

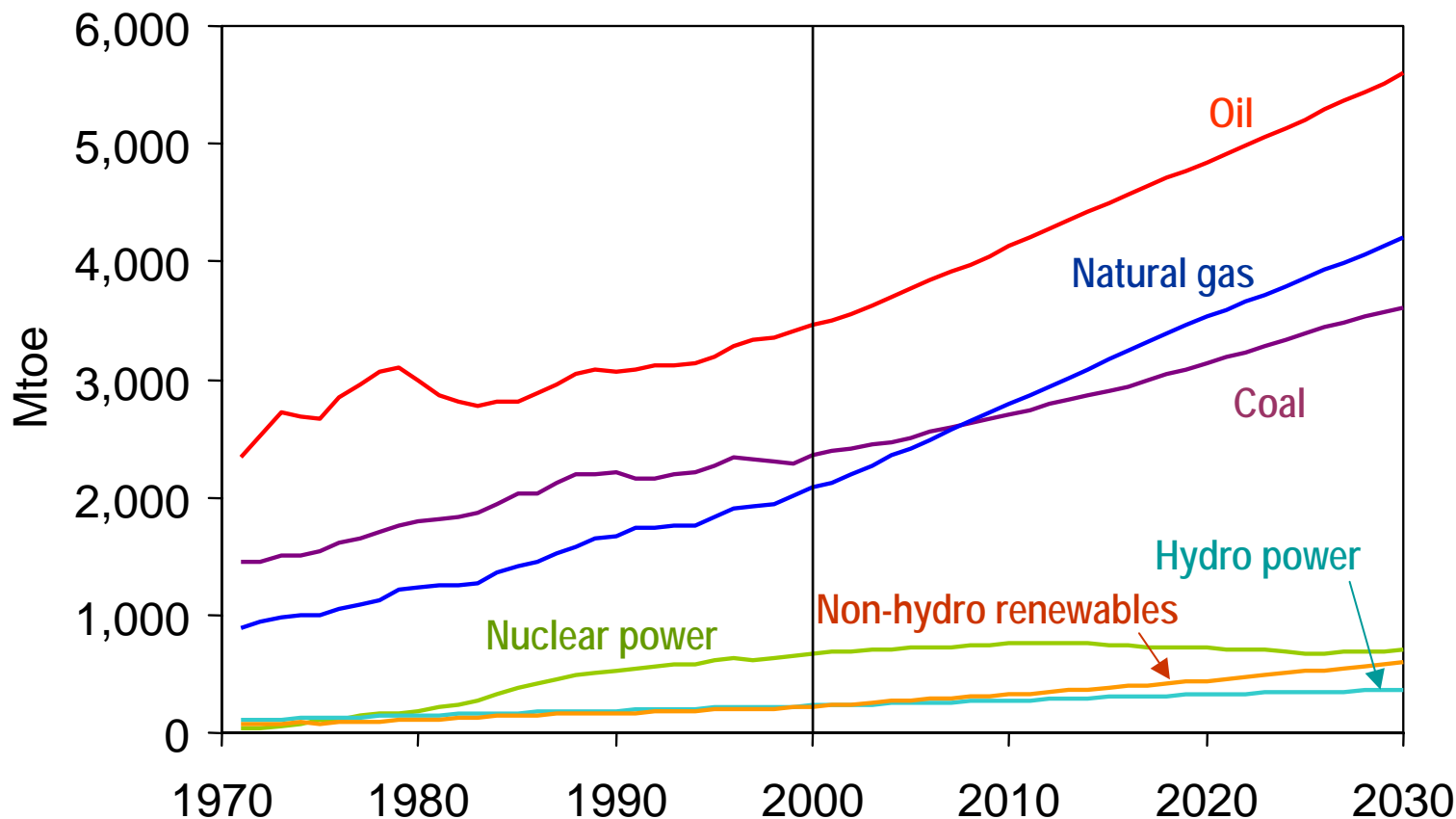
# WORLD ENERGY OUTLOOK 2002

Dr. Fatih Birol  
Chief Economist  
Head, Economic Analysis Division

# World Energy Outlook Series

- World Energy Outlook 1998
- World Energy Outlook - 1999 Insights: *Looking at Energy Subsidies: Getting the Prices Right*
- World Energy Outlook – 2000
- World Energy Outlook – 2001 Insights: *Assessing Today's Supplies to Fuel Tomorrow's Growth*
- World Energy Outlook – 2002
- World Energy Outlook – 2003 Insights: *Global Energy Investment Outlook* (forthcoming)

