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# World Energy Outlook 2004

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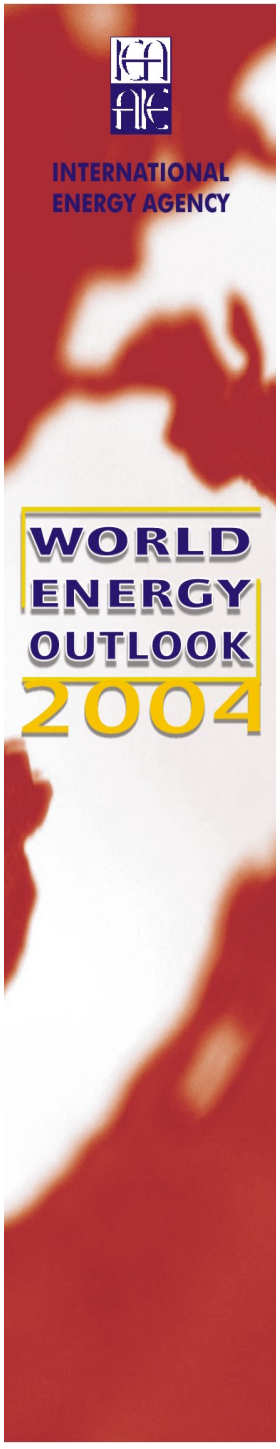
**International Energy Agency**

## *Methane to Markets Ministerial Meeting*

***November 15-17, 2004, Washington DC***




# Energy Market Context

- **International energy markets in turmoil:**
  - Soaring demand and imports in China
  - Heightened geo-political tensions in Middle East, West Africa, Russia and Venezuela
  - Surging energy prices threatening economic growth
  - Carbon-dioxide emissions rising rapidly
- **Current market instability and uncertainties complicate preparation of long-term projections**

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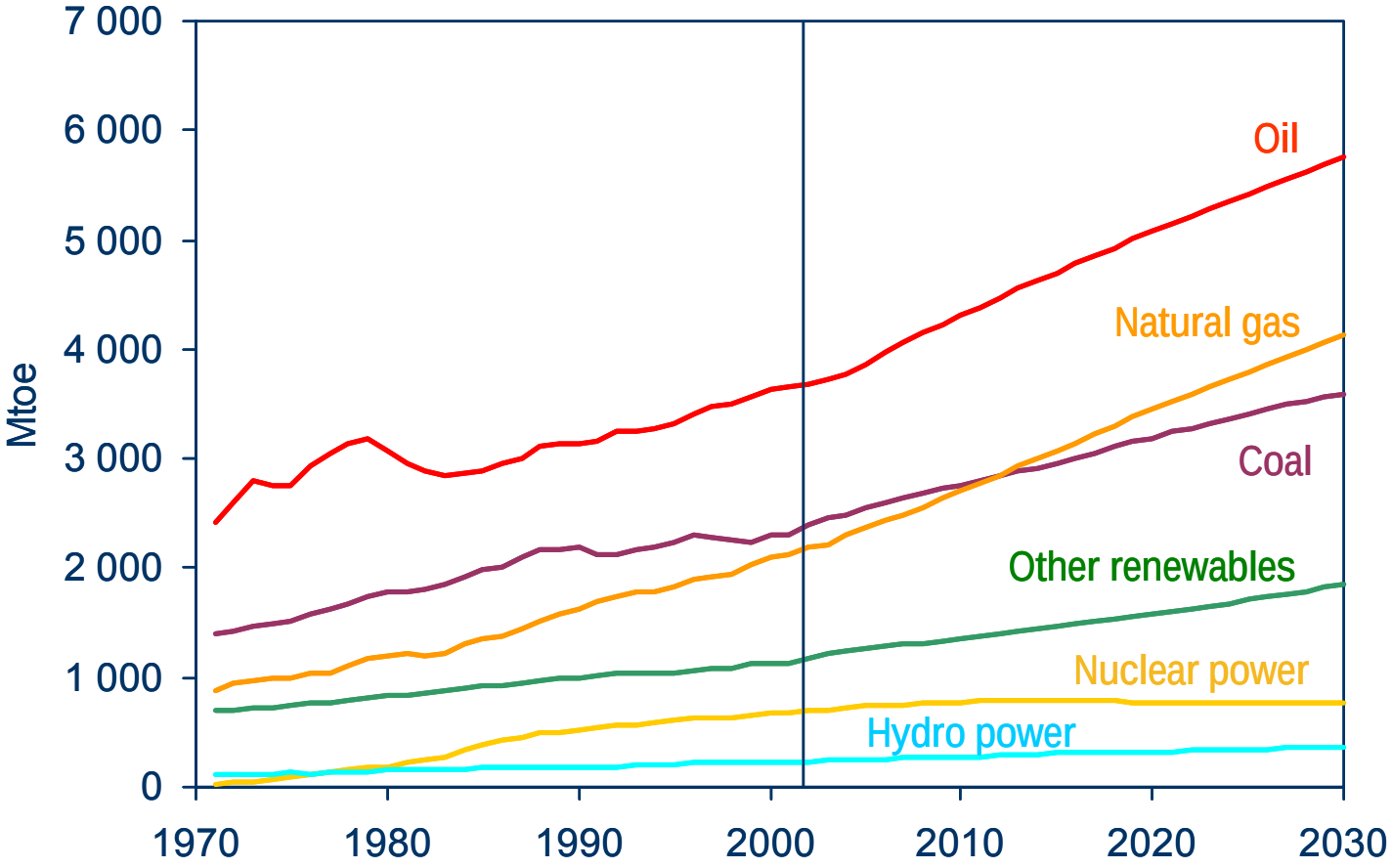
# World Primary Energy Demand




