A stylized world map with a red-to-orange gradient background. The map features a white grid of latitude and longitude lines. Several dark grey arrows are overlaid on the map, pointing in various directions, suggesting global movement or trends. The text is centered over the map.

World Energy Outlook Energy and CO₂ Emissions Trends in the Transport Sector

***Laura Cozzi
International Energy Agency***

**Stern Review Team and Department for Transport
Seminar on Transport, 12 January 2006, London**



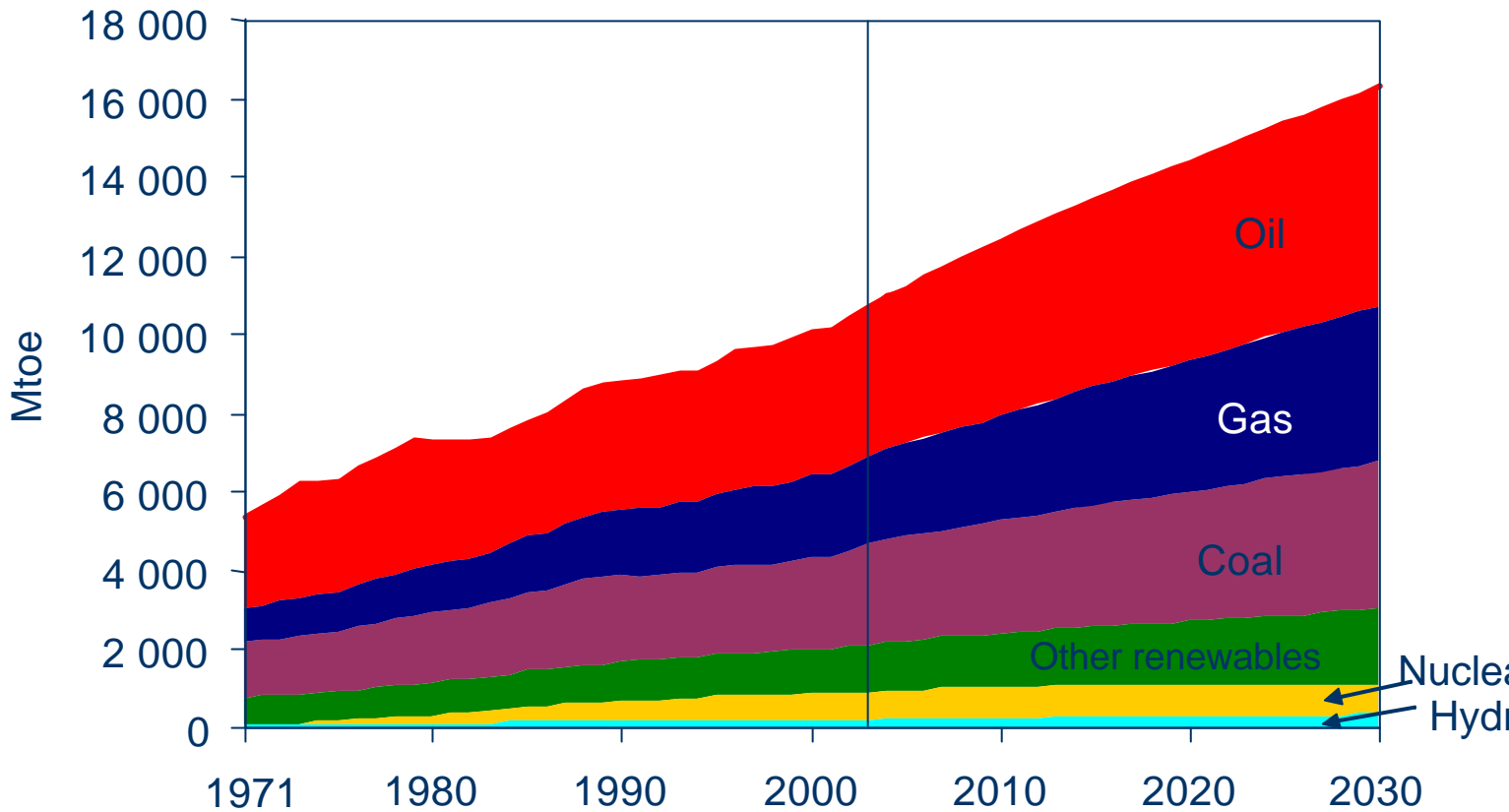
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Reference Scenario



World Primary Energy Demand



Oil, gas and coal together account for 83% of the growth in energy demand between now and 2030 in the Reference Scenario

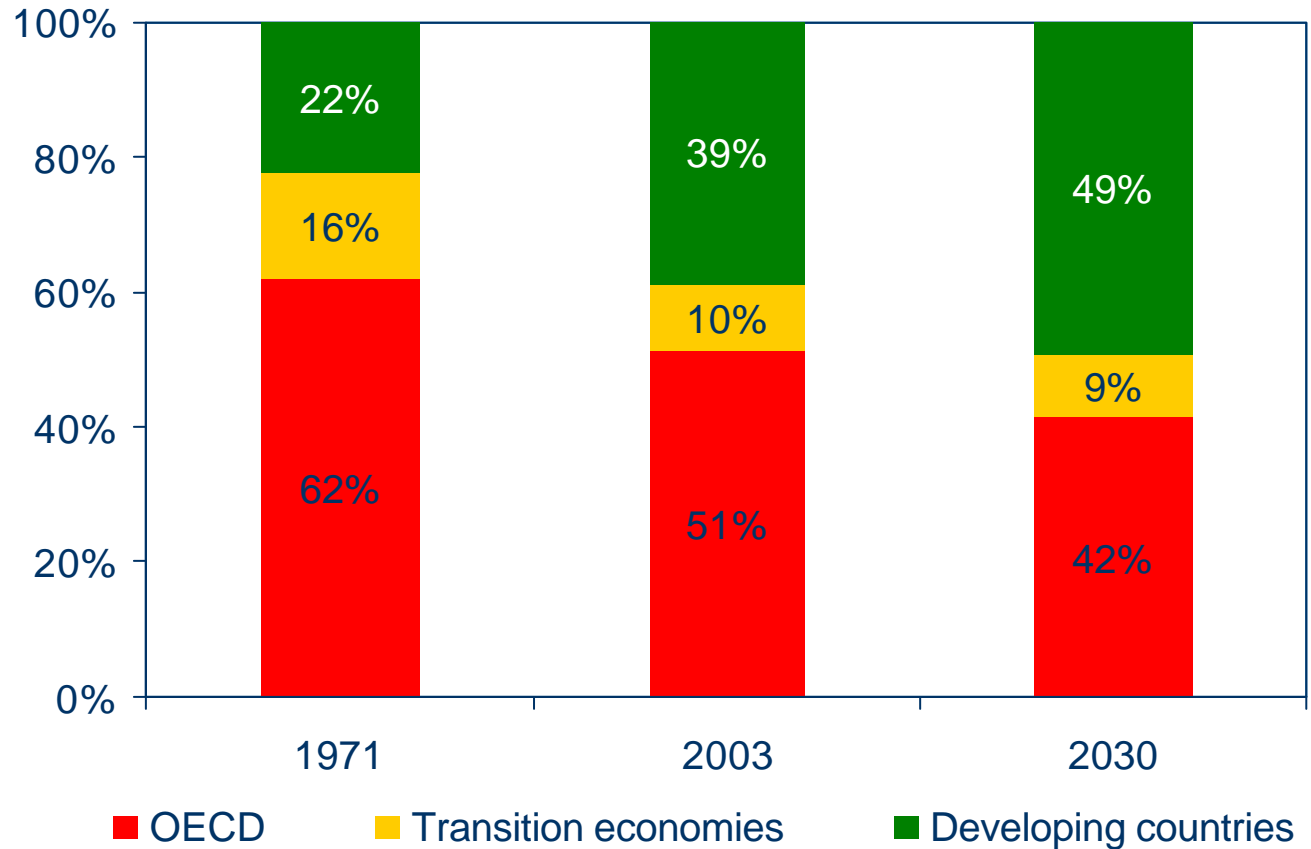
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Regional Shares in World Primary Energy Demand



Two-thirds of the increase in world demand between 2003 and 2030 comes from developing countries, especially in Asia

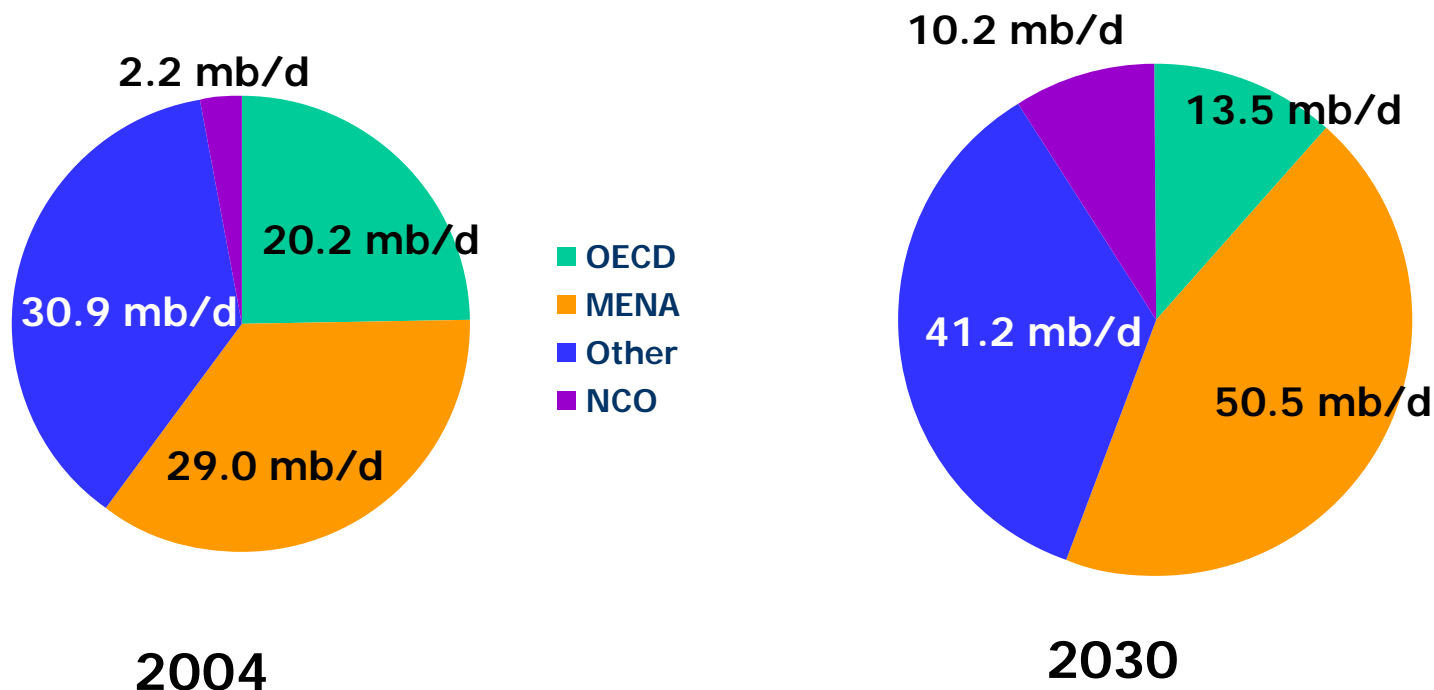
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World Oil Production Shifts Away from OECD



