

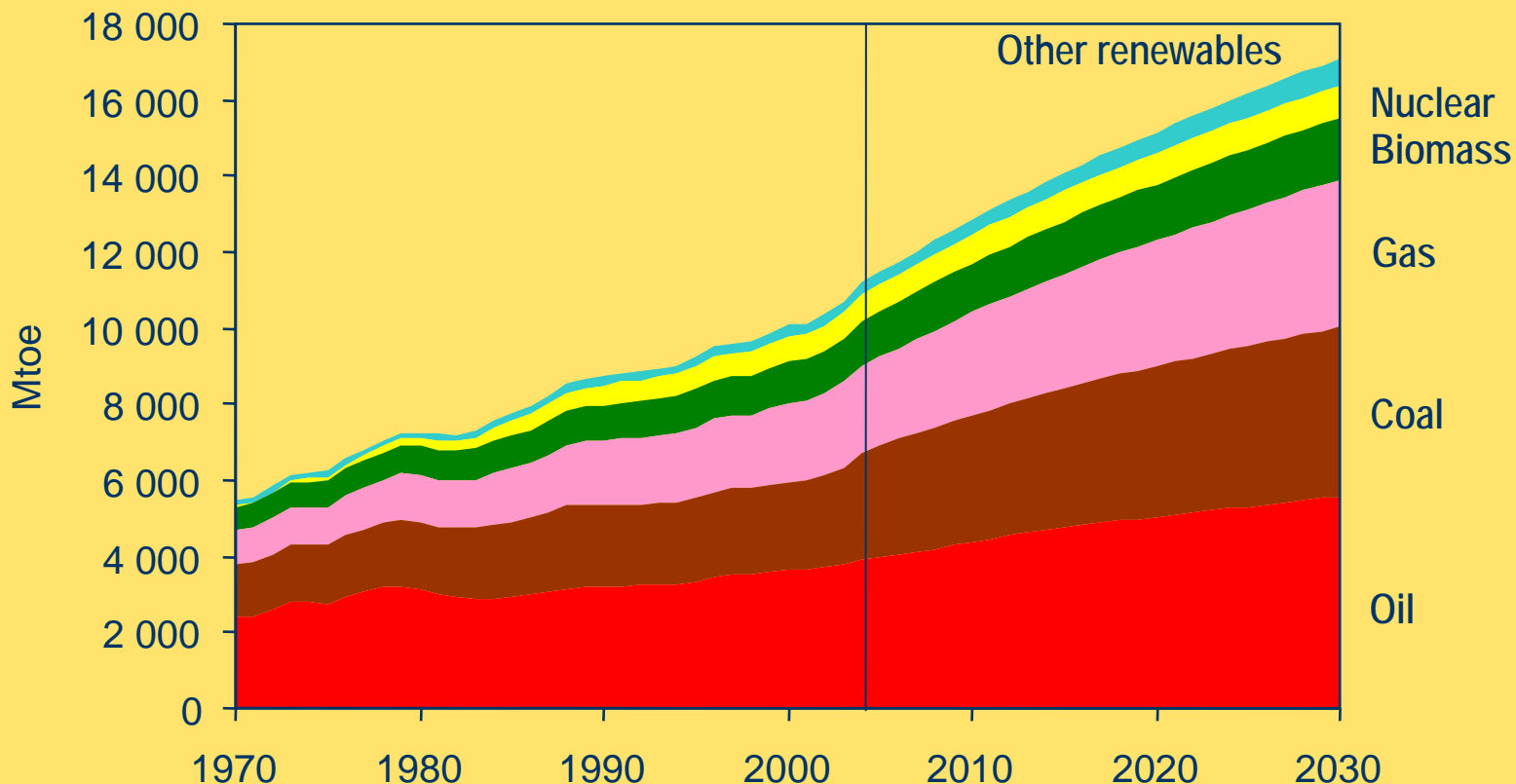


World Energy Outlook Focus on Asia

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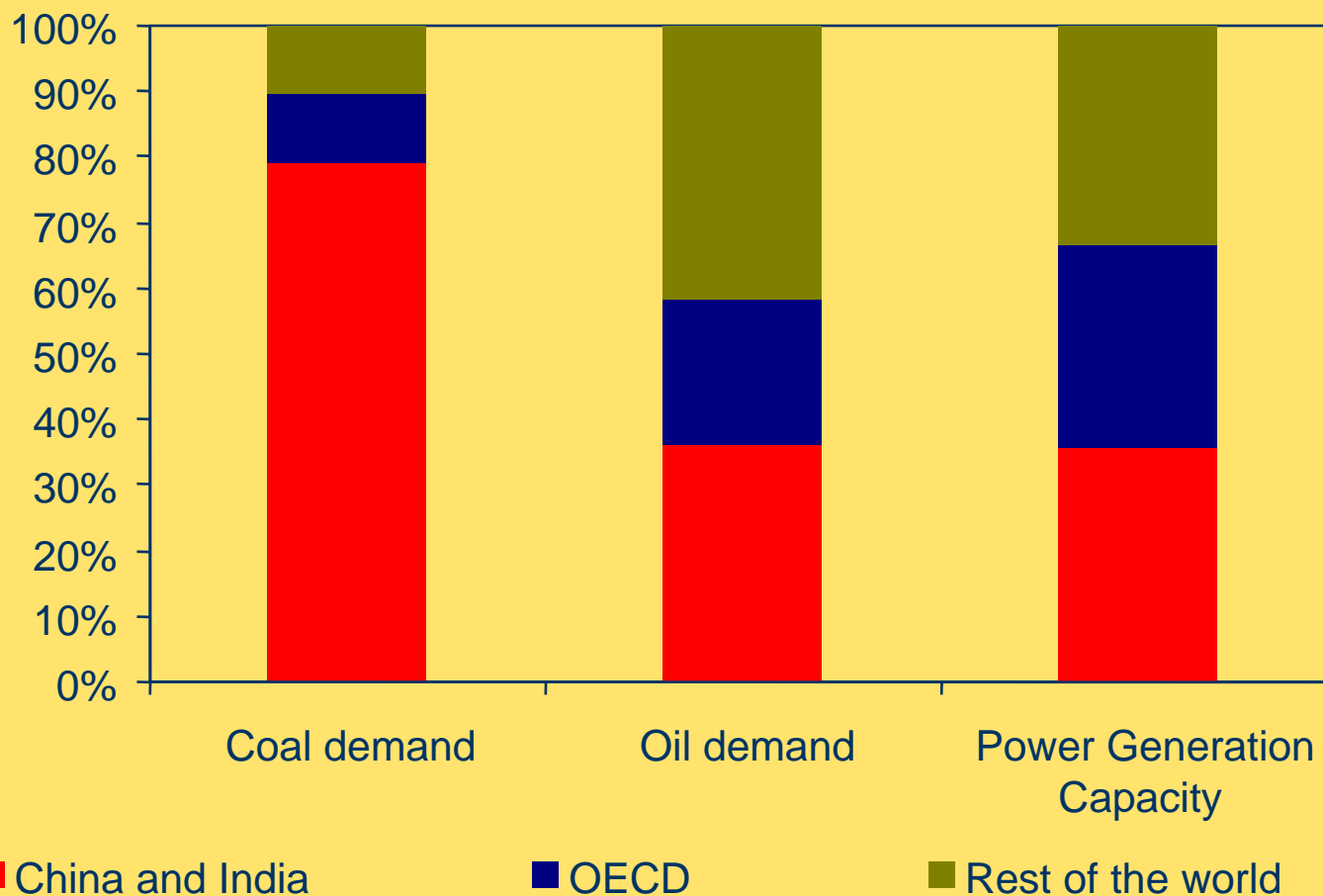
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Reference Scenario: World Primary Energy Demand



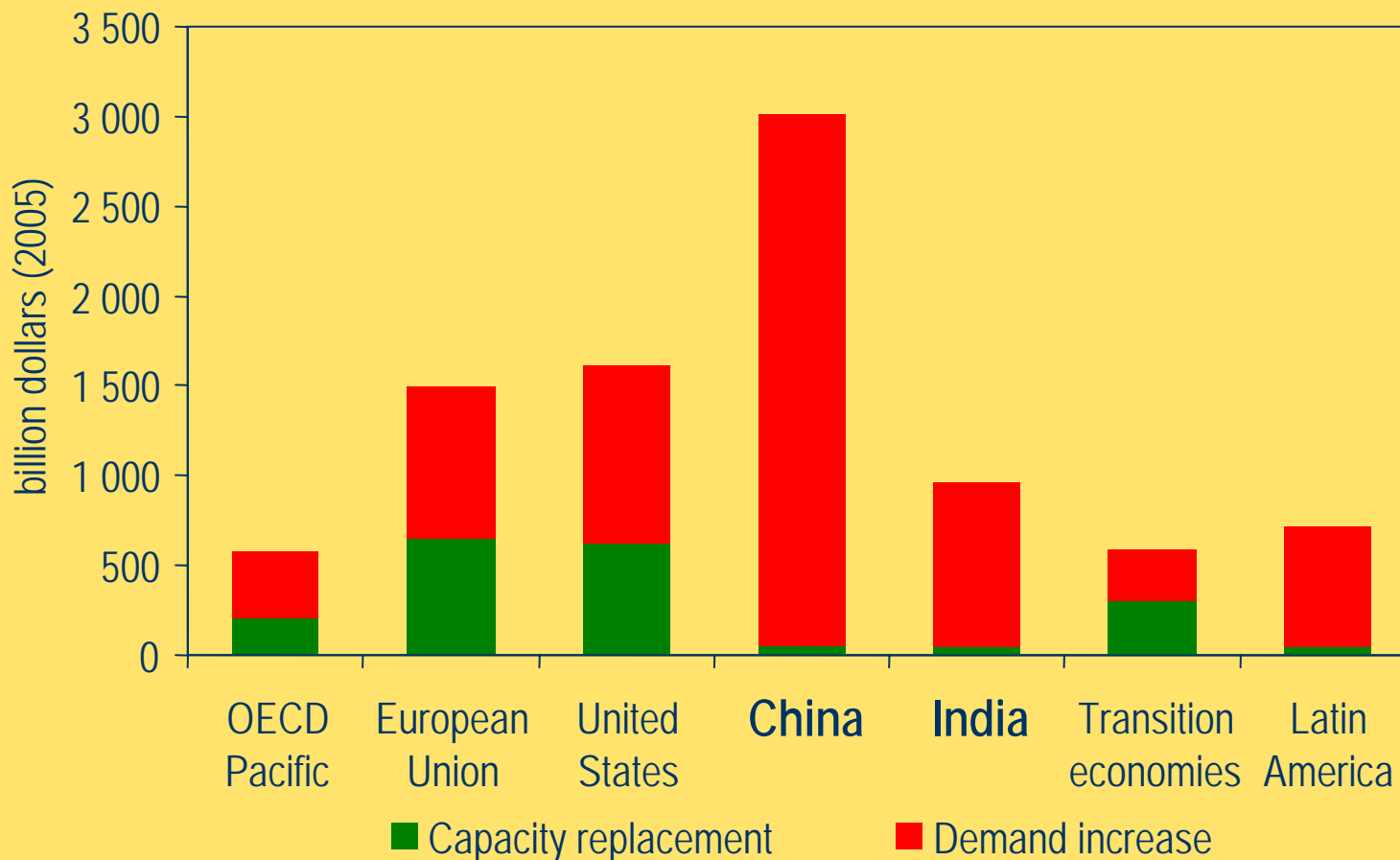
Global demand grows by more than half over the next quarter of a century, with coal use rising most in absolute terms

