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World Energy Outlook 2004

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Executive Director
International Energy Agency

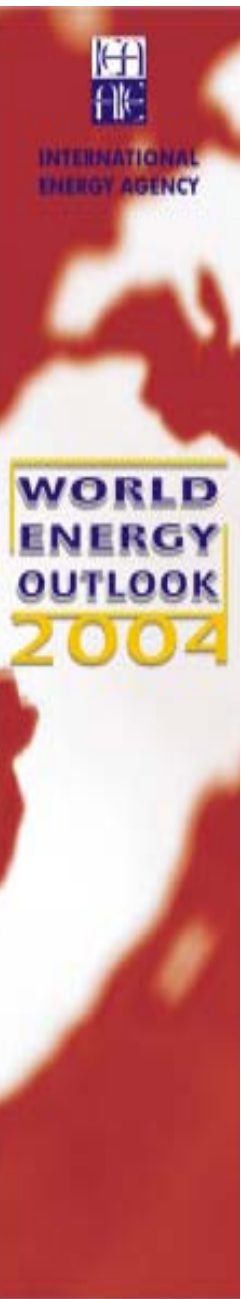
International Energy Symposium, IEEJ
Tokyo
16 November 2004



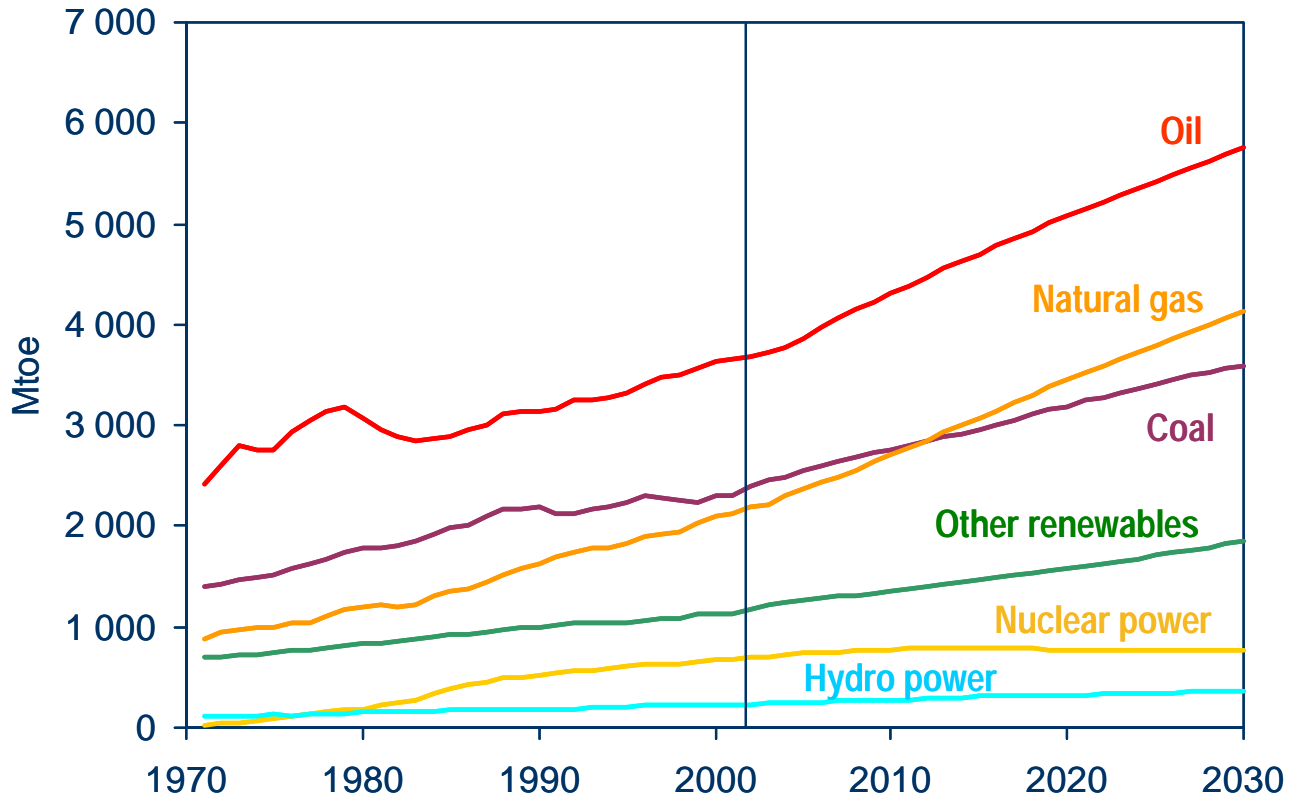
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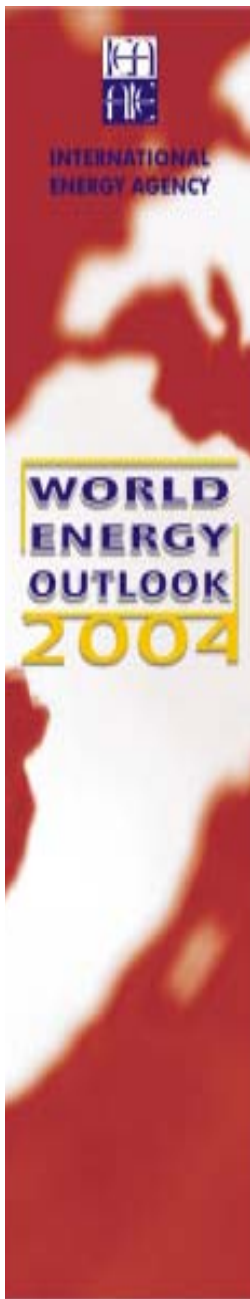
Global Energy Trends: Reference Scenario