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

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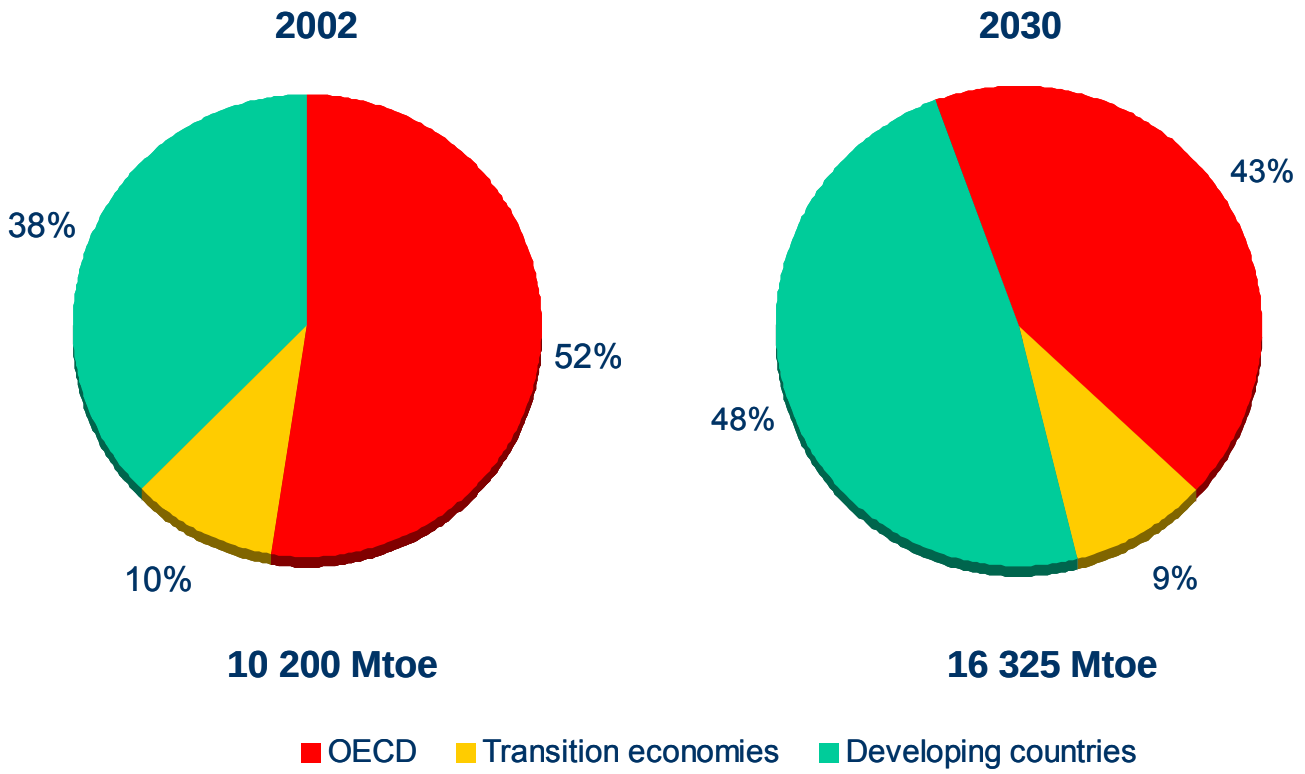
# Regional Shares in World Primary Energy Demand




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

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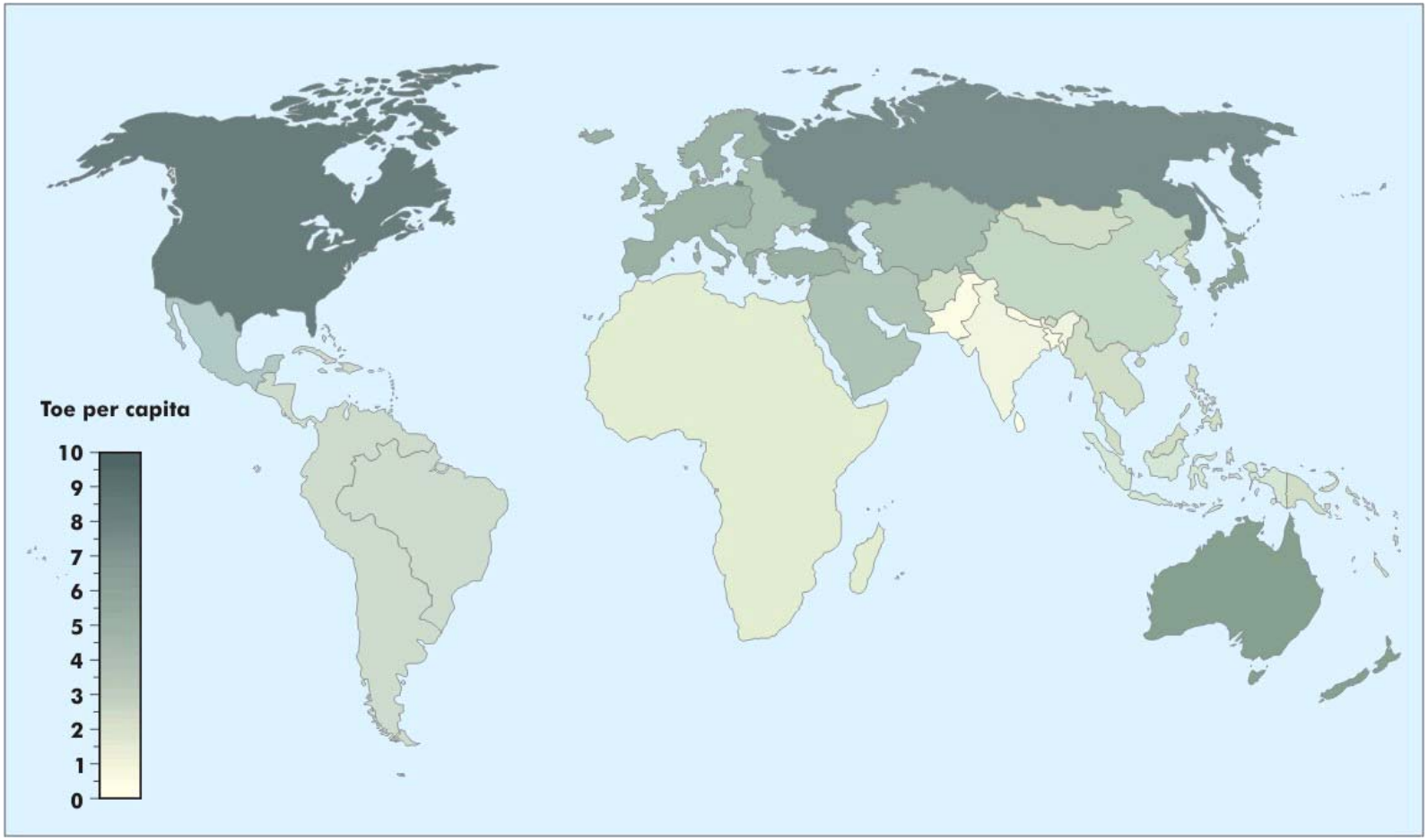
# Per Capita Primary Energy Use, 2030




