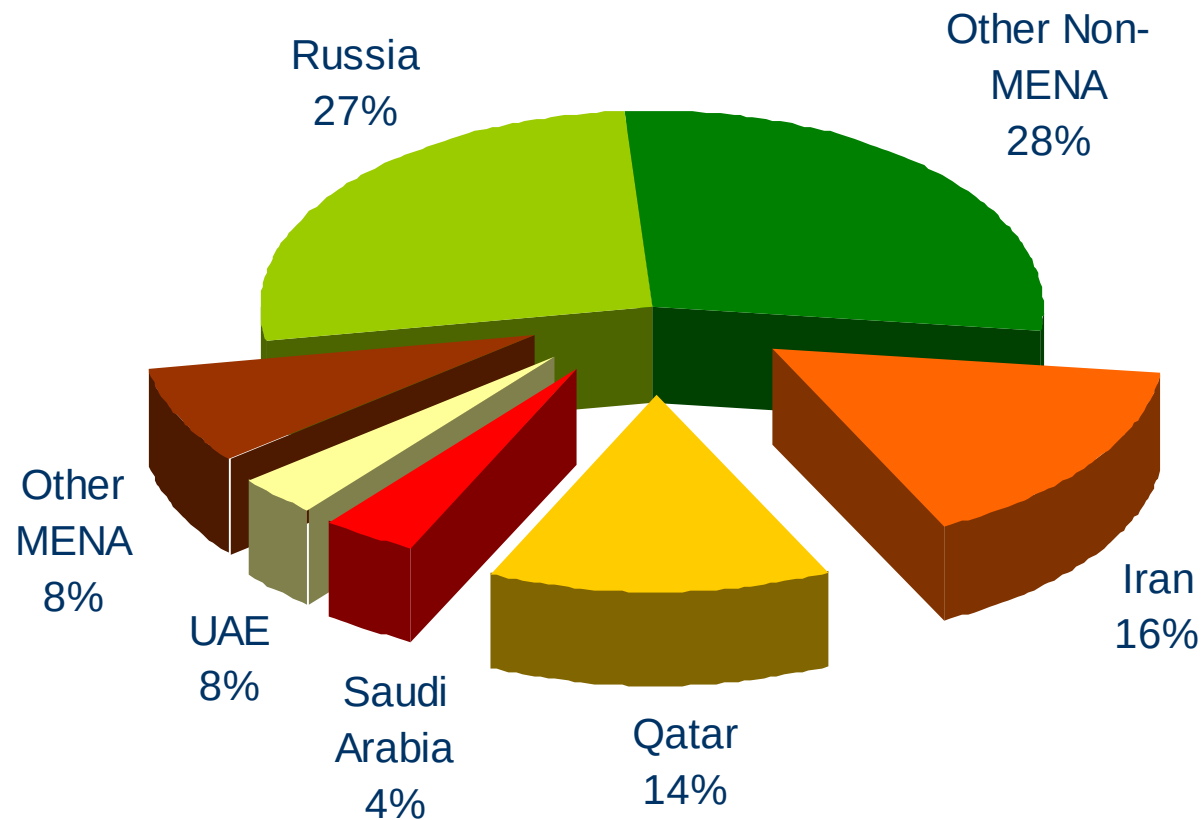
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World Proven Natural Gas Reserves