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



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Transport Energy Demand

Importance of the Transportation Sector

- Energy security: by far the most important driver of oil demand – in a continuously concentrated and uncertain oil supply environment
- Climate change: key polluting sector – and increasing its share

It also has specific characteristic of:

- Concentrating oil demand - rigidity
- Barriers in technology deployment

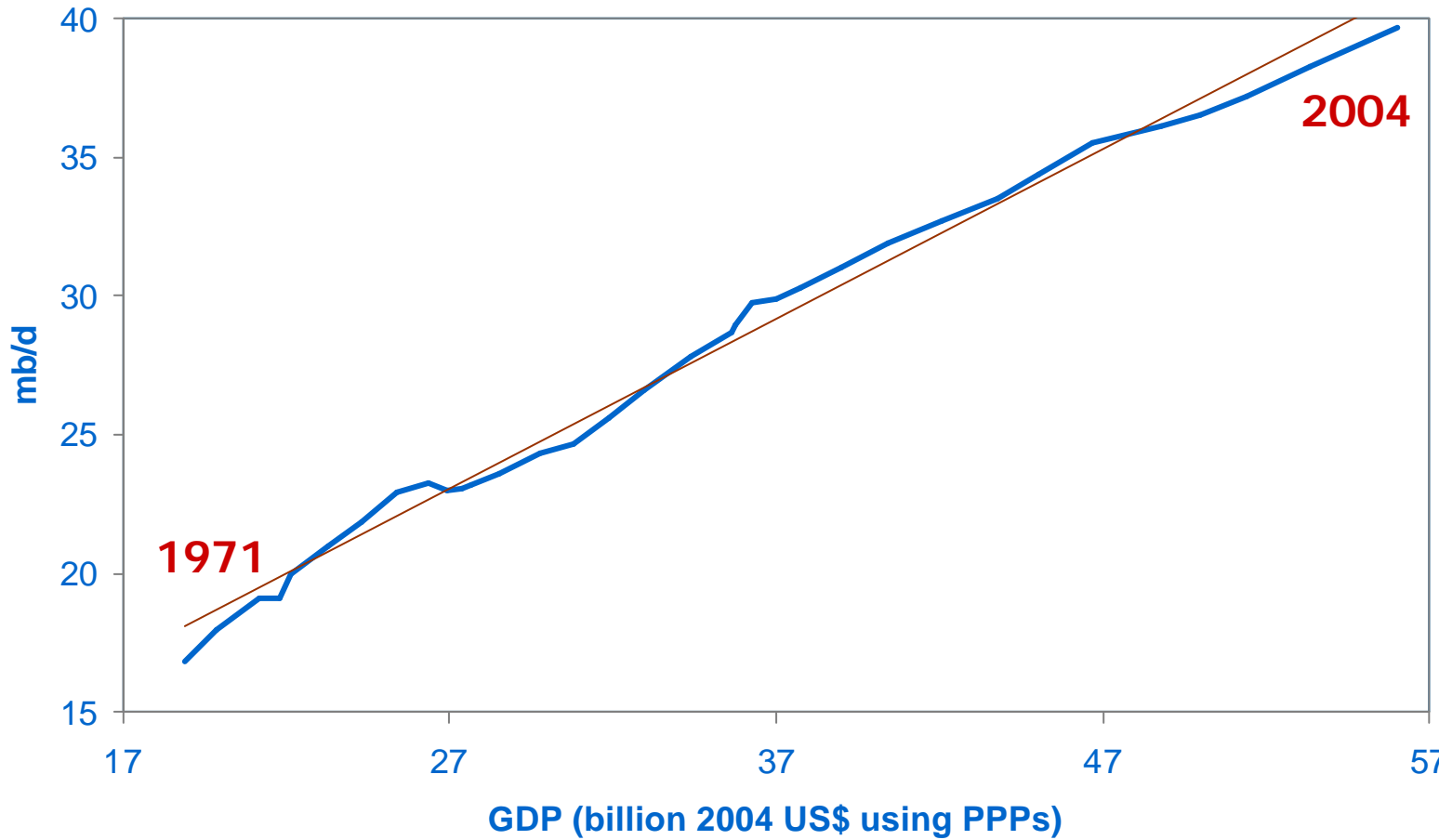
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World Transportation Oil Demand



**Oil demand for transport increases very closely
in line with GDP in all regions**

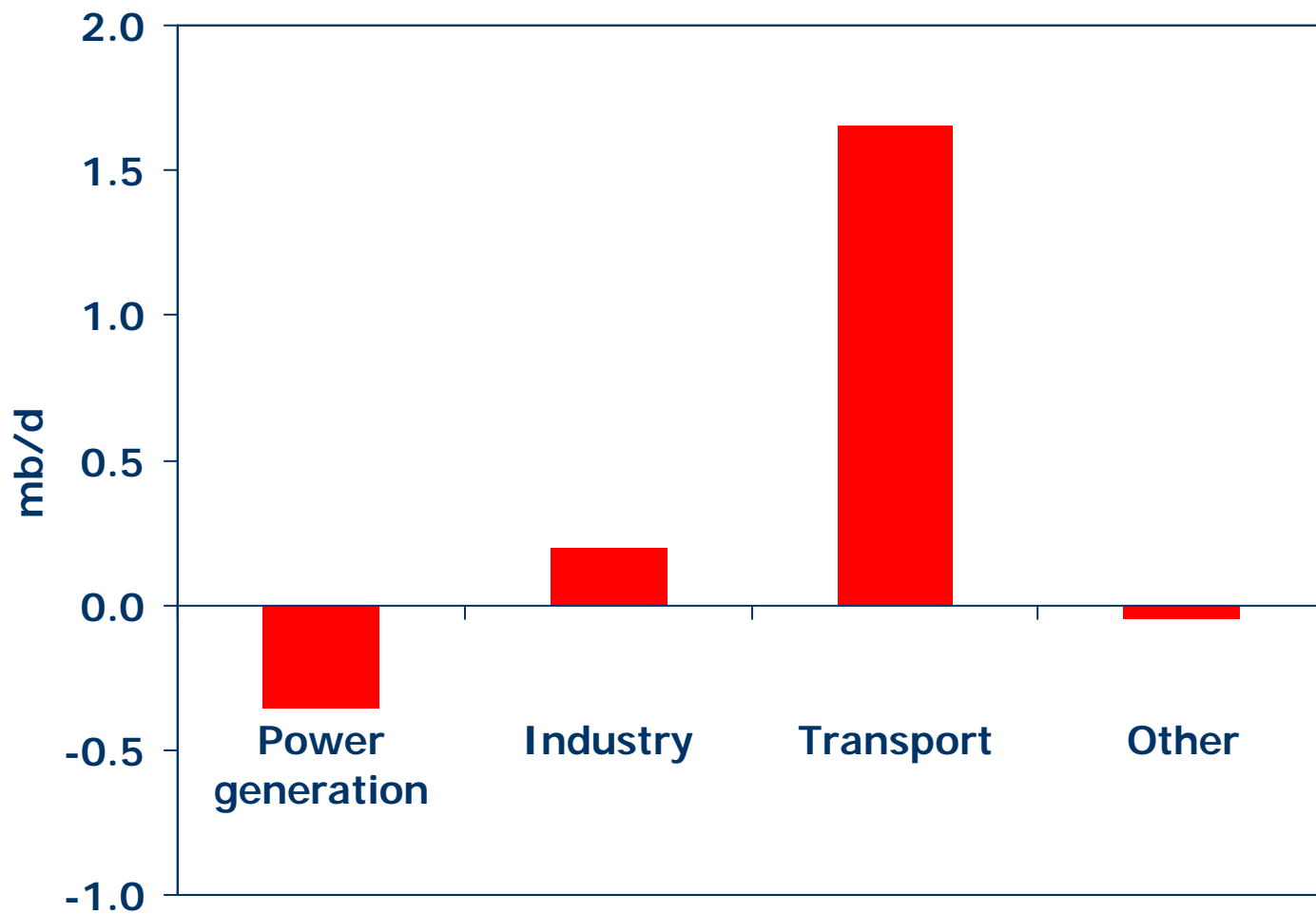
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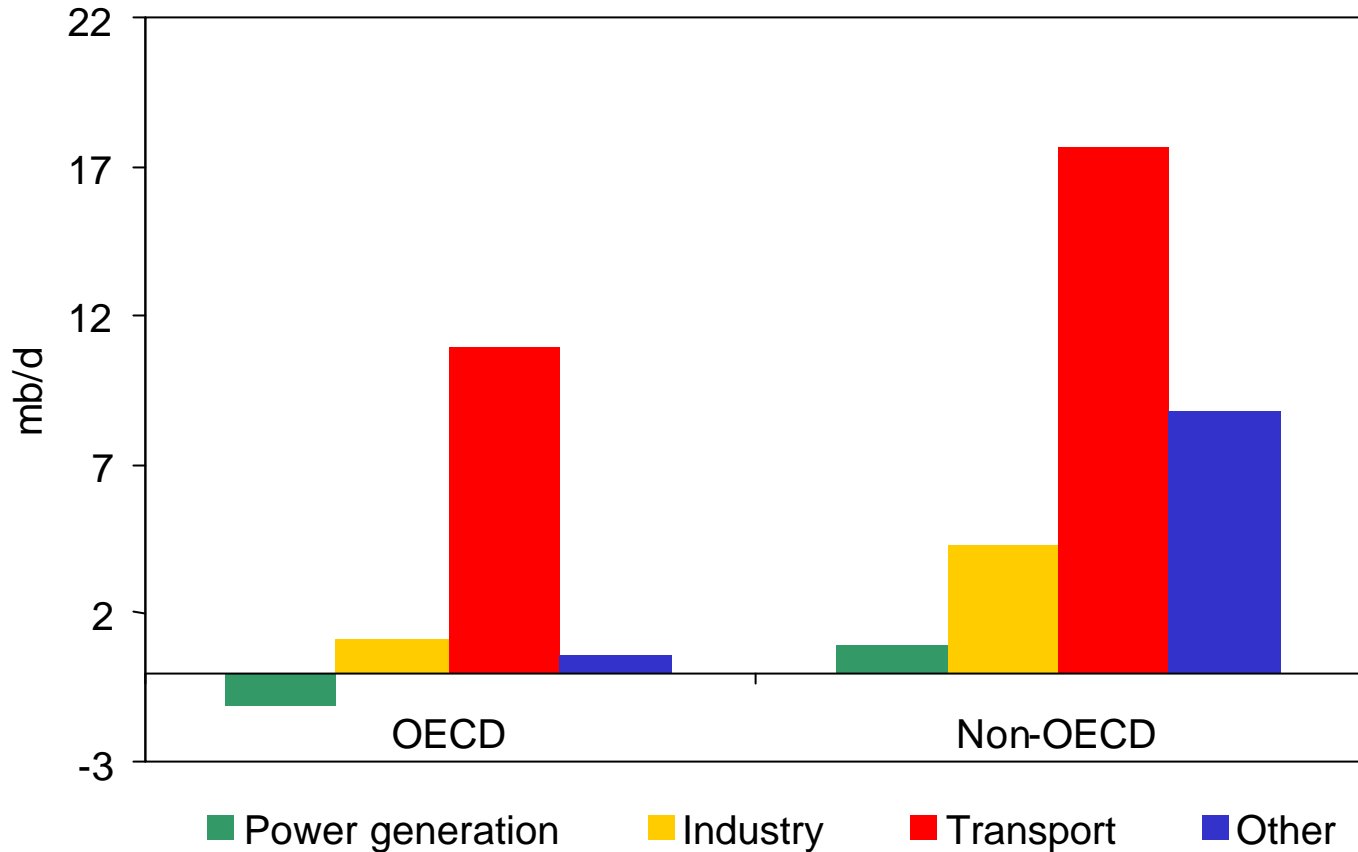
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OECD Oil Demand Growth by Sector, 1999-2004