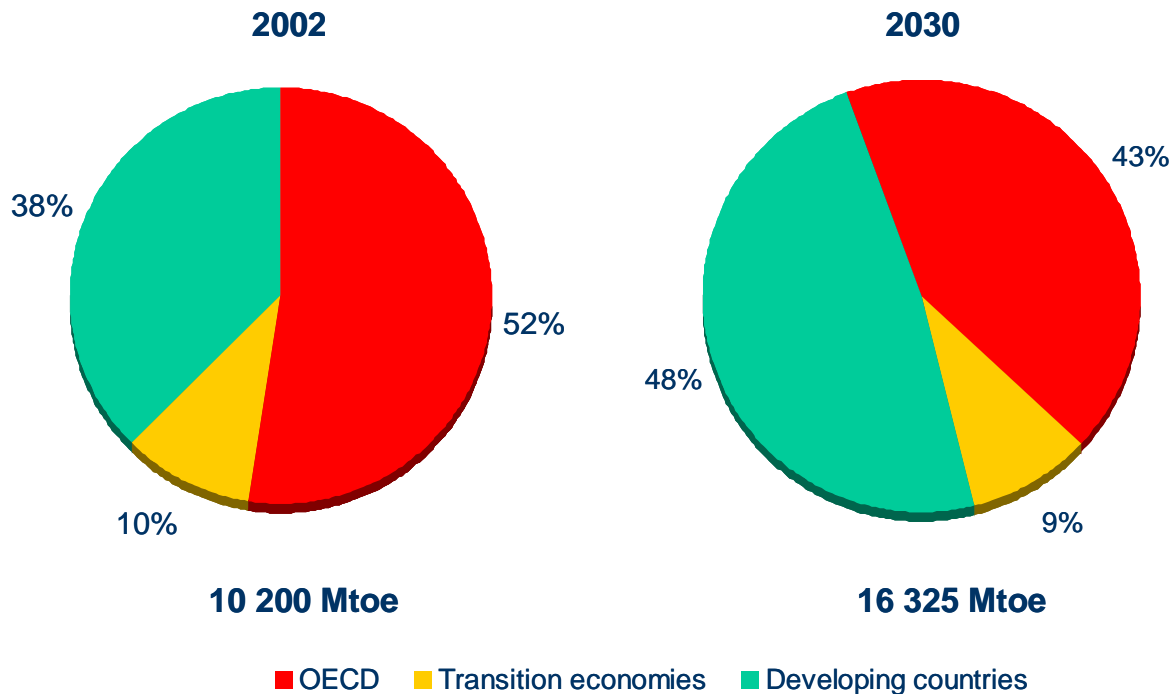
World Primary Energy Demand



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

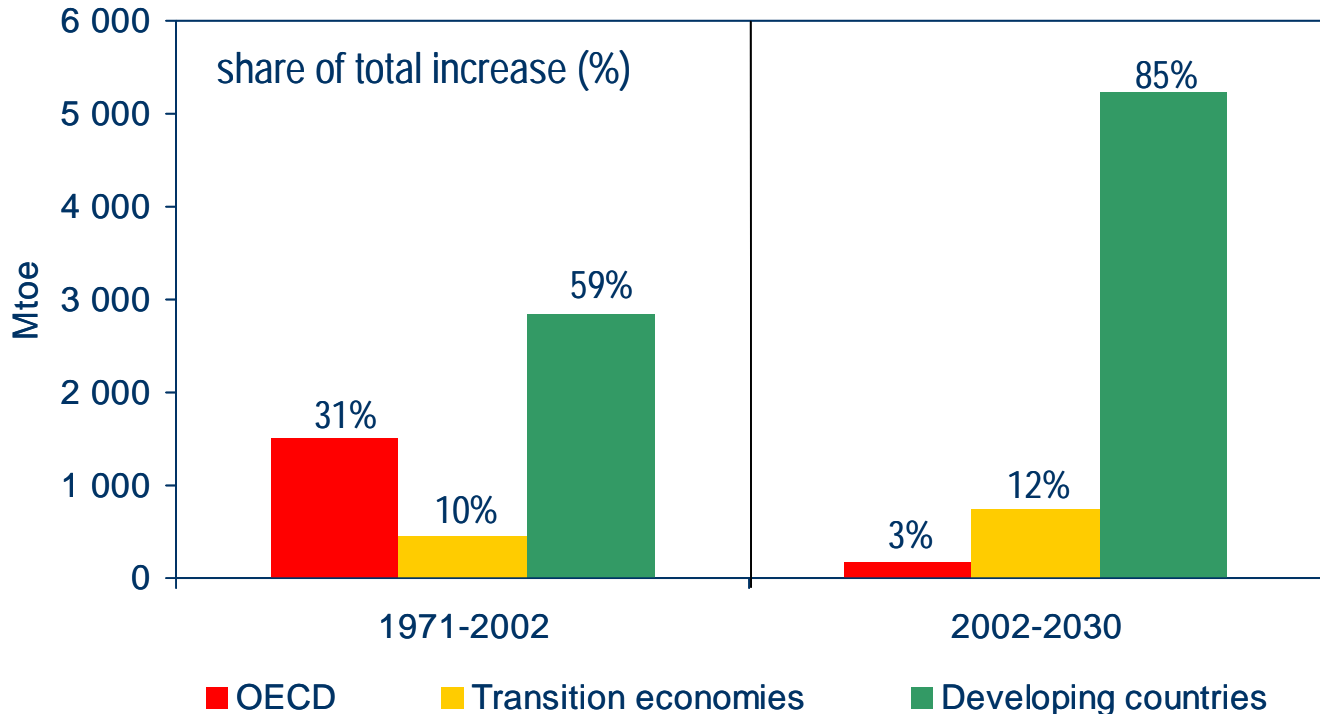


Regional Shares in World Primary Energy Demand

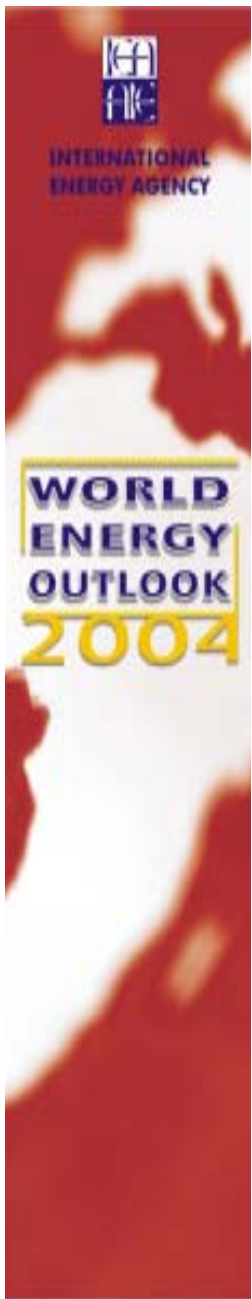


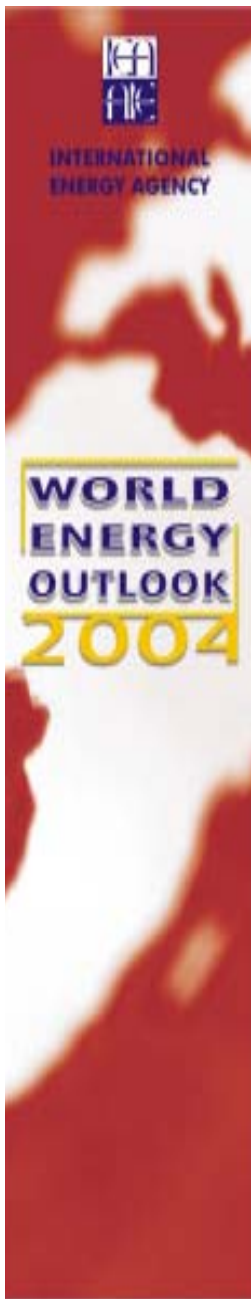
Two-thirds of the increase in world demand between 2002 and 2030 comes from developing countries, especially in Asia

Increase in World Primary Energy Production by Region

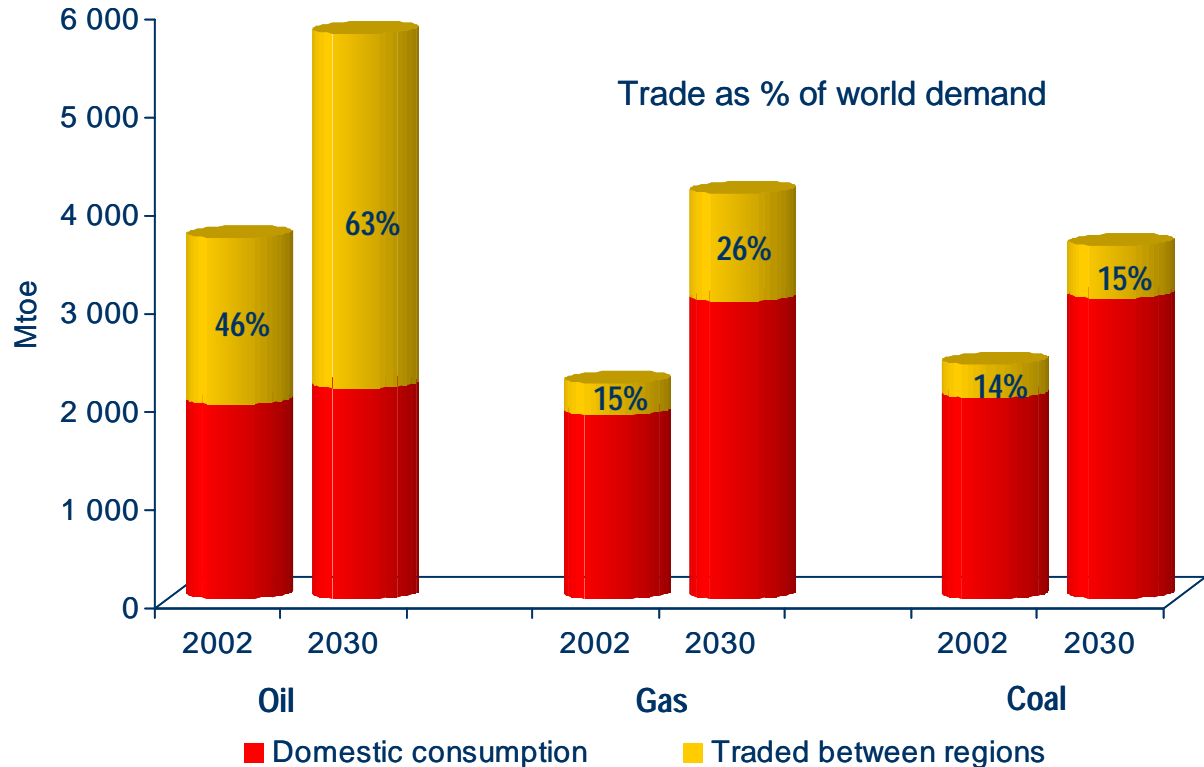


Almost all the increase in production to 2030 occurs outside the OECD, up from less than 70% in 1971-2002



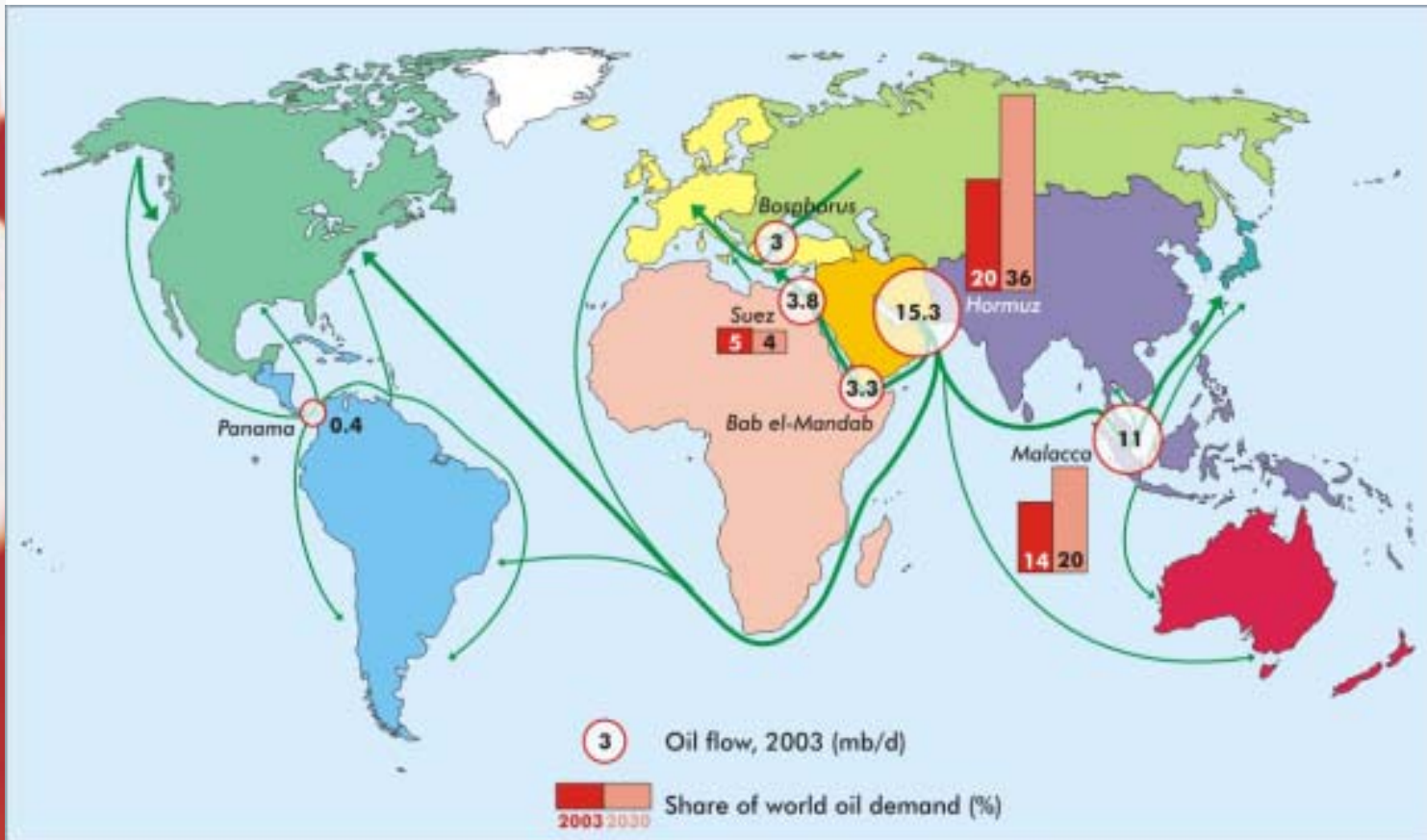
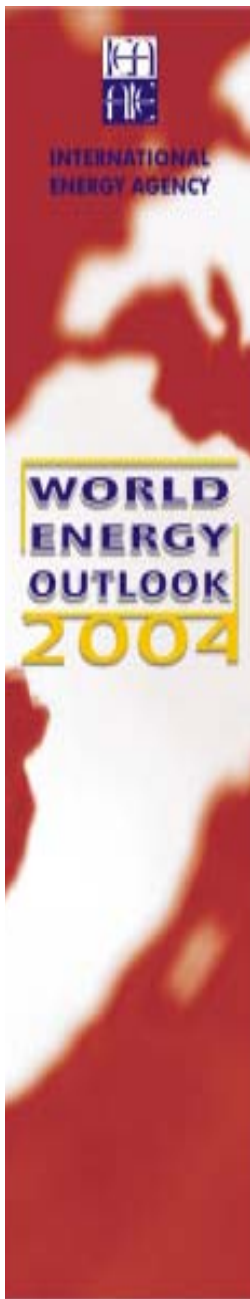


