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World Energy Outlook 2004

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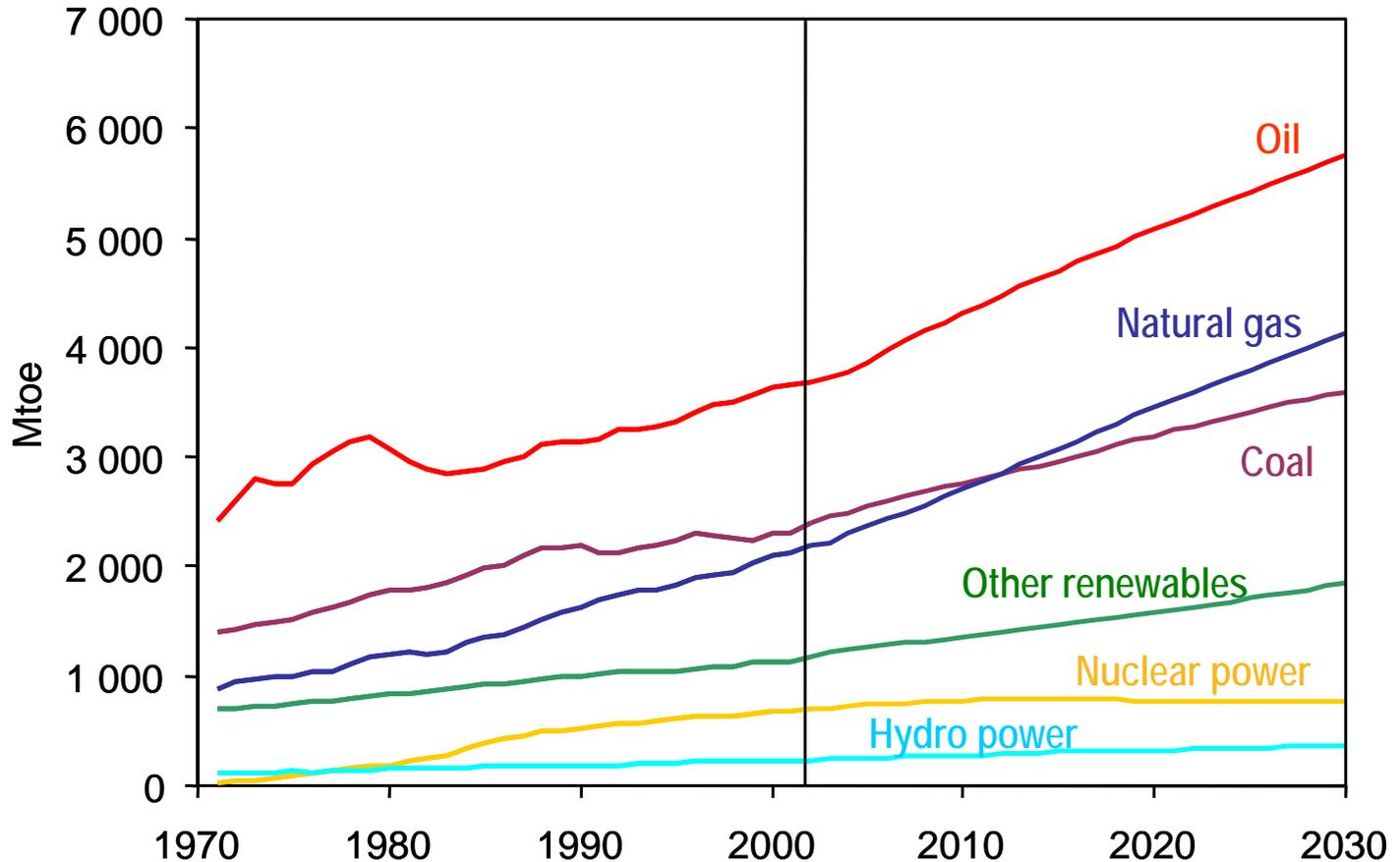
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Global Energy Trends



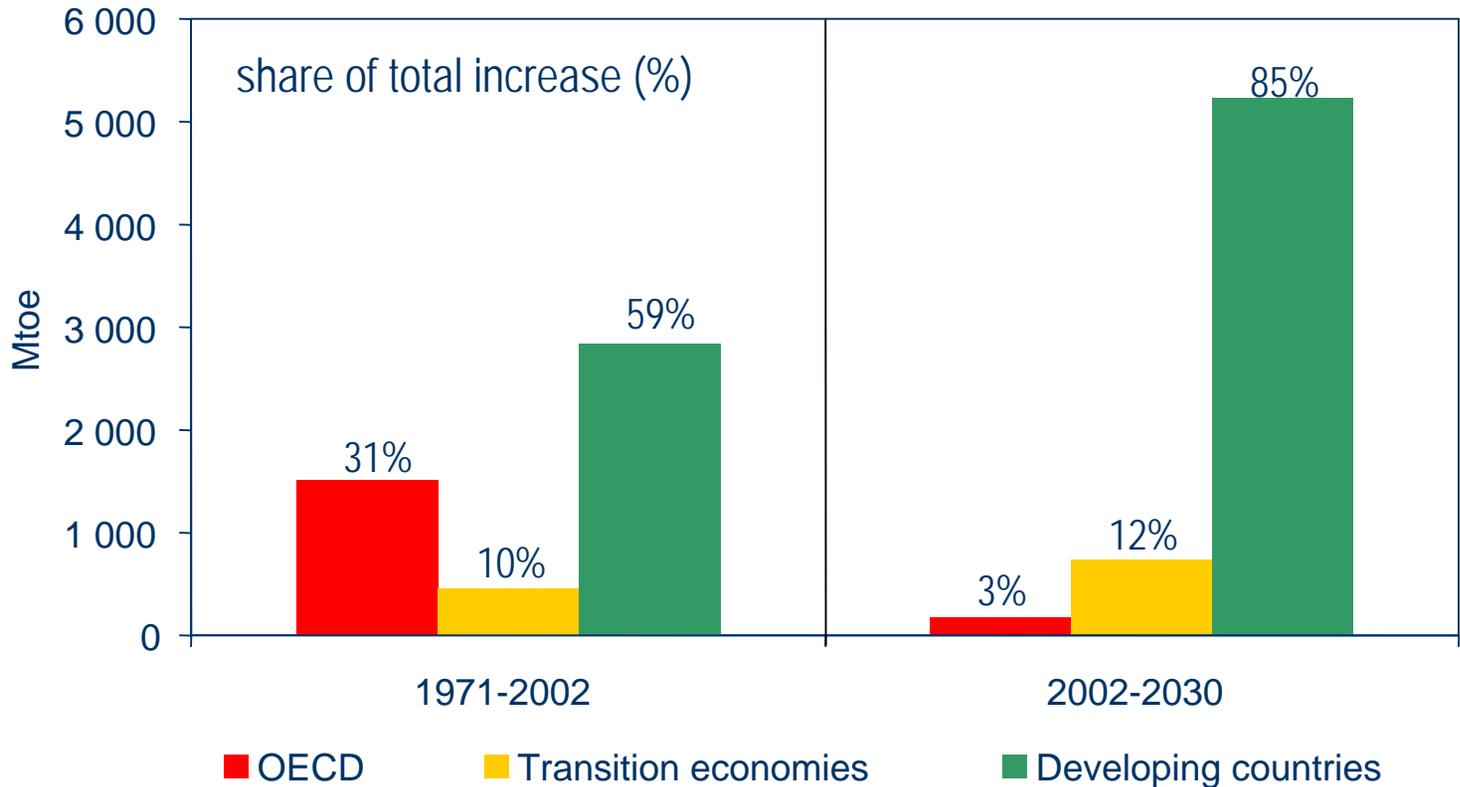
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World Primary Energy Demand