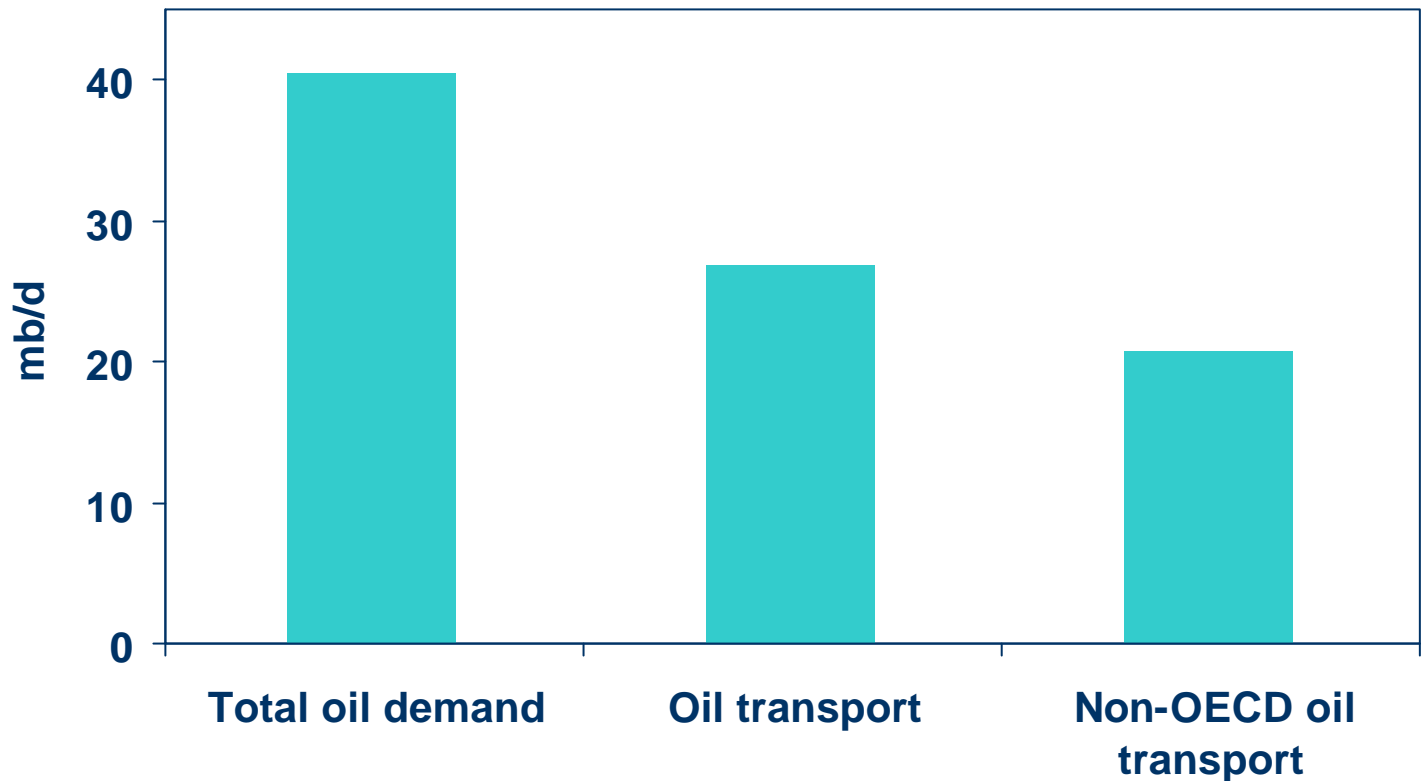
In the OECD, the transport sector accounted for almost all the oil demand growth

Increase in World Oil Demand, 2004-2030



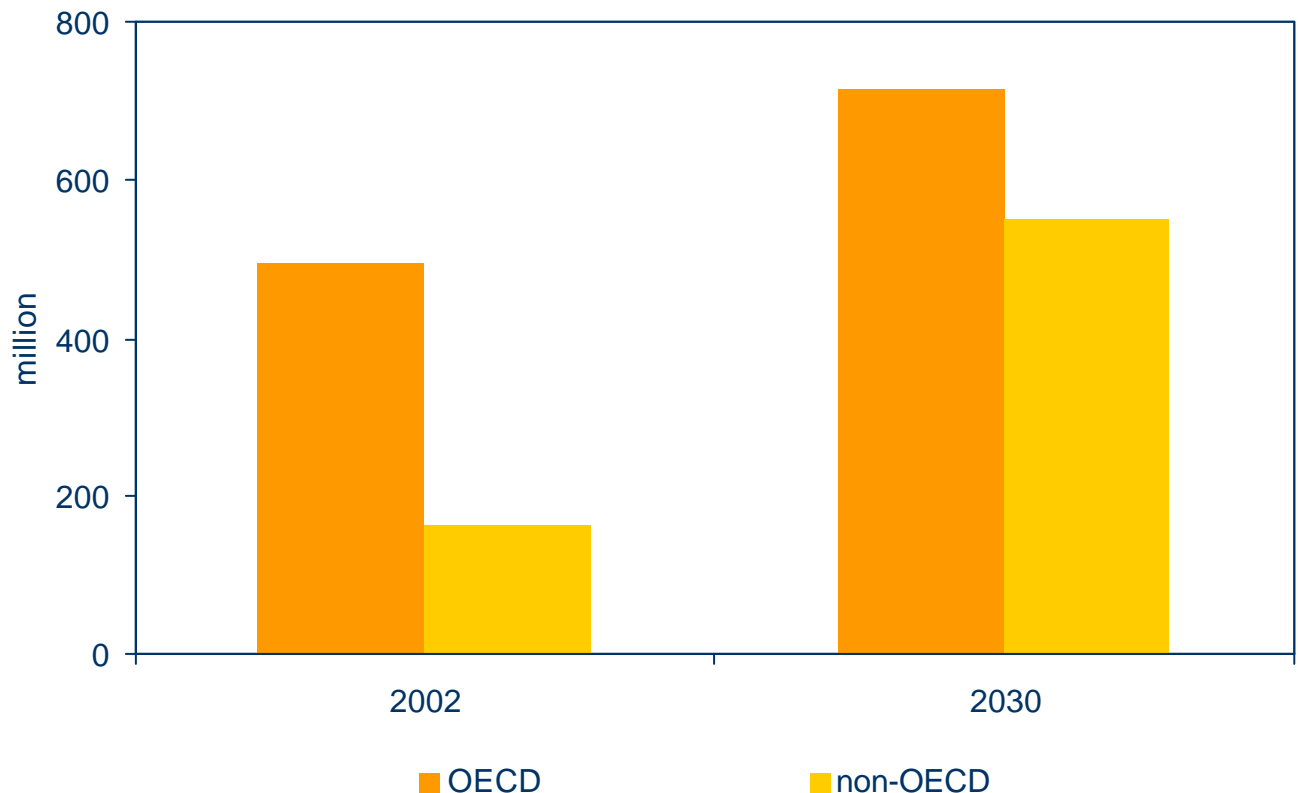
Most of the increase in oil demand comes from the transport sector – especially in OECD countries

