



INTERNATIONAL ENERGY AGENCY

The World Energy Outlook and The Challenges for Asia

Noé van Hulst

Director, Long-term Co-operation and Policy Analysis

**ASEAN Energy Business Forum 2005
Siem Reap, 12 July 2005**



INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

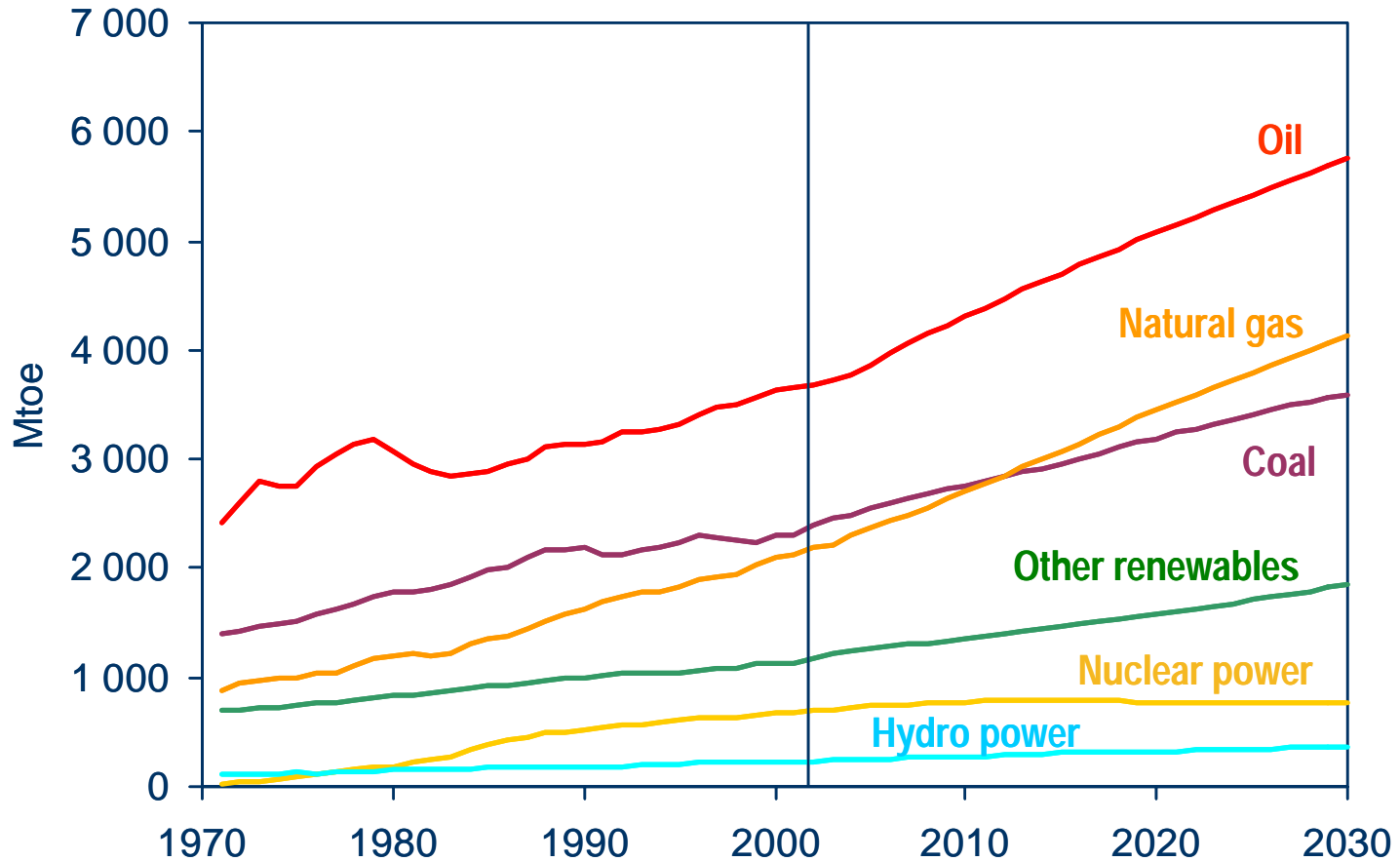
Global Energy Trends: Reference Scenario



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

World Primary Energy Demand



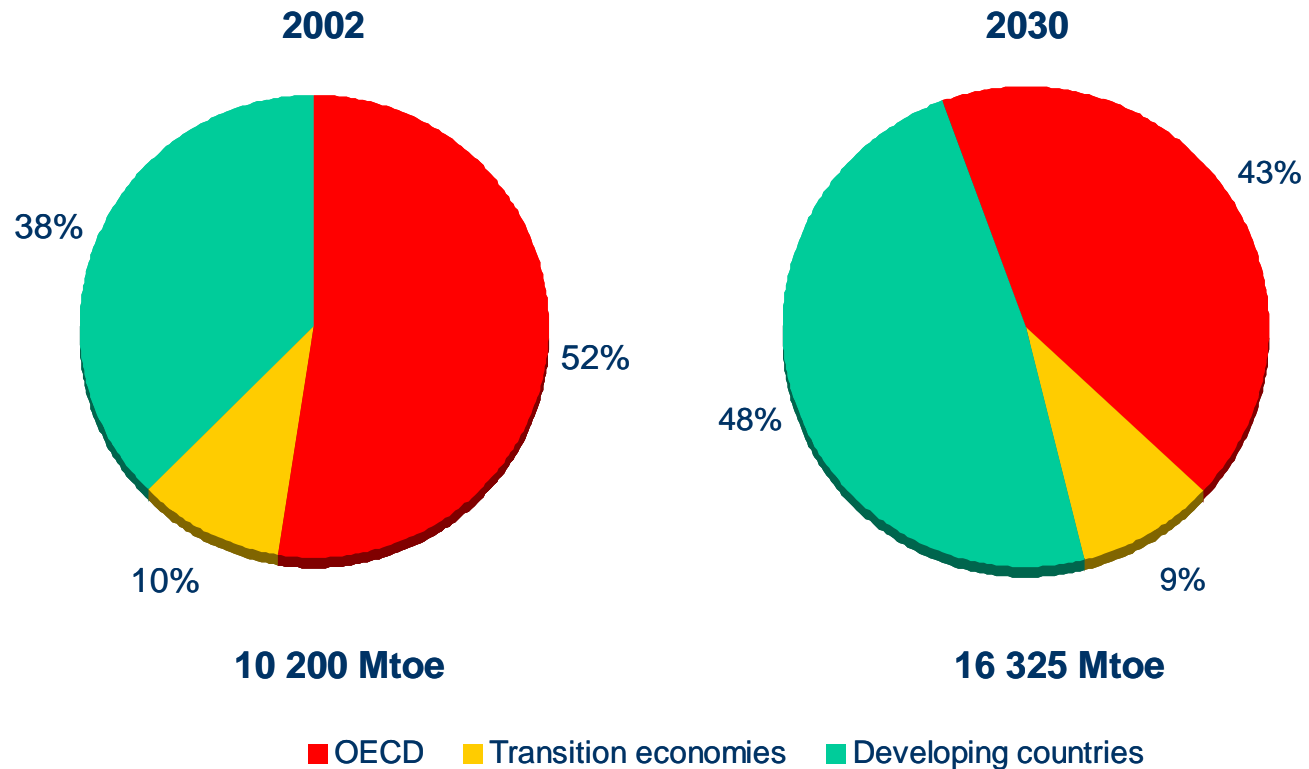
**Fossil fuels will continue to dominate the global energy mix,
while oil remains the leading fuel**



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Regional Shares in World Primary Energy Demand