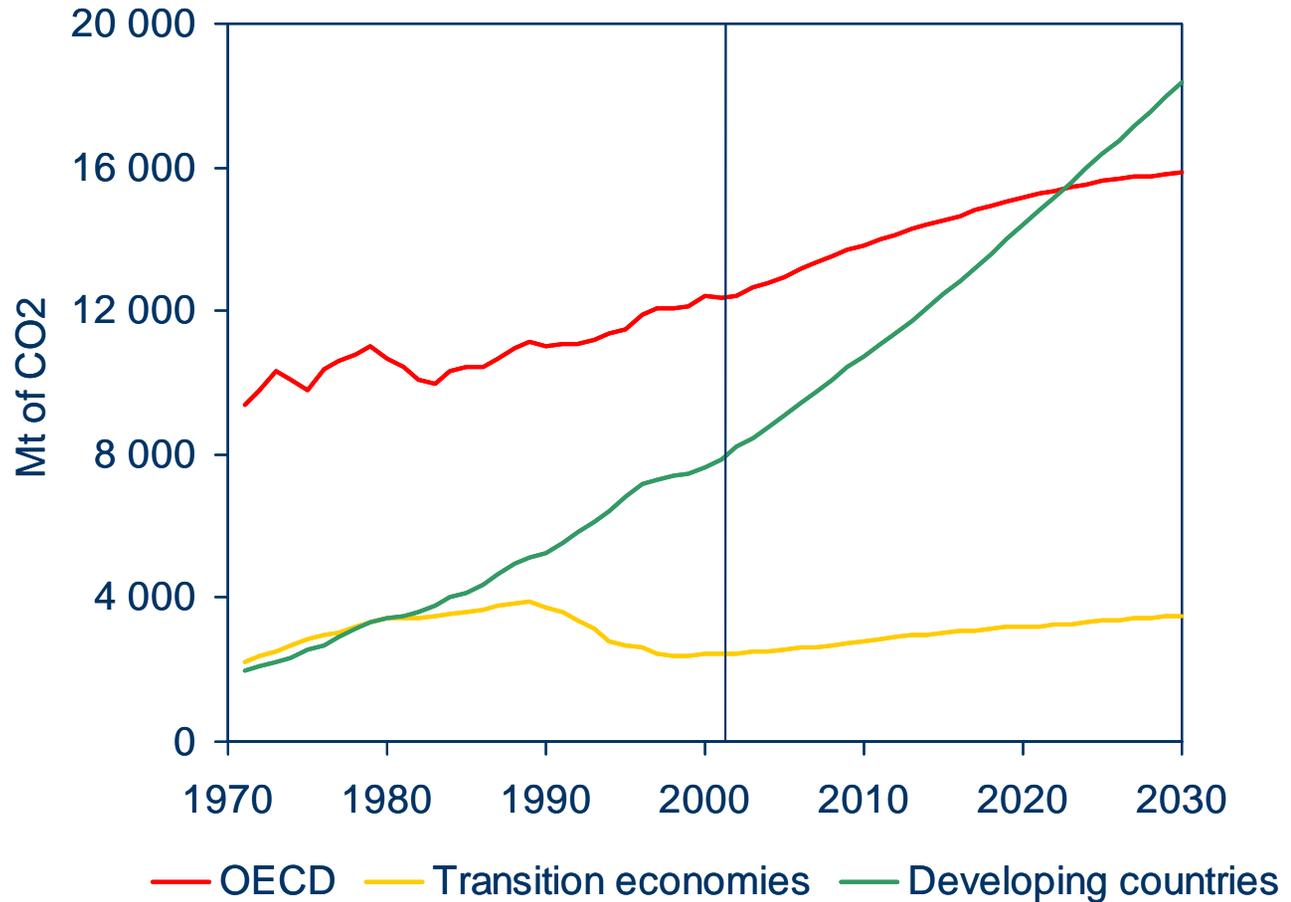
Fossil fuels account for almost 90% of the growth in energy demand between now and 2030