Incremental Oil Demand in the Transport Sector, 2004-2030



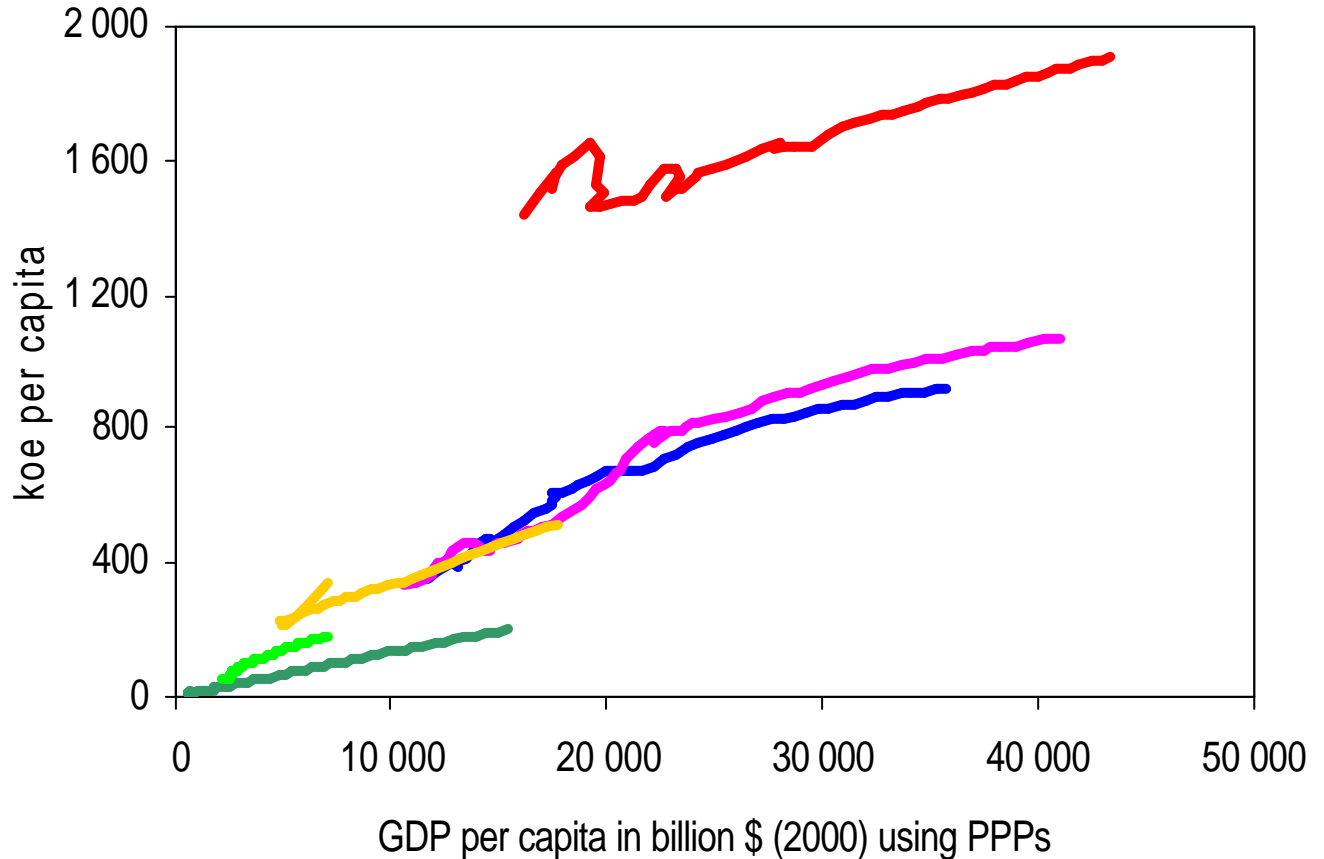
Transport oil demand in non-OECD countries will increase three times more than in the OECD

Vehicle Stock by Region



Increasing income will spur car ownership in non-OECD countries, where the vehicle stock is expected to triple

Per Capita Transport Sector Oil Demand and GDP, 1971-2030



- OECD North America
- OECD Europe
- OECD Pacific
- Transition economies
- China
- Other developing countries

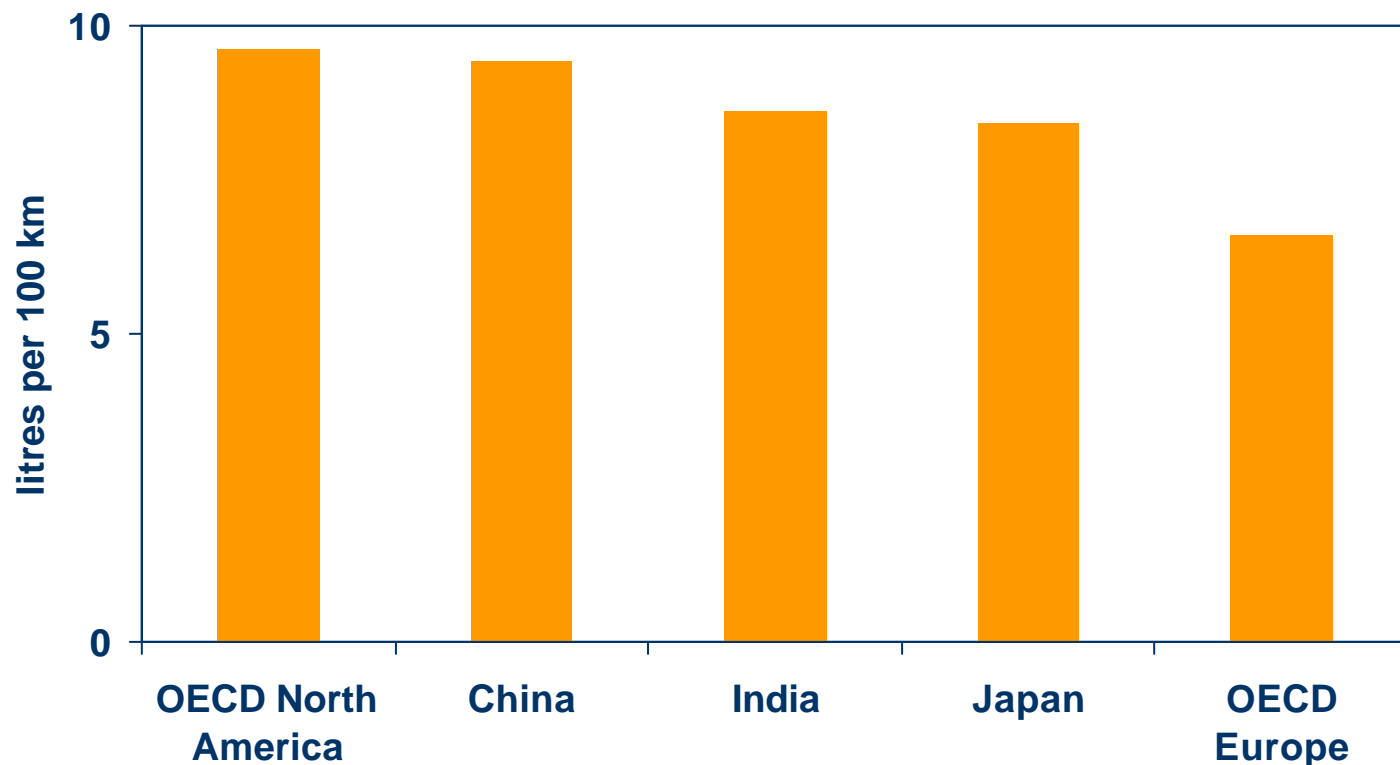
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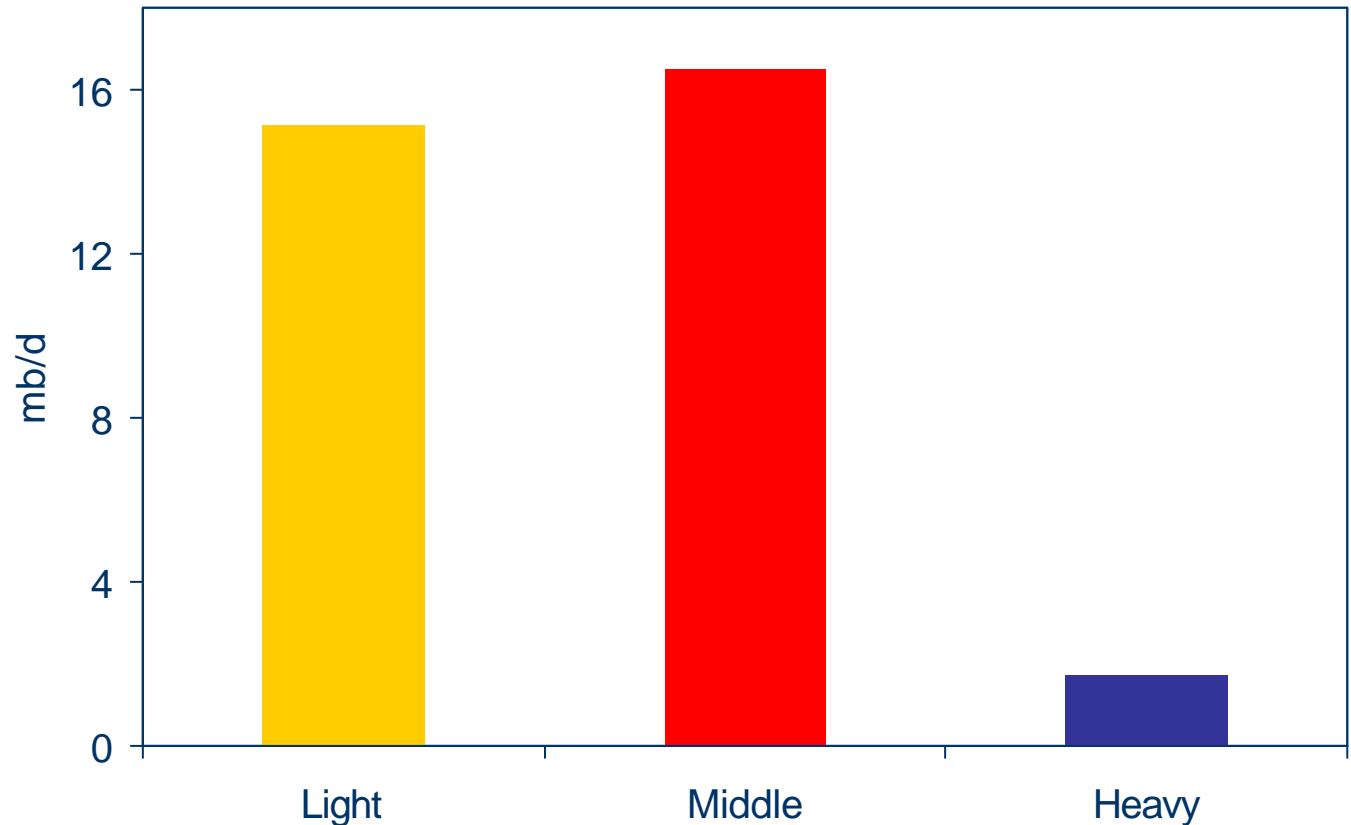
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New Vehicles Fuel Efficiency, 2002