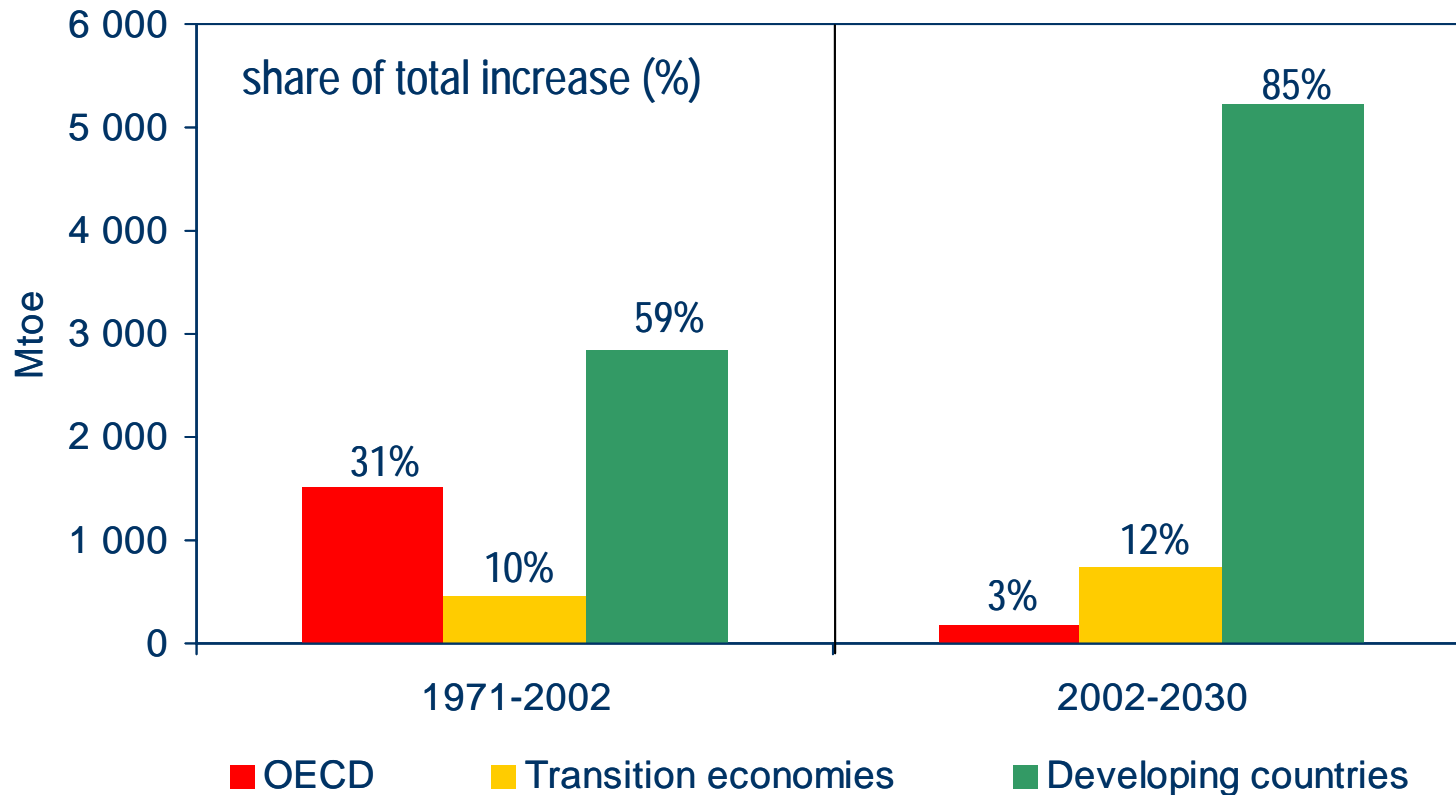
Two-thirds of the increase in world demand between 2002 and 2030 comes from developing countries, especially in Asia



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Increase in World Primary Energy Production by Region



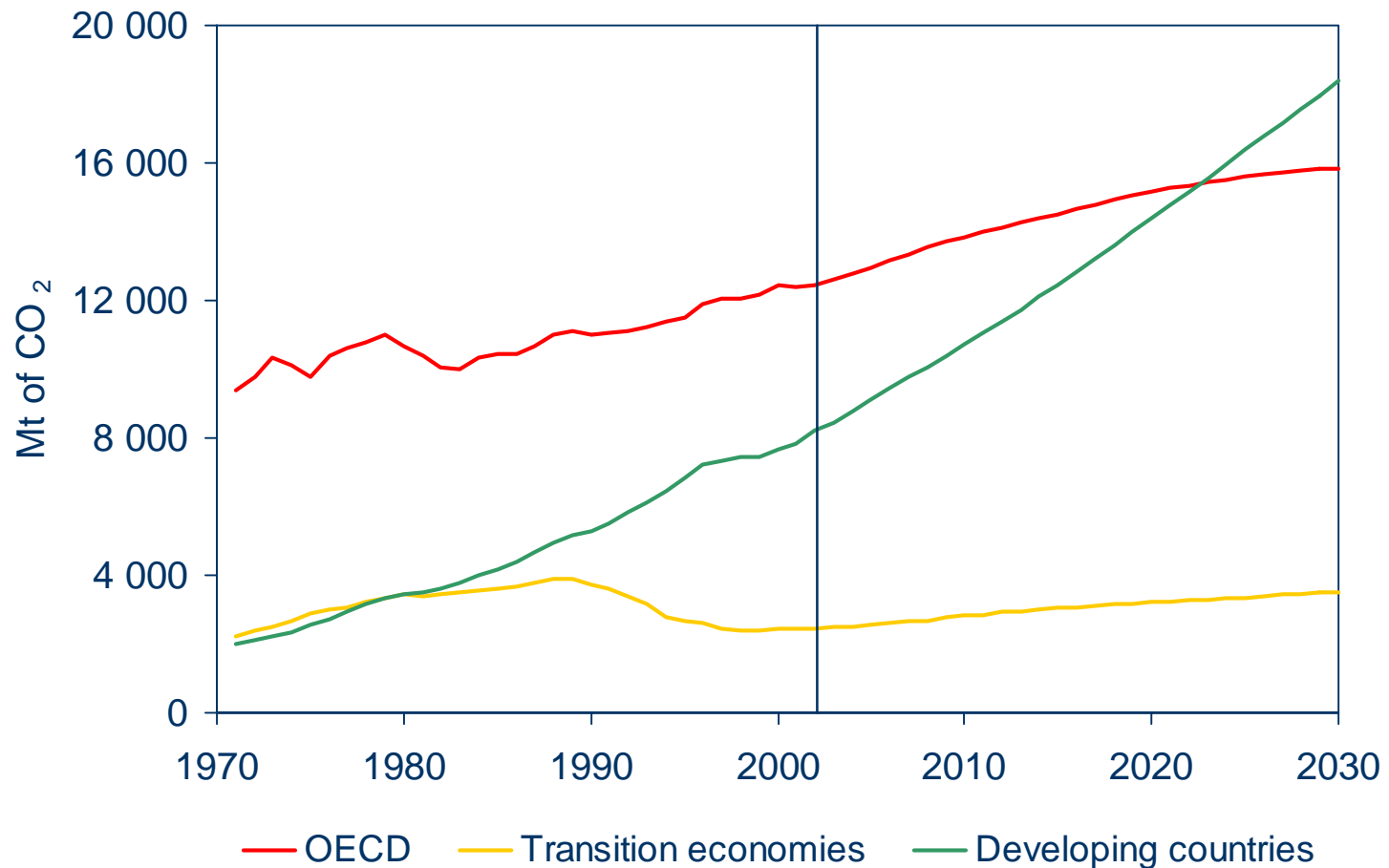
Almost all the increase in production to 2030 occurs outside the OECD, up from less than 70% in 1971-2002



INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

CO₂ Emissions, 1971-2030



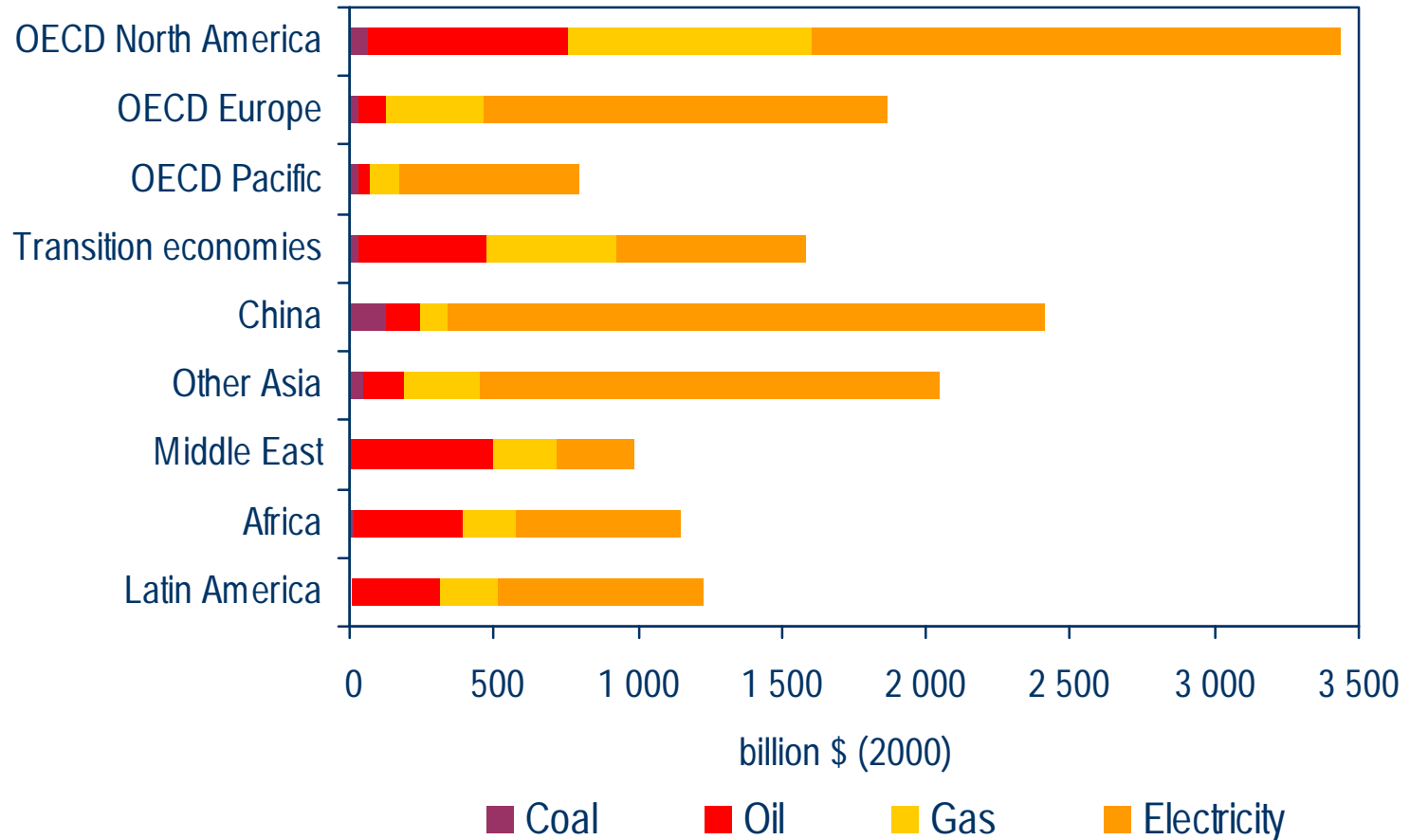
CO₂ emissions will increase fastest in developing countries, overtaking OECD in the 2020s



INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

Cumulative Energy Investment, 2003-2030



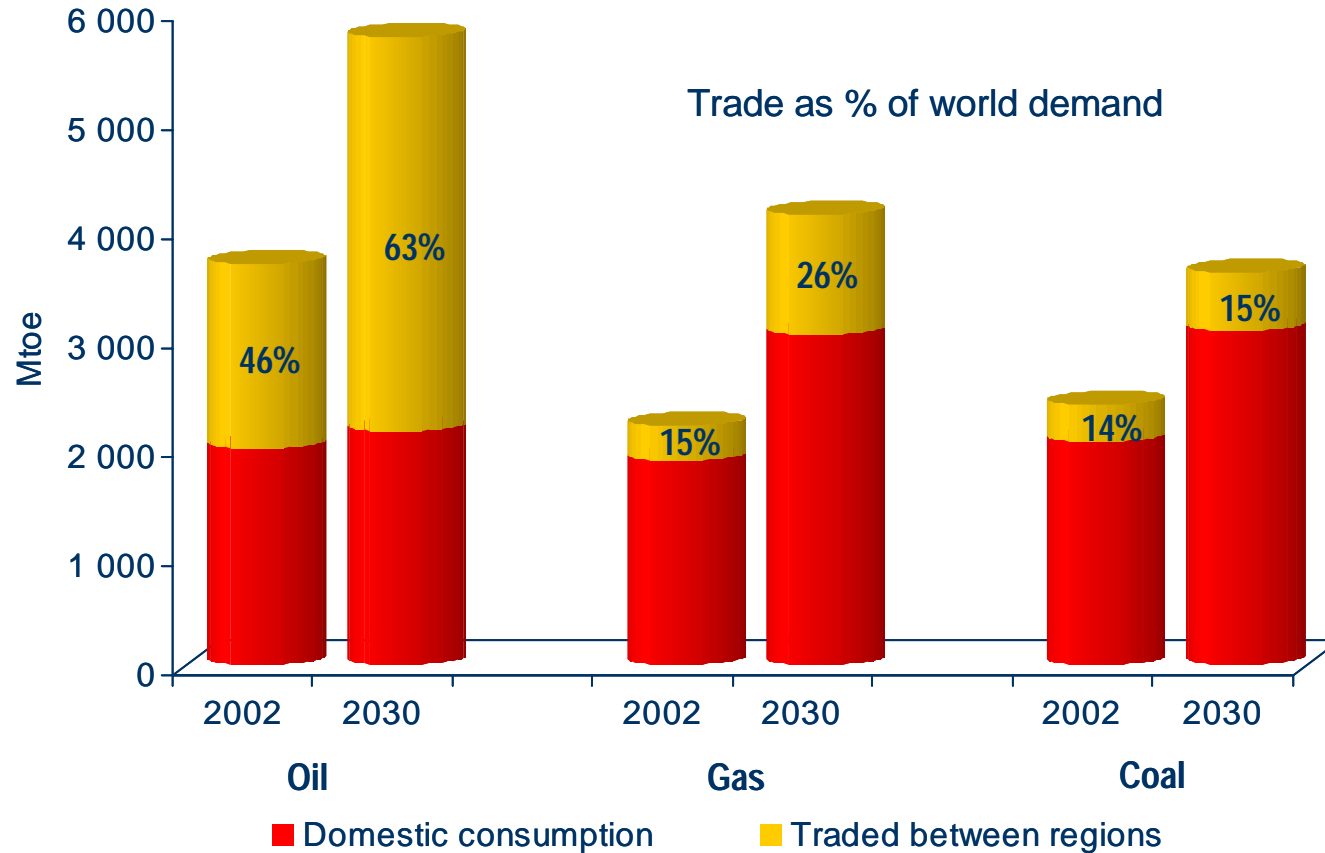
**Power sector absorbs 62% of global energy investment in
the period 2003-2030**



INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

Inter-Regional Trade in World Fossil-Fuel Supply



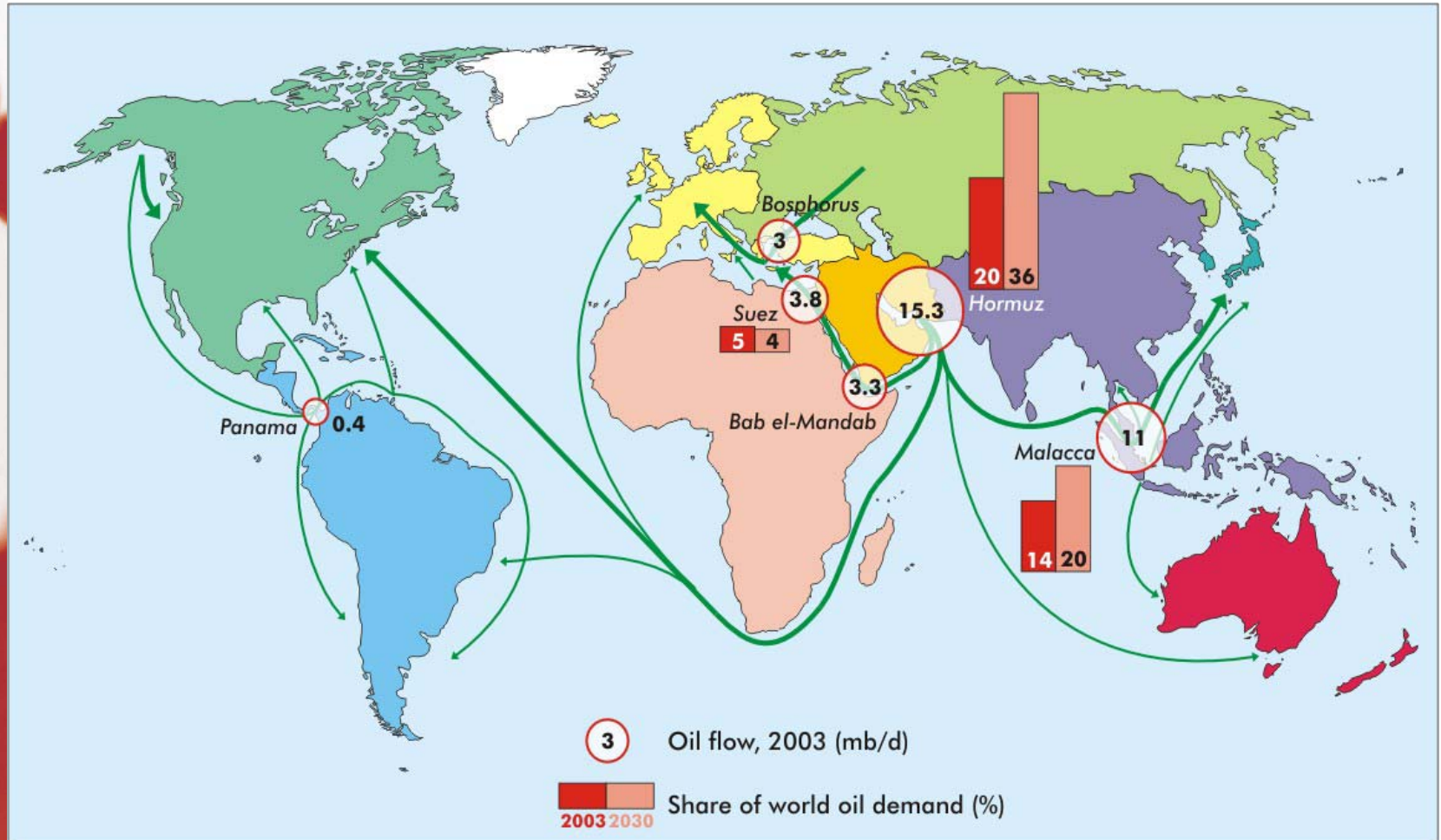
Energy trade between regions more than doubles by 2030, most of it still in the form of oil