Share of China and India in the Global Coal, Oil and Power Capacity Growth, 2004-2030



China and India account for a significant part of the growth in the global fuel demand and power generation capacity

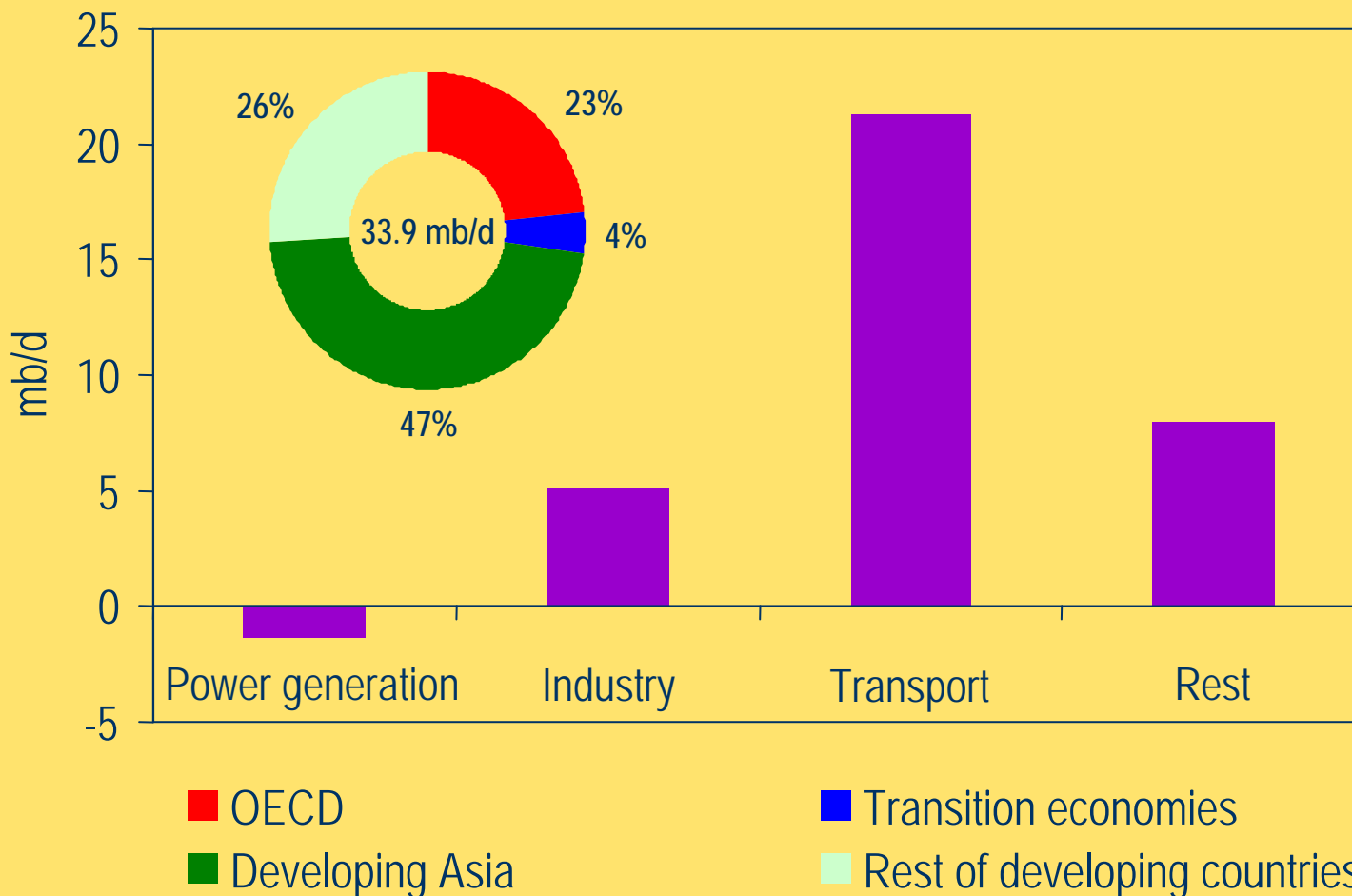
Reference Scenario: Cumulative Power-Sector Investment, 2005-2030



Huge investment (\$5 trillion) is required in developing Asia, of which more than \$3 trillion in China and \$1 trillion in India

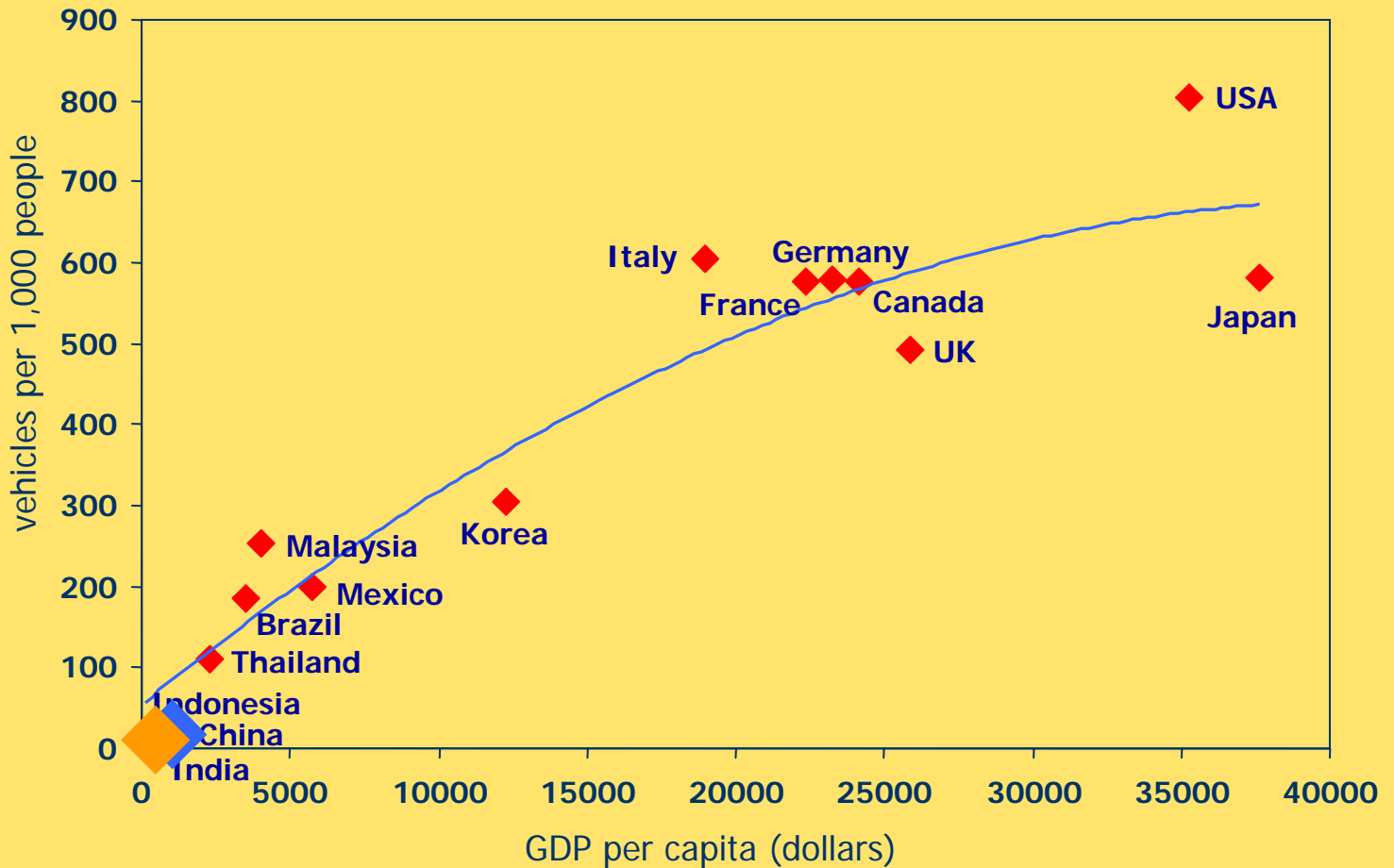
Challenge 1: Security of Supply

Reference Scenario: Incremental Oil Demand, 2005-2030



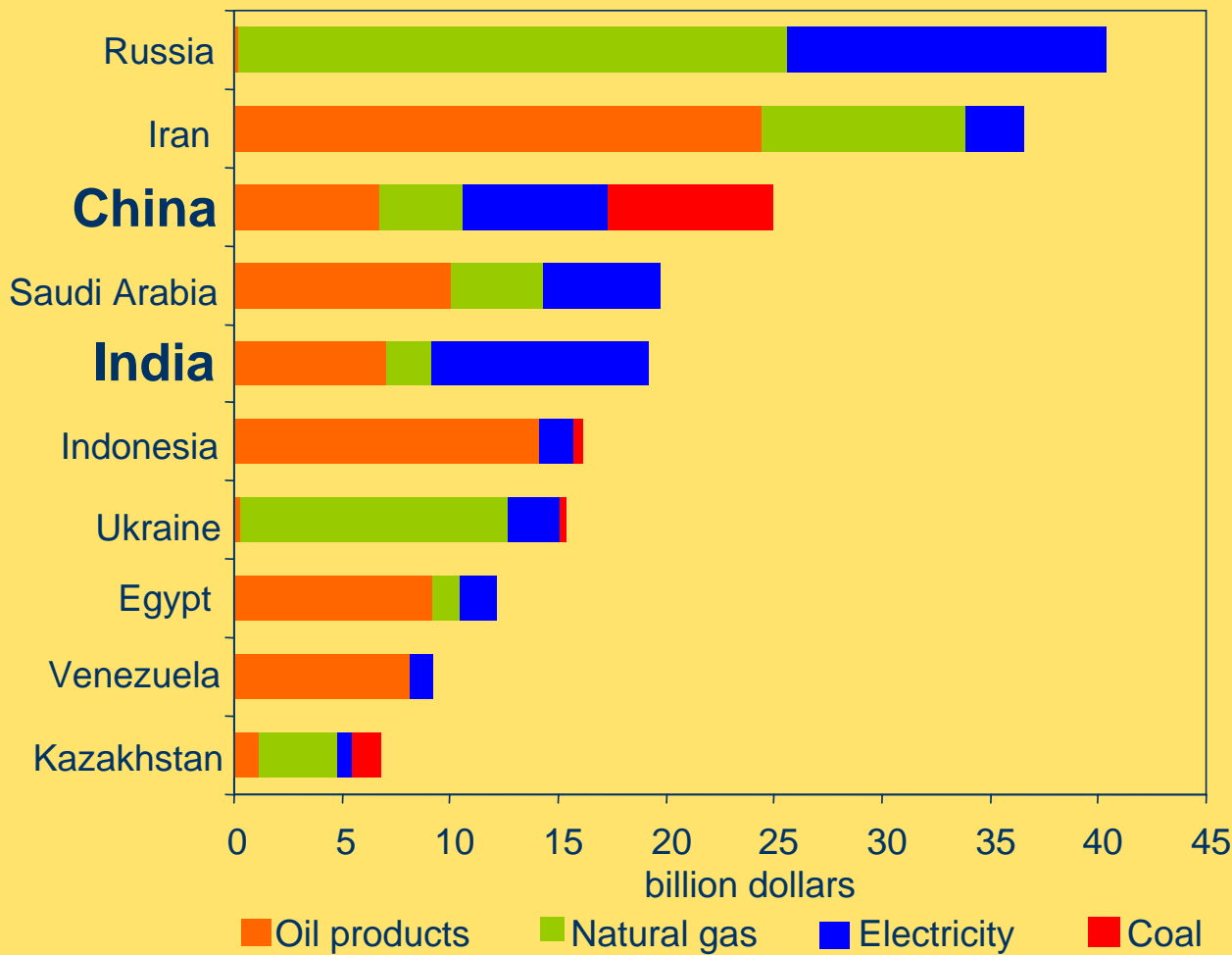
Most of the increase in oil demand comes from developing countries, where economic growth – the main driver of oil demand – is most rapid