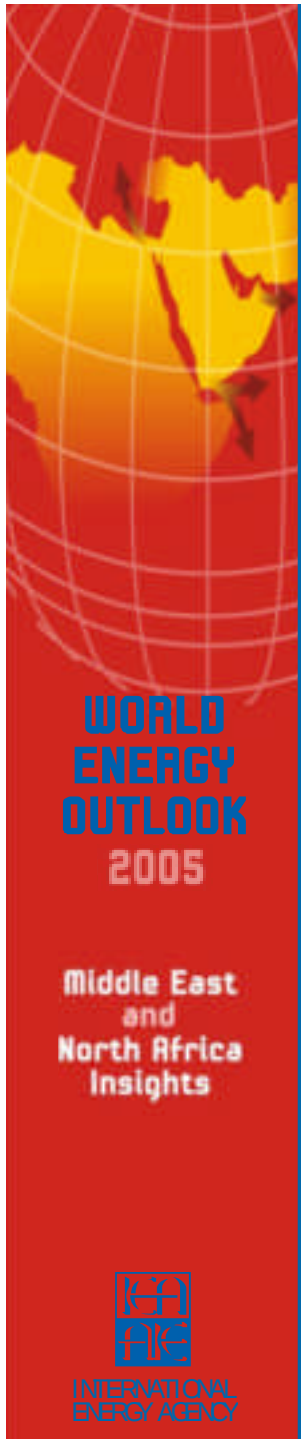
MENA's share of global gas reserves is much higher than its share of current production, suggesting strong potential for growth

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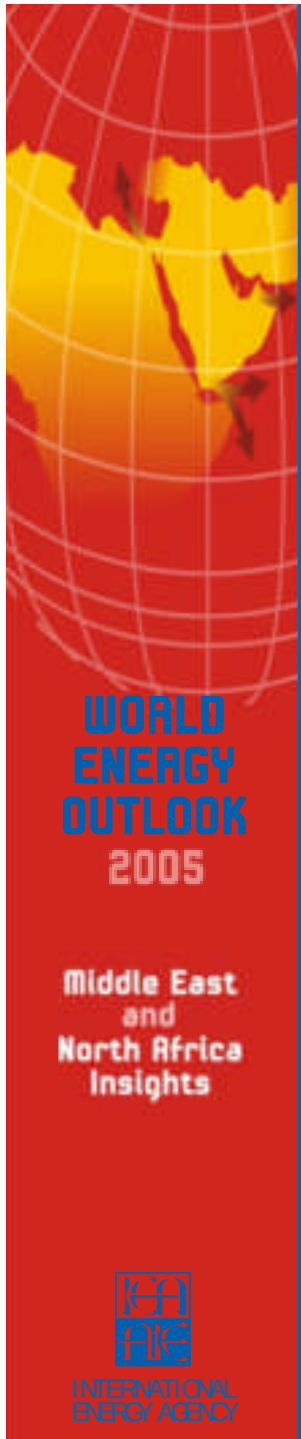


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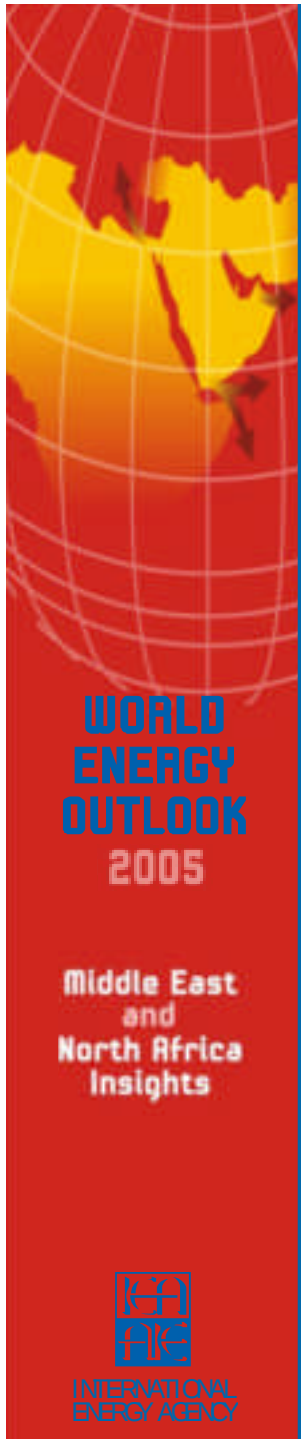
World Energy Outlook 2005 – 3 Scenarios

- Reference Scenario
 - ❑ Incorporates assumptions about economic & population growth, energy prices, technology & public policies
 - ❑ Does not take account of any possible, potential or even likely new energy & environment policies
- Deferred Investment Scenario
 - ❑ Assumes MENA upstream oil investment is constant as share of GDP at level of past decade
 - ❑ Impact on MENA oil and gas production, international energy prices & global energy balance
- World Alternative Policy Scenario
 - ❑ Assumes environmental & energy-security policies now under consideration are adopted
 - ❑ Impact on prices, global energy balance & call on MENA oil/ gas