Increase in World Primary Energy Production by Region



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

World Energy-Related CO₂ Emissions



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

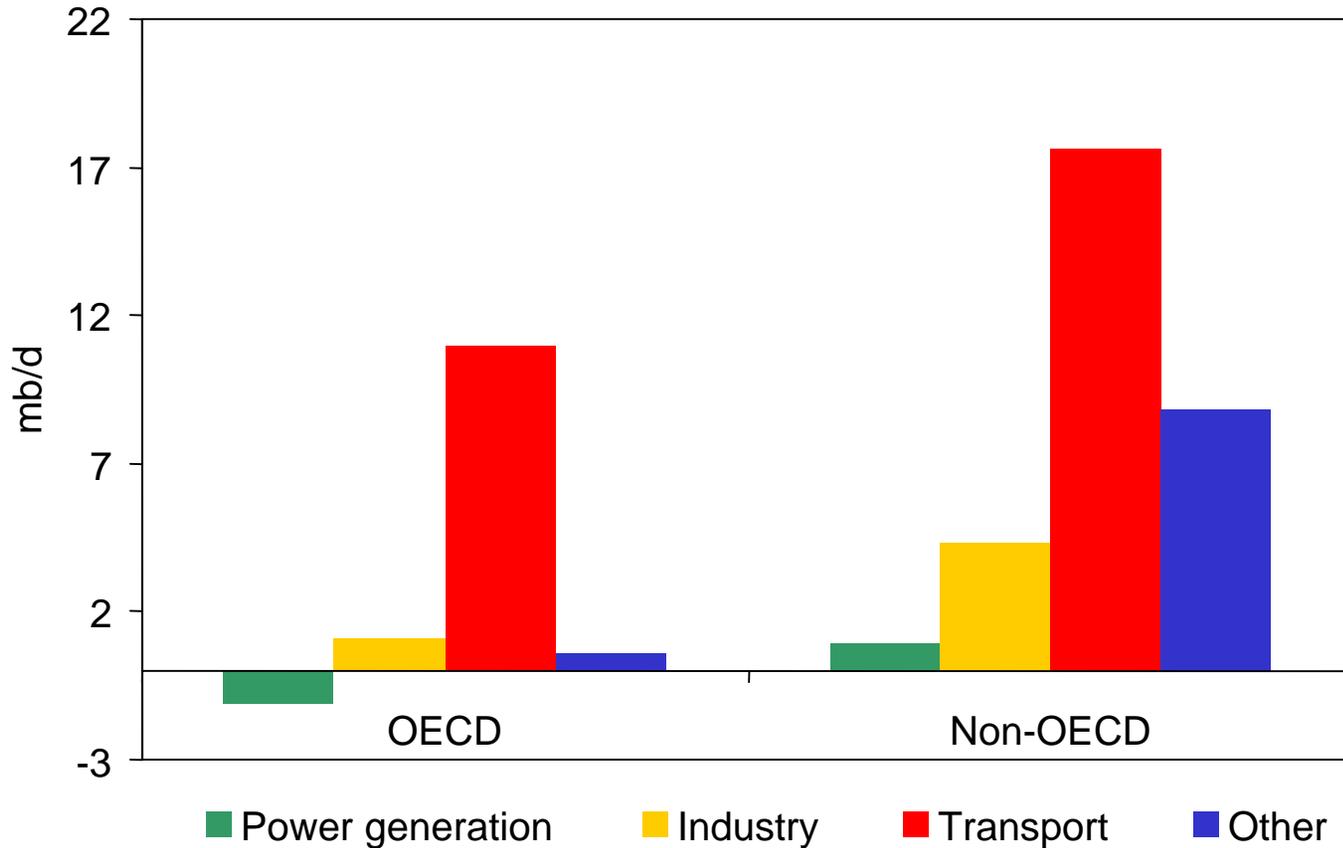


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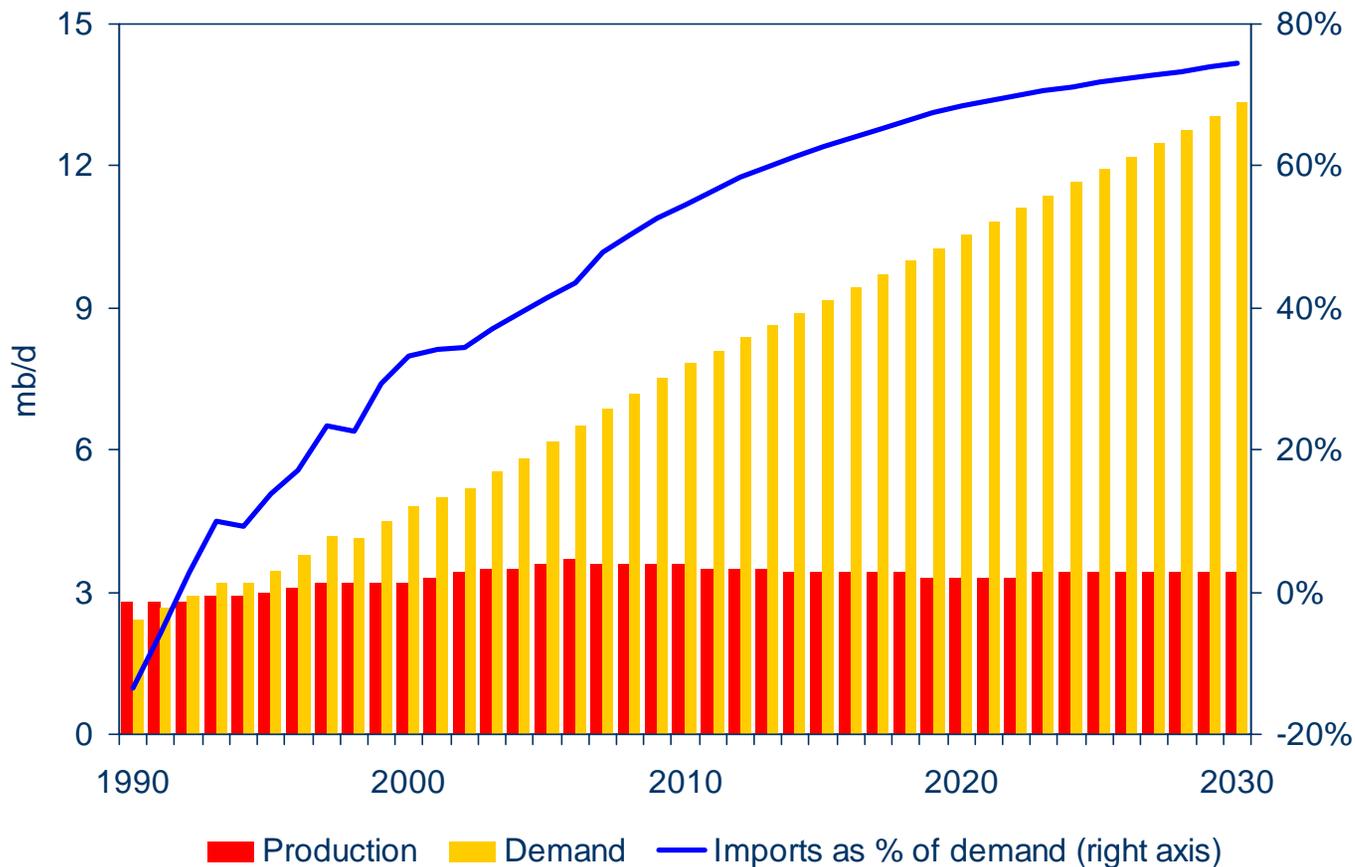
Oil Market Outlook

Increase in Primary Oil Demand, 2002-2030



Most of the increase in oil demand comes from the transport sector – especially in OECD countries

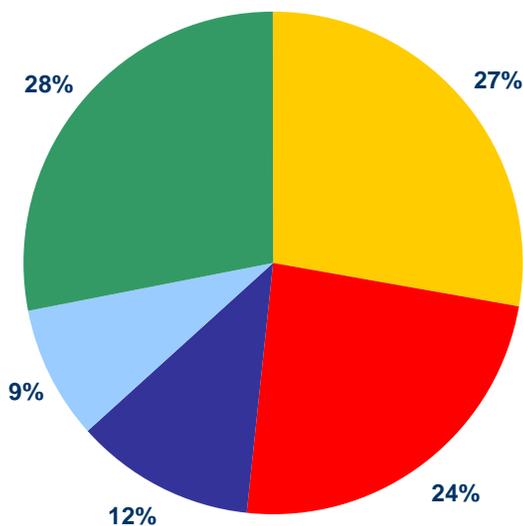
China Oil Supply Balance



China's oil imports will soar from less than 2 mb/d now to almost 10 mb/d in 2030 – equal to over 74% of domestic demand

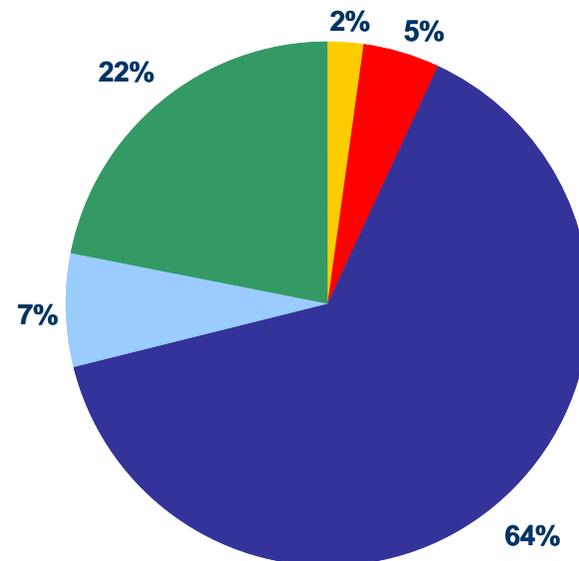
Undiscovered Oil & Gas Resources & Exploration Wells Drilled, 1995-2003

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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Oil Reserves Transparency

- The Earth's oil resources are adequate until 2030 and beyond
- Less certain is whether sufficient investment will flow to the 'right' locations at the 'right' time
- IEA calls for improved oil reserve data transparency, including:
 - A universally-recognised, transparent, consistent and comprehensive reporting system
 - A system of collecting, compiling & publishing primary data on national reserves
- IEA to develop initiative through international forums in conjunction with others orgs. (eg. OPEC, UN, financial regulators) and our member govts