**Per capita energy use remains far higher in Northern hemisphere, especially in North America and Russia**

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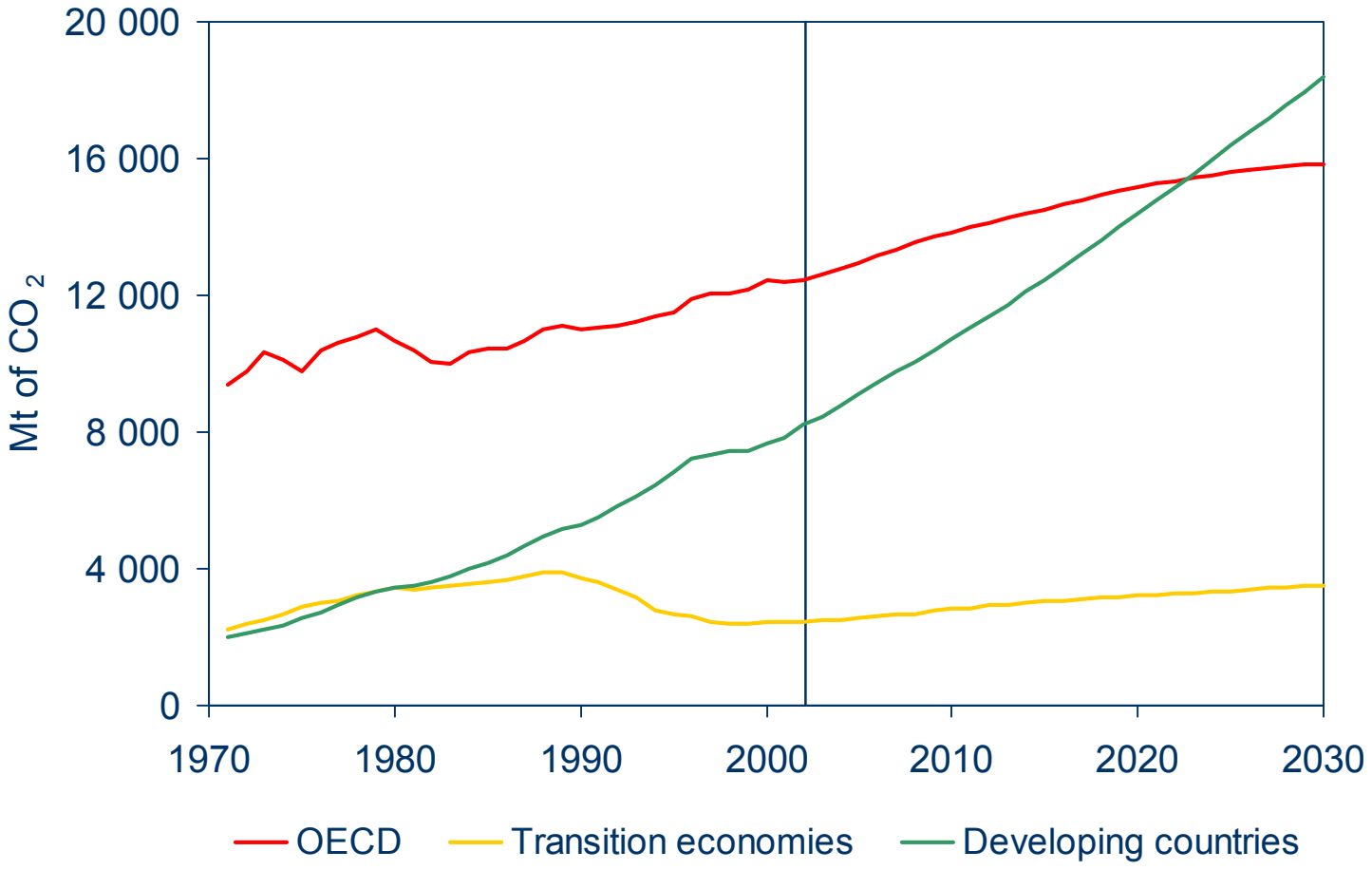
# $CO_2$ Emissions, 1971-2030




**$CO_2$ emissions will increase fastest in developing countries, overtaking OECD in the 2020s**

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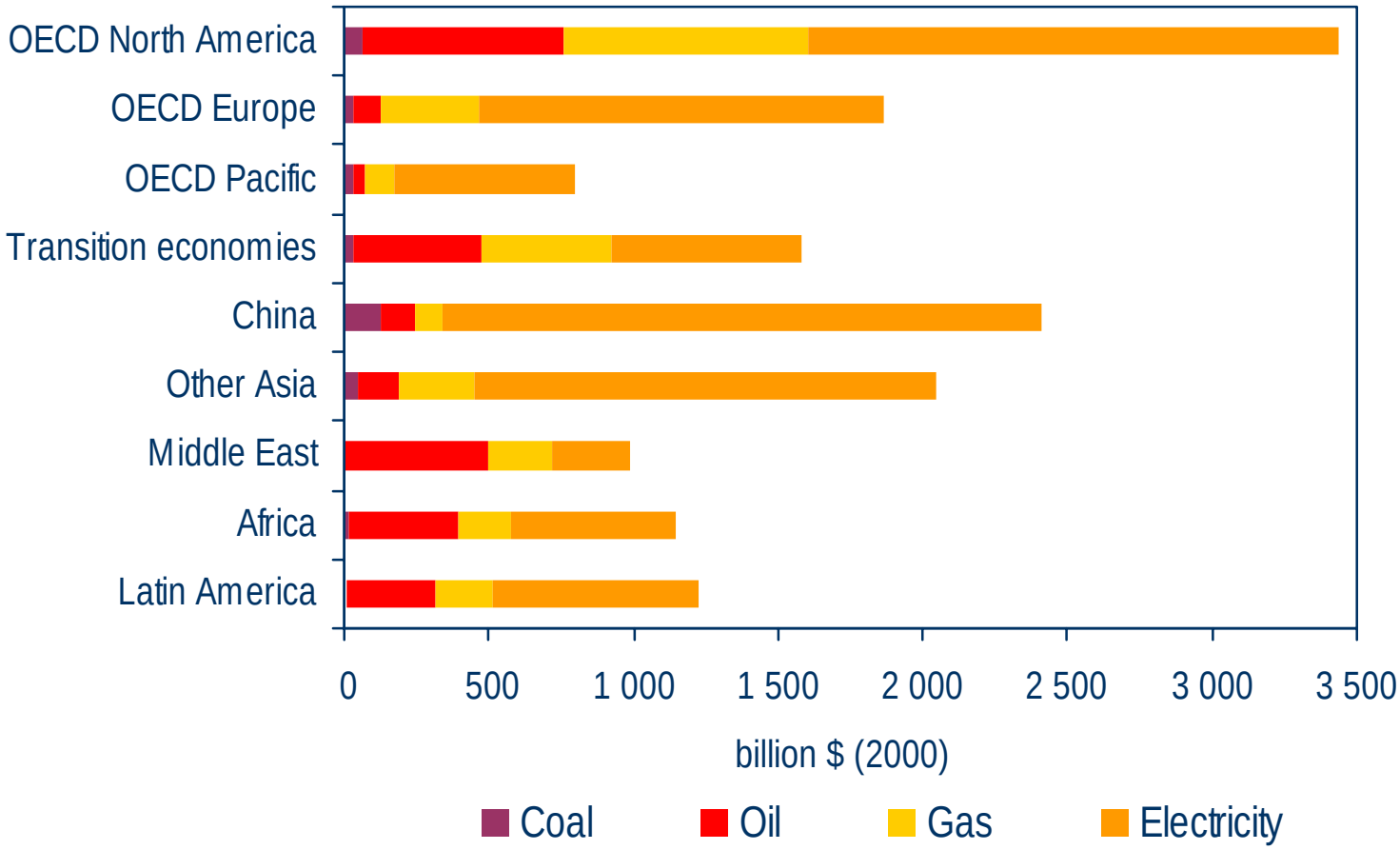
# Cumulative Energy Investment, 2003-2030