Inter-Regional Trade in World Fossil-Fuel Supply



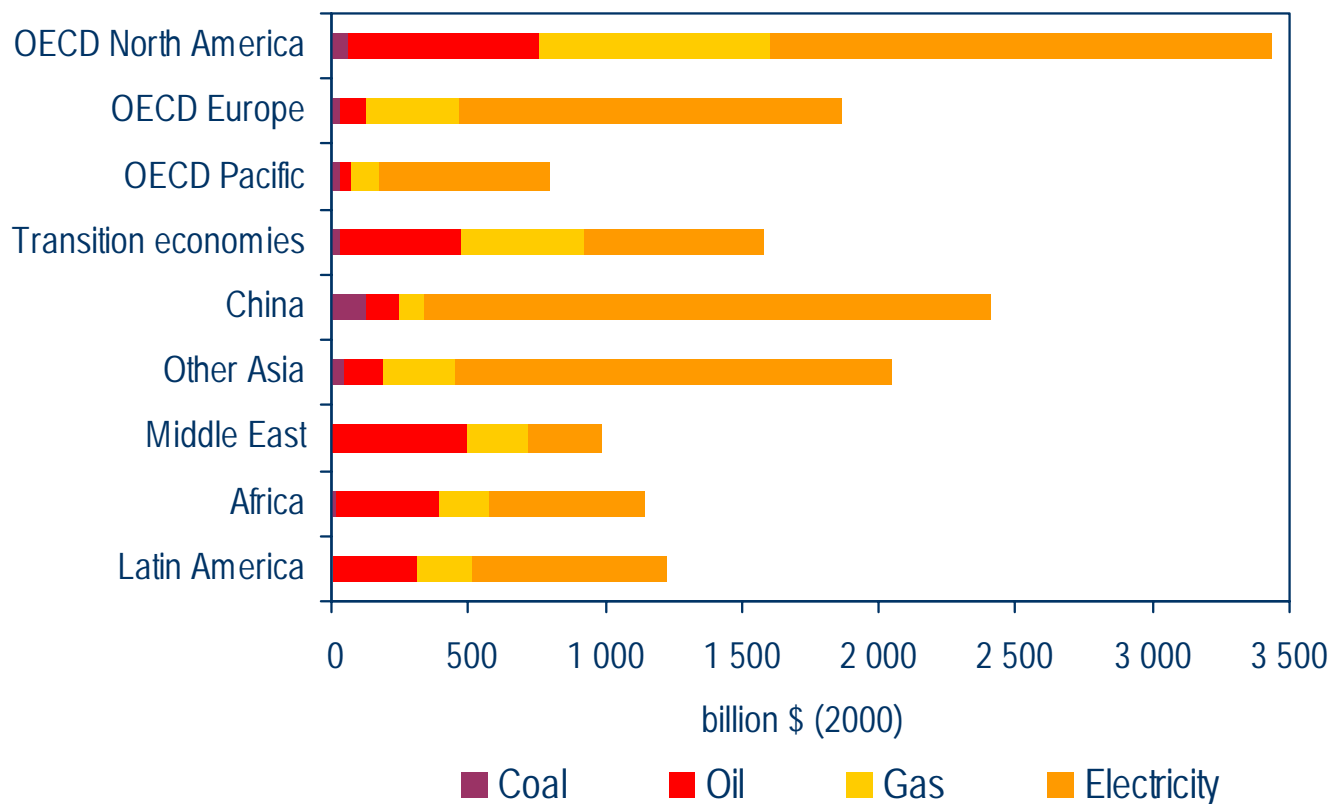
Energy trade between regions more than doubles by 2030, most of it still in the form of oil

Oil Flows & Major Chokepoints: The "Dire Straits"

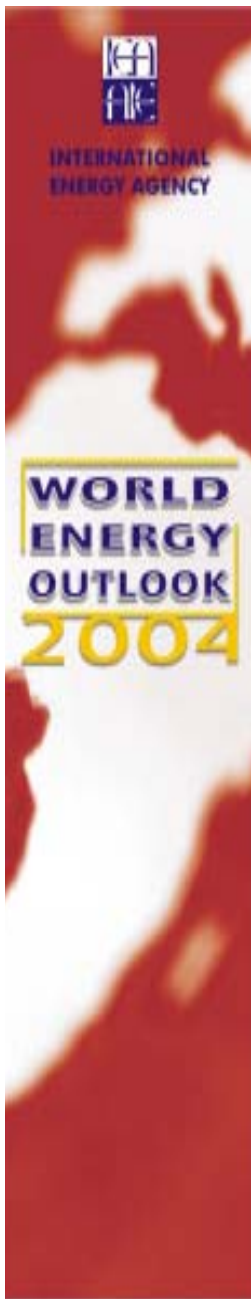


The risk of an oil-supply disruption will grow as trade & flows through key maritime & pipeline chokepoints expand

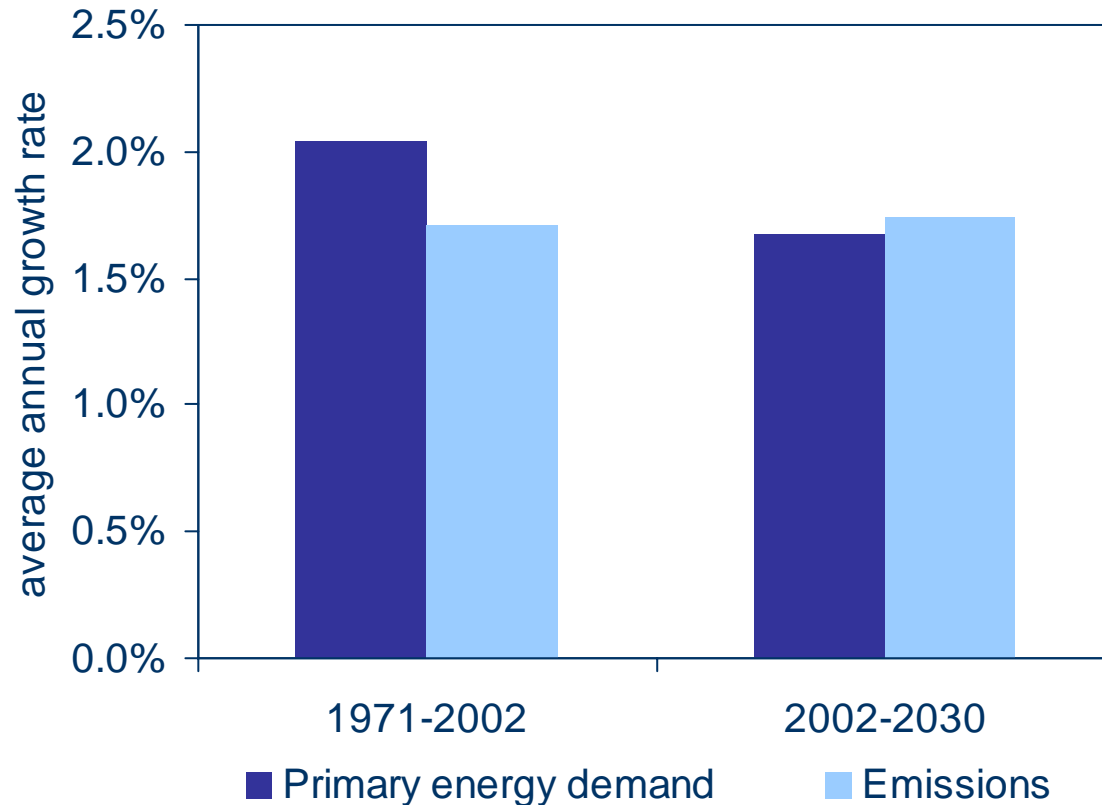
Cumulative Energy Investment, 2003-2030



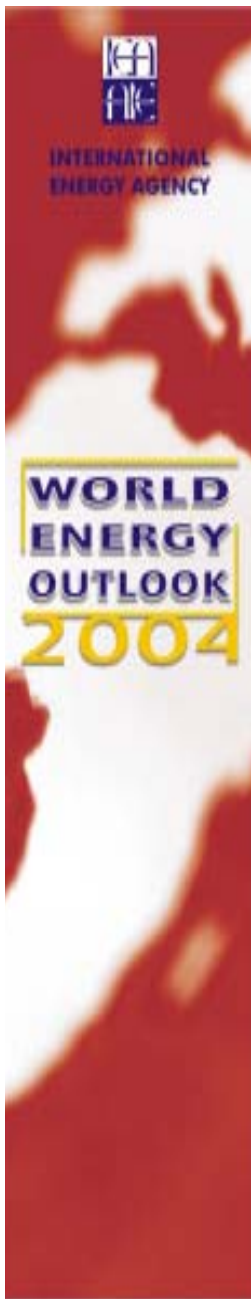
Power sector absorbs 62% of global energy investment in the period 2003-2030