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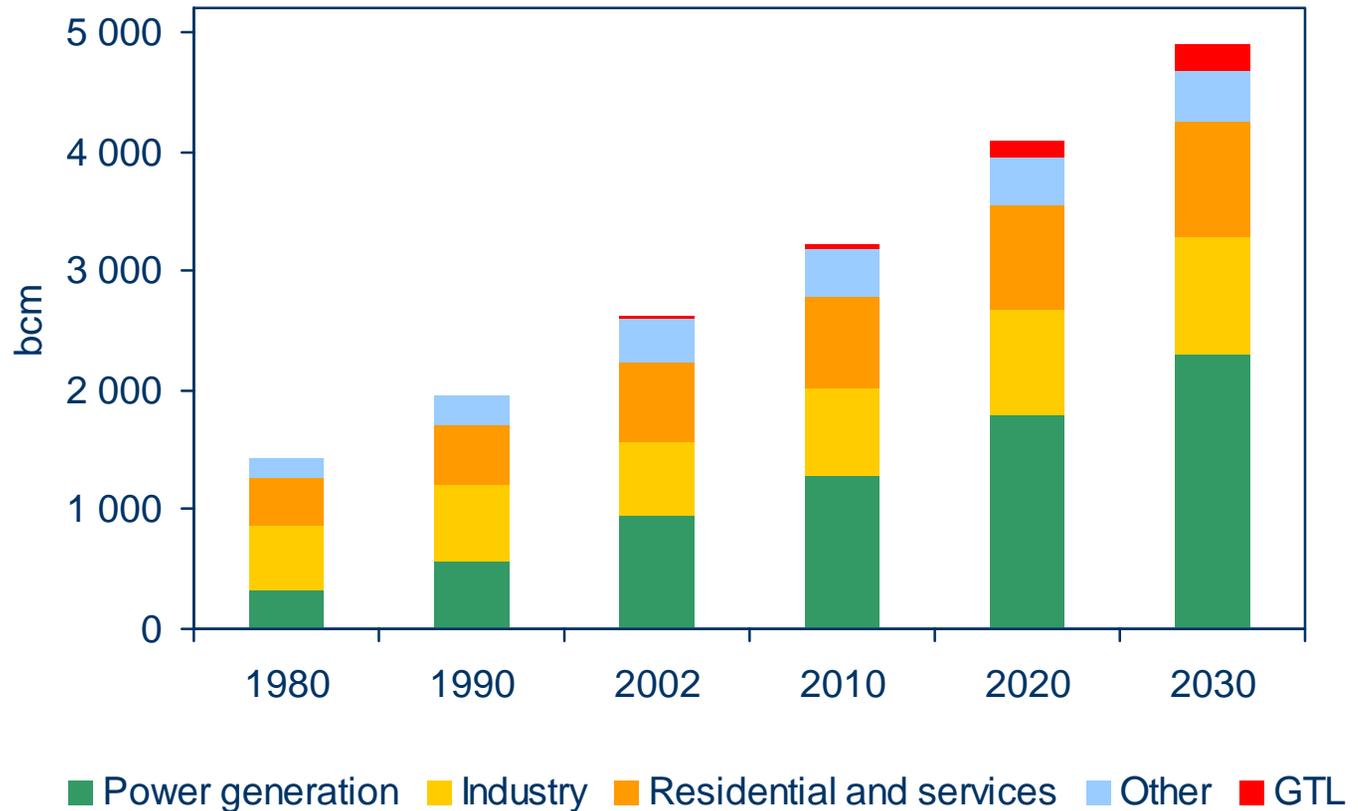


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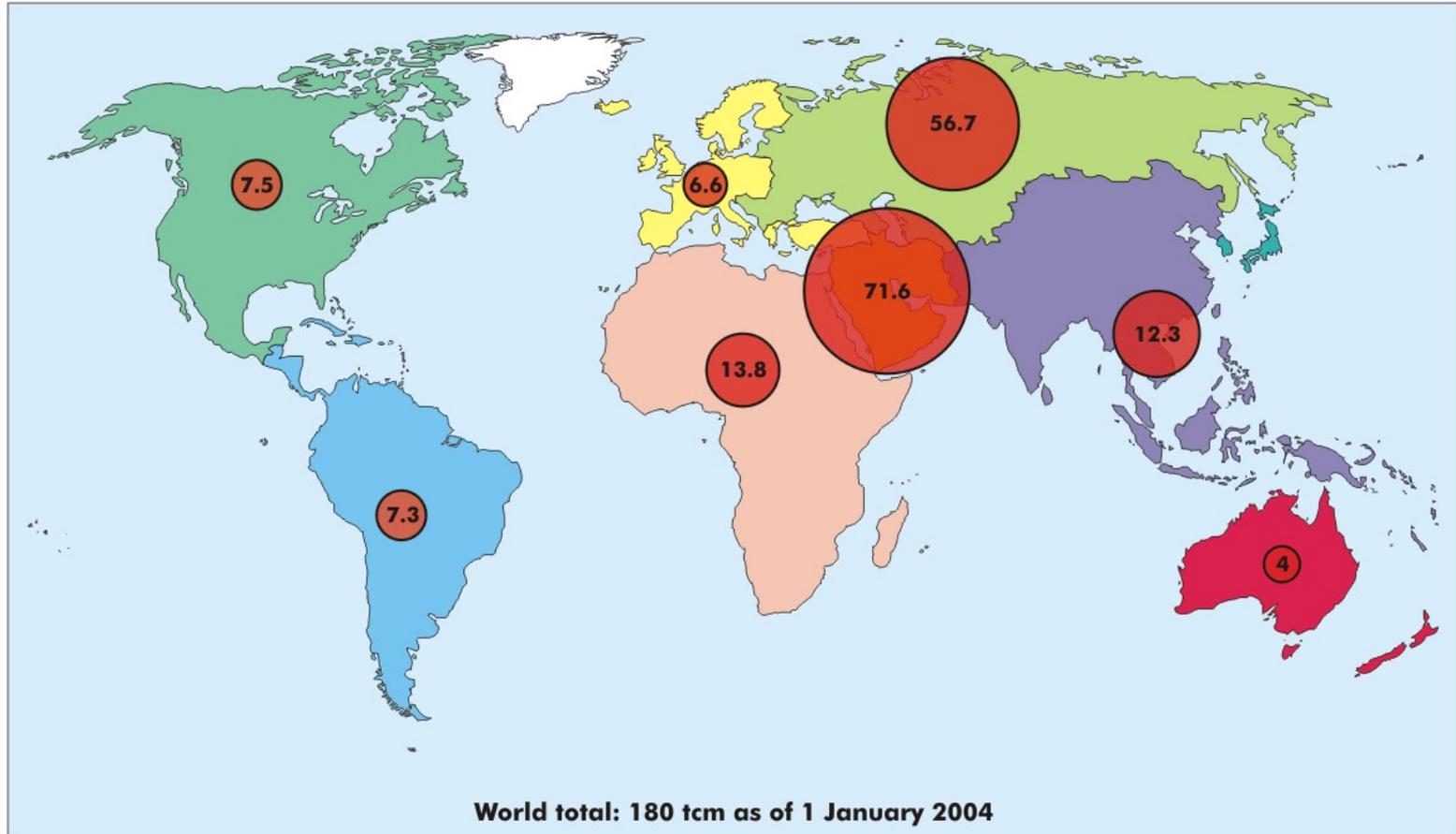
Gas Market Outlook