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

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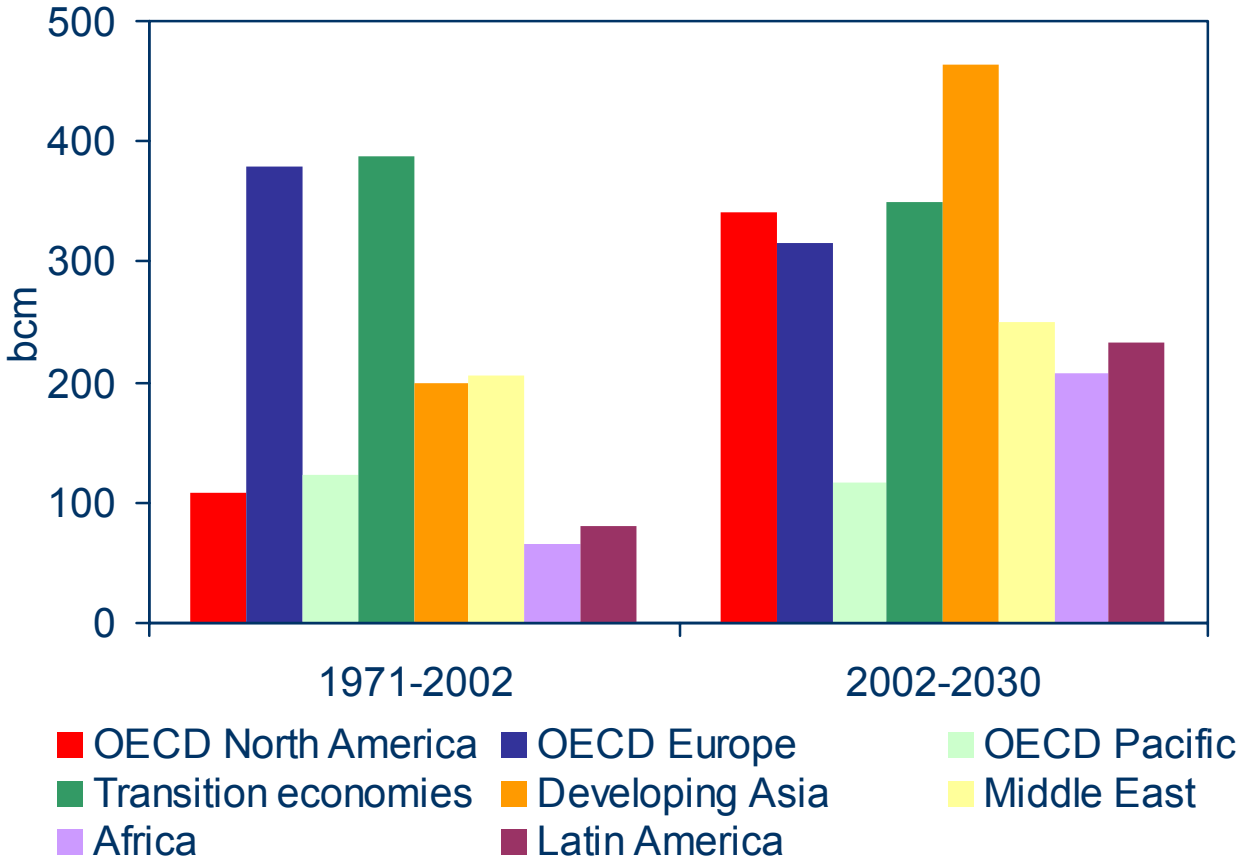
# Increase in World Primary Gas Demand by Major Region




**Most regions see an acceleration in gas use, especially in developing Asia**

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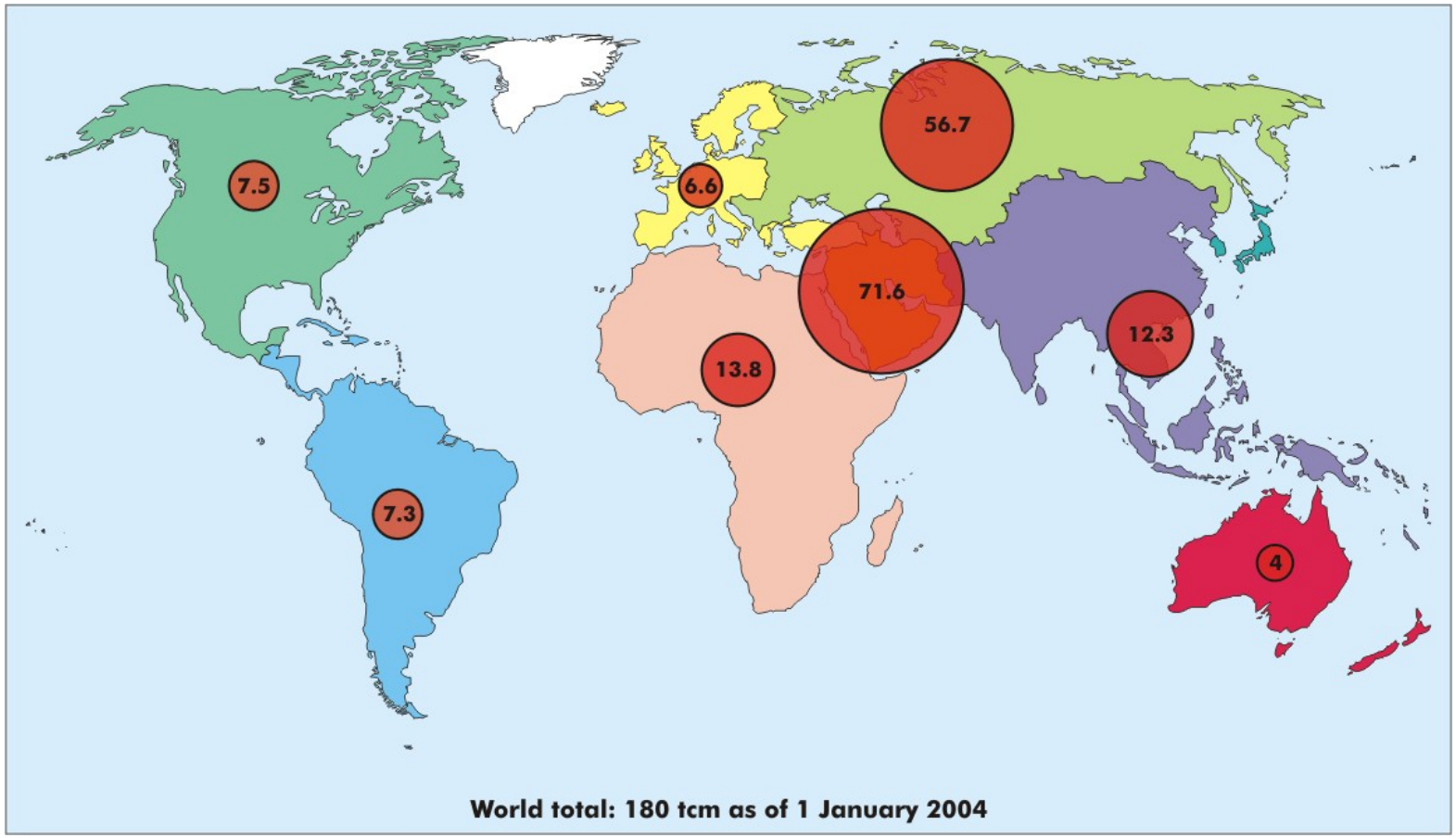
# Proven Natural Gas Reserves