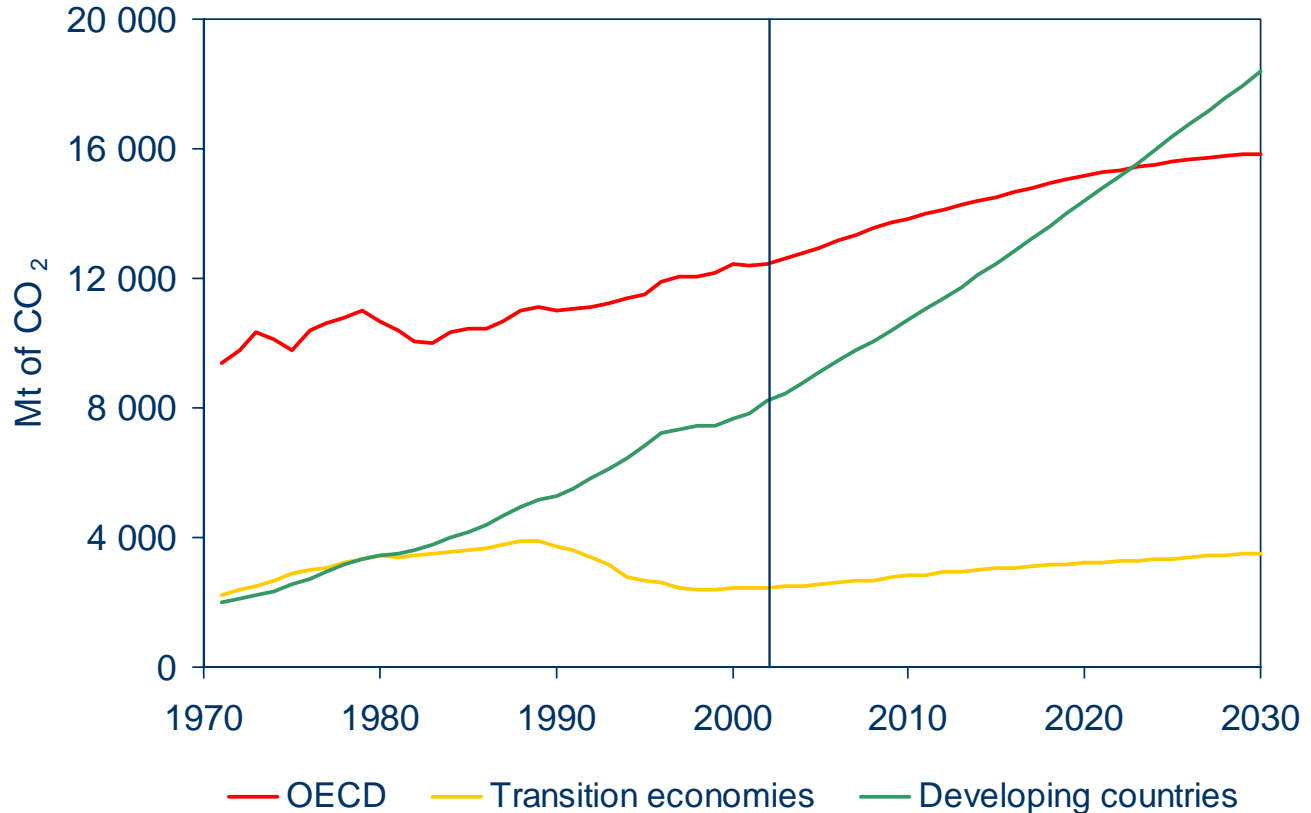
Growth in World Energy Demand & CO₂ Emissions



Average carbon content of primary energy increases slightly through 2030 – in contrast to past trends



CO₂ Emissions, 1971-2030



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

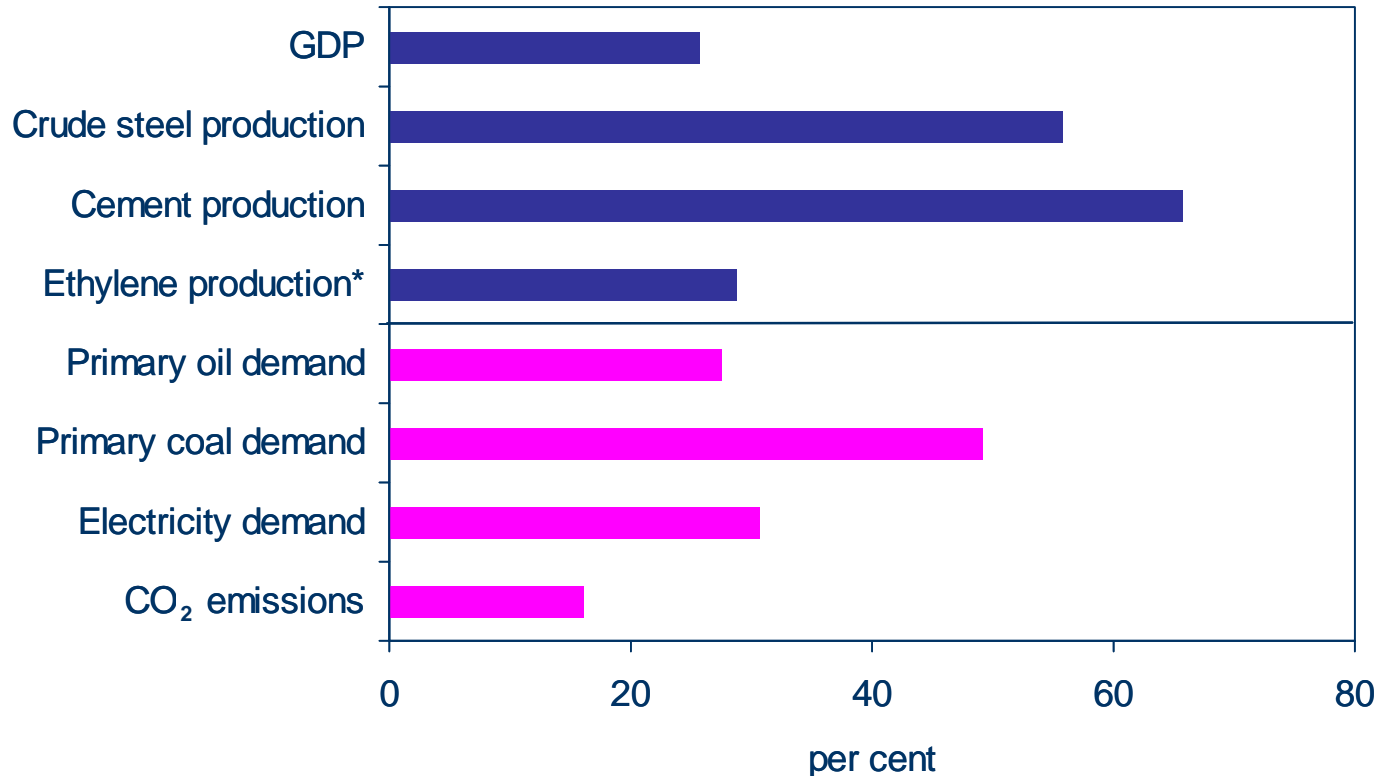


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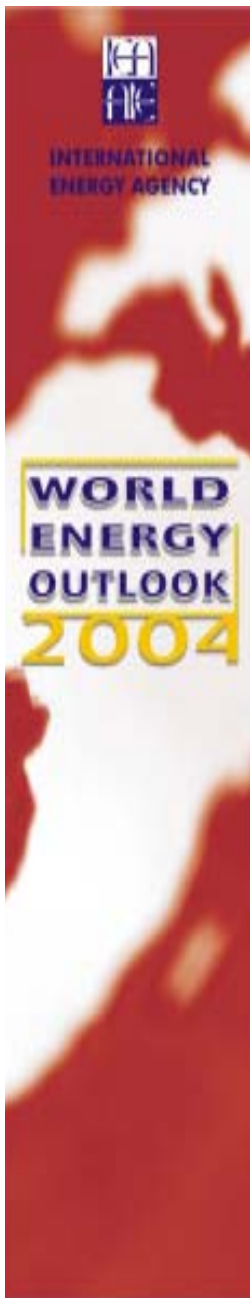
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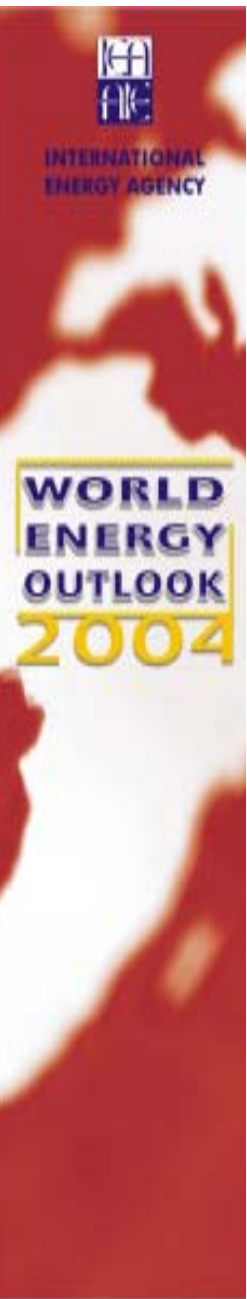
Asia-Pacific Energy Trends: Reference Scenario