Increase in Primary Gas Demand



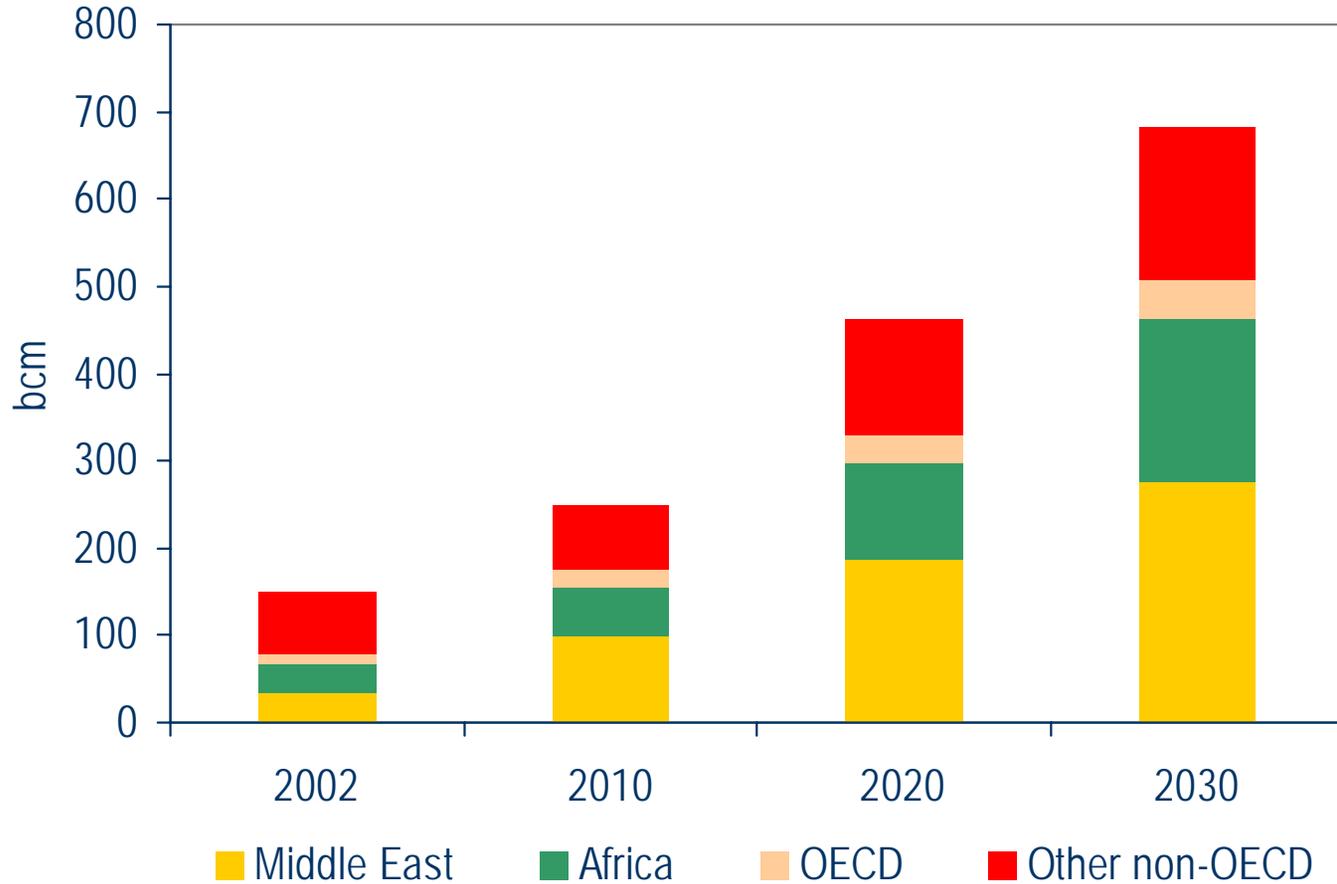
Most of the increase in gas demand comes from the power sector – especially in OECD countries

Proven Natural Gas Reserves



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

Sources of LNG



LNG trade will expand rapidly, with most new supplies coming from OPEC countries



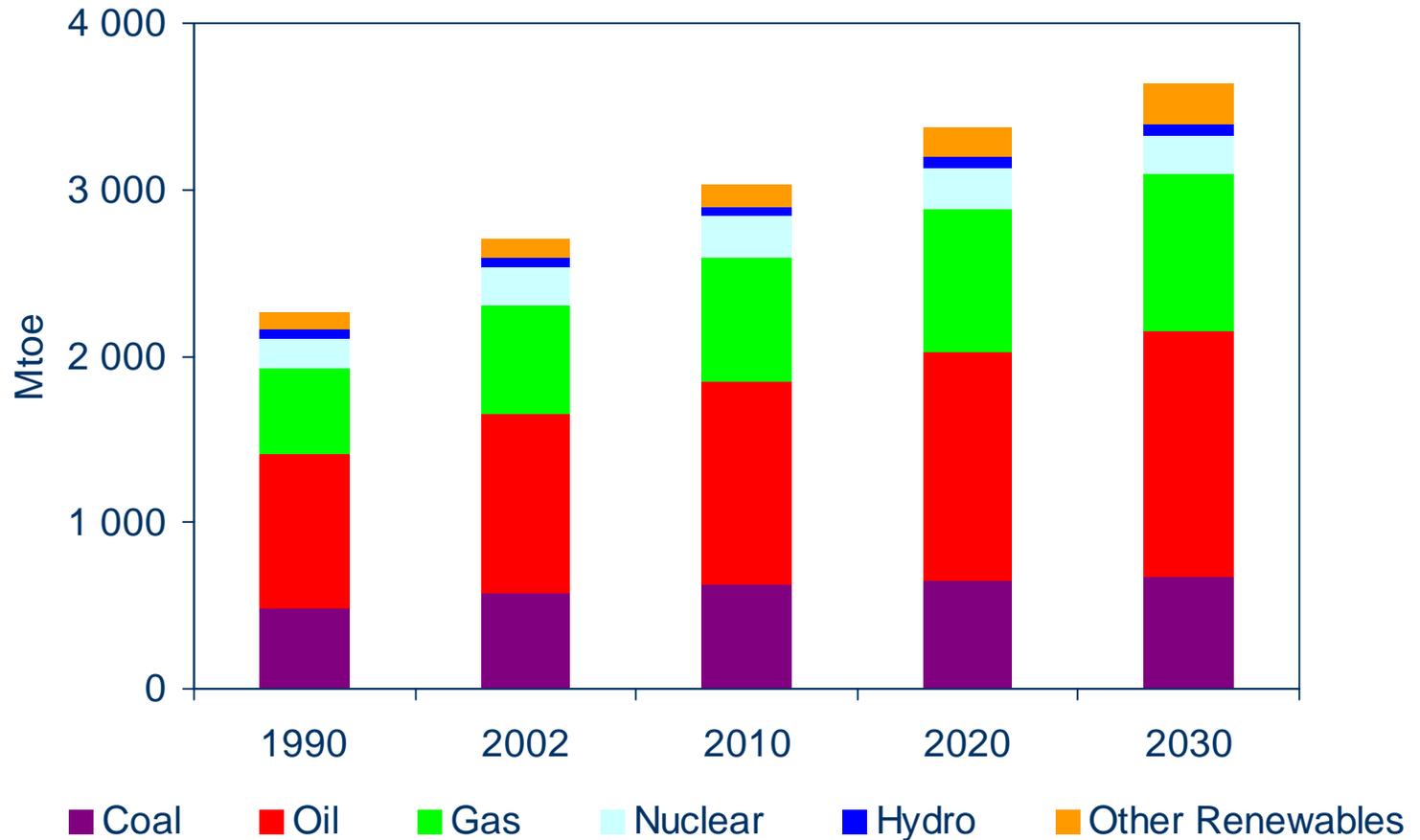
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Energy Trends in North America: Reference Scenario