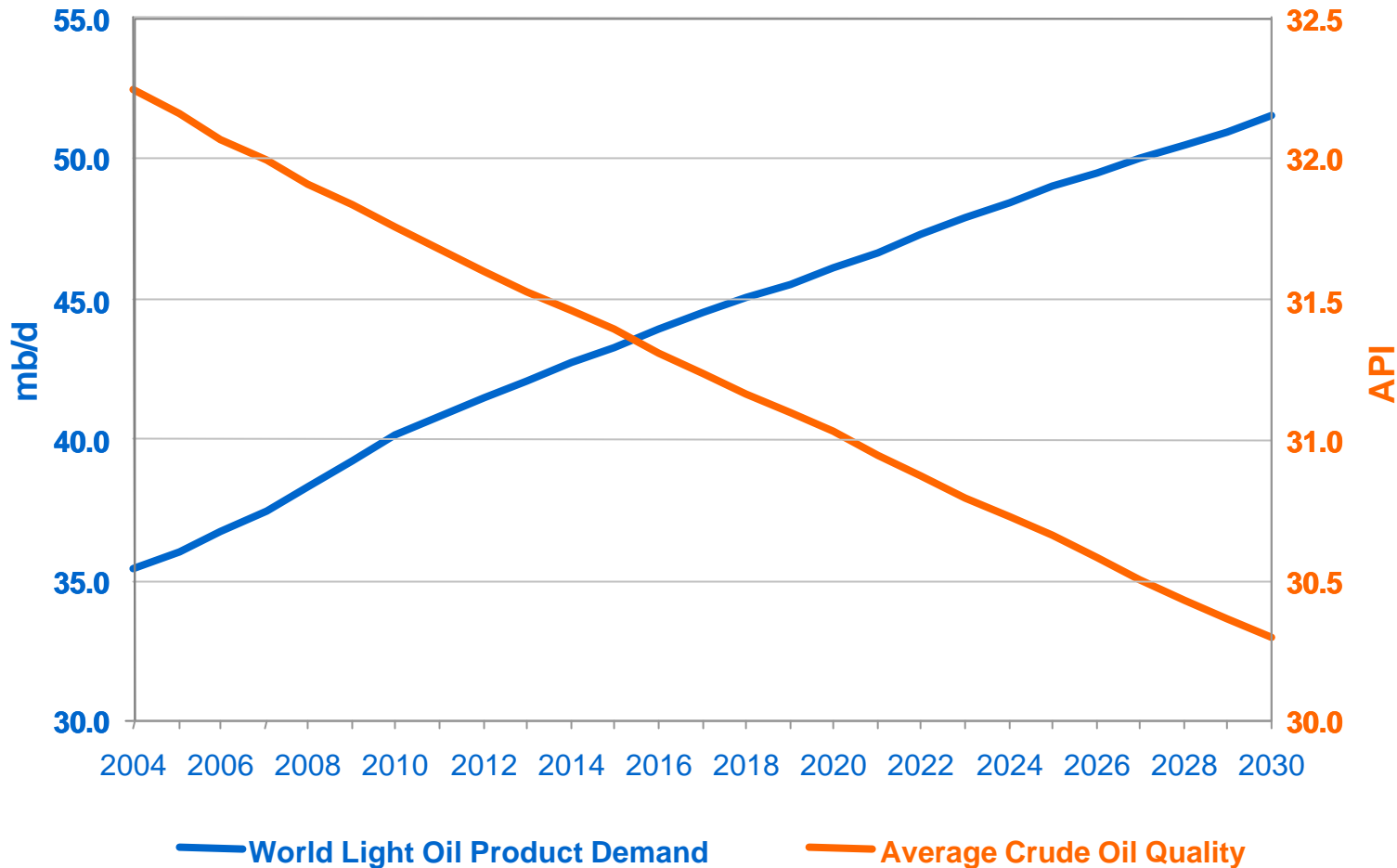
Scope for improvement in new vehicles fuel efficiency is generally greater in developing countries

Incremental Global Oil Demand, 2003-2030



Under 5% of projected demand growth is for heavy ends, with a small rise in developing countries offsetting a continuing fall in the OECD

Oil Product Mix vs. Crude Oil Quality



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



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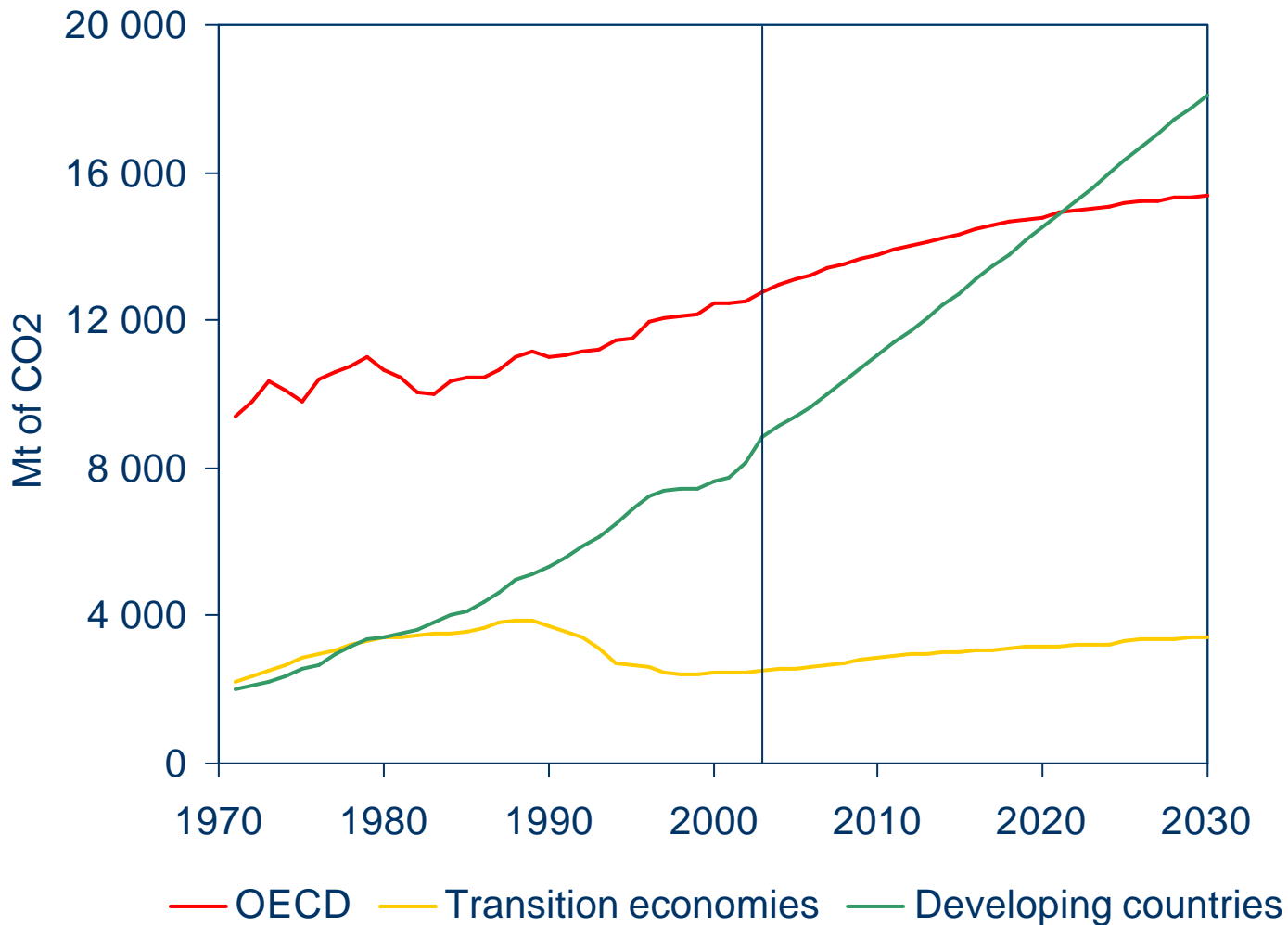
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Environmental Implications

Energy-Related CO₂ Emissions by Region



Global emissions grow more than 50% between now & 2030, with developing countries' emissions overtaking OECD's in the 2020s