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Oil Flows and Major Chokepoints: The "Dire Straits"



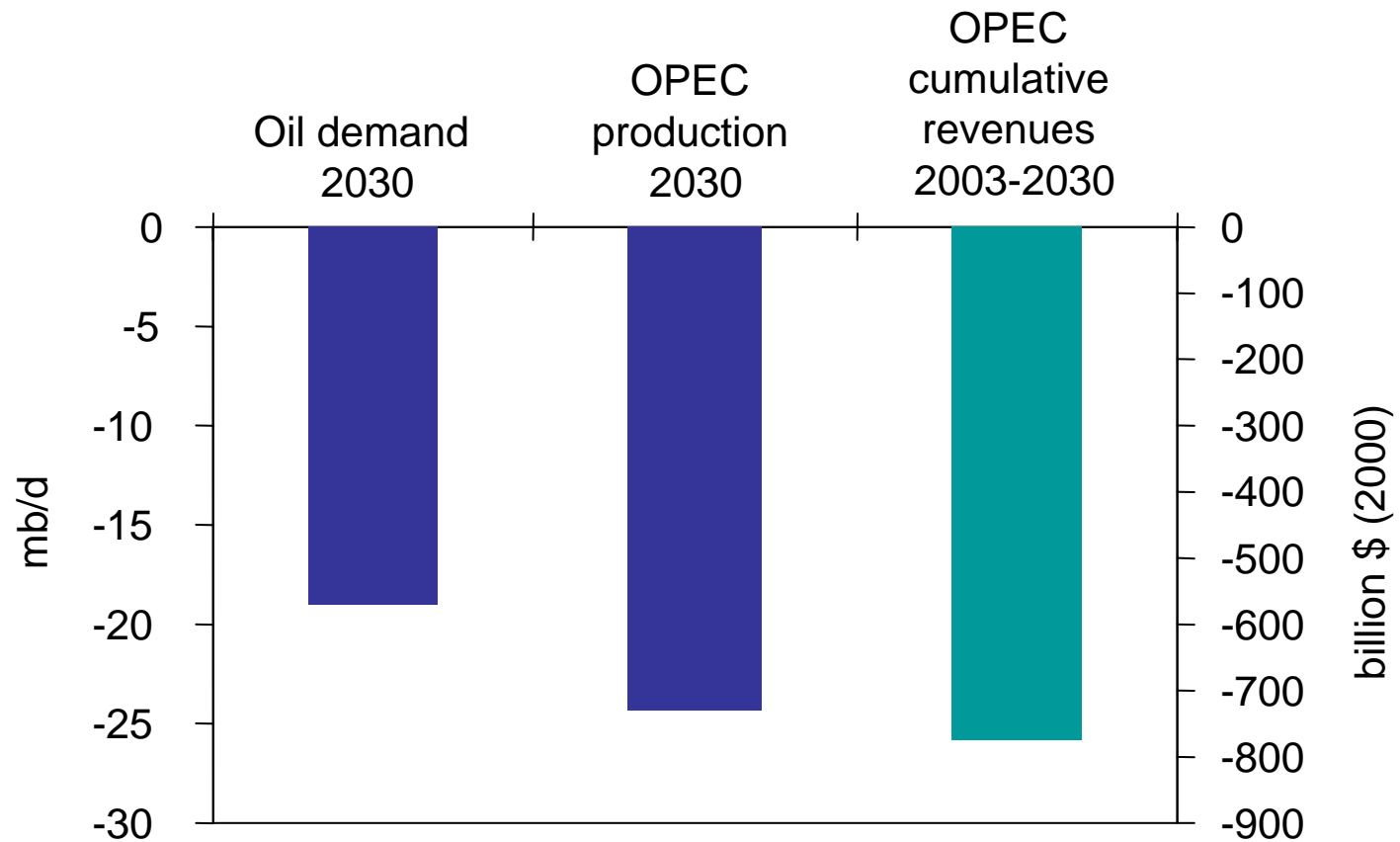
The risk of an oil-supply disruption will grow as trade & flows through key maritime and pipeline chokepoints expand



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Oil Market Implications of High Oil Price Case vs Reference Scenario