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

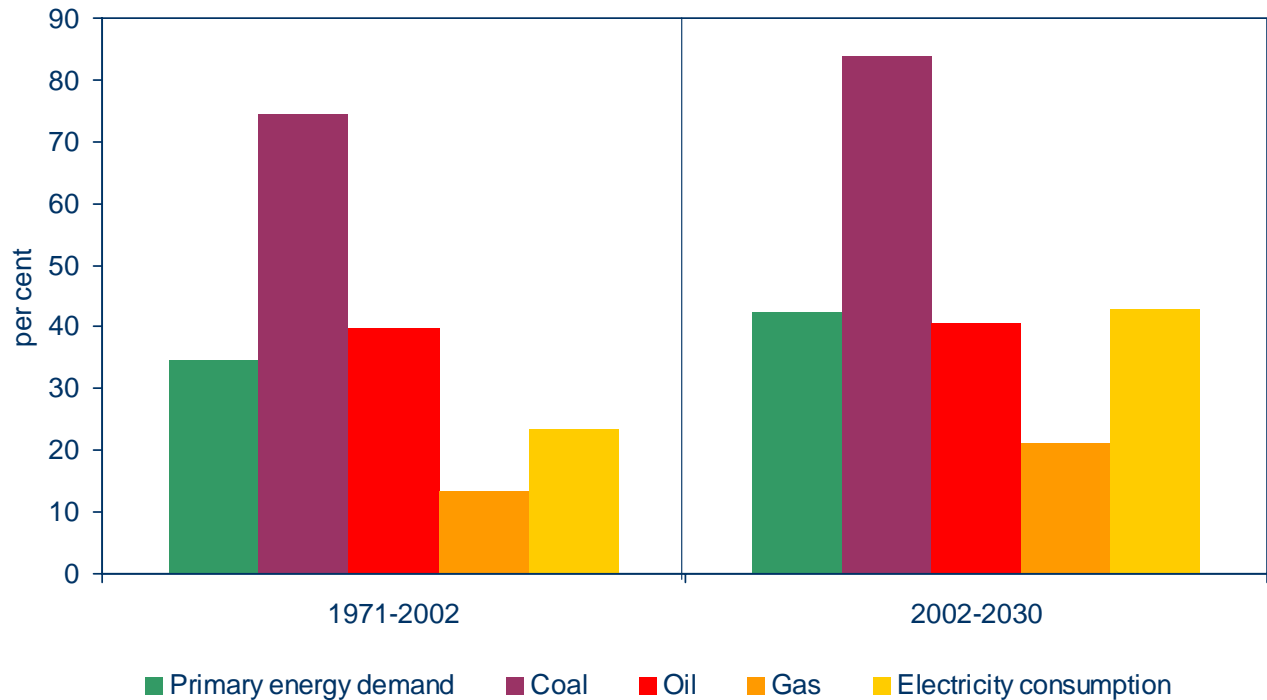


Booming industrial production in China is driving up energy demand & emissions - and energy prices

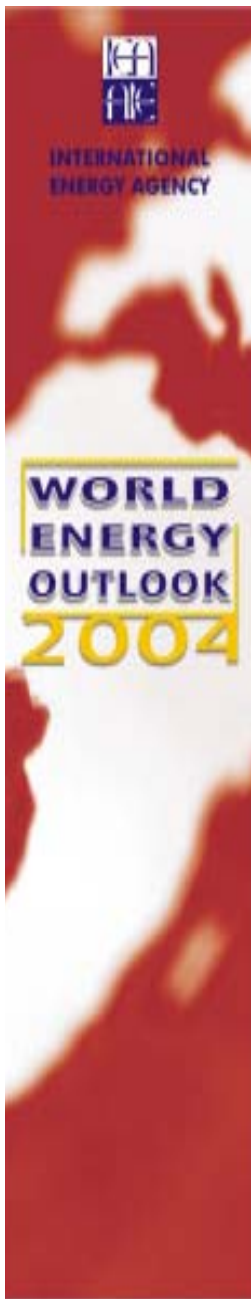




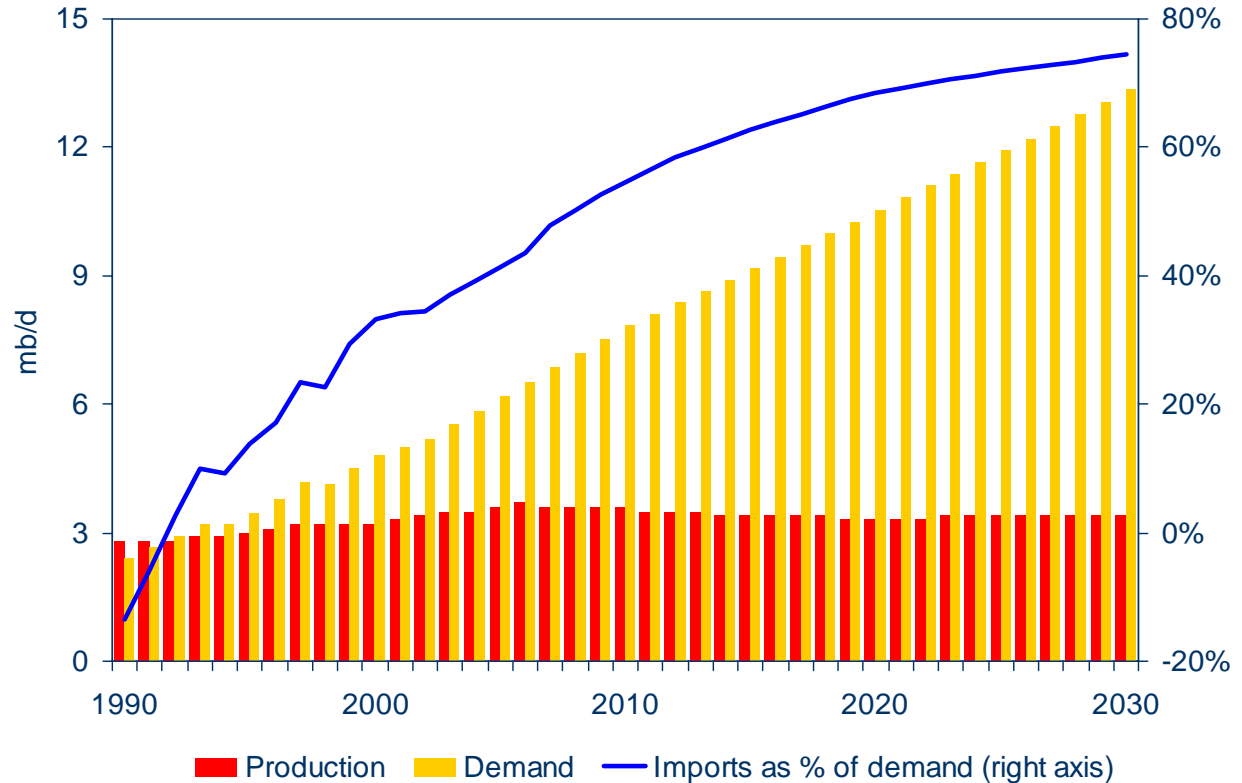
Share of Developing Asia in World Incremental Energy Demand



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



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



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OECD Asia Energy Trends: Reference Scenario

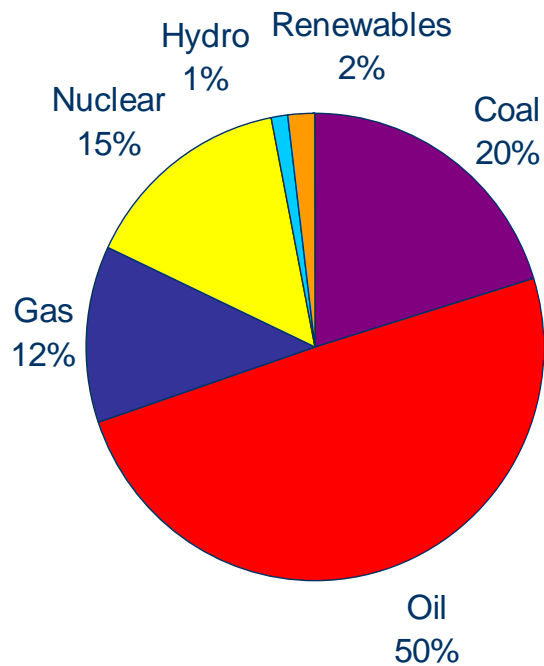


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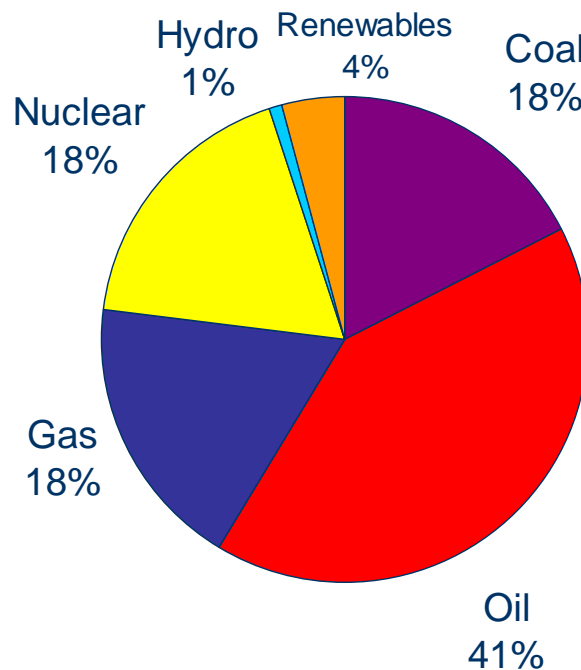
Primary Fuel Mix in Japan & Korea