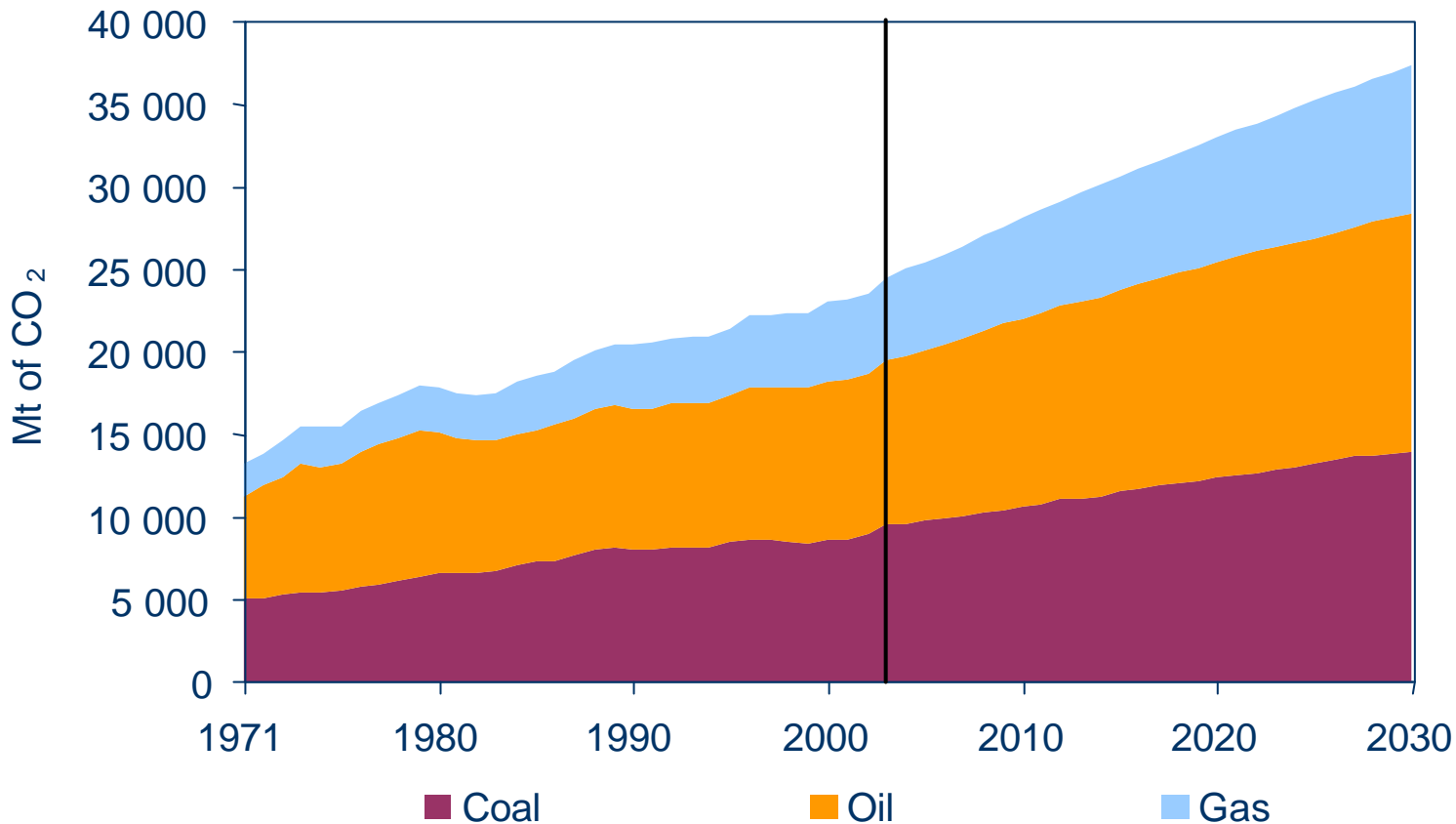
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World Energy-Related CO₂ Emissions



Global emissions grow more than 50% between 2003 and 2030, but fuel shares hardly change

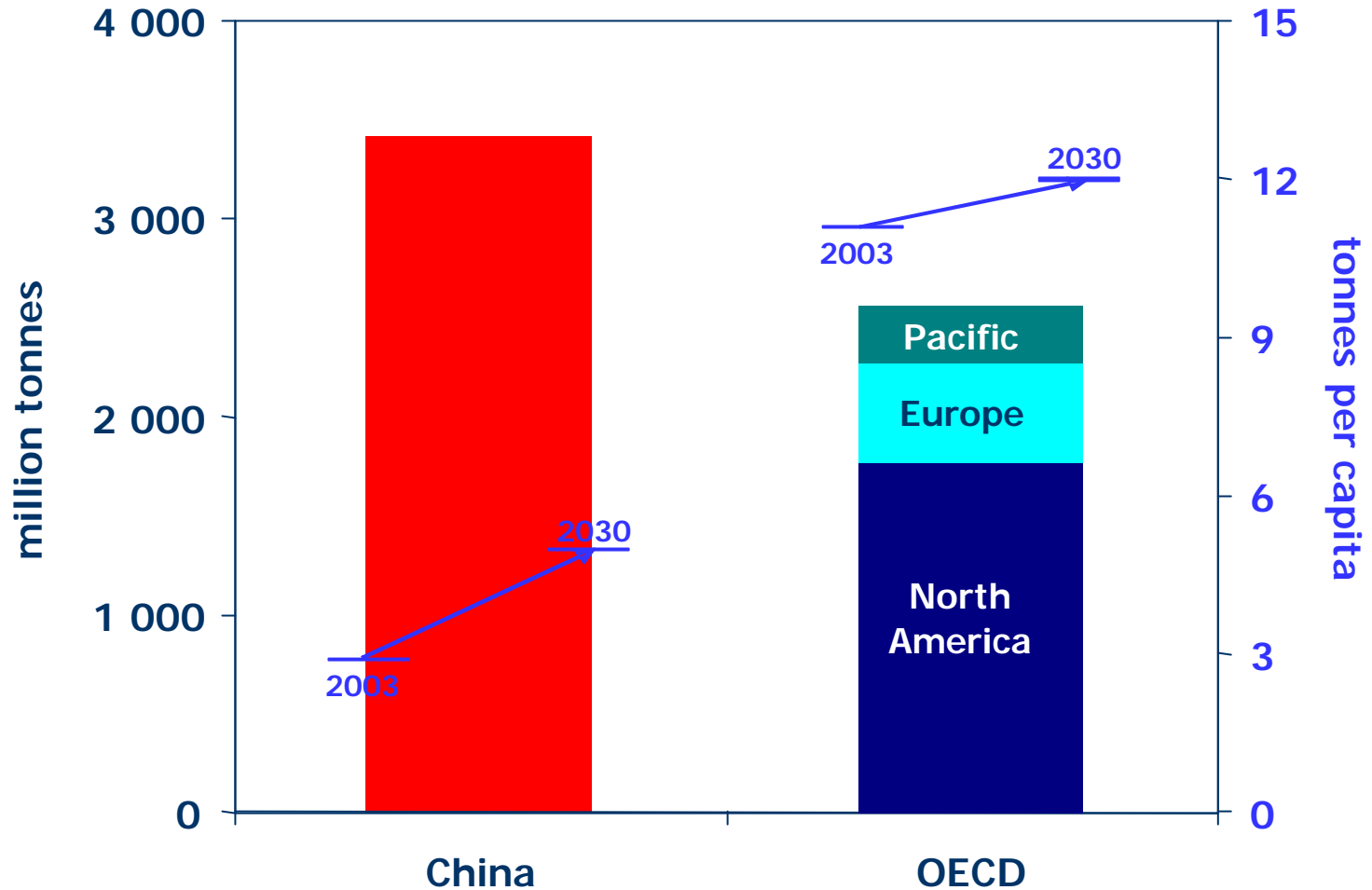
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CO₂ Increase, 2003-2030



OECD CO₂ additions only three quarters of Chinese CO₂ rise, but OECD emissions per capita still two times higher in 2030

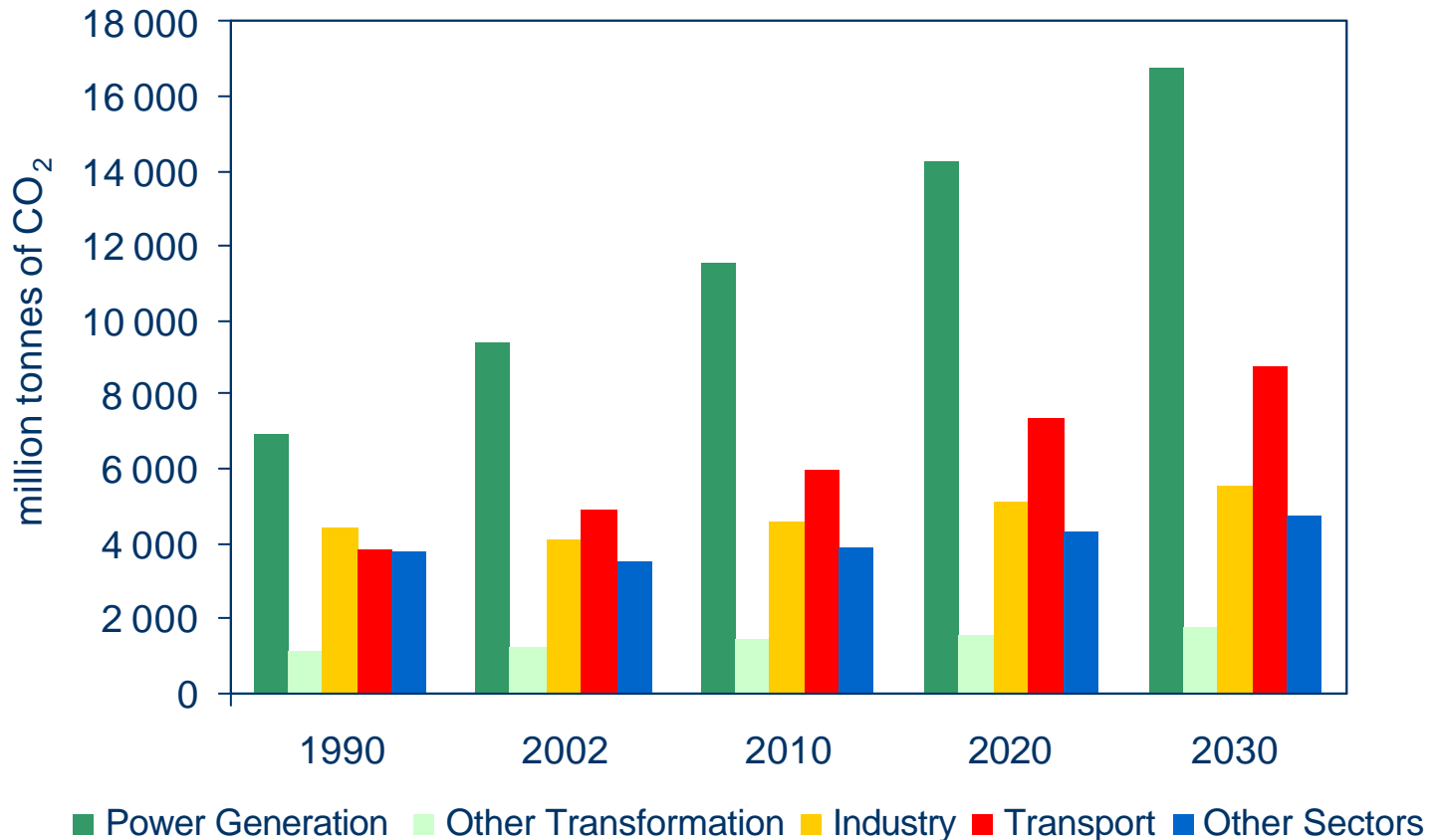
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CO₂ emissions by sector, 1990-2030