**Crude oil price is assumed to remain at average for 2004 to date,
with major implications for global oil markets**



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

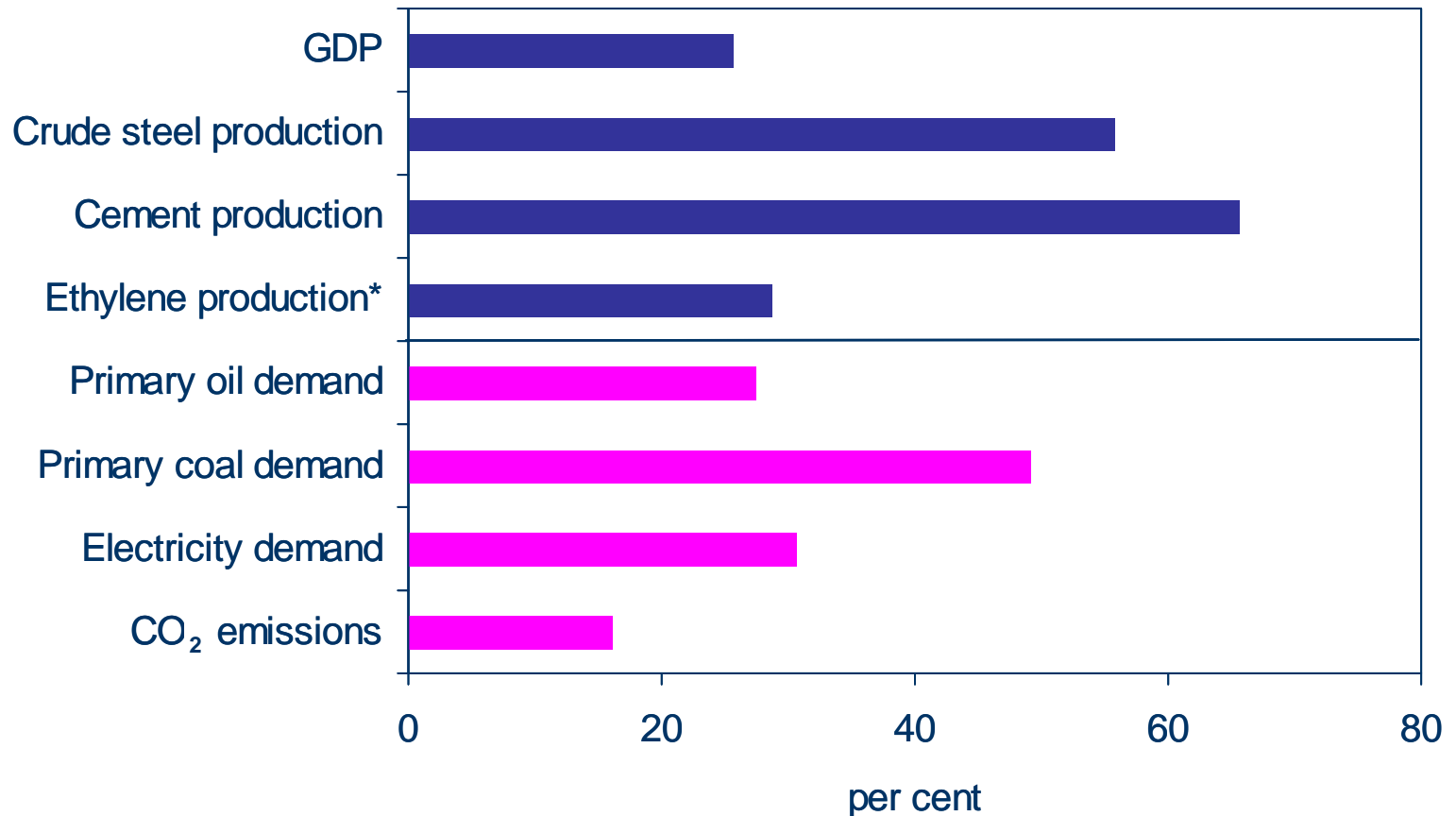
Asian Energy Trends: Reference Scenario



INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

China's share of Incremental World Production and Energy Demand, 1998-2003



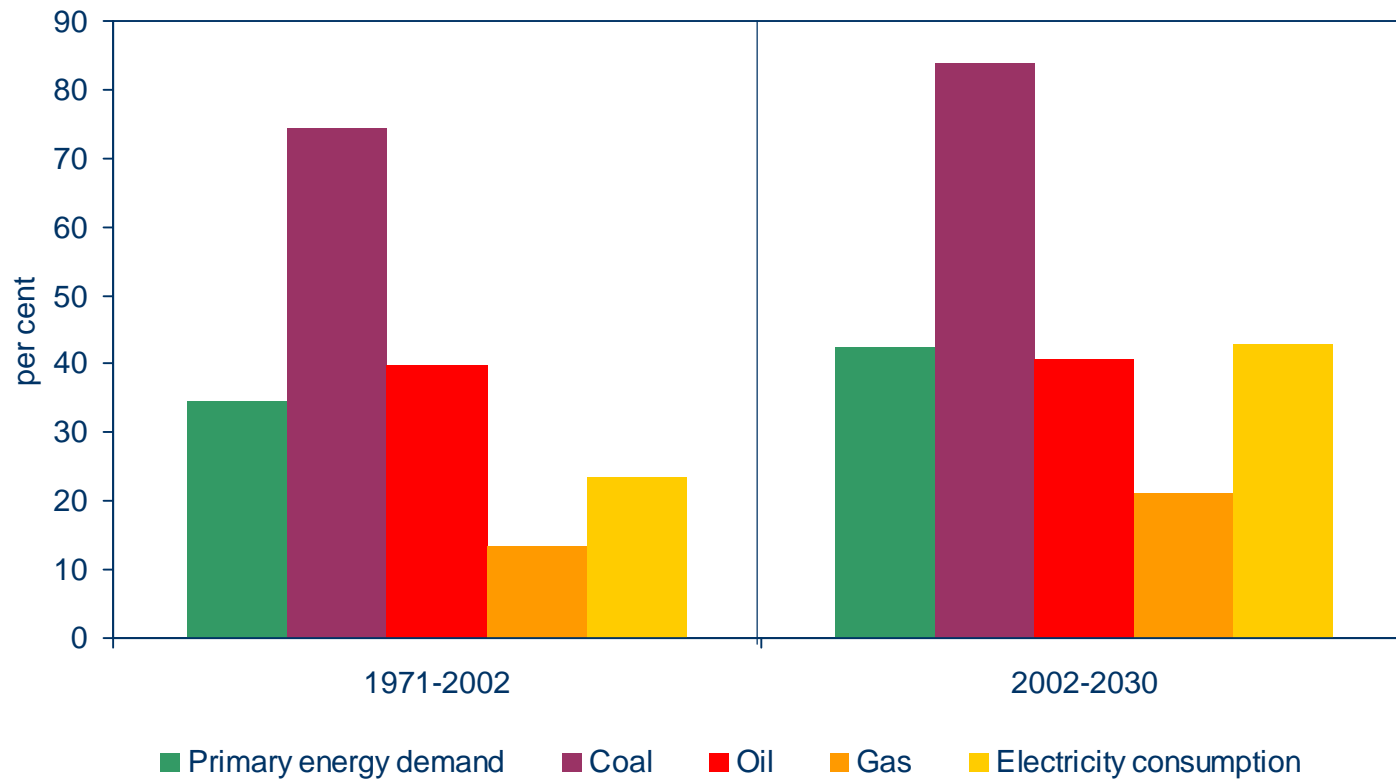
Booming industrial production in China is driving up energy demand and emissions - and energy prices



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Share of Developing Asia in World Incremental Energy Demand



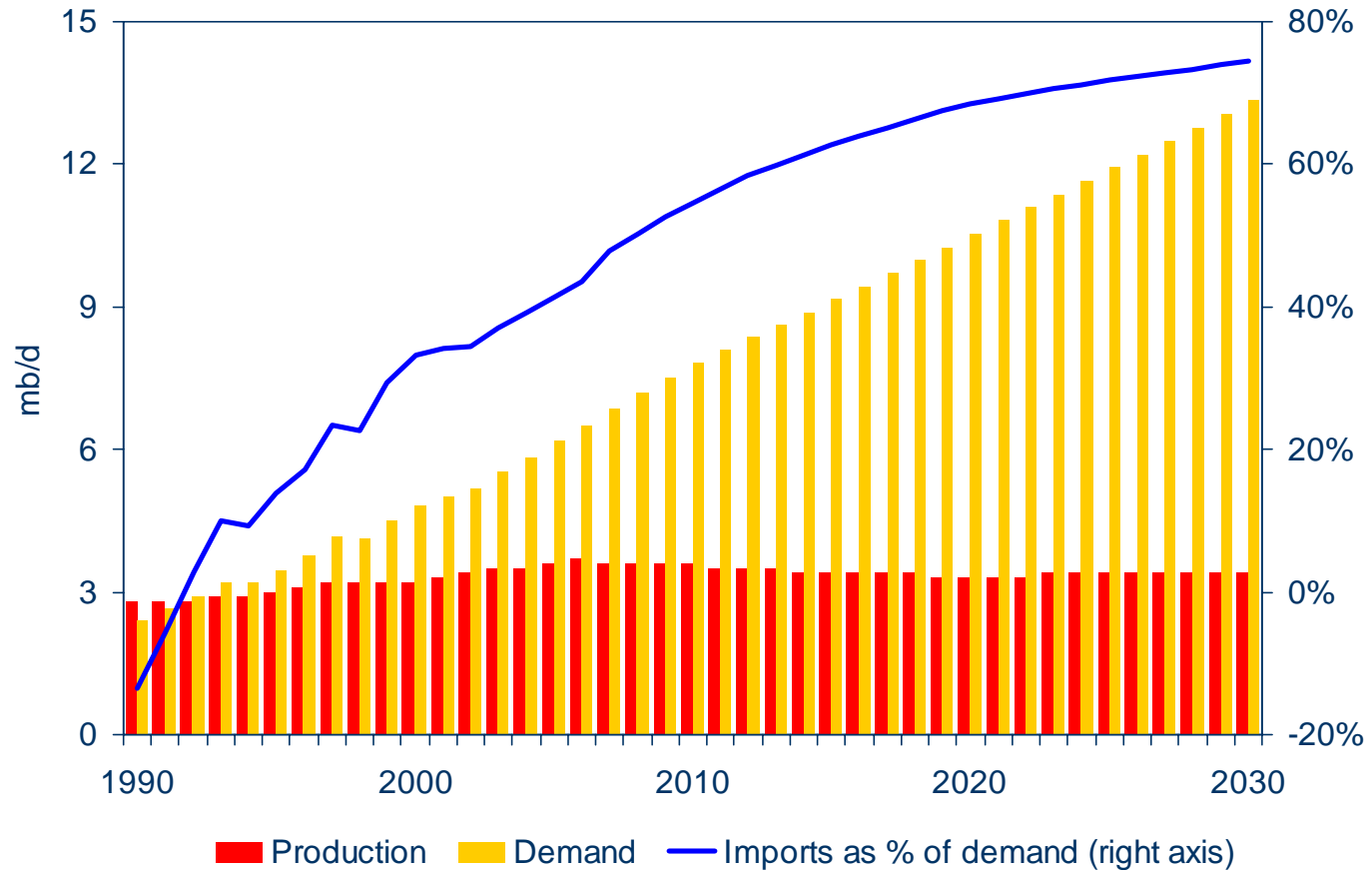
Developing Asia will account for 42% of the increase in demand through 2030, compared with 34% in the last three decades