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

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# World Alternative Policy Scenario

- **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
- **Basic macroeconomic & population assumptions as for Reference Scenario, but energy prices change**

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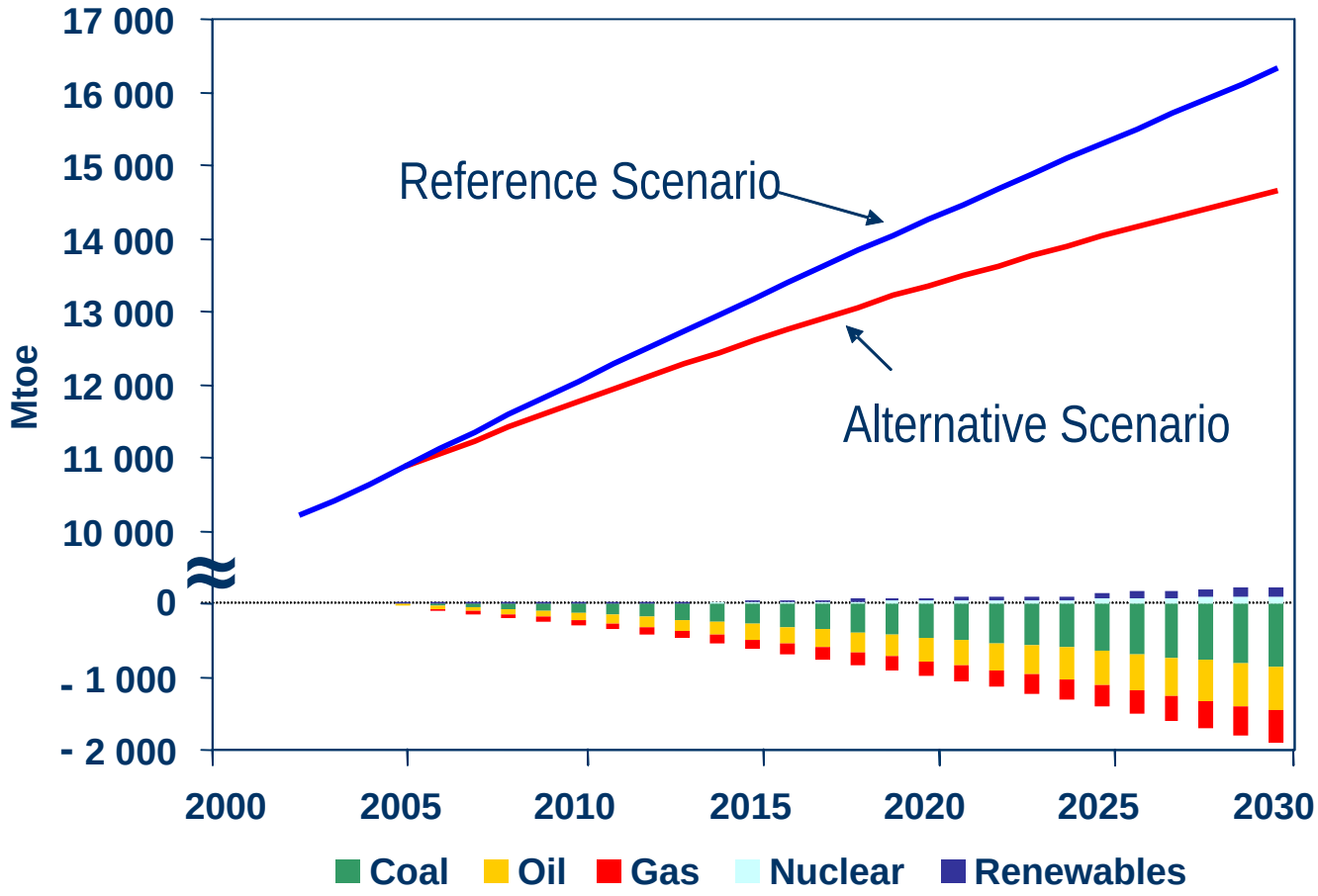
# World Primary Energy Demand in Reference & Alternative Scenarios