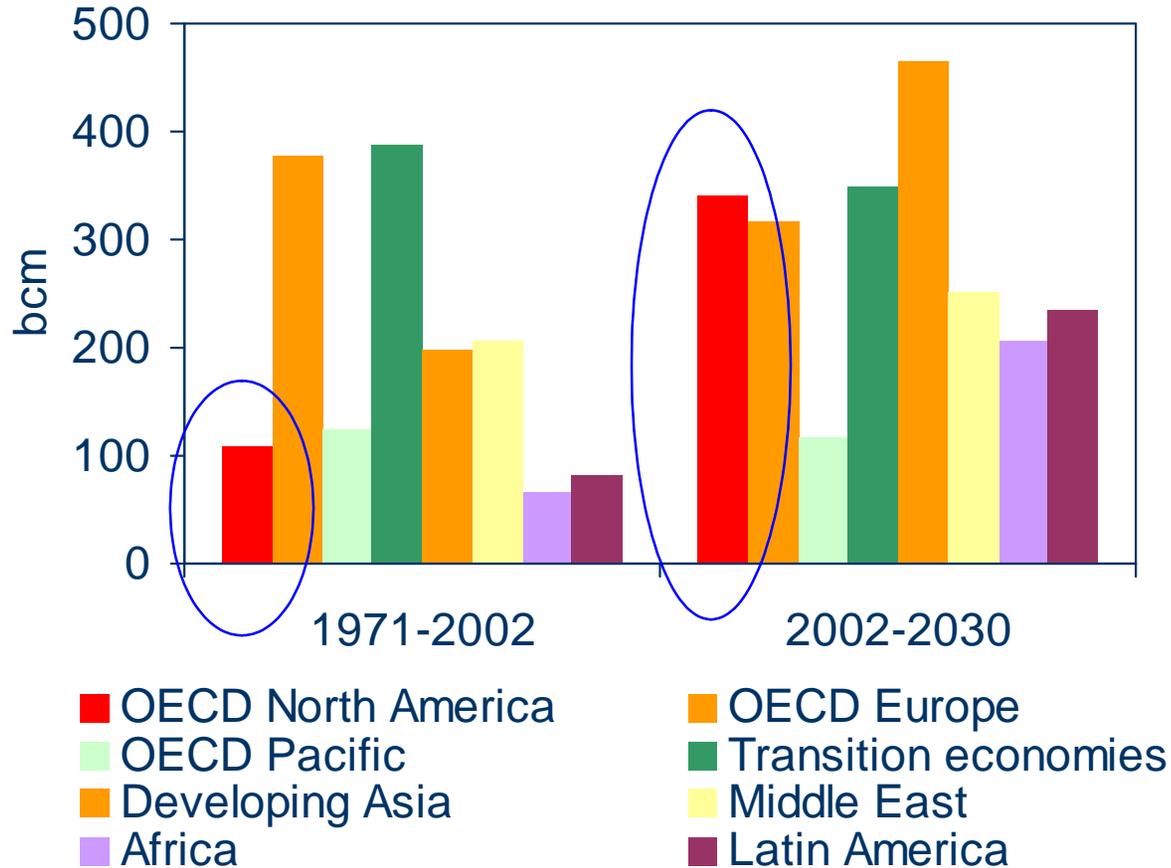


North American Primary Energy Use



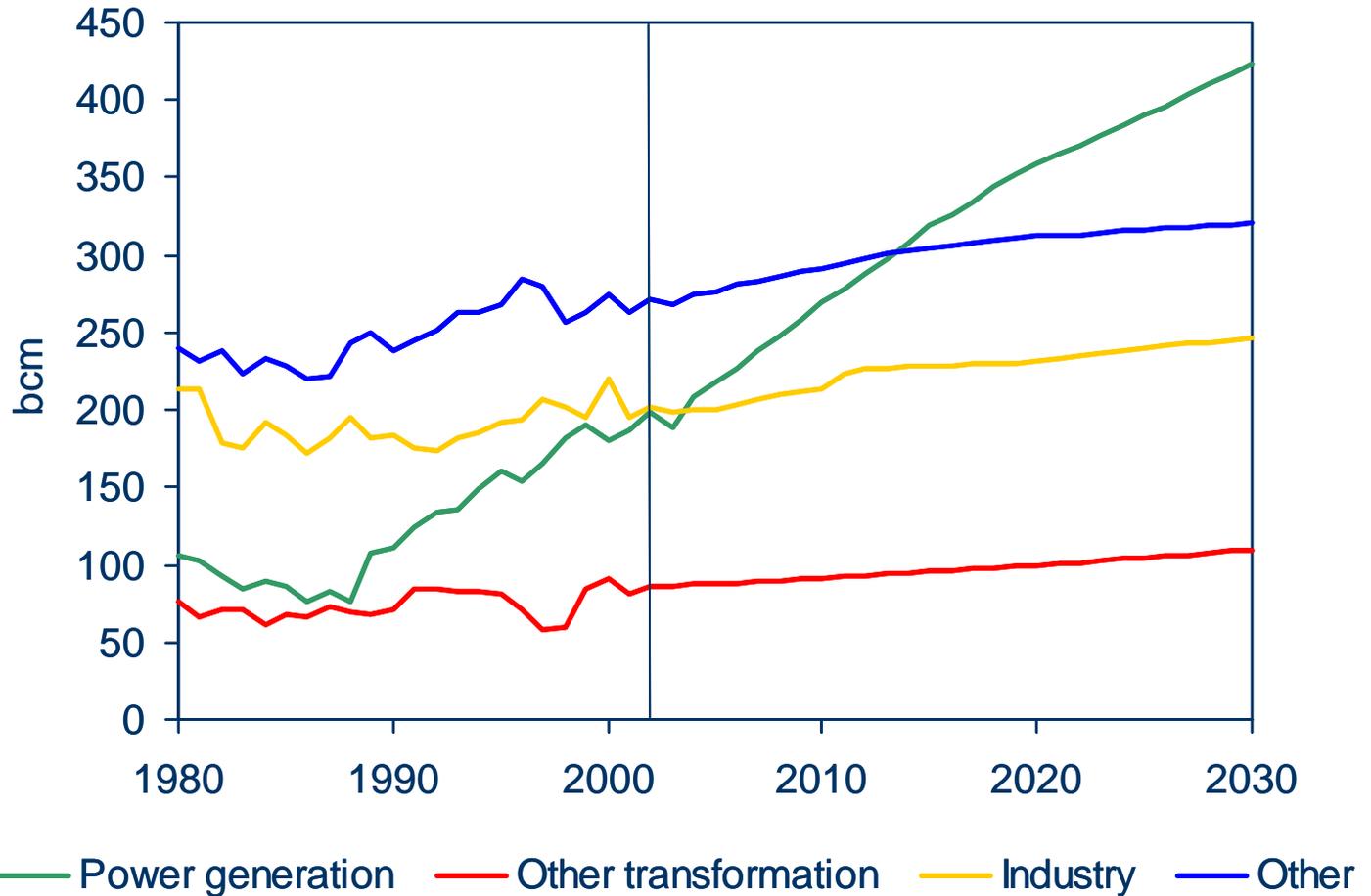
The shares of natural gas & renewables in the primary fuel mix increase most – driven by rising power-sector demand