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

China Oil Supply Balance



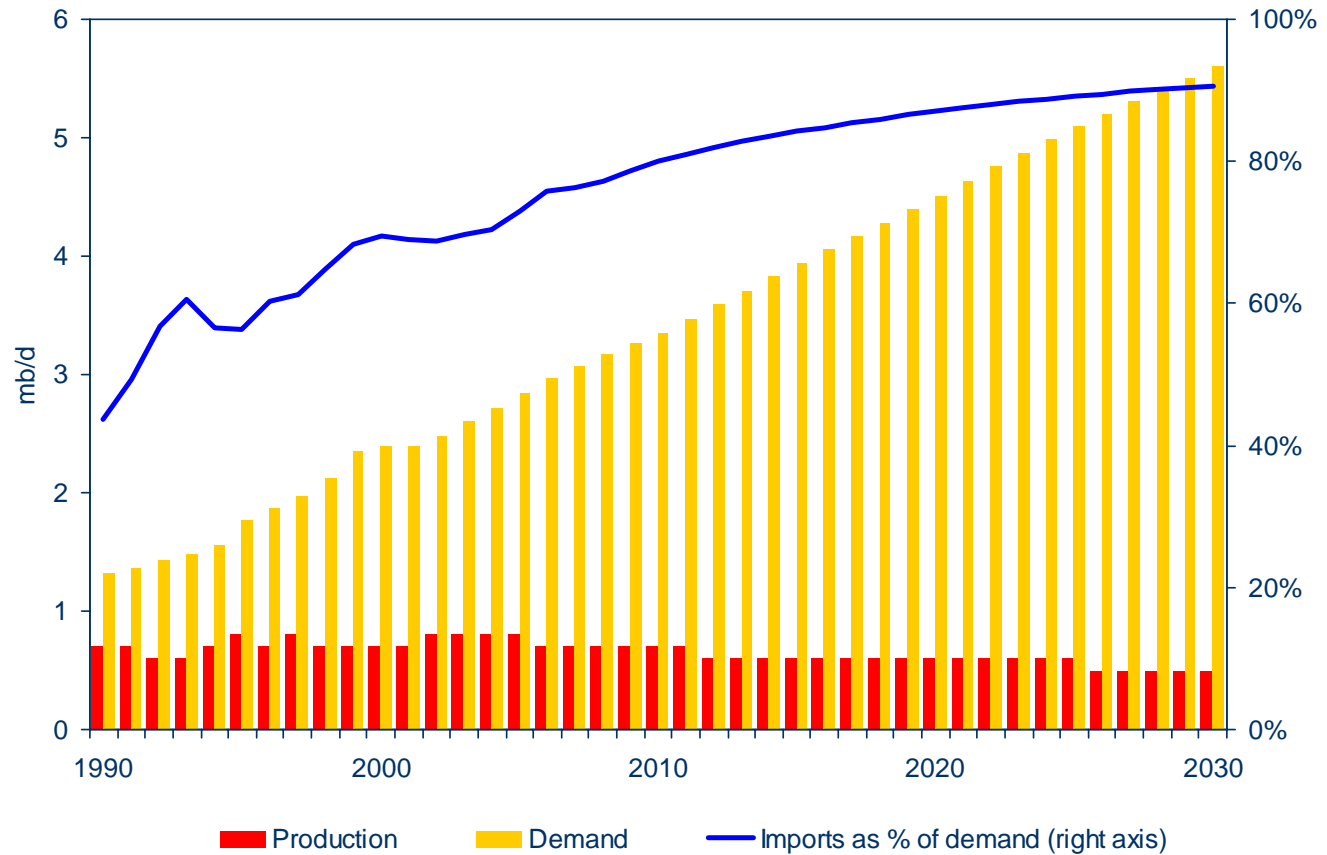
China's oil imports will soar from around 2 mb/d now to almost 10 mb/d in 2030 – equal to over 74% of domestic demand



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

India Oil Supply Balance



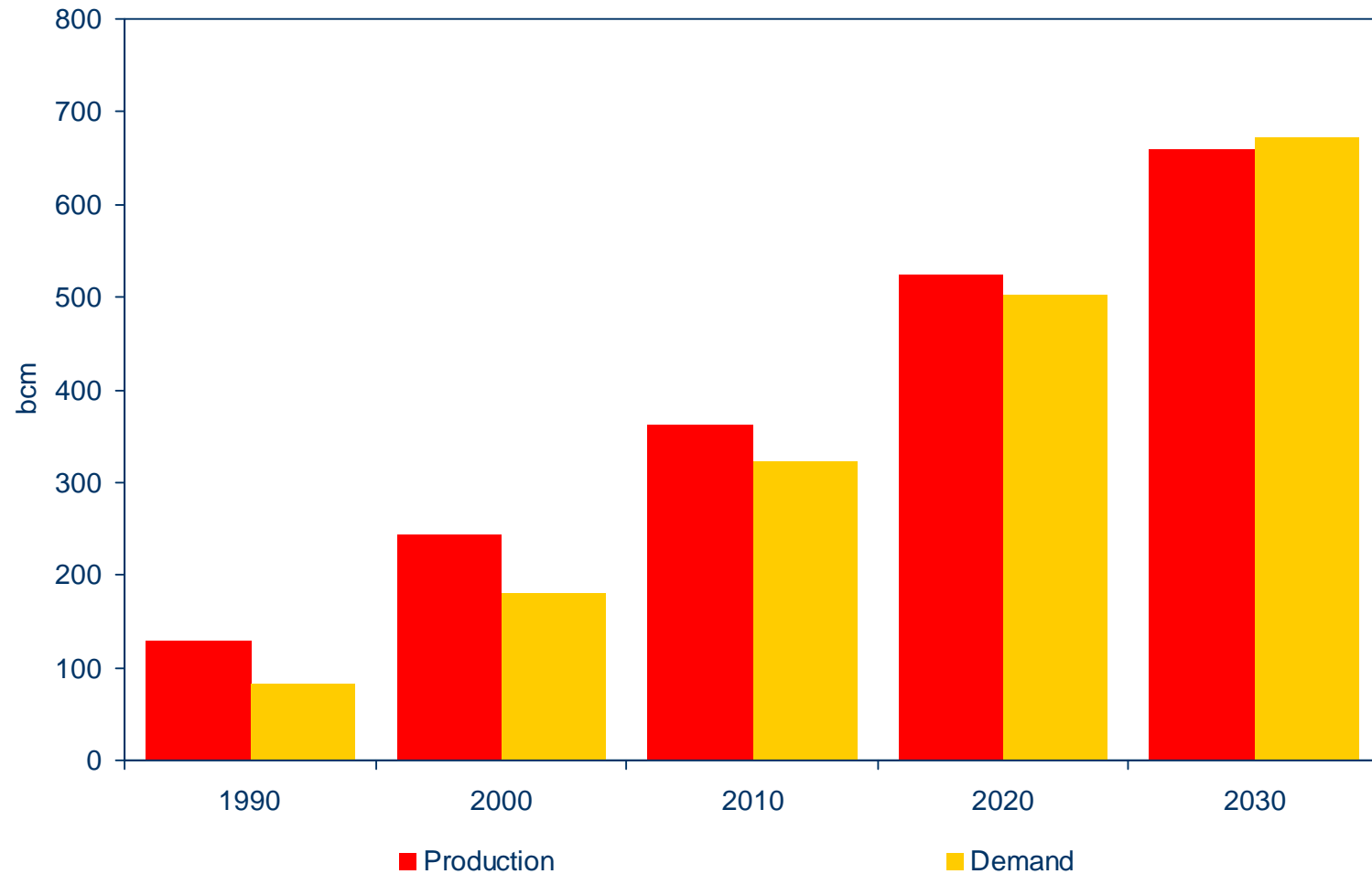
India's import dependence will increase from around 70% today to more than 90% in 2030



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Developing Asia Gas Supply Balance



Developing Asia's gas demand will grow faster than production – the region becomes net importer in 2030