**Coal demand falls most among fossil fuels, partially offset by more use of renewables**

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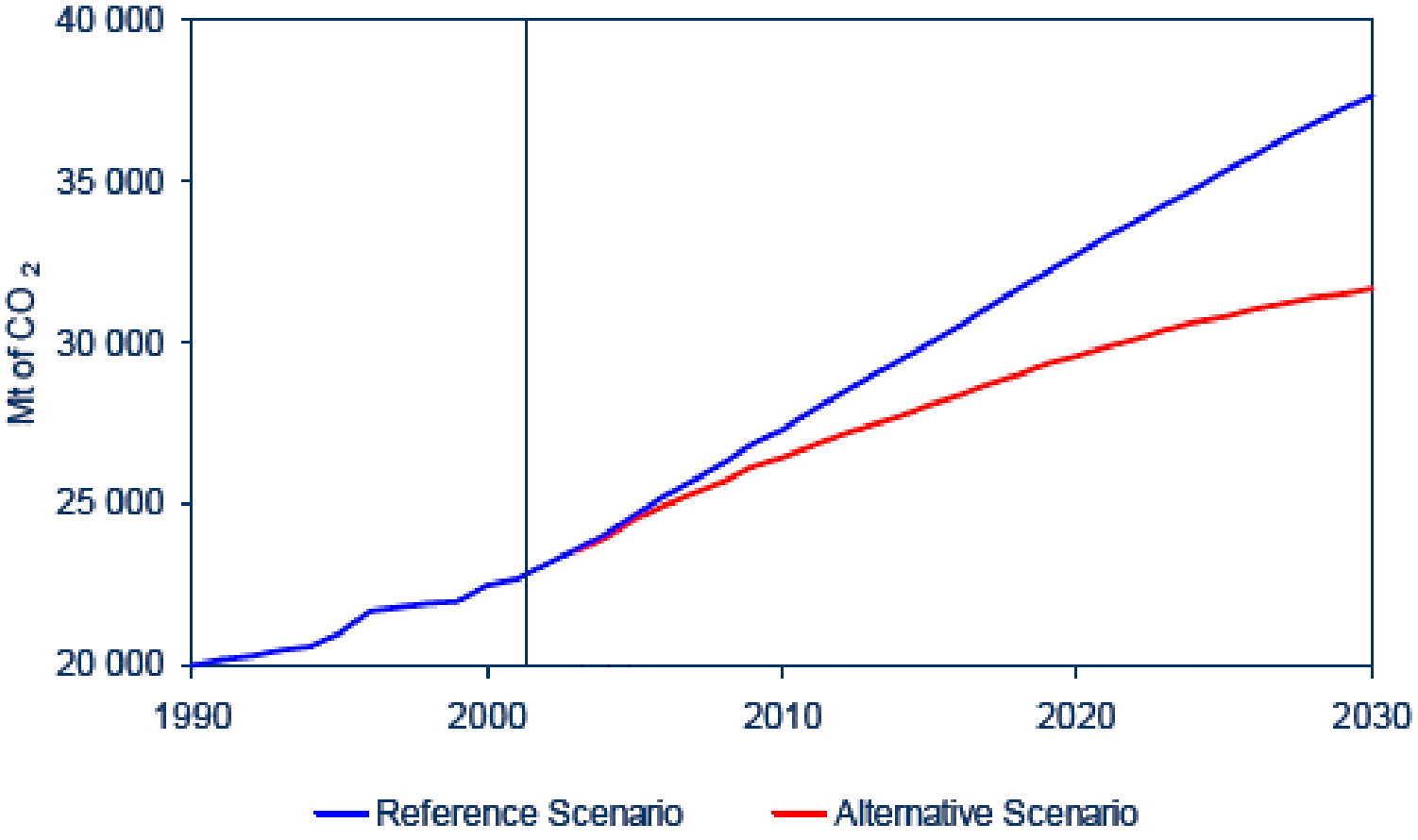
# Global CO2 Emissions in the Reference & Alternative Scenarios




**$CO_2$ emissions are 16 % less in the Alternative Scenario in 2030, a reduction of about 6 Gt of $CO_2$**

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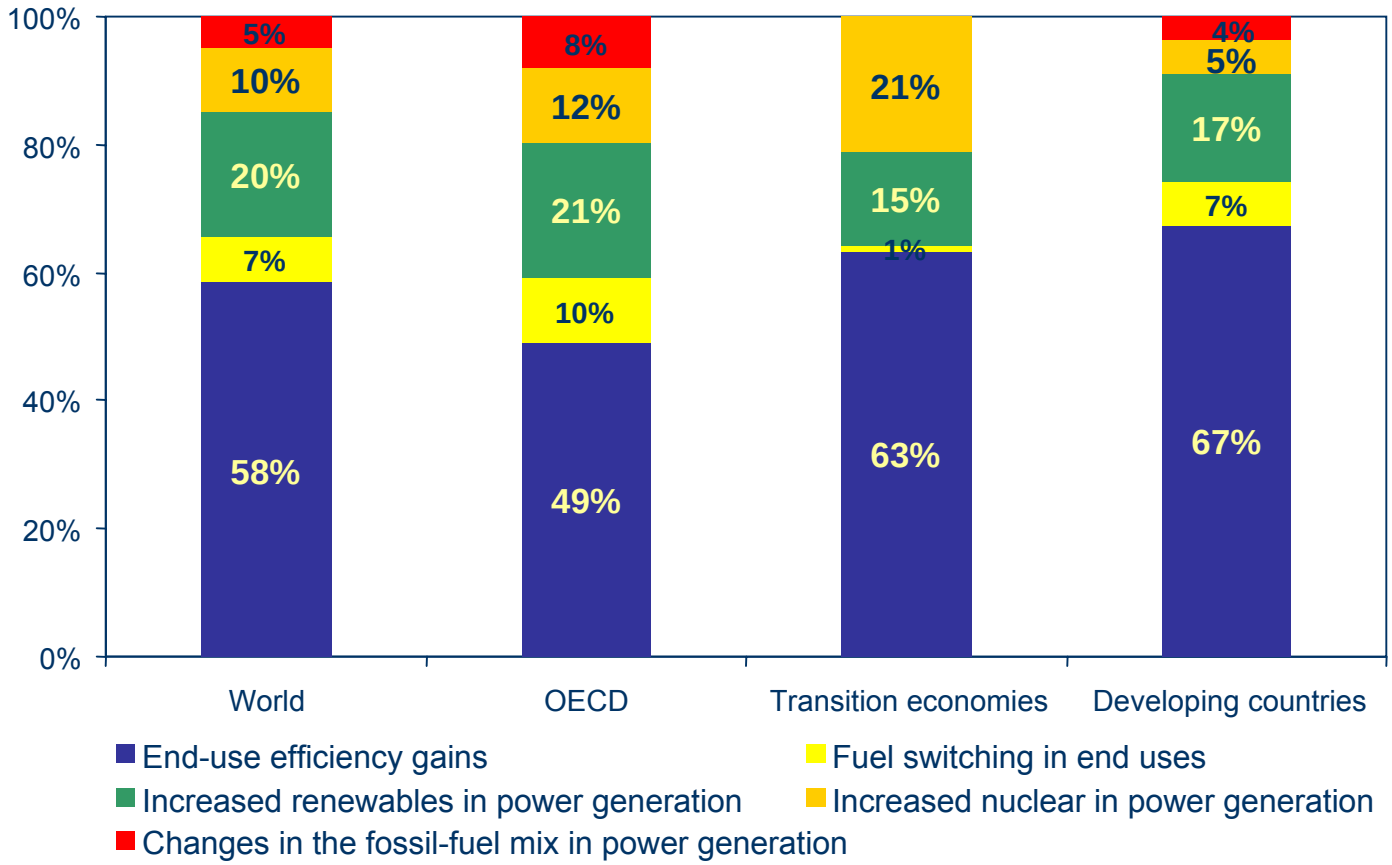
# Contributory Factors in $CO_2$ Reduction Alternative vs Reference Scenario 2002-2030