2002



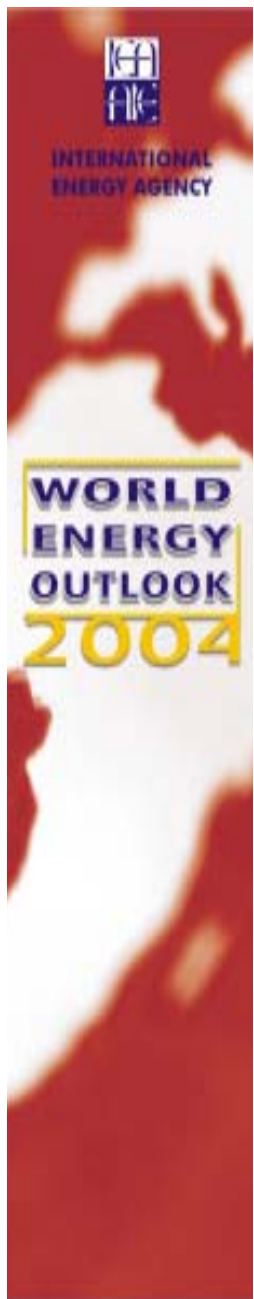
721 Mtoe

2030

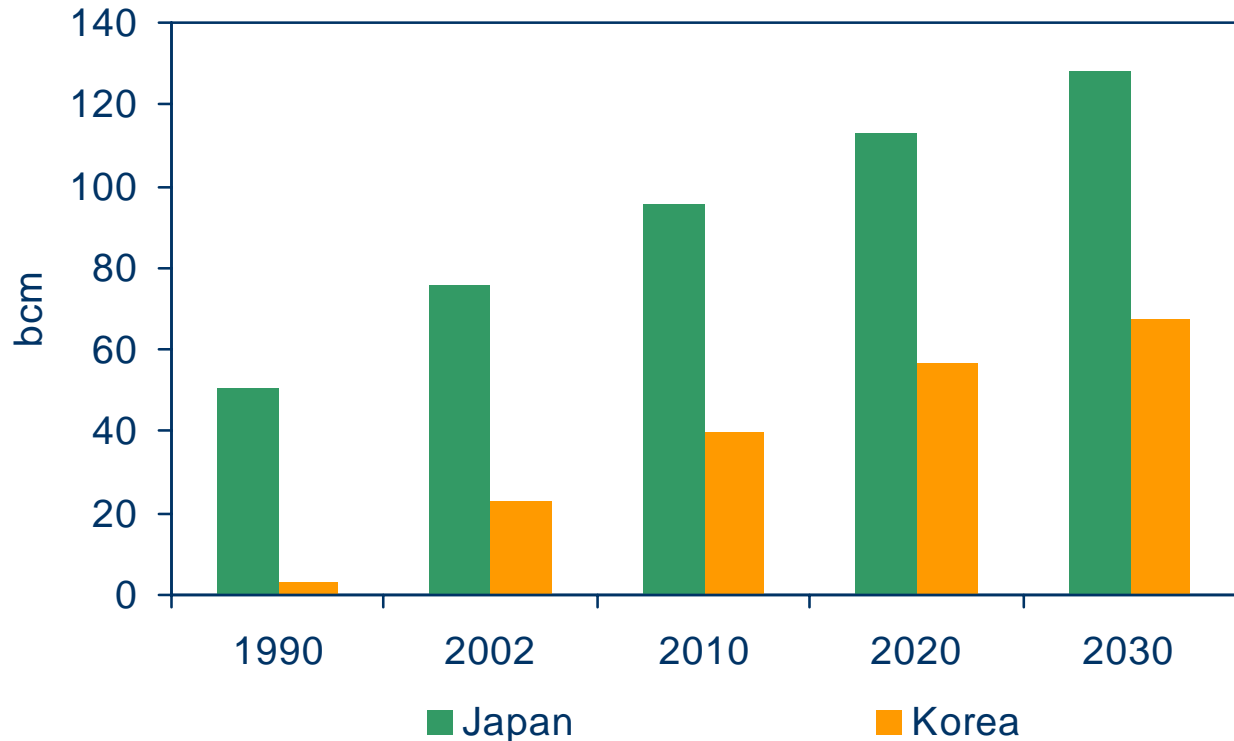


956 Mtoe

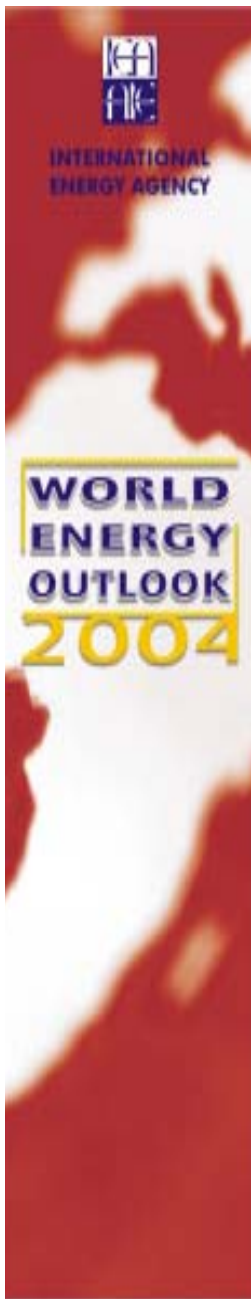
Increased use of gas & nuclear for power generation reduces the share of oil & coal in the primary fuel mix



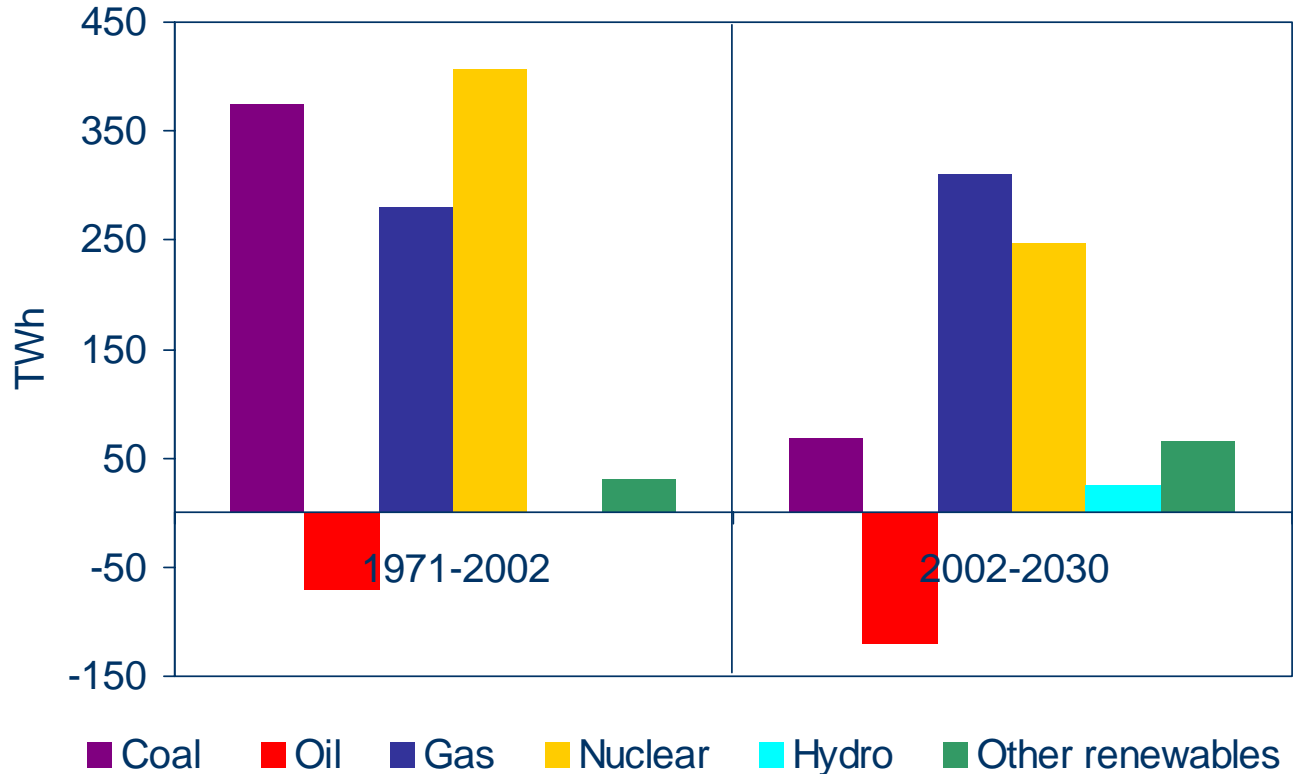
Primary Gas Demand in Japan & Korea



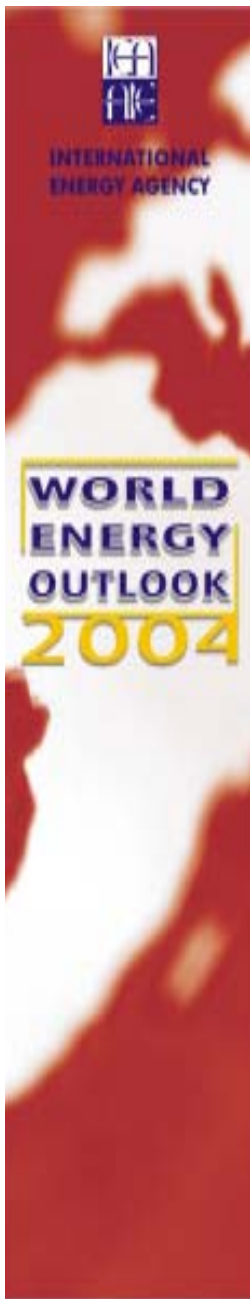
Power generation underpins surging gas use in both Japan & Korea