The share of transport in CO₂ emissions will increase from 21% today to 23% in 2030

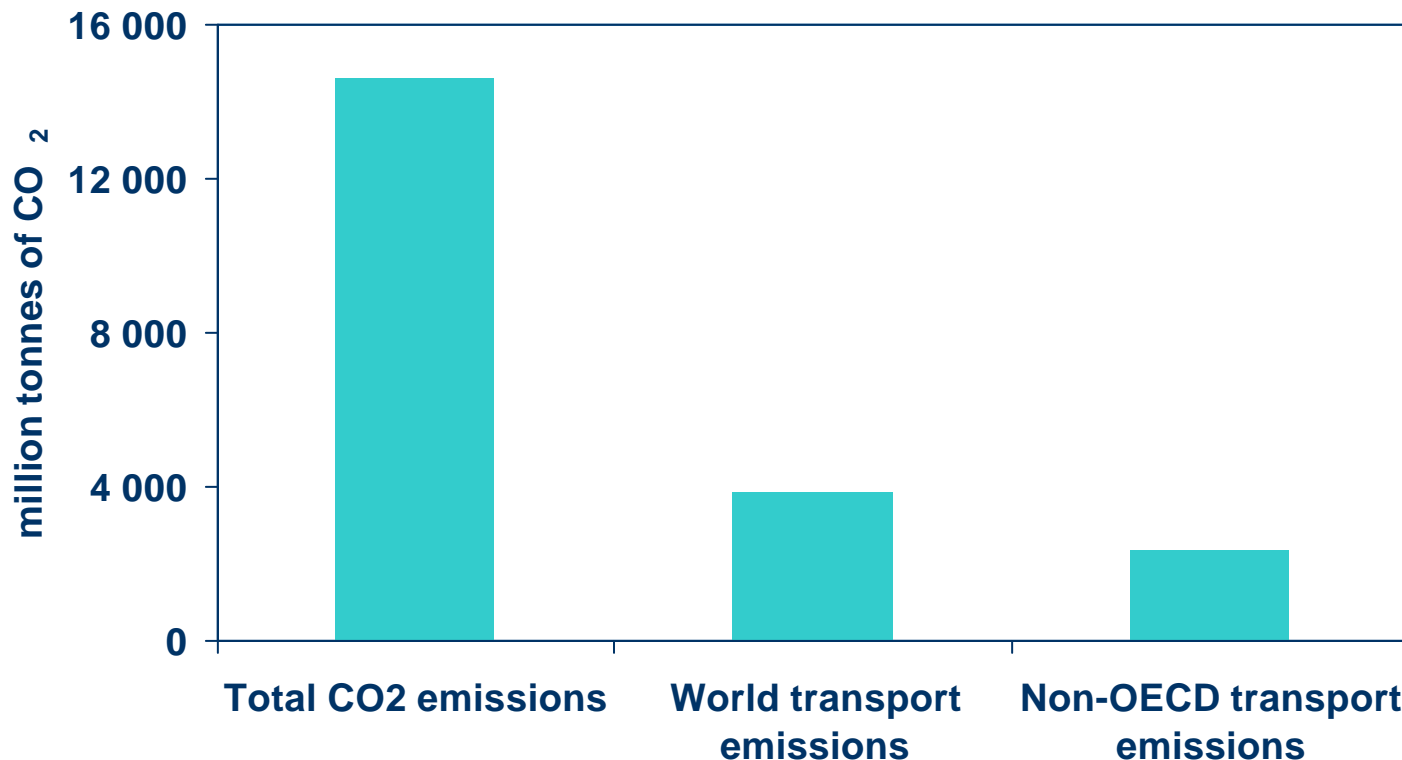
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Incremental CO₂ emissions in the Transport Sector, 2002-2030



Transport accounts for a quarter of total CO₂ emissions increase, most of which will come from non-OECD



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World Alternative Policy Scenario

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

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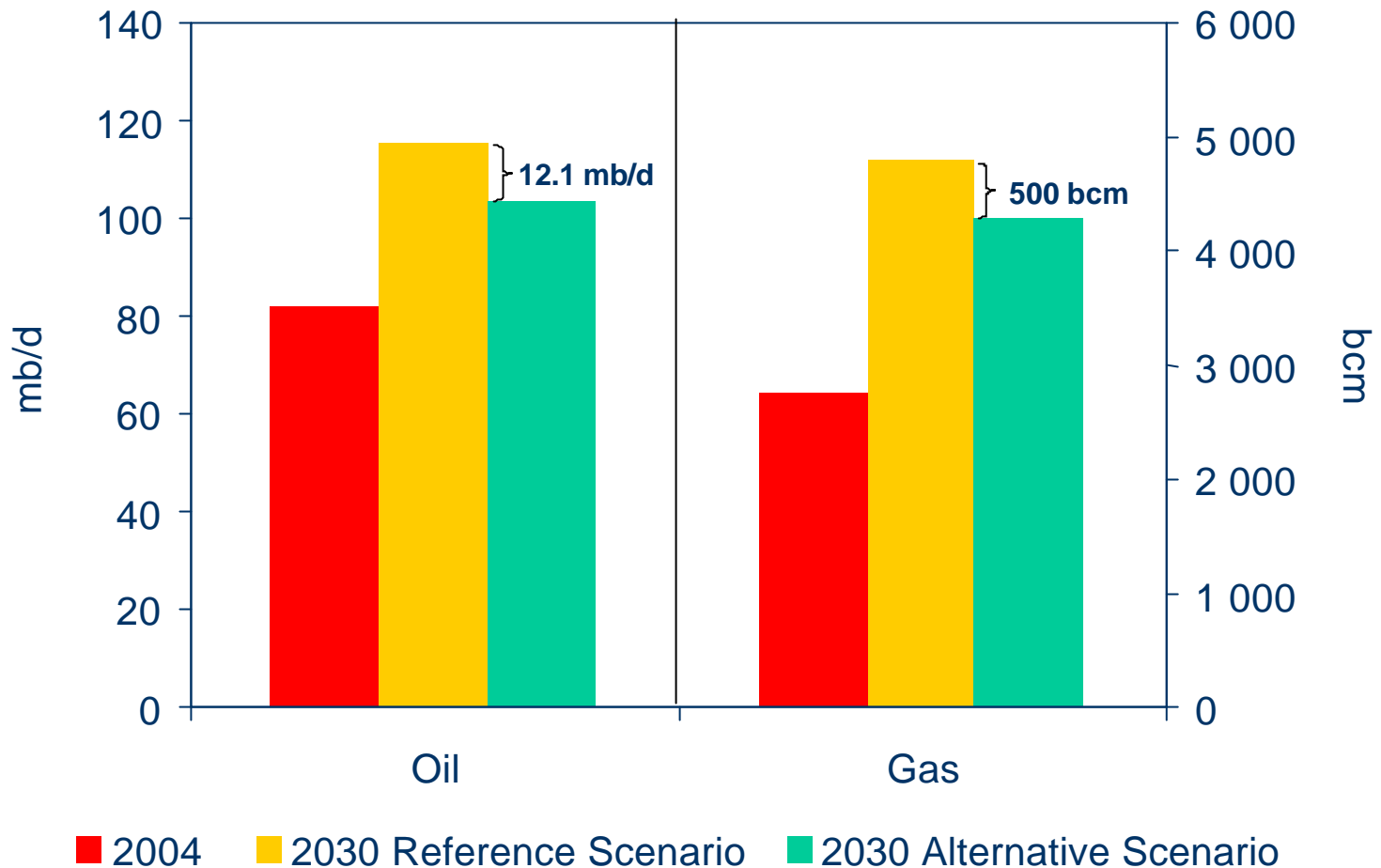
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Alternative Policy Scenario