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

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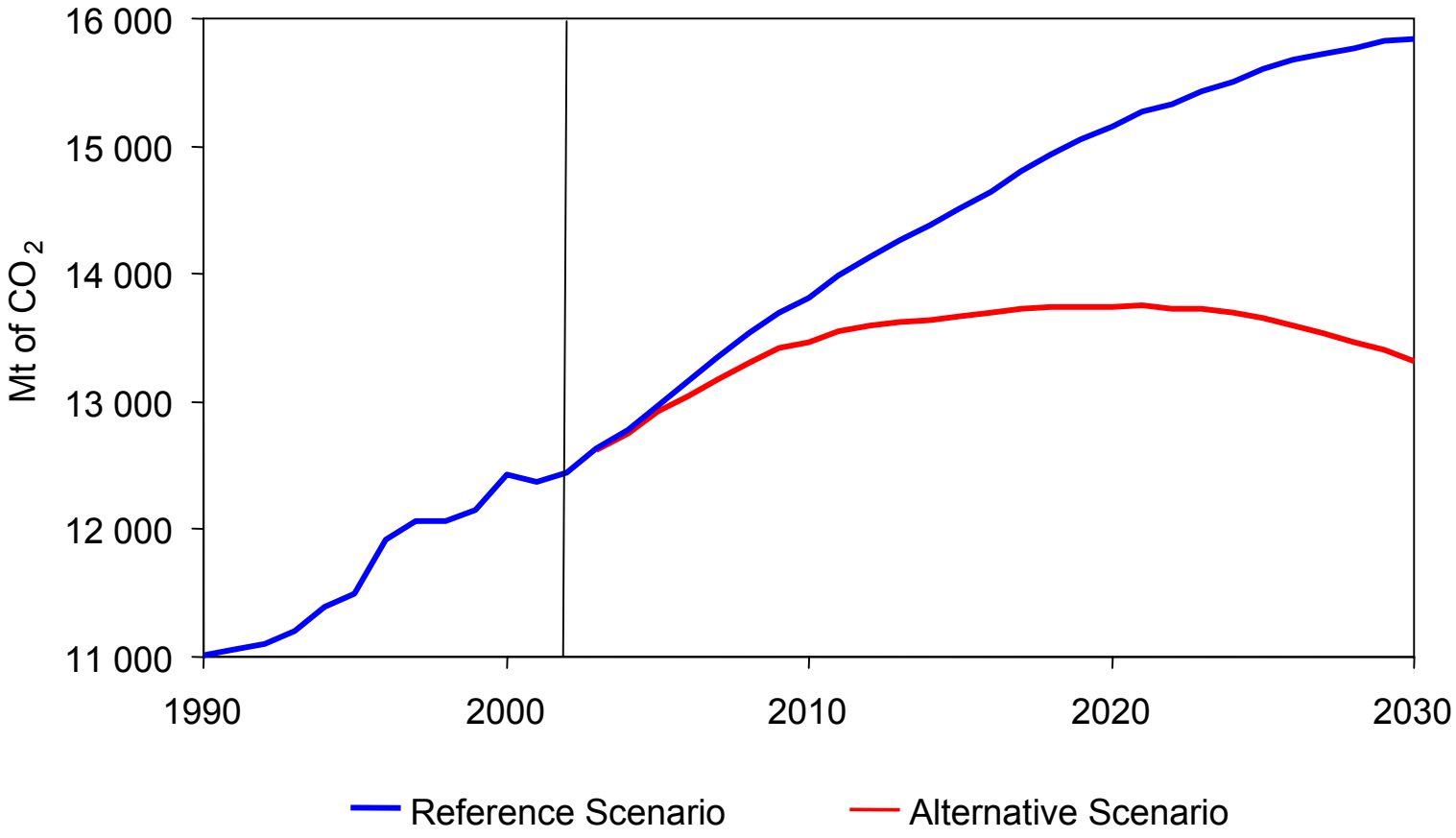
# OECD $CO_2$ Emissions in the Reference & Alternative Scenarios




**OECD $CO_2$ emissions peak around 2020, 25% higher than in 1990**

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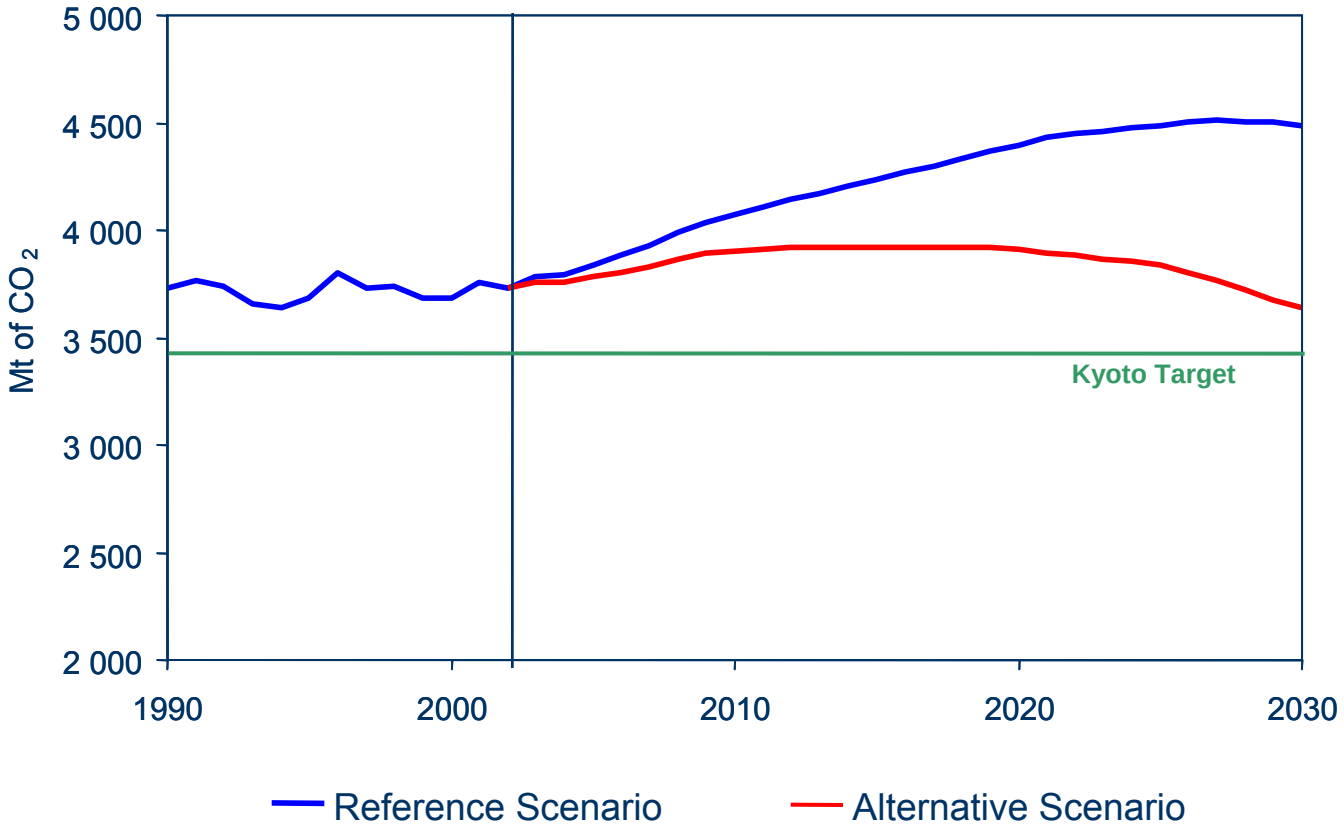
# EU $CO_2$ Emissions in the Reference & Alternative Scenarios