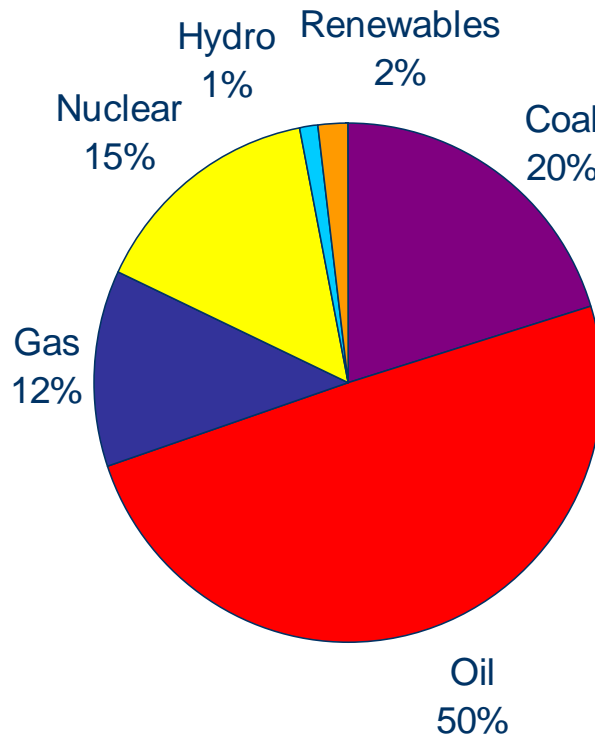


INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

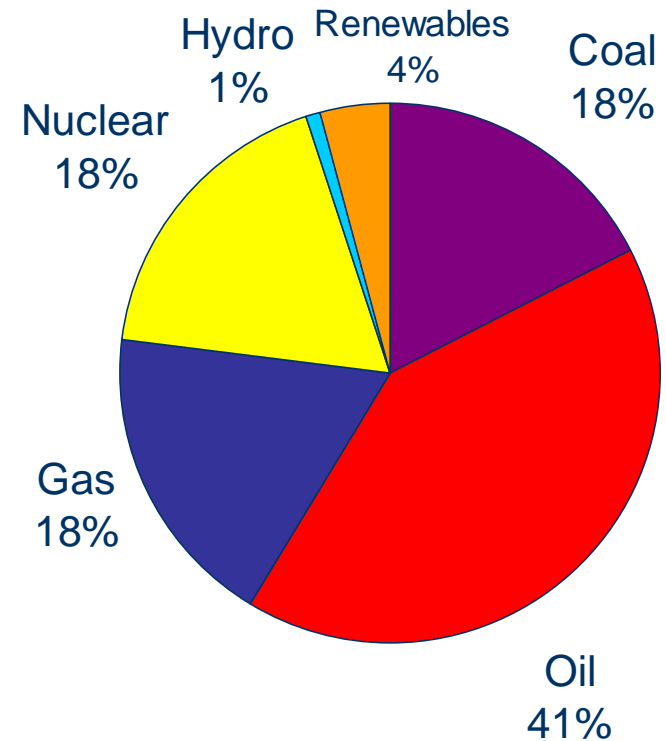
Primary Fuel Mix in Japan and Korea

2002



721 Mtoe

2030



956 Mtoe

Increased use of gas and nuclear for power generation reduces the share of oil and coal in the primary fuel mix



INTERNATIONAL
ENERGY AGENCY

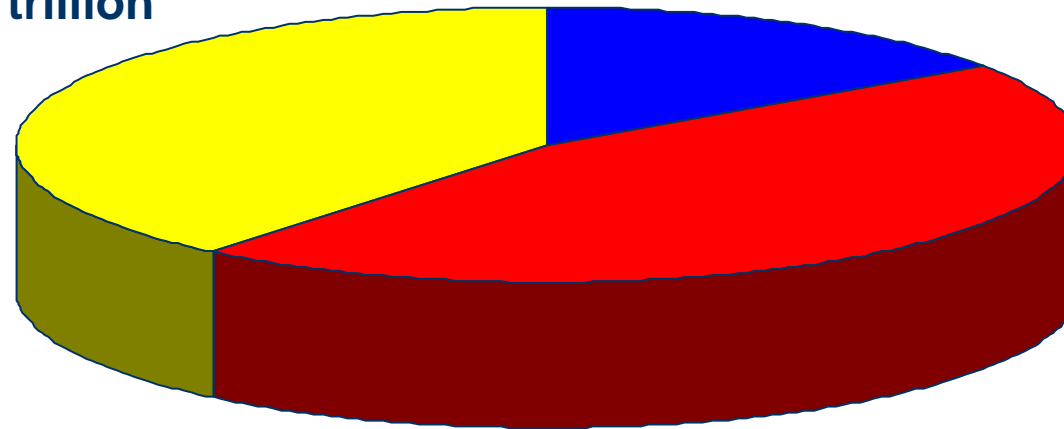
WORLD
ENERGY
OUTLOOK
2004

OECD Asia Pacific and Developing Asia Energy Investment, 2003-2030

Total \$5.3 trillion

Other Developing
Asia \$2.1 trillion

OECD Asia Pacific
\$0.8 trillion



China \$2.4 trillion

**Energy Investment needed in OECD Asia Pacific and
Developing Asia amounts to \$5.3 trillion**



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

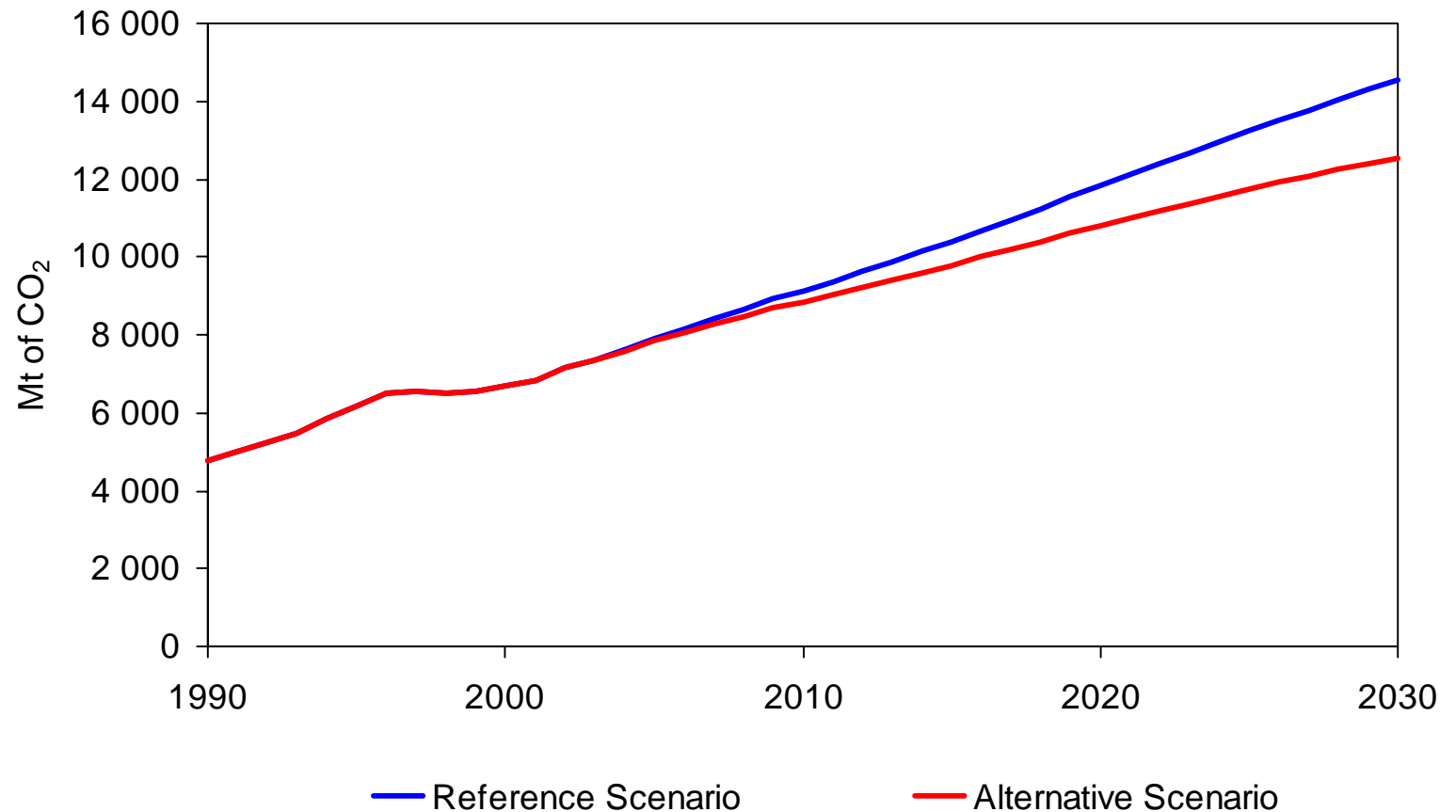
Asian Energy Trends: Alternative Policy Scenario