Incremental Demand for Natural Gas by Region



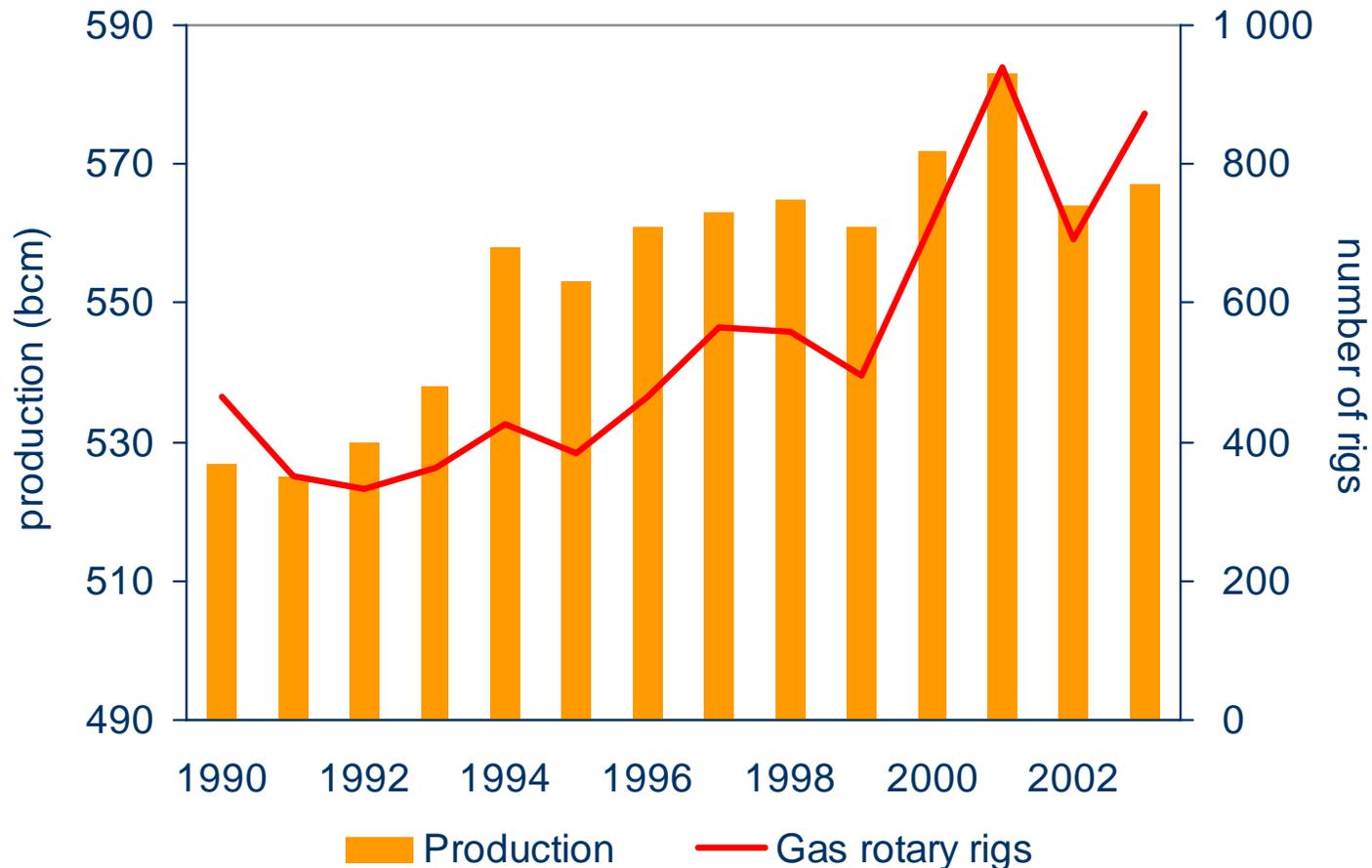
North America sees the 3rd largest increase in gas demand, remaining the world's largest gas market in 2030

North American Natural Gas Demand



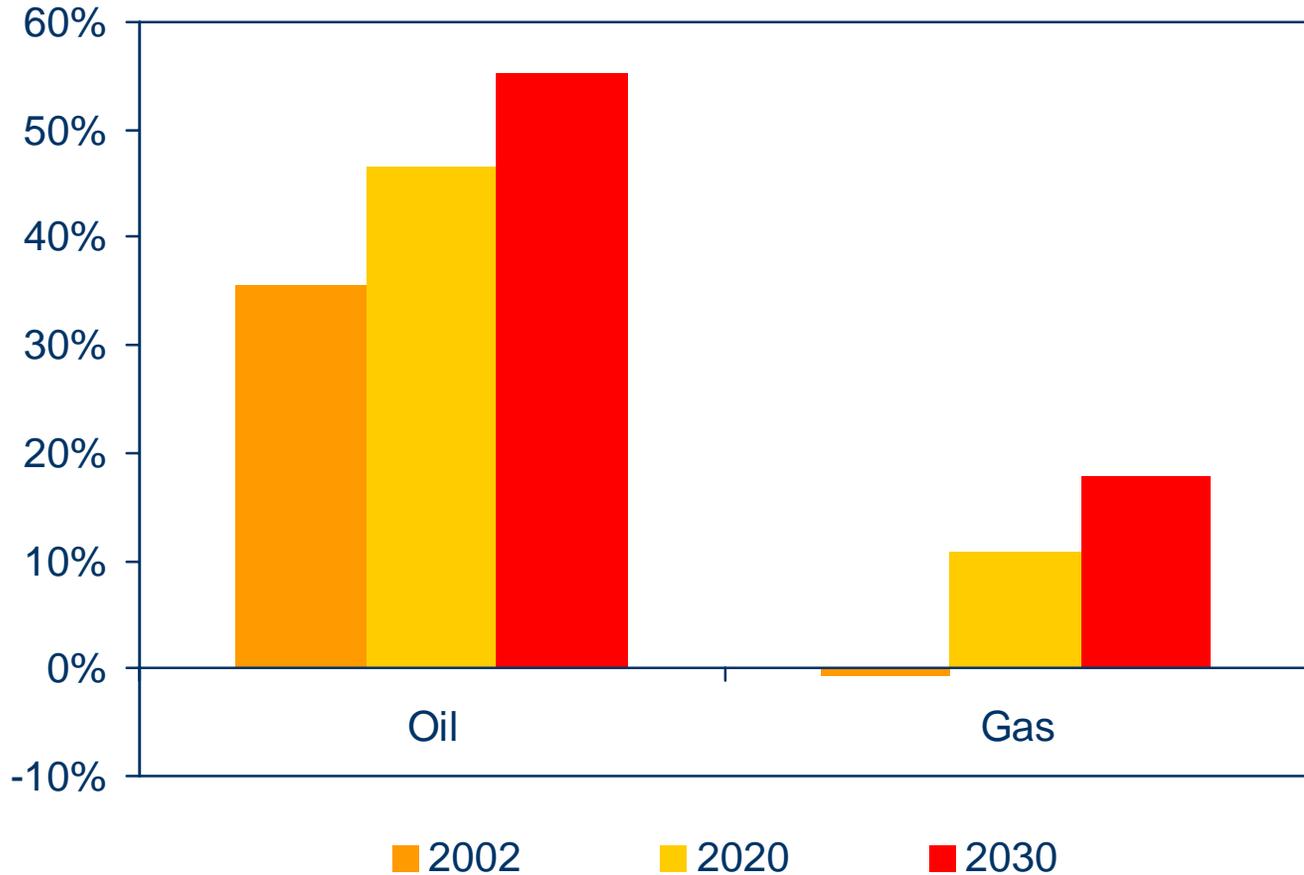
The power sector accounts for two-thirds of the projected increase in gas demand to 2030

US Marketed Gas Production & Drilling



Gas drilling in the US in recent years has been intense, but production has hardly risen since the end of 1990s

Net Imports of Oil & Gas as Share of Demand in OECD North America



North America becomes increasingly dependent on imports of oil & gas



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Alternative Policy Scenario

- Analyses impact of new environmental & energy-security policies worldwide
 - *OECD (including US, Canada and Mexico):* 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