Deferred Investment Scenario

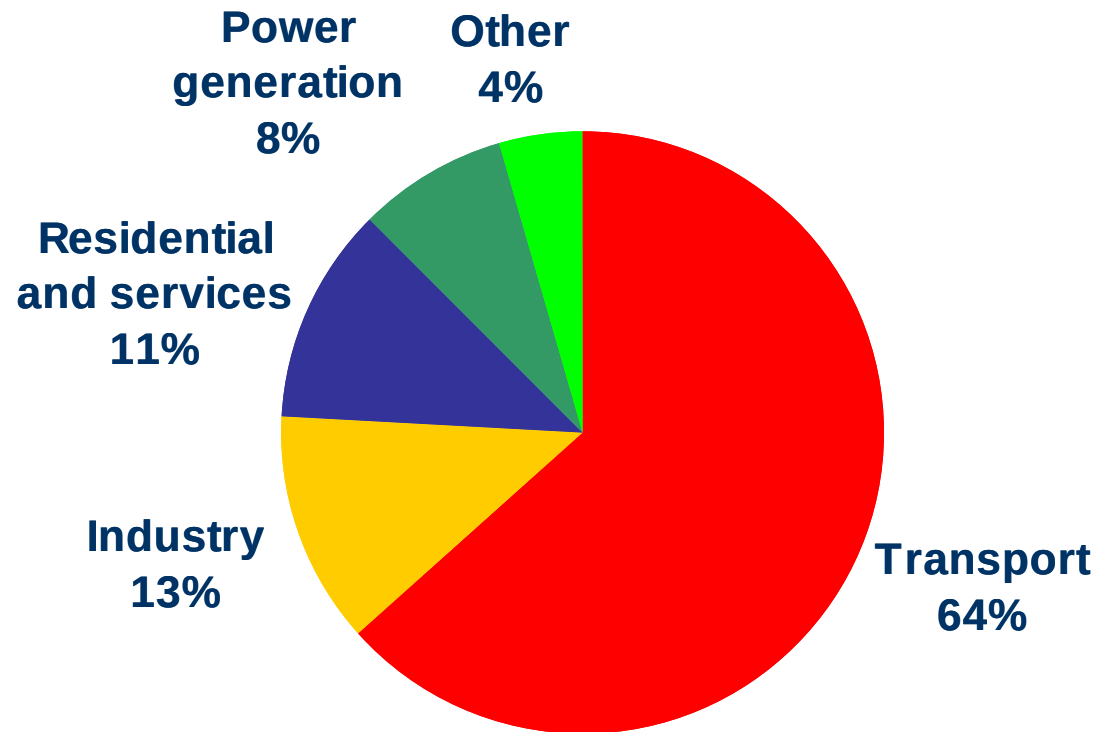
- How would global energy markets evolve if investment MENA upstream oil industry grew slower than in the Reference Scenario?
- Investment might be deferred because of
 - Deliberate policy on the part of producers
 - External financing constraints
- Investment is assumed to remain constant as share of GDP in each country
- Results in a reduction of between 10% and 40% in oil investment vis-à-vis the RS
- MENA oil production falls progressively versus the RS
- Oil prices are driven higher, dragging up gas & coal prices
- MENA gas production is also lower due to
 - ❑ Lower associated oil/gas output
 - ❑ Reduced global gas demand & call on MENA gas



World Alternative Policy Scenario (WAPS)

- Analyses impact of new environmental & energy-security policies worldwide
 - ❑ *OECD*: Policies currently under consideration
 - ❑ *Non-OECD*: Also includes more rapid declines in energy intensity resulting from faster deployment of more-efficient technology
- Impact on fuel mix, CO₂ emissions & investment needs
- Basic macroeconomic & population assumptions as for Reference Scenario, but energy prices change