Vehicle Ownership, 2004



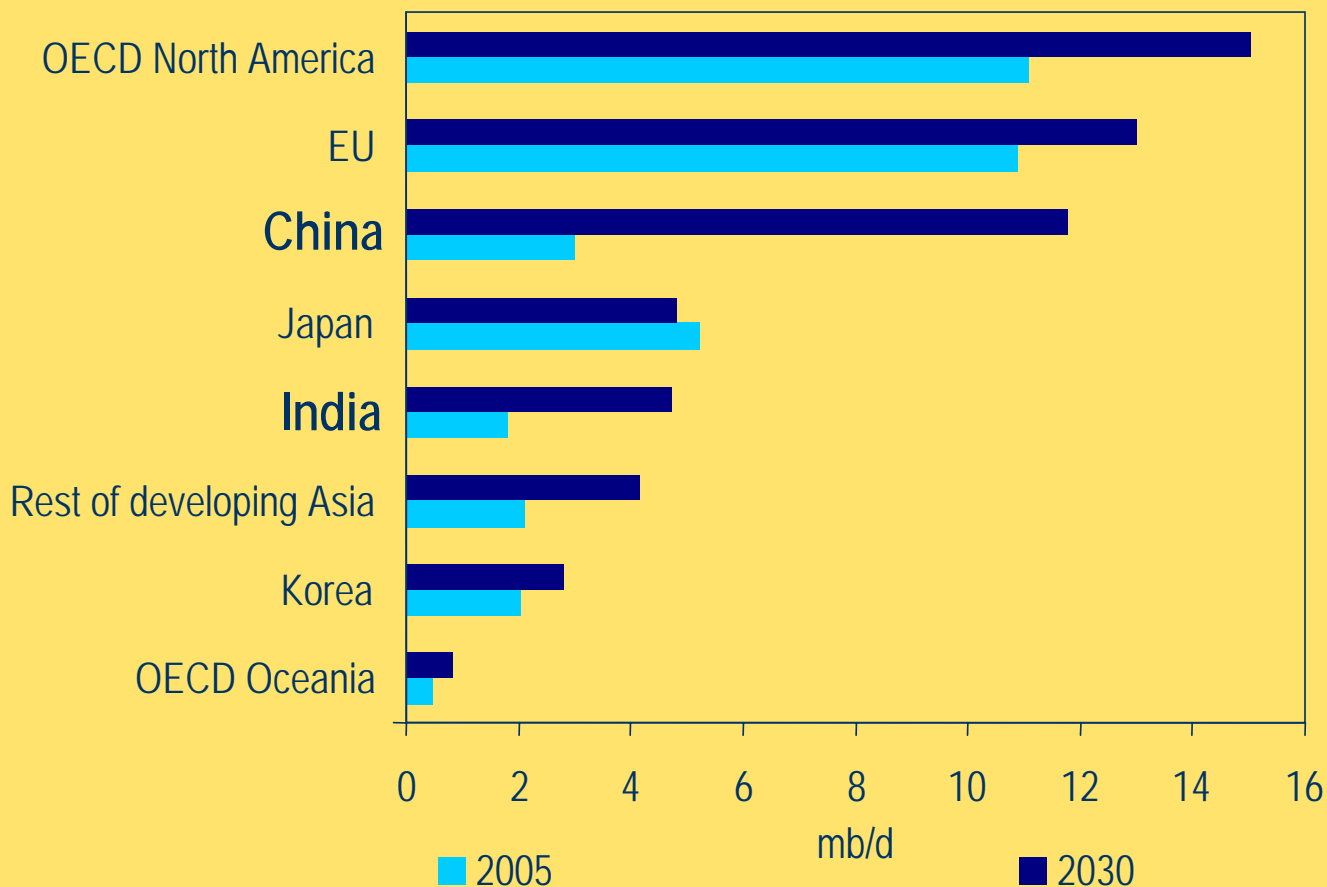
The potential for increased vehicle ownership in emerging markets, in particular China and India, is huge

World Energy Consumption Subsidies in non-OECD Countries, 2005



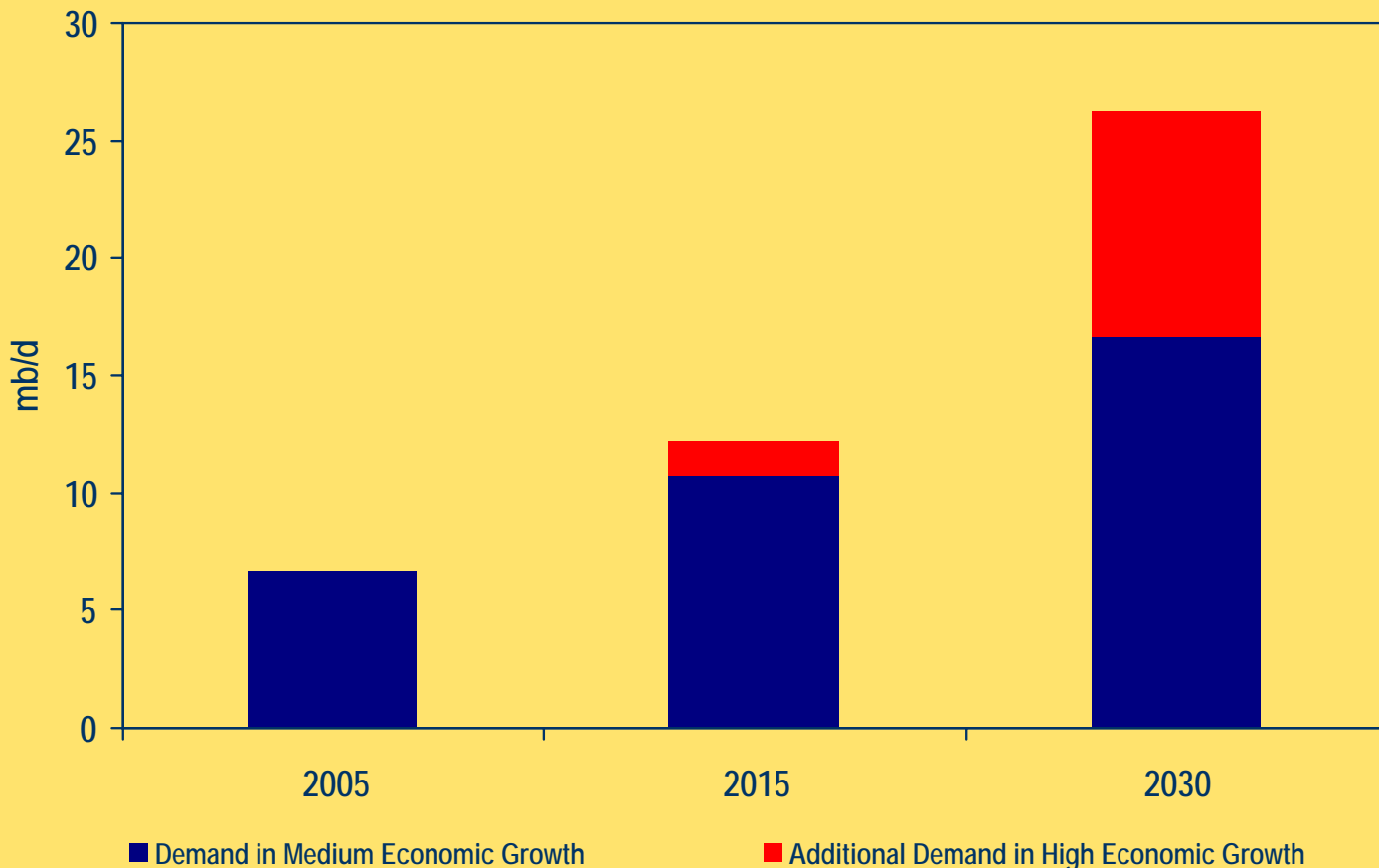
World subsidies amount to well over \$250 billion per year – China and India subsidising \$25 billion and \$20 billion per year respectively