Main Policies for Transport

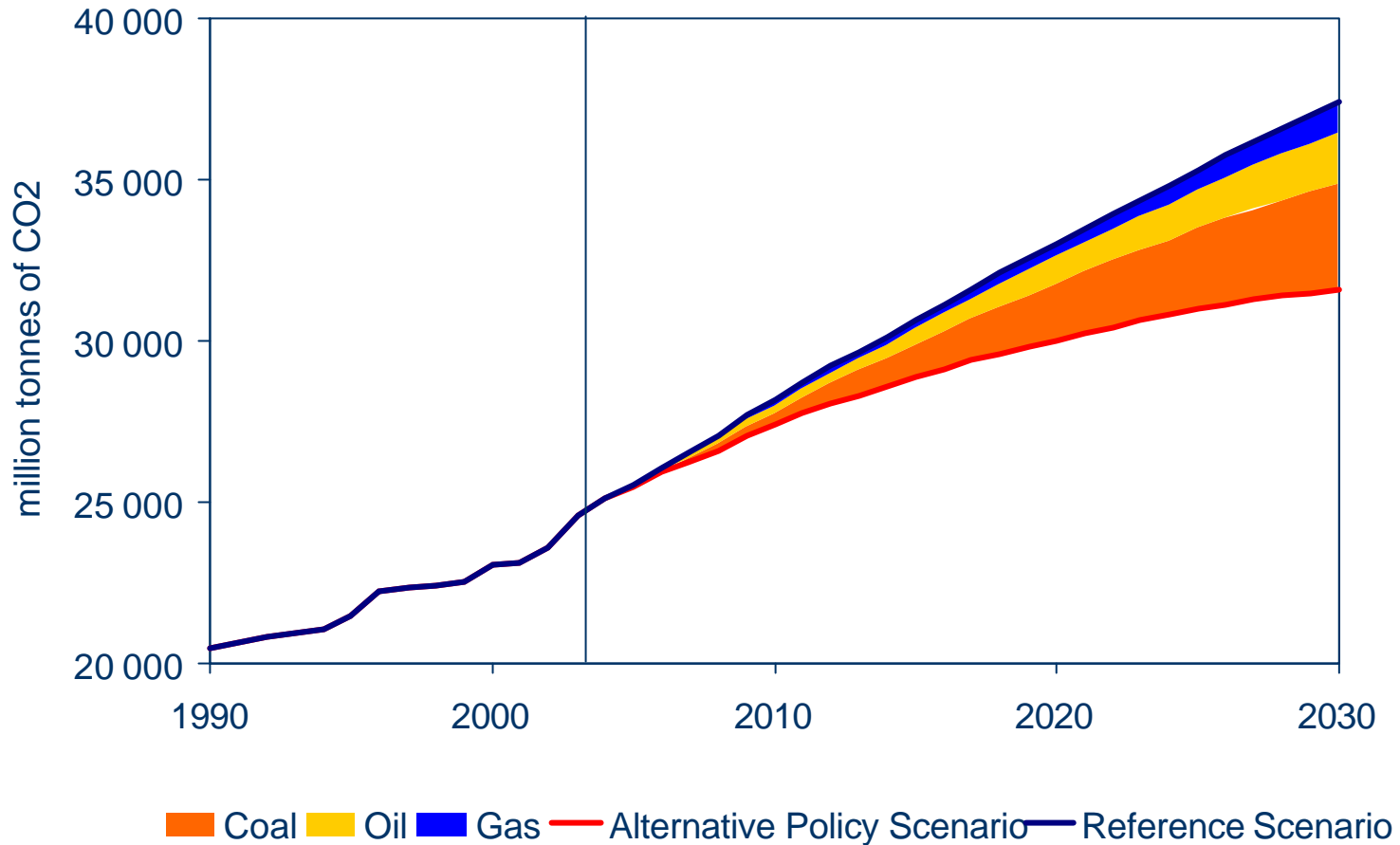
- Improve vehicle fuel efficiency
(e.g. strengthen of US CAFE standards, prolongation of Chinese standards)
- Increased sales of alternative fuel vehicles and fuels
(e.g. biofuels in Europe, Brazil)
- Increased sales of hybrid and fuel-cell powered vehicles
- Mode switching
(e.g. increased high speed rail in Japan)

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

Global Energy-Related CO₂ Emissions



In 2030, CO₂ emissions are 16% lower than in the Reference Scenario but are still more than 50% higher than 1990

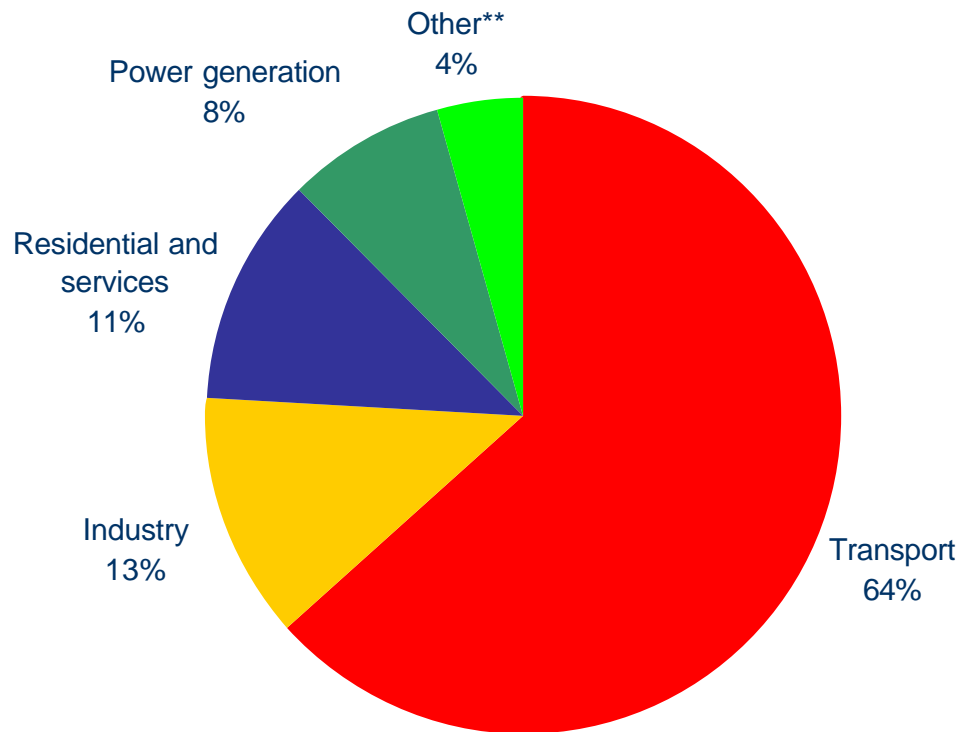
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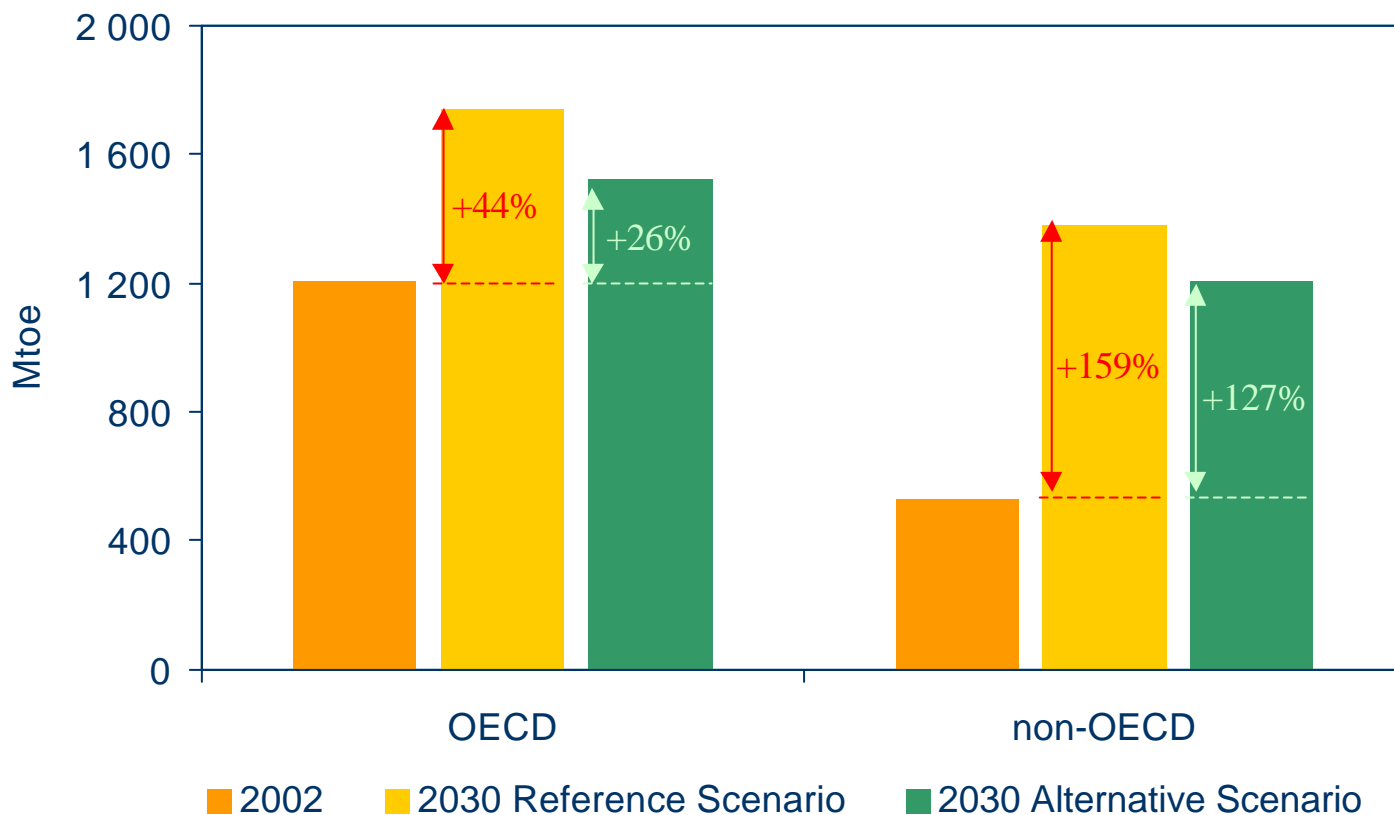
Reduction in Oil Demand in the Alternative Policy Scenario, 2030



Oil savings = 12.1 mb/d

Transport accounts for two-thirds of the oil savings in the Alternative Scenario and for 20% of the CO₂ emissions reduction

Oil Demand for Transport in the Reference and Alternative Scenarios by Region



The largest decline in consumption in percentage terms will occur in non-OECD countries, in volume terms it will occur in OECD countries

Forthcoming Work in WEO-2006

- World Alternative Policy Scenario
 - Elevating the significance as a “tool for change”
 - Deepening and broadening the analysis
- Country focus: Brazil
- Impact of high oil prices on demand and the economy
- Beyond 2030

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