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

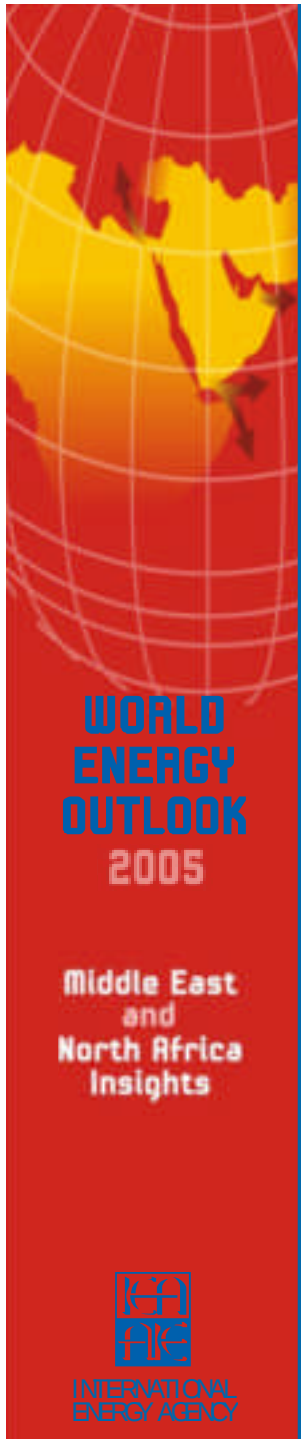


Oil savings = 12.8 mb/d

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

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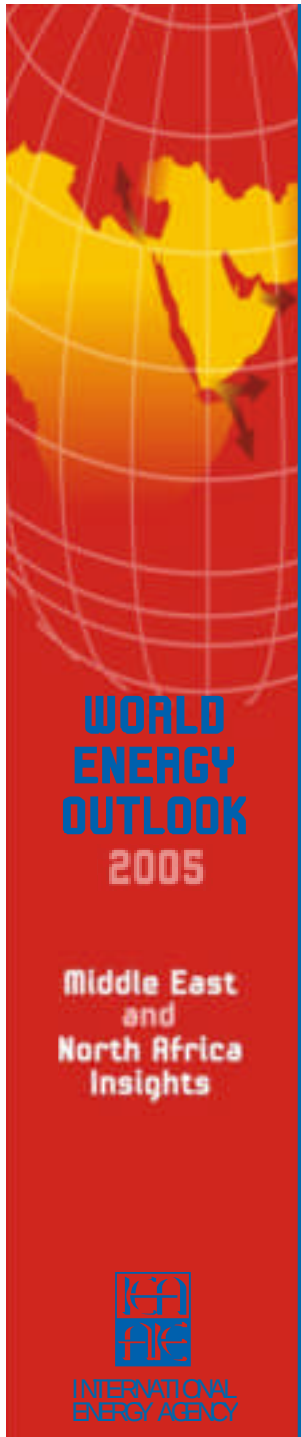


Conclusions

- If governments stick with current policies, global energy needs will be more than 50% higher in 2030 than today
- Fossil fuels will continue to dominate the energy mix
- Projected market trends raise serious concerns
 - Increased vulnerability to supply disruptions
 - Rising CO₂ emissions
 - Huge energy-investment needs
- Upstream MENA investment is a critical uncertainty
 - ❑ Constraining the long-term expansion of productive capacity will be in neither producers' nor consumers' interests
- More vigorous consuming-country policies could curb demand growth & reduce reliance on MENA oil and gas
 - ❑ Far more radical policy action & technology breakthroughs would be needed to reverse these trends

World Energy Outlook 2005

- Answers the question: how much oil and gas will the Middle East and North Africa export through to 2030?
- Focuses on Saudi Arabia, Iran, Iraq, Kuwait, the UAE, Qatar, Egypt, Libya and Algeria
- Analyses three distinct scenarios: Reference, Deferred Investment and Alternative Policy
- Draws implications for global energy markets, international oil and gas prices and energy security
- Released on 7th November





Thank you!

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www.worldenergyoutlook.org