Reference Scenario: Net Oil Imports



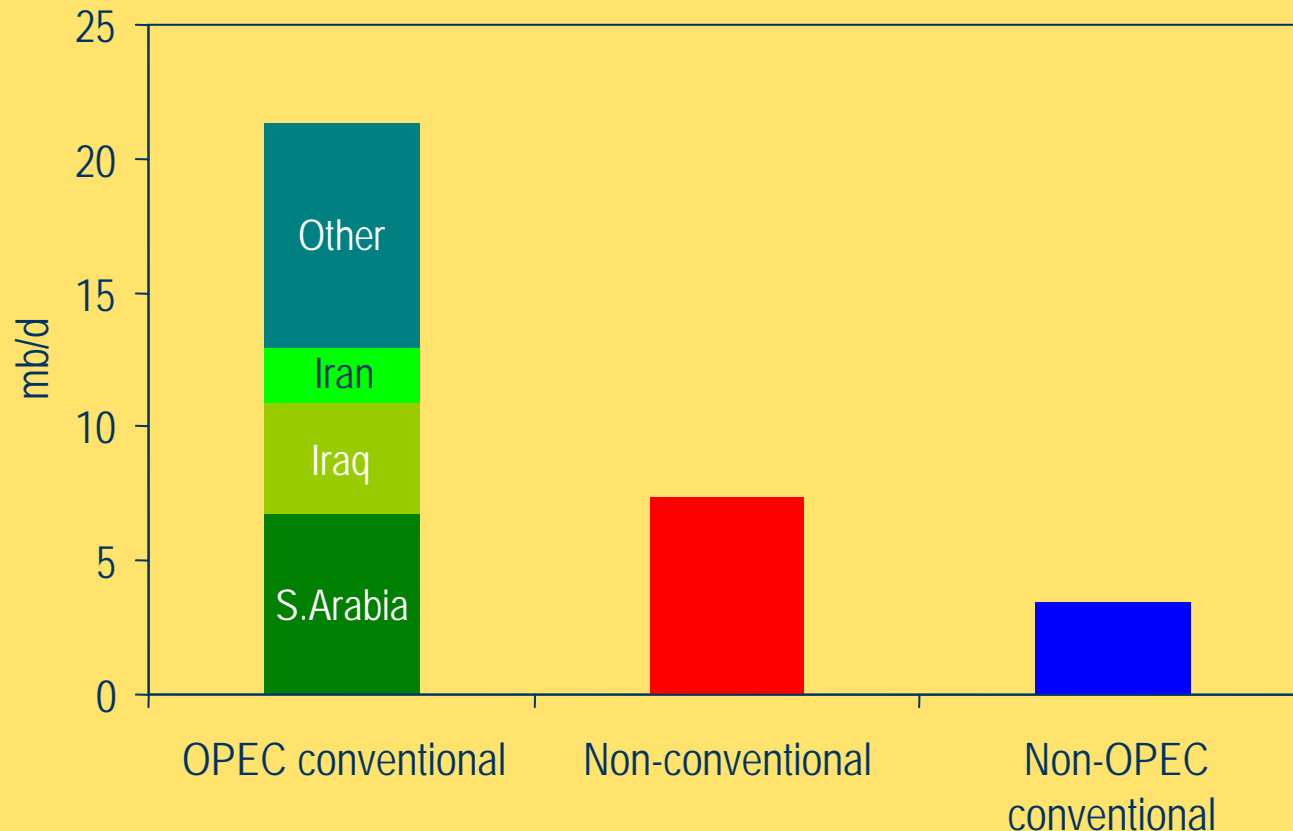
China sees the biggest jump in oil imports in absolute terms, import dependency reaching nearly 80% in 2030

China's Oil Demand: Medium and High Economic Growth Scenarios



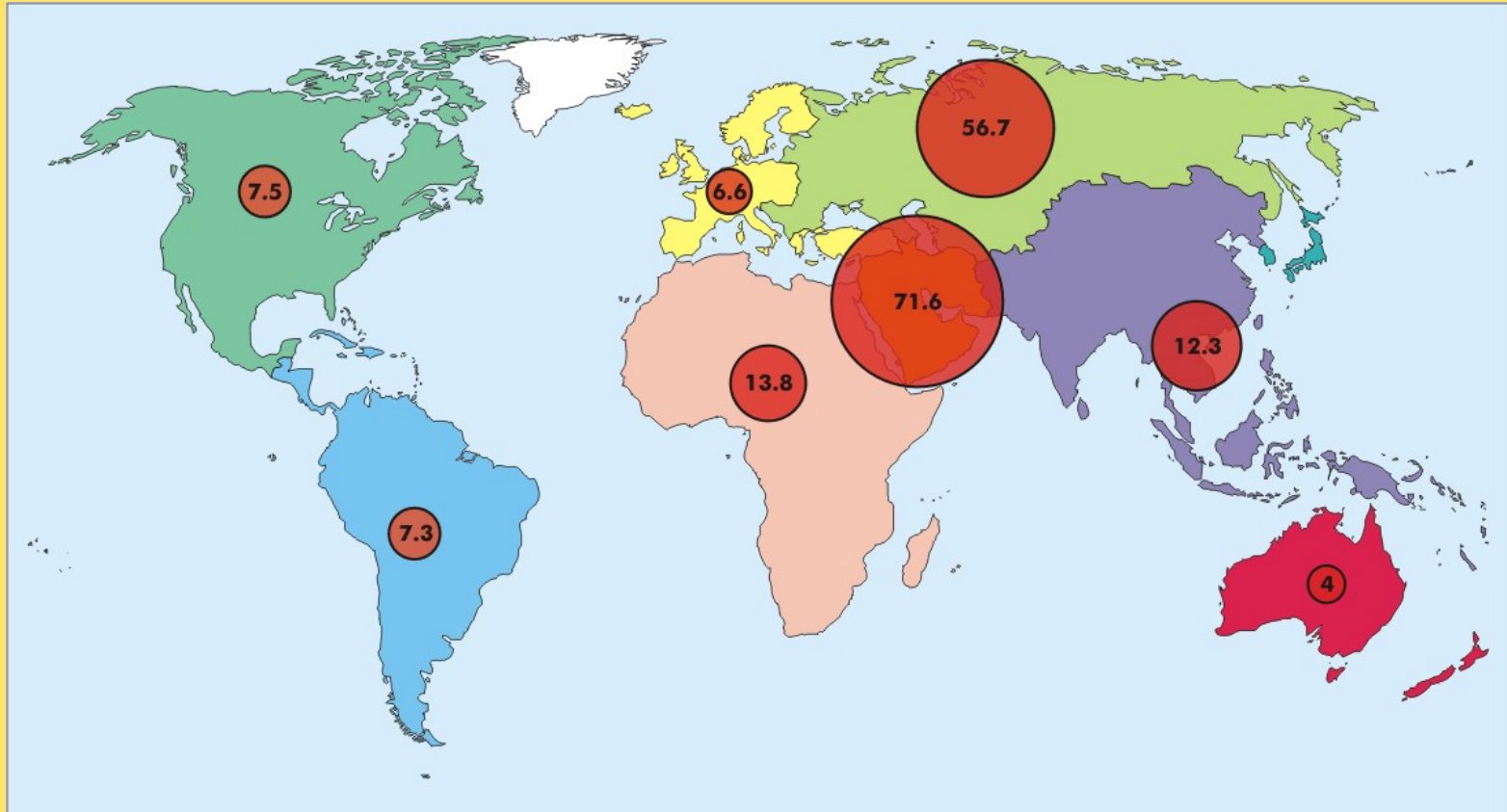
China's 2 % point higher economic growth will bring in 2030 additional oil demand more than the growth from OECD

Reference Scenario: Increase in World Oil Supply, 2005-2030



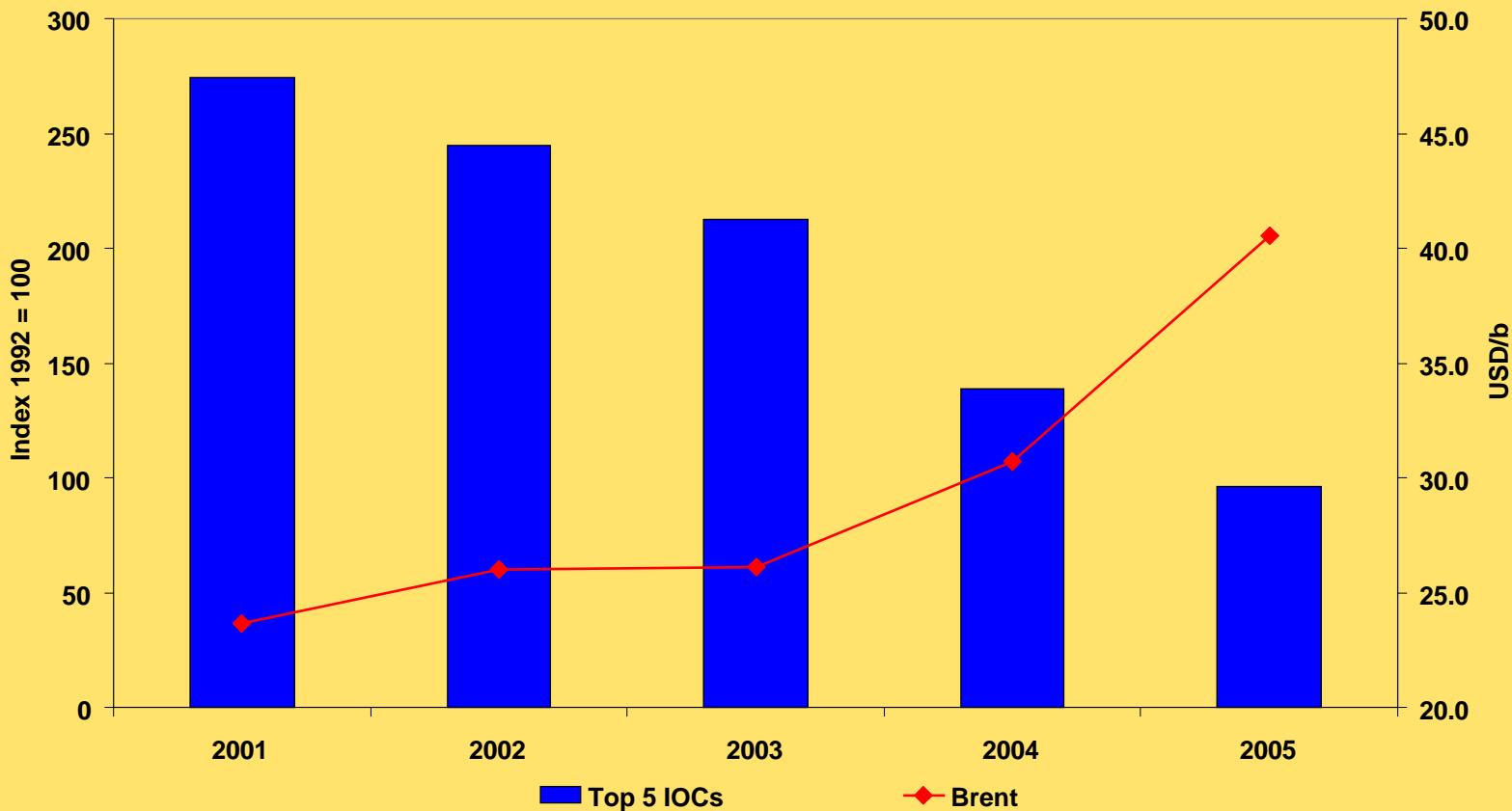
The share of OPEC in world oil supply increases sharply as conventional non-OPEC production peaks towards the middle of next decade

Proven Natural Gas Reserves



Gas reserves are concentrated in FSU and MENA regions – Russia and Iran together account almost half of global gas reserves