**With new policies, EU $CO_2$ emissions stabilise by 2010 and fall after 2020**

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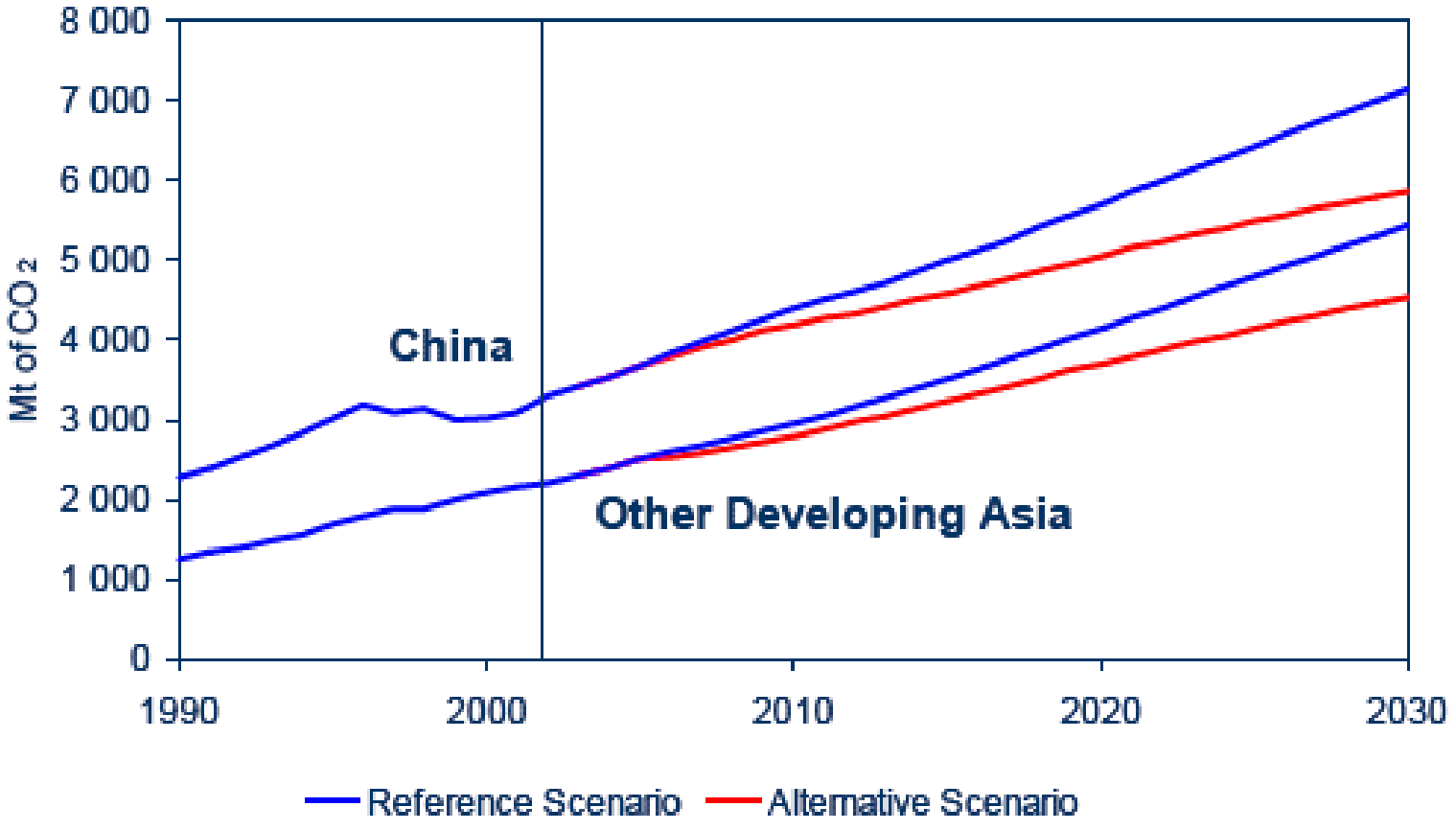
# Developing Asia $CO_2$ Emissions in the Reference & Alternative Scenarios




**With new policies, China curbs its $CO_2$ emissions by 18 % in 2030 & the rest of Developing Asia by 17 %**

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# 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 $CO_2$ 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**

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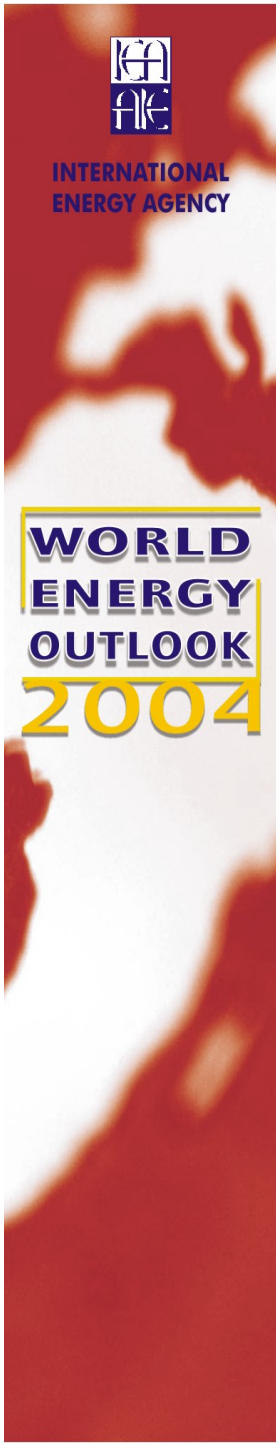
# Summary & Conclusions (2)

- **Urgent & decisive government action is needed**
- **Asia's importance to world energy markets – and its share in $CO_2$ 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**
- **The Methane Programme will contribute to both energy security and environmental sustainability**




# IEA Methane Related Activities: www.iea.org

- IEA Greenhouse Gas R+D Programme: www.ieagreen.org.uk
- Emission Reduction in the natural gas sector through project-based mechanisms (2003)
- GHG mitigation investments in Russia's Natural Gas Sector – examining economic and environmental issues (2005)
- IEA BioEnergy: www.ieabioenergy.com