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Asia CO₂ Emissions in the Reference and Alternative Scenarios



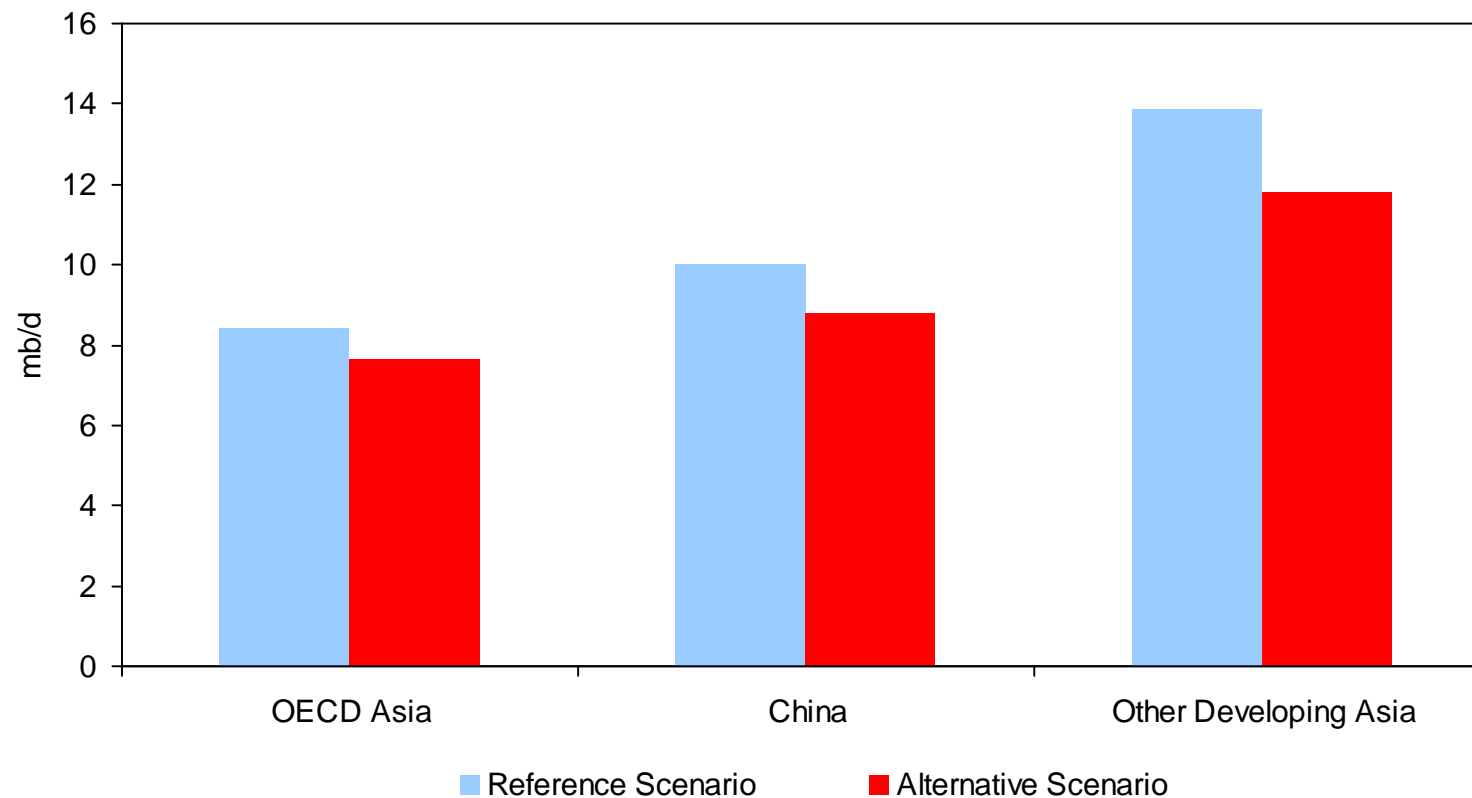
With new policies, Asia could curb its CO₂ emissions by 14% in 2030



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Net Oil Imports in the Alternative and Reference Scenarios, 2030



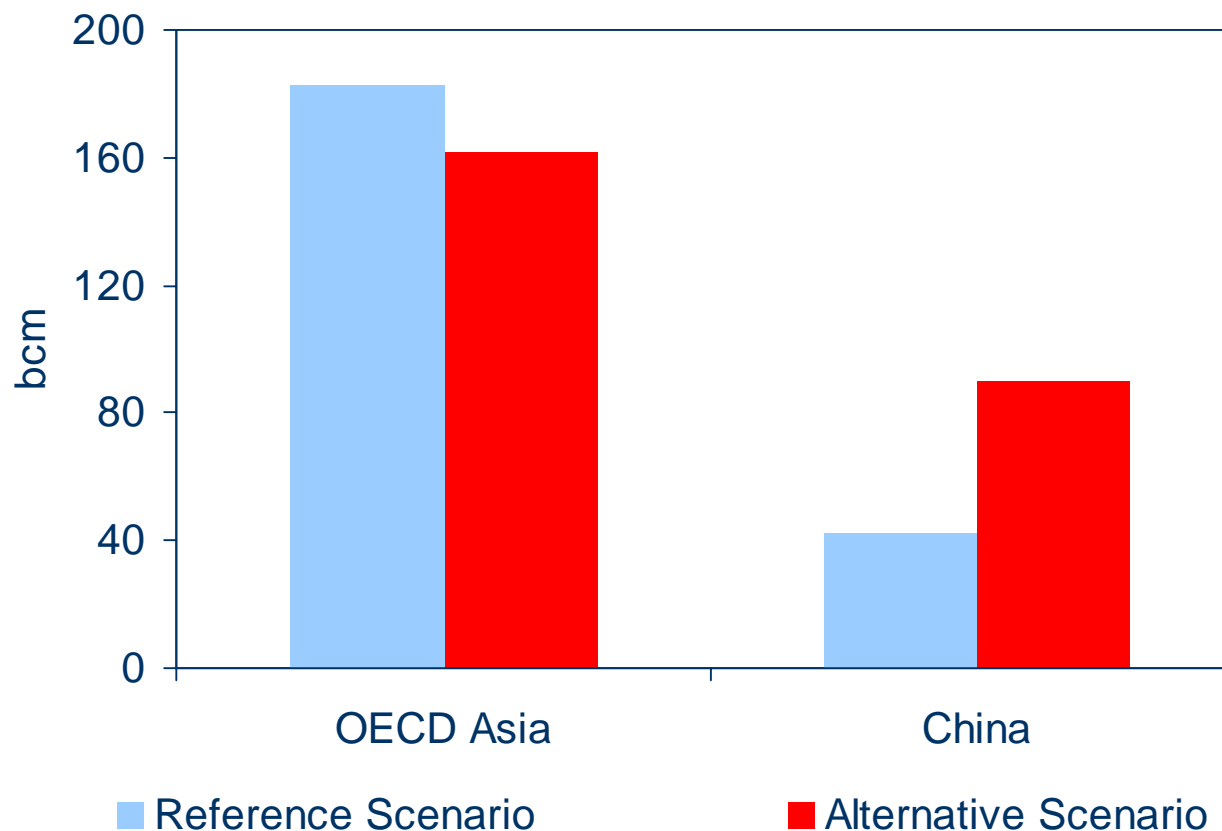
New policies reduce oil imports in each region, and the impact would be larger for China and Other Developing Asia



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Net Gas Imports in the Alternative and Reference Scenarios, 2030



New policies reduce gas imports in OECD Asia, but increase them in China – because of switching from coal



INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

Summary and Conclusions



INTERNATIONAL
ENERGY AGENCY

**WORLD
ENERGY
OUTLOOK
2004**

Summary and 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 and 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 and emissions significantly
- But a truly sustainable energy system will call for faster technology development and deployment
- Urgent and decisive government action is needed



INTERNATIONAL
ENERGY AGENCY

WORLD
ENERGY
OUTLOOK
2004

Summary and Conclusions (2)

- Asia's importance to world energy markets – and its share in CO₂ emissions - will continue to grow
 - Most of the region's incremental demand and emissions will come from developing Asia – notably China and India
 - Energy demand will grow much more slowly in Japan and Korea
- Net imports of oil and gas – and reliance on key chokepoints - will continue to grow
- Investment needed in OECD Asia Pacific and Developing Asia from 2003 to 2030 amounts to US\$5.3 trillion
- New policies would reverse the rising emissions trend in OECD Asia, but not in developing Asia