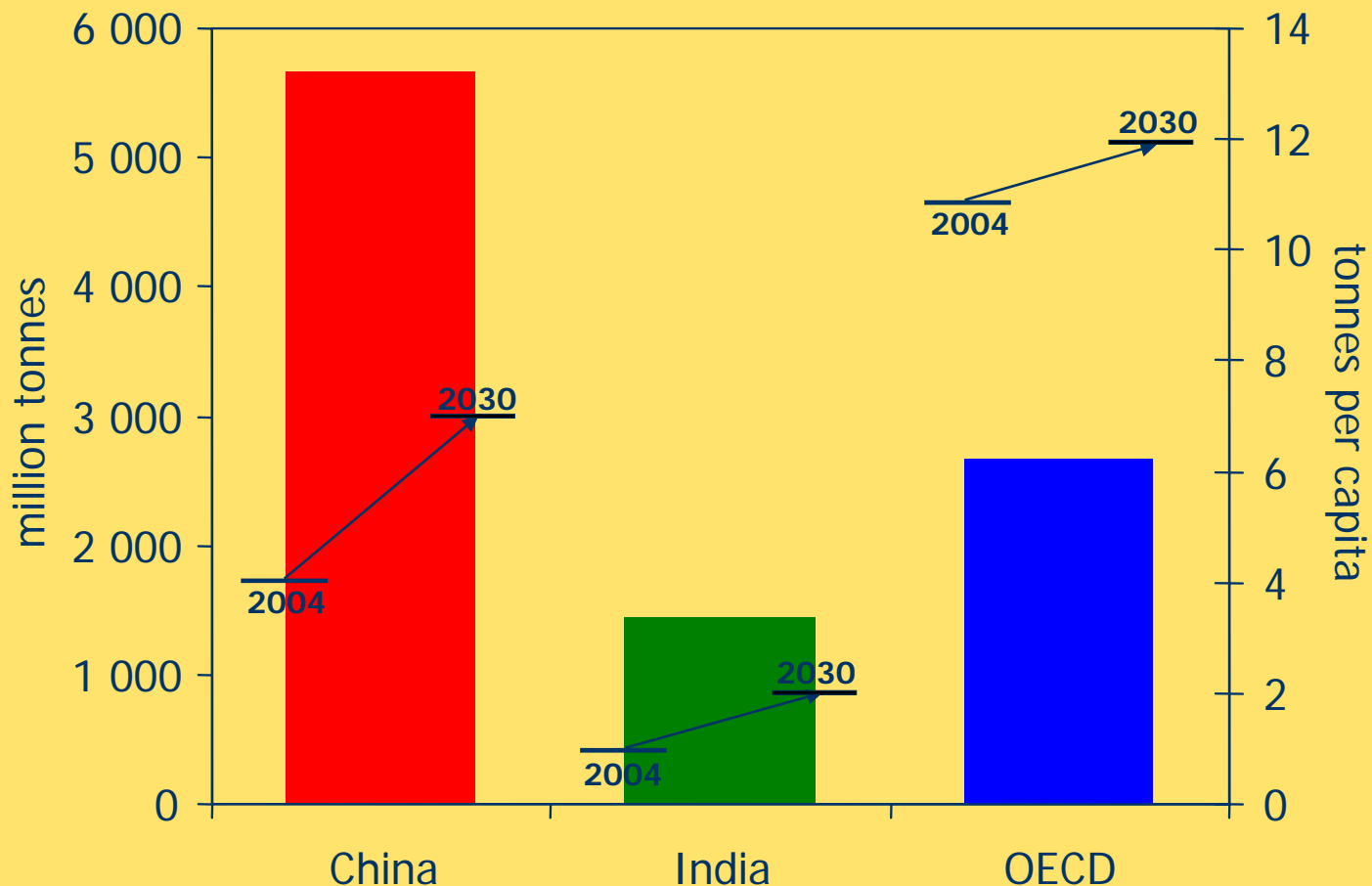
Top 5 IOC's Average Reserves Replacement Ratio



The current reserve replacement ratio of top 5 IOCs has fallen, and its becoming more difficult to replace reserves despite rising oil prices

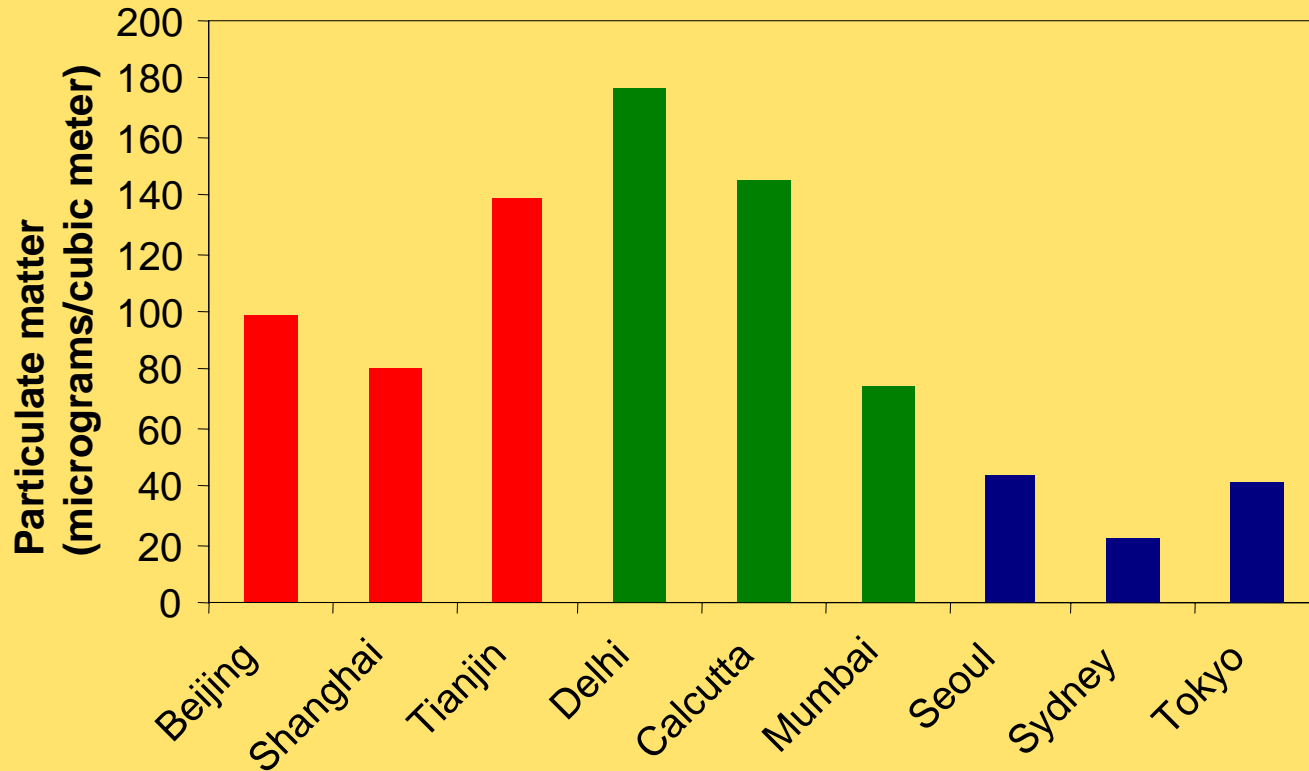
Challenge 2: Environmental Sustainability

CO₂ Emissions Growth 2004-2030



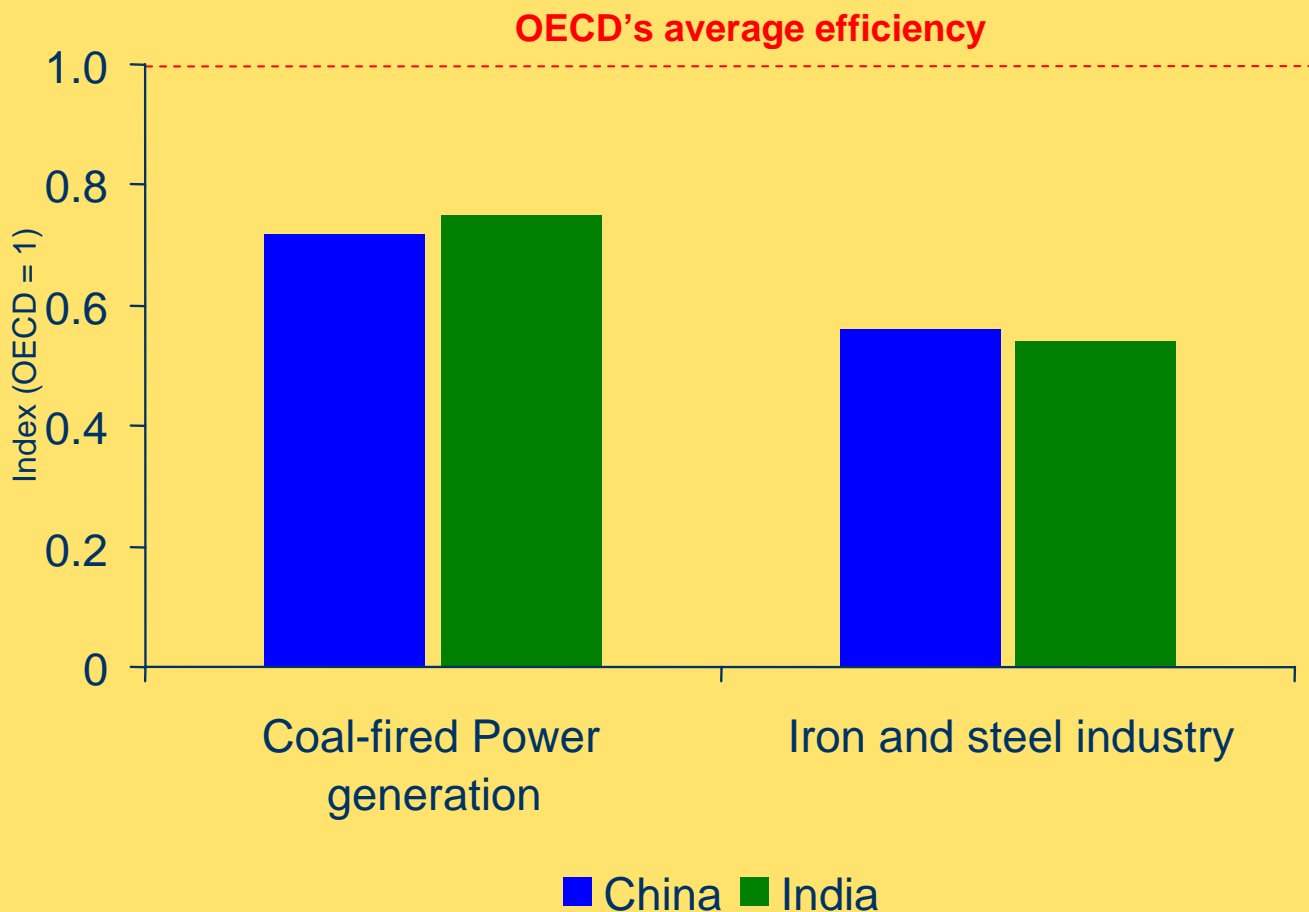
Emissions growth in China is twice as large as in the OECD, but in 2030 per capita emissions will still be lower than current OECD ones