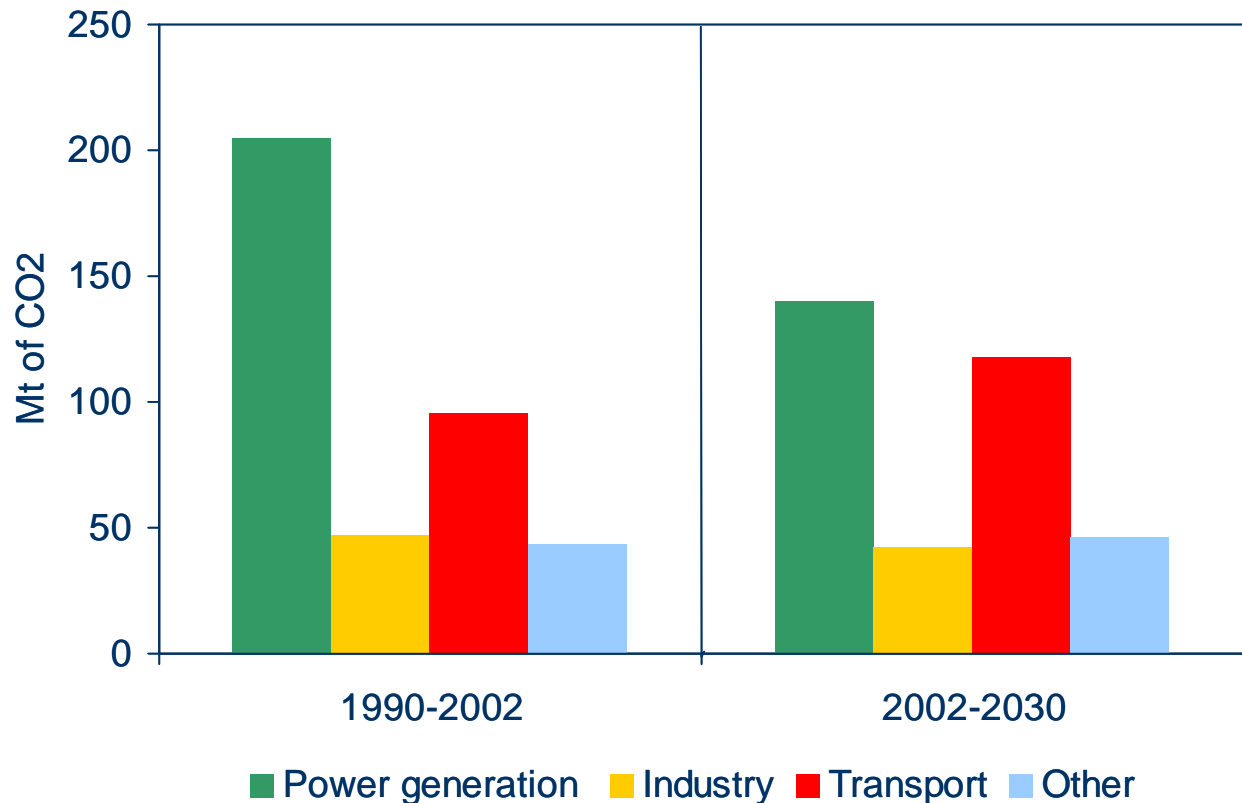
Change in Electricity Generation by Fuel in Japan & Korea



Most new power-generation capacity is gas-fired or nuclear



Increase in Energy-Related CO₂ Emissions by Sector in Japan & Korea



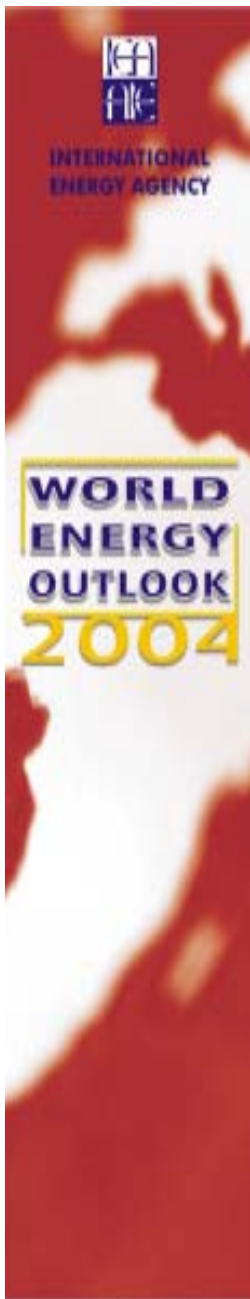
Most of the projected increase in emissions comes from power generation & transport in almost equal measure



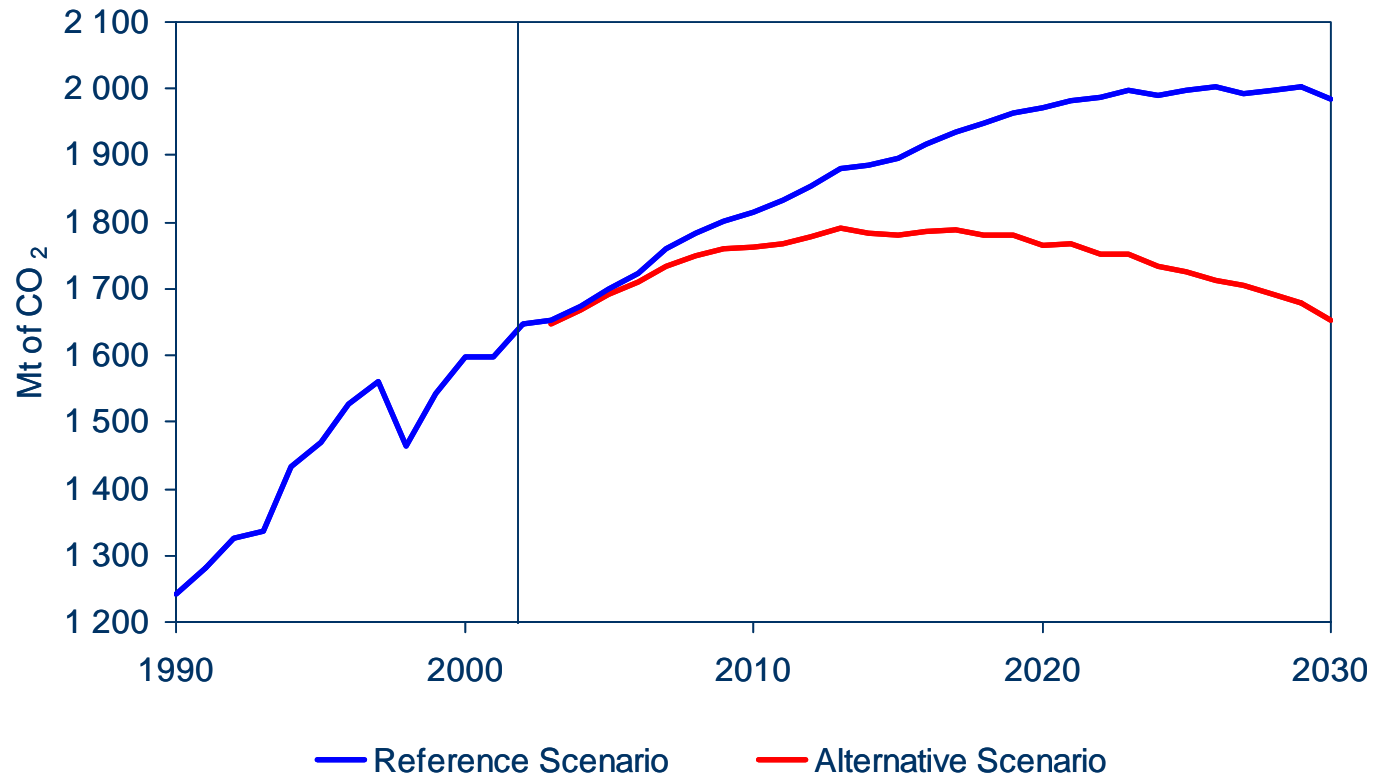
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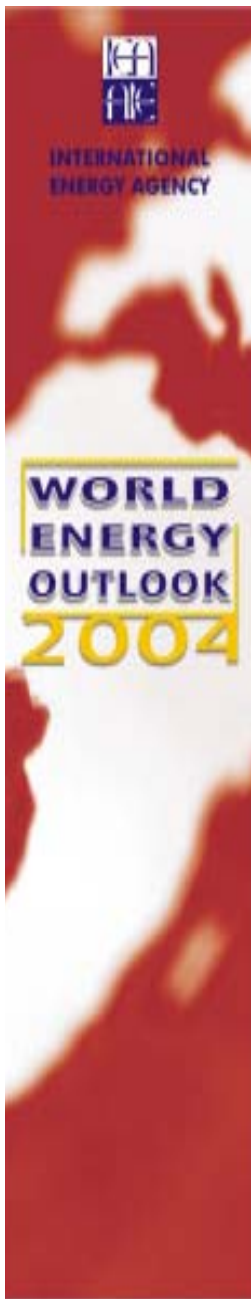
Asia-Pacific Energy Trends: Alternative Policy Scenario