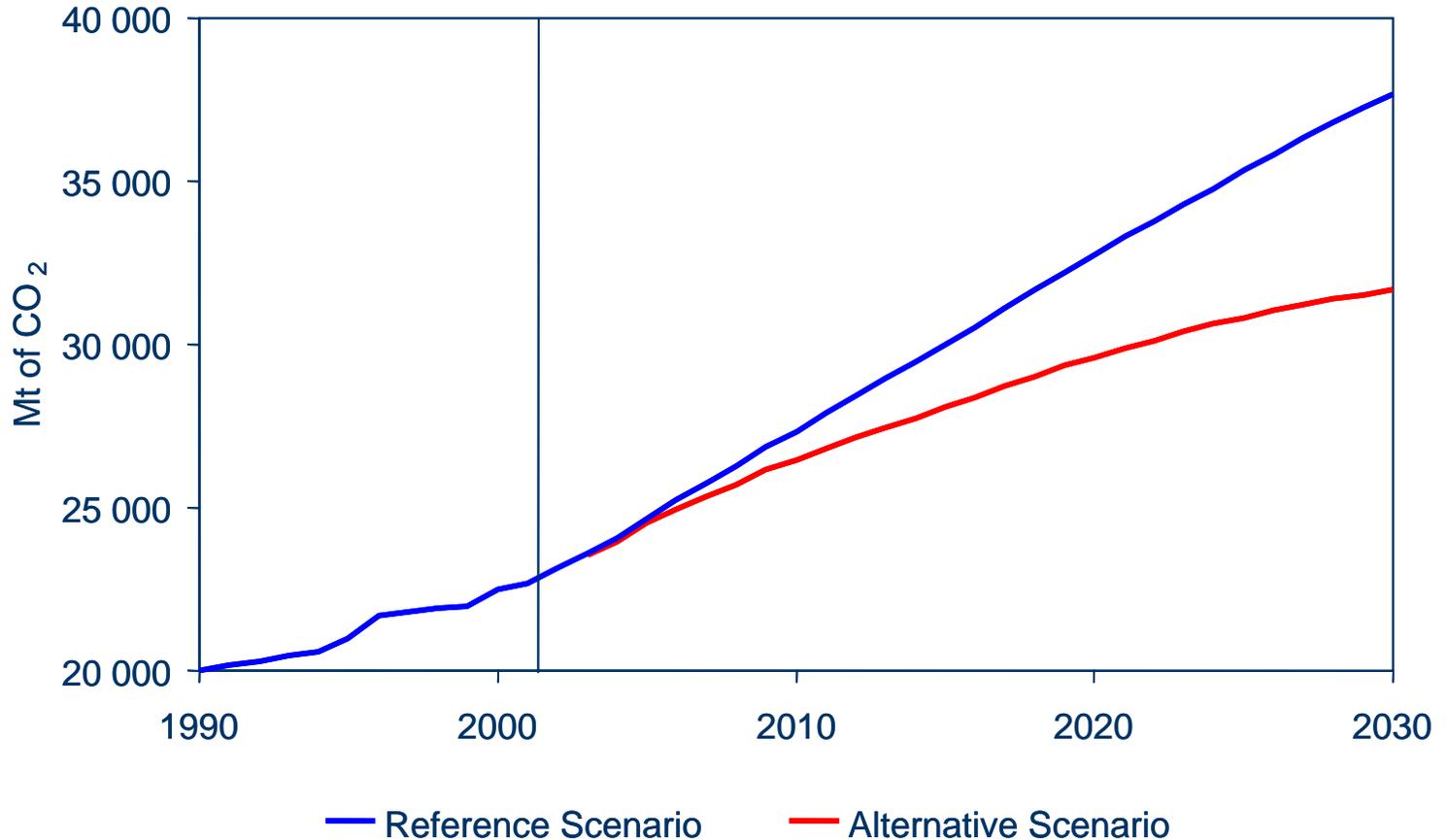
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Global CO₂ Emissions in the Reference & Alternative Scenarios



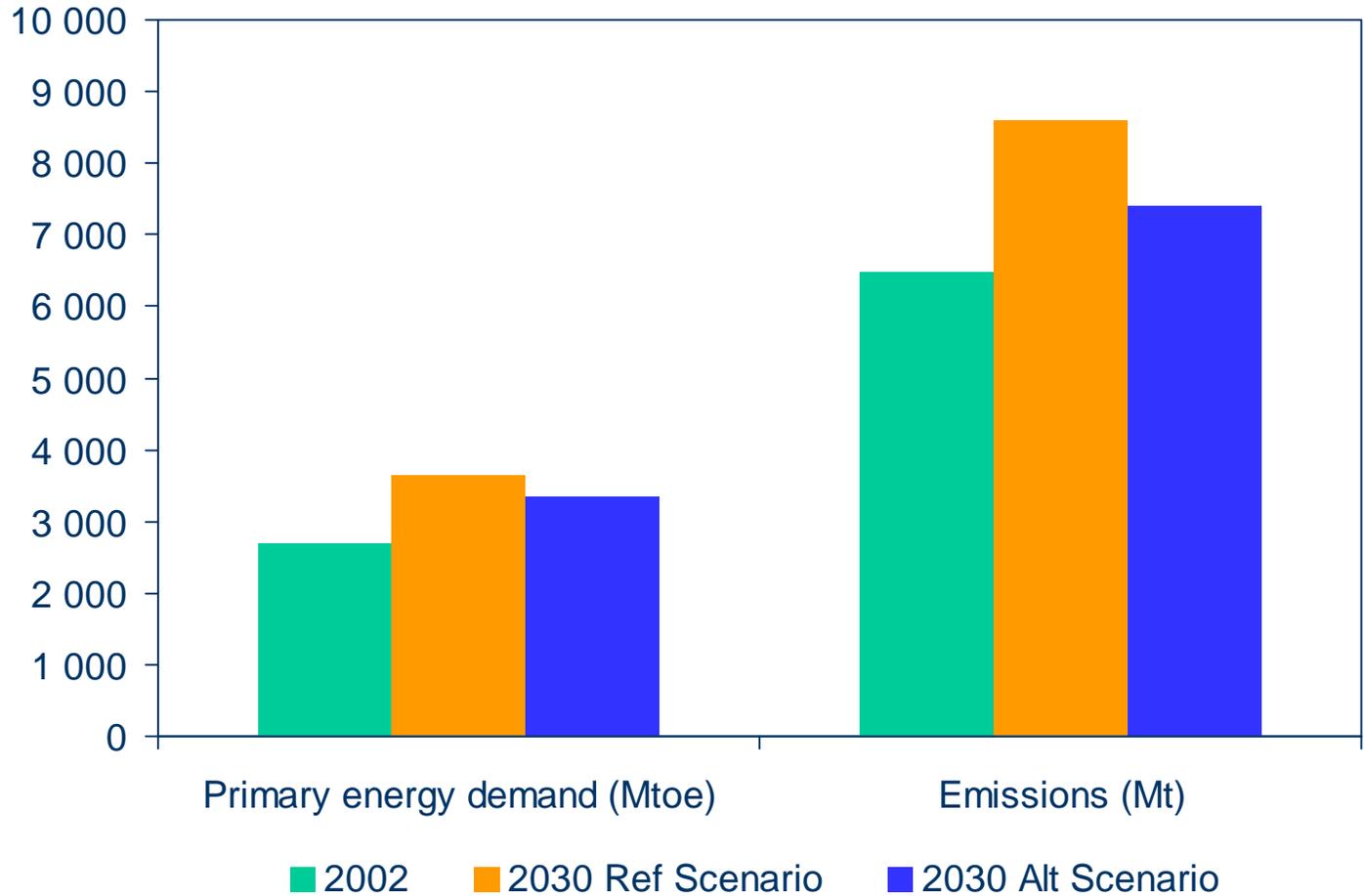
**CO₂ emissions are 16% less in the AS in 2030,
a reduction of about 6 Gt of CO₂**



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North American Energy Demand & CO₂ Emissions



Coal demand falls most, partially offset by more use of renewables



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Summary & Conclusions



Summary & Conclusions (1)

- On current policies, world energy needs will be almost 60% higher in 2030 than now
- Energy resources are more than adequate to meet demand until 2030 & well beyond
- But projected market trends raise serious concerns:
 - Increased vulnerability to supply disruptions
 - Rising CO₂ emissions
 - Huge energy-investment needs
 - Persistent energy poverty
- More vigorous policies would curb rate of increase in energy demand & emissions significantly
- But a truly sustainable energy system will call for faster technology development & deployment
- Urgent & decisive government action is needed



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Summary & Conclusions (2)

- North American demand projected to grow by 1.1% p.a. – lower than most other regions
- CO₂ emissions will grow almost as fast
- Investment of \$3.5 trillion needed through 2030 – more than half for electricity
- Oil & gas imports will continue to grow, but decline rates & drilling costs uncertain
- Liberalisation not expected to undermine power investment, but concerns about reliability & peak capacity
- Changing environmental policies are risks and opportunities for investors

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