Air Pollution in selected cities in Asia-Pacific Region



Twenty of the 30 most polluted cities in the world are located in China

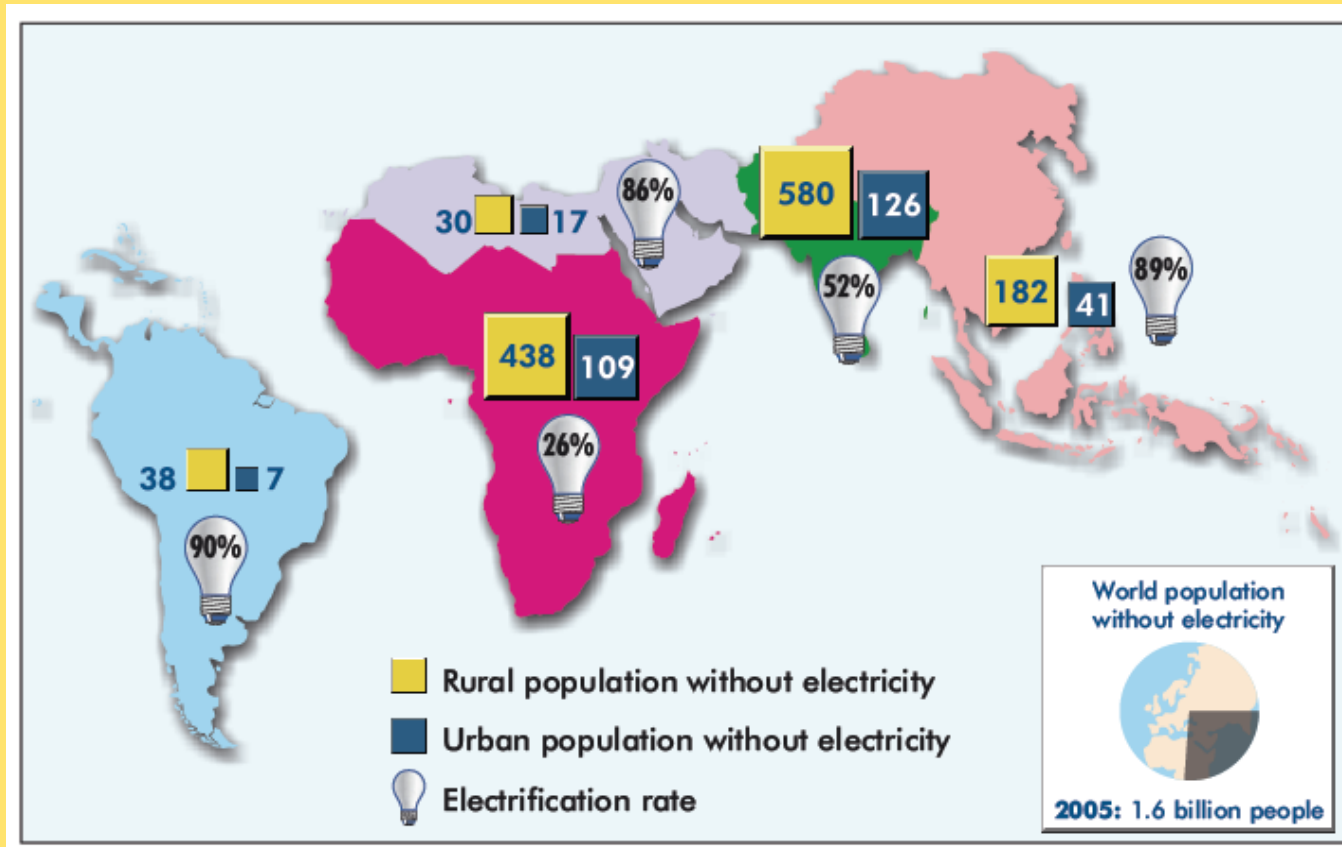
Energy Efficiency in selected sectors in China and India compared with OECD



Energy efficiency in China and India has generally improved in recent years, but it is still well below the OECD averages

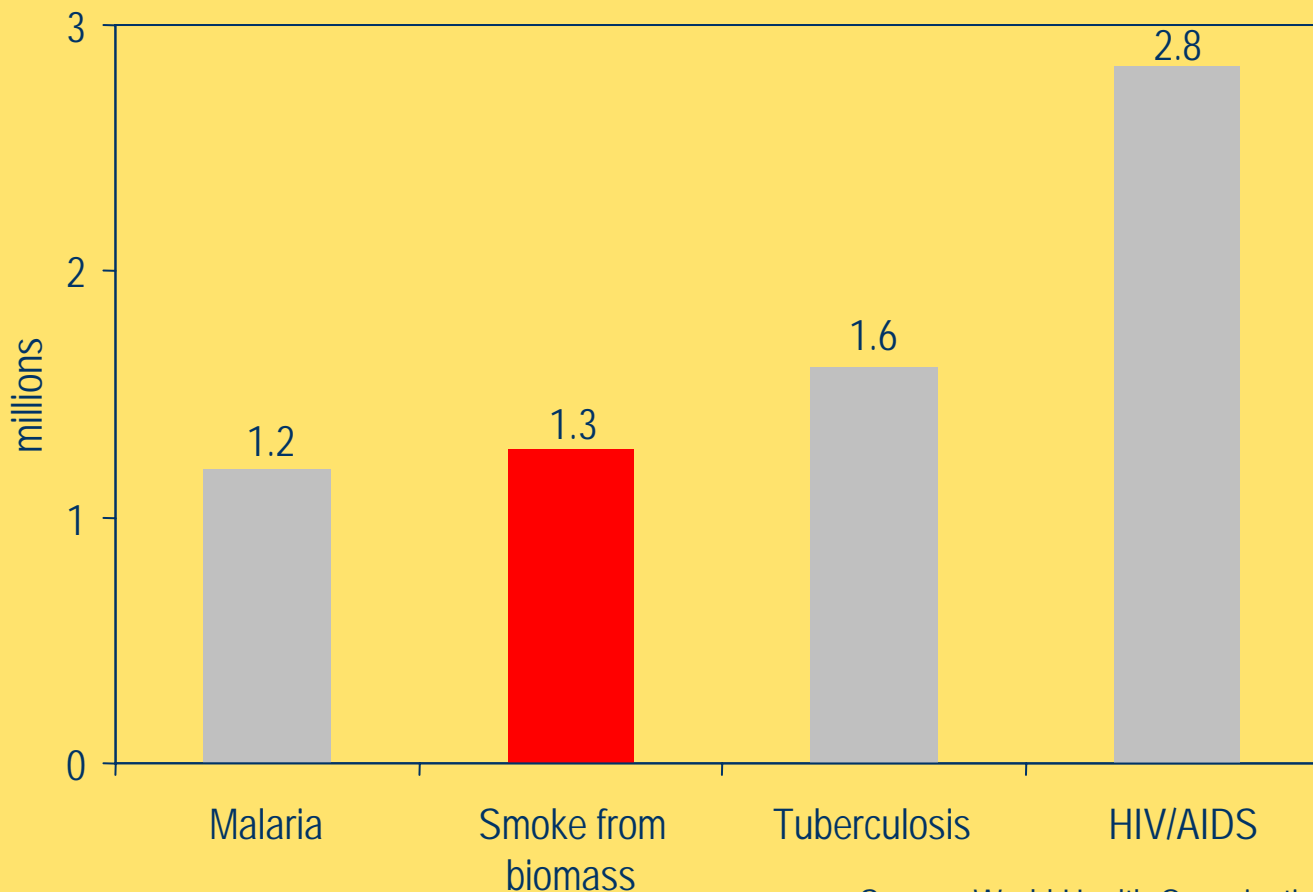
Challenge 3: Energy and Poverty

Population without electricity, 2005



To achieve the Millennium development Goals, the number of people without access to electricity would need to fall to under a billion by 2015

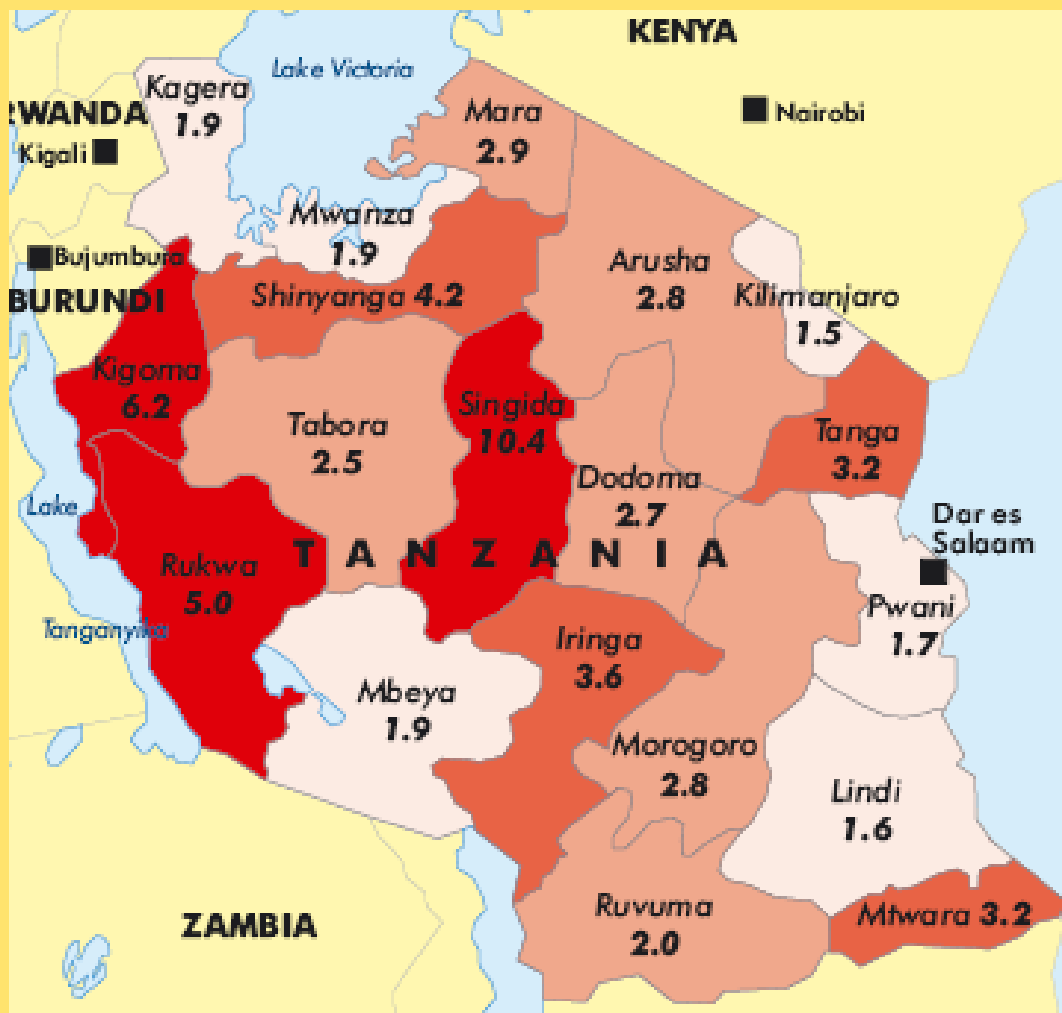
Energy Poverty: Annual Deaths from Indoor Air Pollution