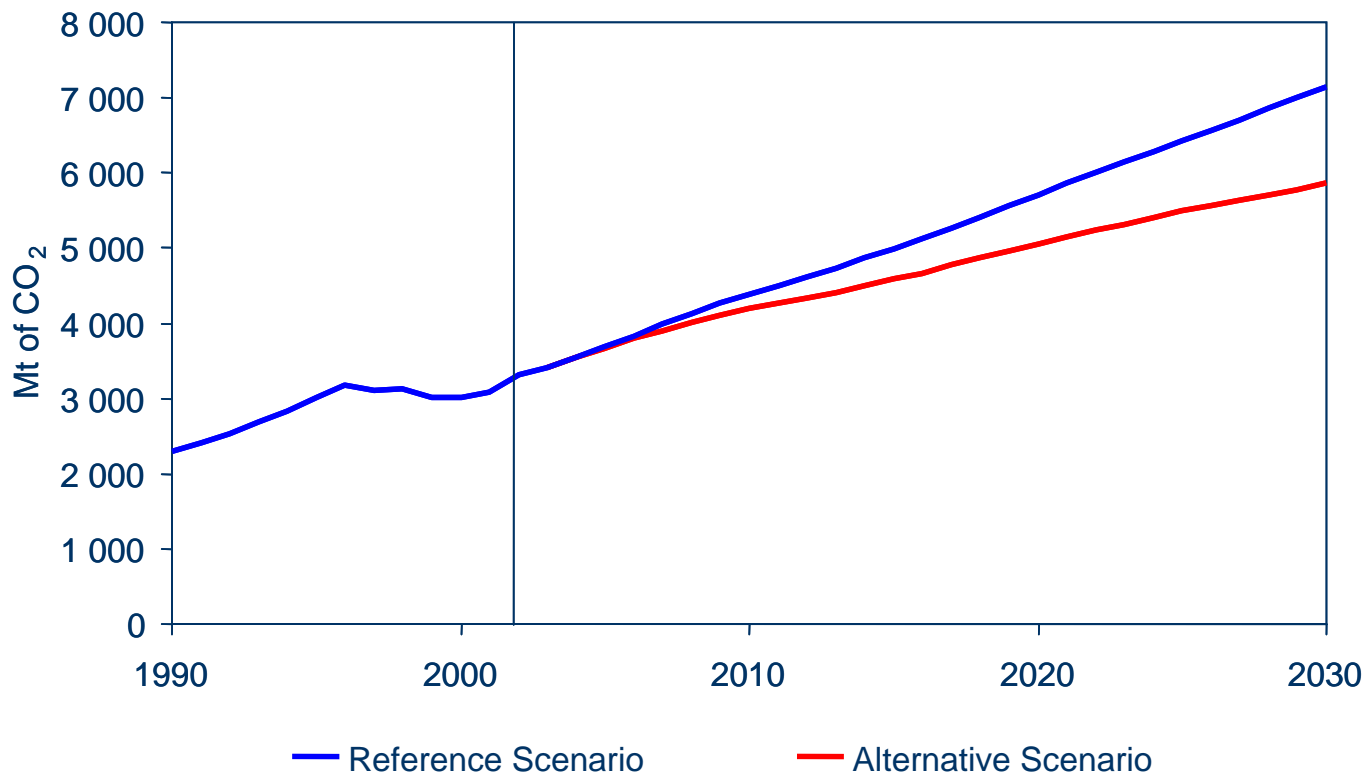
Japan & Korea CO₂ Emissions in the Reference & Alternative Scenarios



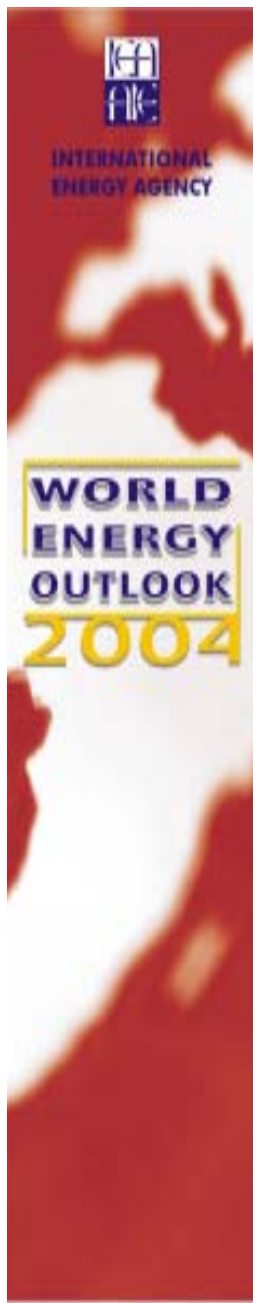
With new policies, Japan & Korea stabilise their emissions in the 2010s and drive them back down to 2002 levels by 2030



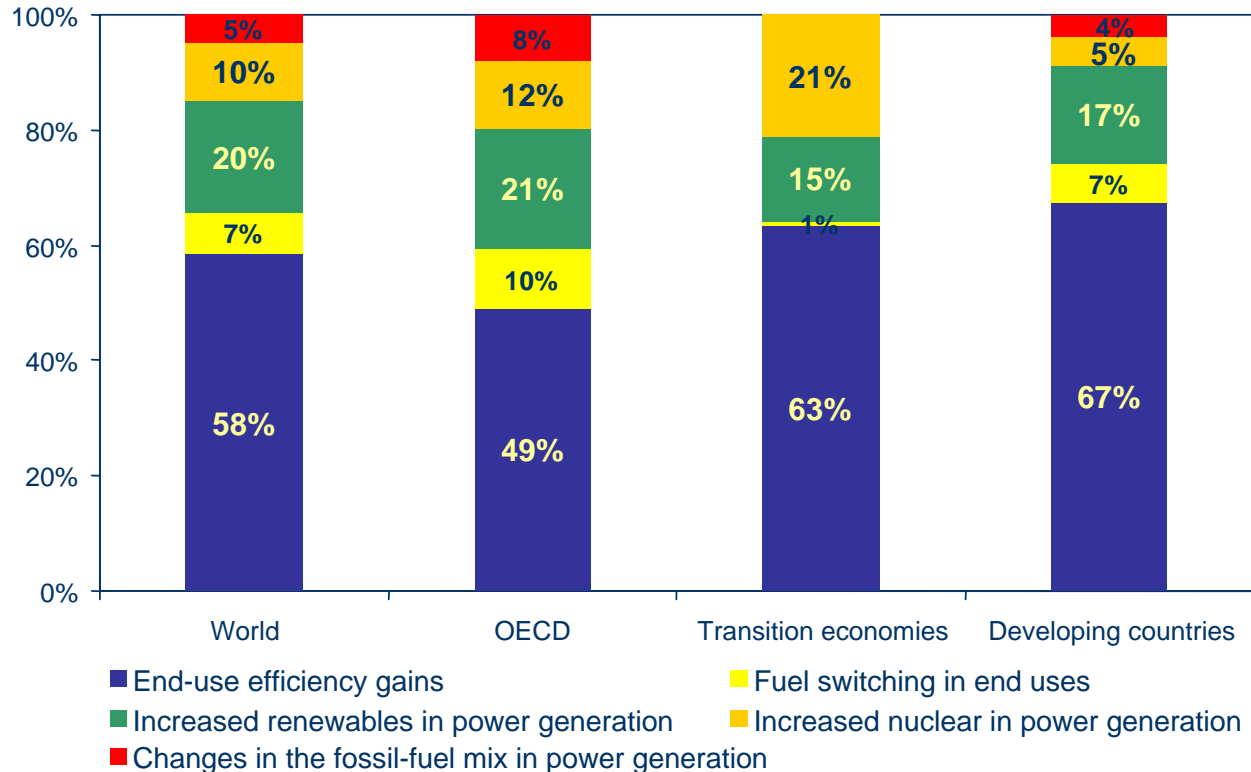
China CO₂ Emissions in the Reference & Alternative Scenarios



**With new policies, China could curb
its CO₂ emissions by 18% in 2030**



Contributory Factors in CO₂ Reduction Alternative vs Reference Scenario 2002-2030



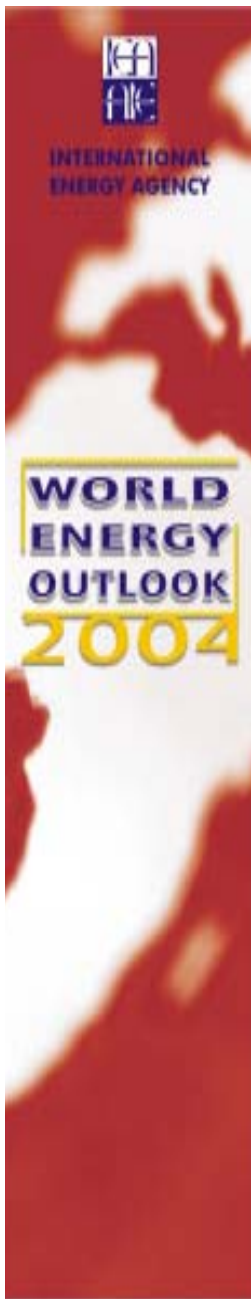
Improvements in end-use efficiency contribute for more than half of decrease in emissions, and renewables use for 20%



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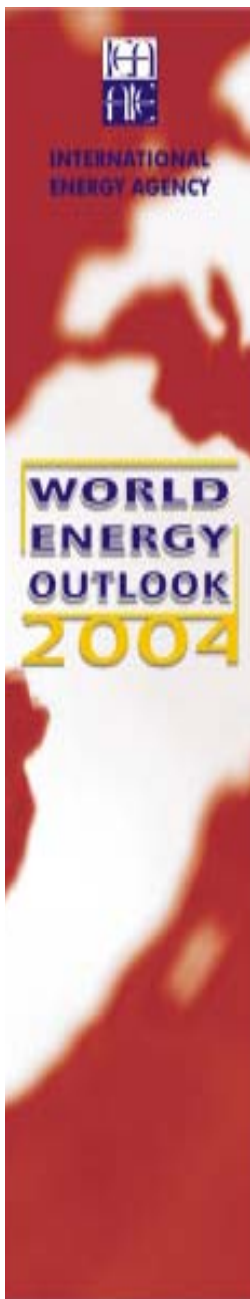
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Summary & Conclusions



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



Summary & 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 & emissions will come from developing Asia – notably China & India
 - Energy demand will grow much more slowly in Japan & Korea
- Net imports of oil & gas – and reliance on key chokepoints - will continue to grow
- New policies would reverse the rising emissions trend in OECD Asia, but not in developing Asia