Source: World Health Organization

The number of people using dirty traditional biomass for cooking is set to grow from 2.5 billion now to 2.7 billion in 2030 absent new policies

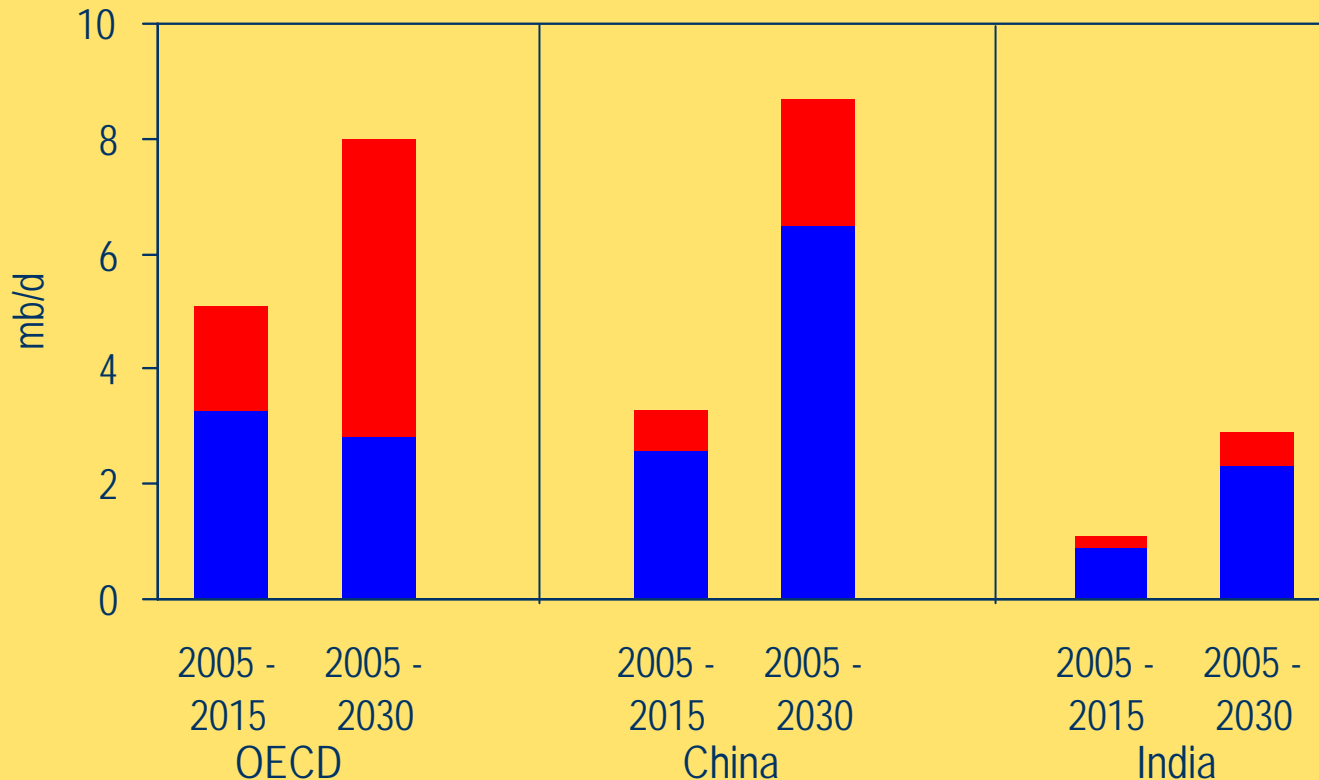
Distance Travelled to Collect Fuelwood





Alternative Policy Scenario

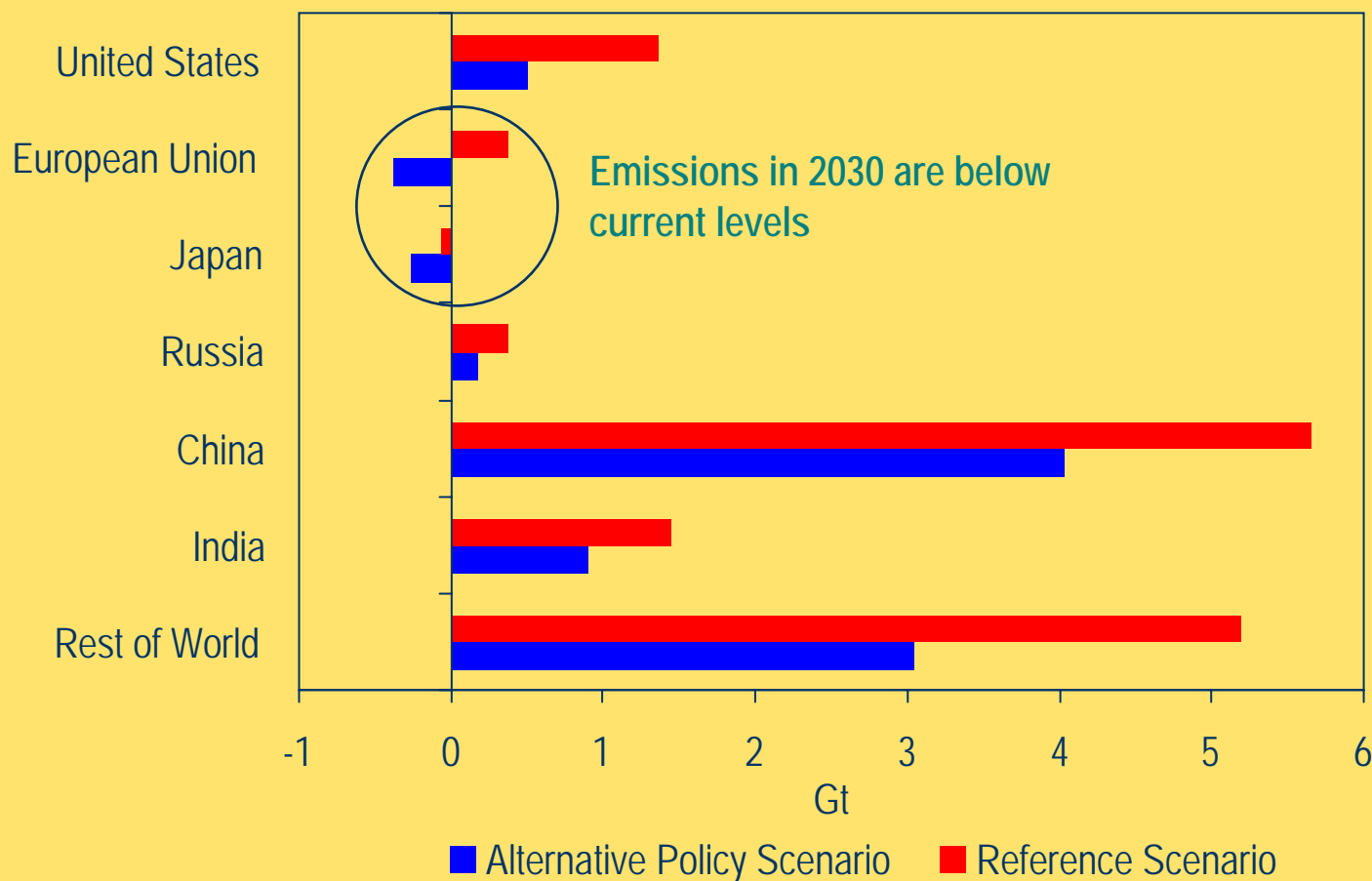
Alternative Policy Scenario: Increase in Net Oil Imports, 2005-2030



■ Alternative Policy Scenario ■ Savings compared with Reference Scenario

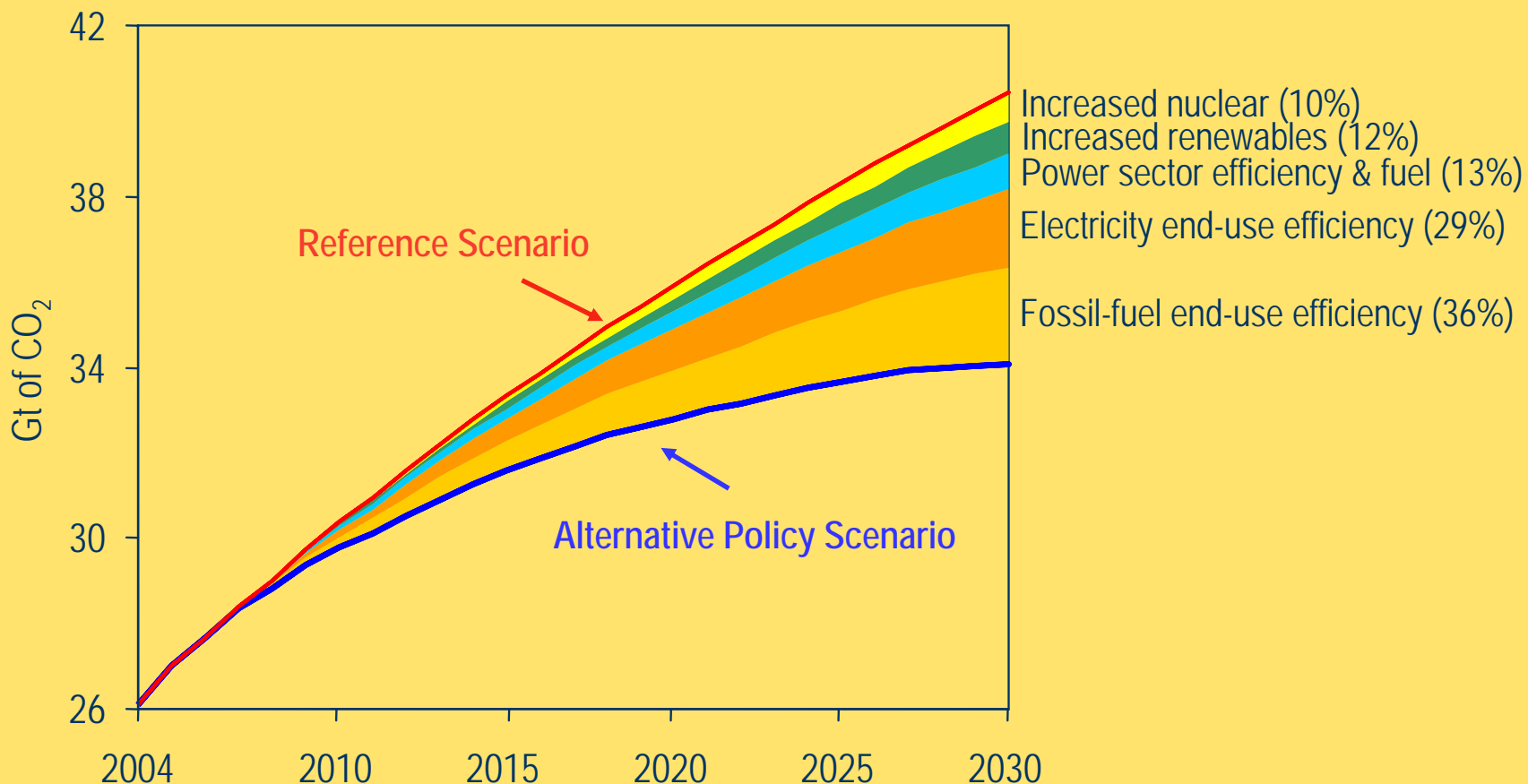
The rise in China and India oil imports can be significantly tempered in the Alternative Policy Scenario

Alternative Policy Scenario: Change in Energy-Related CO₂ emissions, 2004-2030



Emissions in OECD countries peak by 2015 and then decline – below 1990 levels by 2030 in the EU

The Alternative Policy Scenario: Key Policies for Global CO₂ Reduction



Improved end-use efficiency accounts for over two-thirds of avoided emissions in 2030 in the APS

Alternative Policy Scenario : Key policies that Make a Global Difference

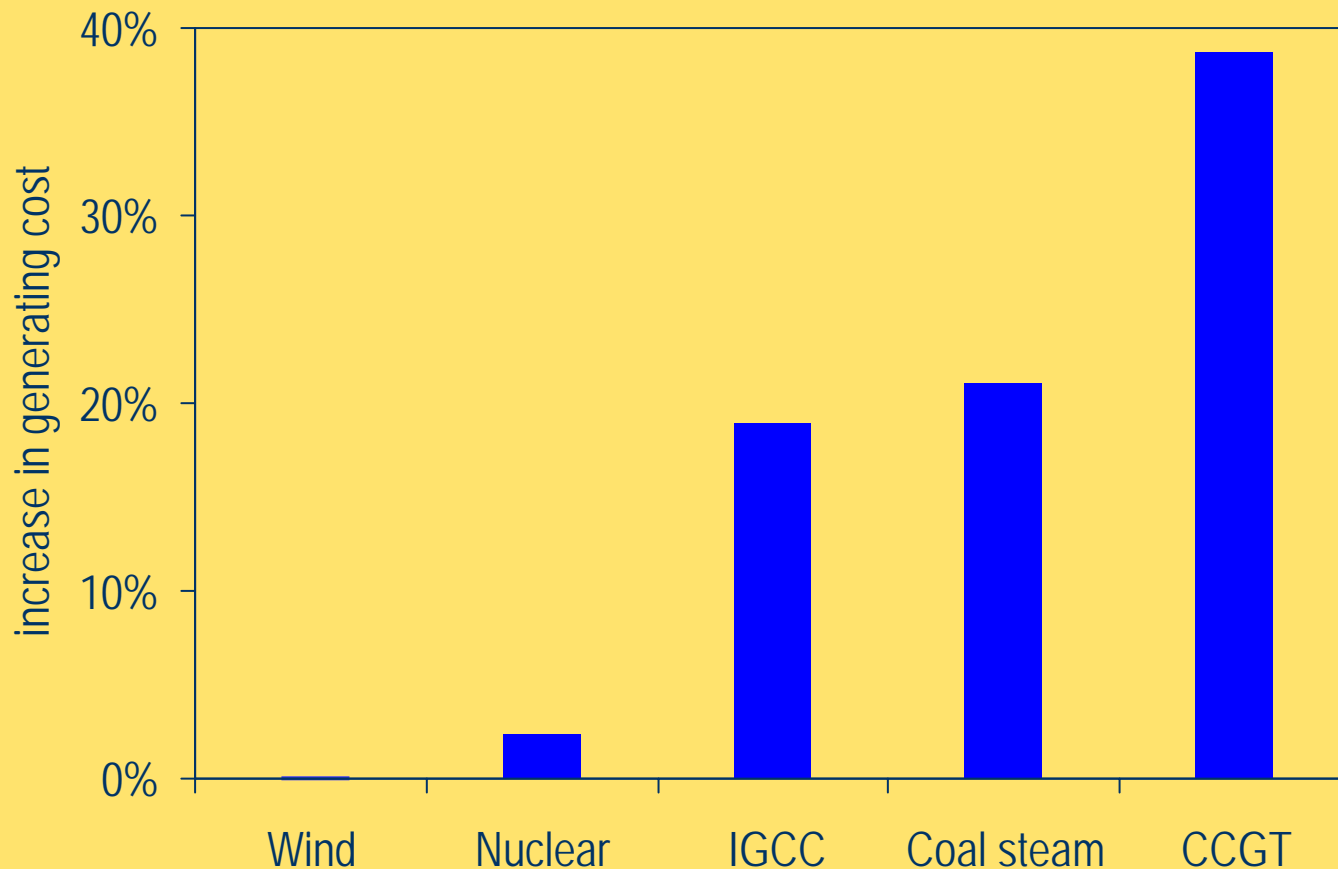
	<i>Energy efficiency</i>	<i>Power generation</i>
US	<ul style="list-style-type: none"> ● Tighter CAFE standards ● Improved efficiency in residential & commercial sectors 	<ul style="list-style-type: none"> ● Increased use of renewables
EU	<ul style="list-style-type: none"> ● Increased vehicle fuel economy ● Improved efficiency in electricity use in the commercial sector 	<ul style="list-style-type: none"> ● Increased use of renewables
China	<ul style="list-style-type: none"> ● Improved efficiency in electricity use in industry ● Improved efficiency in electricity use in the residential sector 	<ul style="list-style-type: none"> ● Increased efficiency of coal-fired plants ● Increased use of renewables ● Increased reliance on nuclear
India	<ul style="list-style-type: none"> ● Minimum requirements for energy-efficient design of buildings ● Improved efficiency in iron and steel sector 	<ul style="list-style-type: none"> ● Increased use of renewables ● Reduced transmission and distribution losses

Just fifteen policies in the US, EU, China and India account for over 40% of the global emissions reduction in 2030 in the Alternative Policy Scenario

Renewed Interest in Nuclear Power

- Growing concerns over energy security, surging fossil-fuel prices & rising carbon emissions
- Positive aspects of nuclear power
 - ❑ *proven technology for large-scale baseload electricity generation*
 - ❑ *reduce dependence on imported gas*
 - ❑ *no emissions of greenhouse gases or local pollutants*
 - ❑ *produces electricity at competitive & stable cost*
 - ❑ *uranium resources abundant & widespread*
- But governments need to play a stronger role in facilitating investment where nuclear is accepted

Impact of a 50% Increase in Fuel Price on Generating Costs

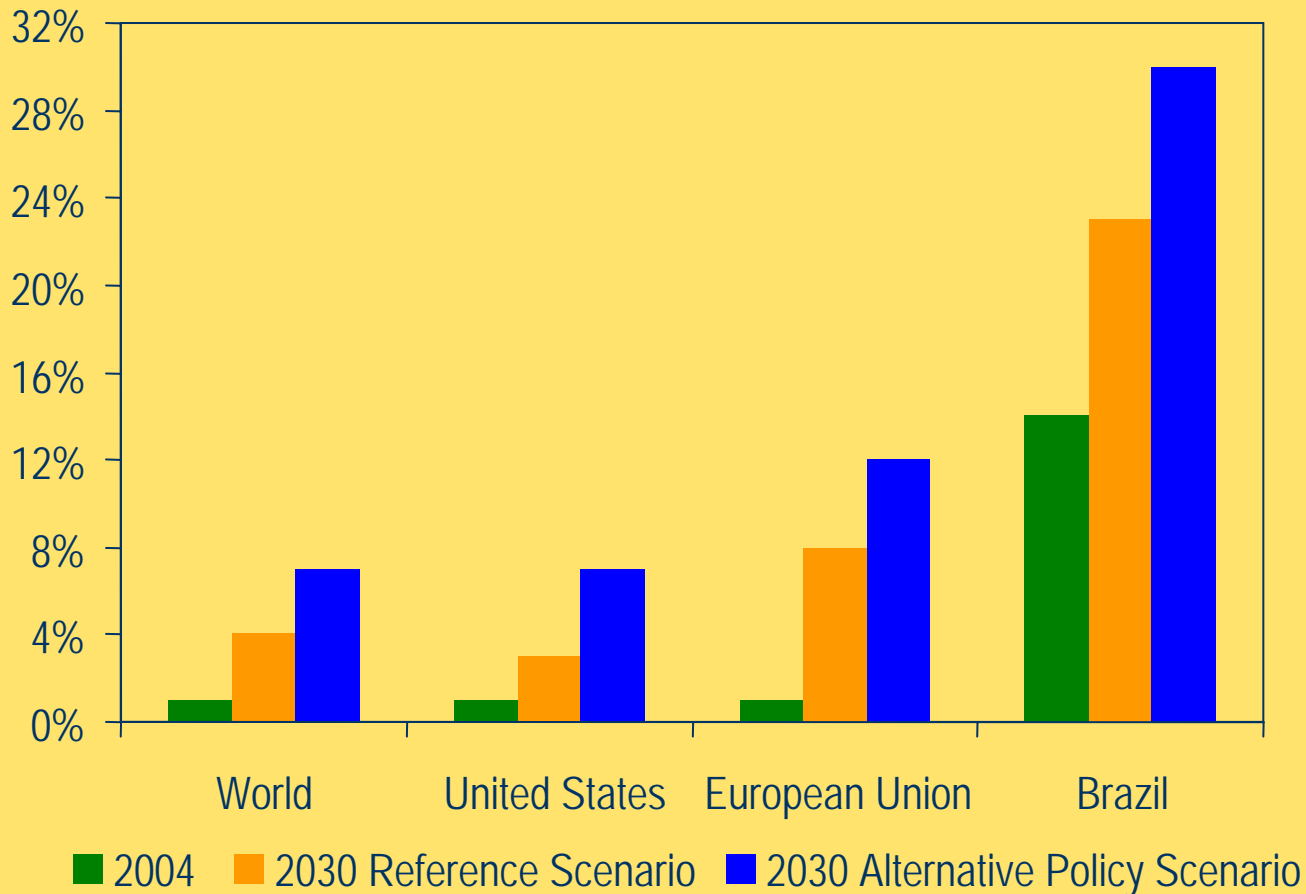


Nuclear generating costs are far less sensitive to fuel price increases than gas or coal plants

Outlook for Biofuels

- Interest in biofuels is soaring
- Biofuels can help address twin threats of growing energy insecurity & climate change through
 - *Increased diversity of geographic & fuel sources*
 - *Lower greenhouse-gas emissions - depending on how they are produced*
- Higher oil prices have made biofuels more competitive, but further cost reductions are needed
- Availability of arable land will constrain biofuels potential in the medium term
- Long-term prospects hinge on new technology

Share of Biofuels in Road-Transport Fuel Consumption



Biofuels are set to play a much larger role in meeting world road-transport fuel demand

Summing Up

- **A rapidly growing portion of energy/oil demand rise will come from Developing Asia**
- **The pace of this growth will hinge on the pace and nature of the economic development and energy prices**
- **Implementation of new policies in Developing Asia has significant consequences for rest of the world**
- **WEO 2007: Dedicated to China – India and their impact on world energy markets and environment**