# World Primary Energy Demand

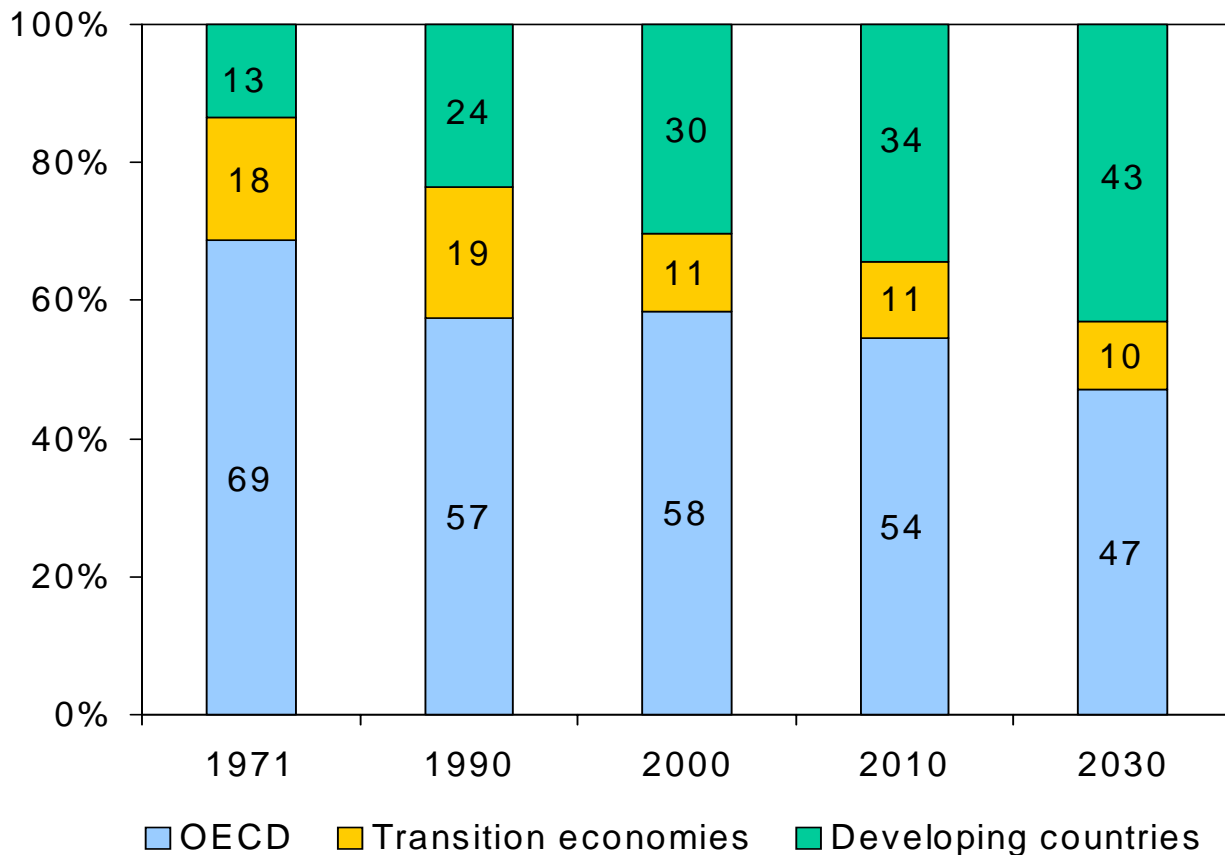


*Gas grows fastest in absolute terms & non-hydro renewables fastest in % terms, but oil remains the dominant fuel in 2030*



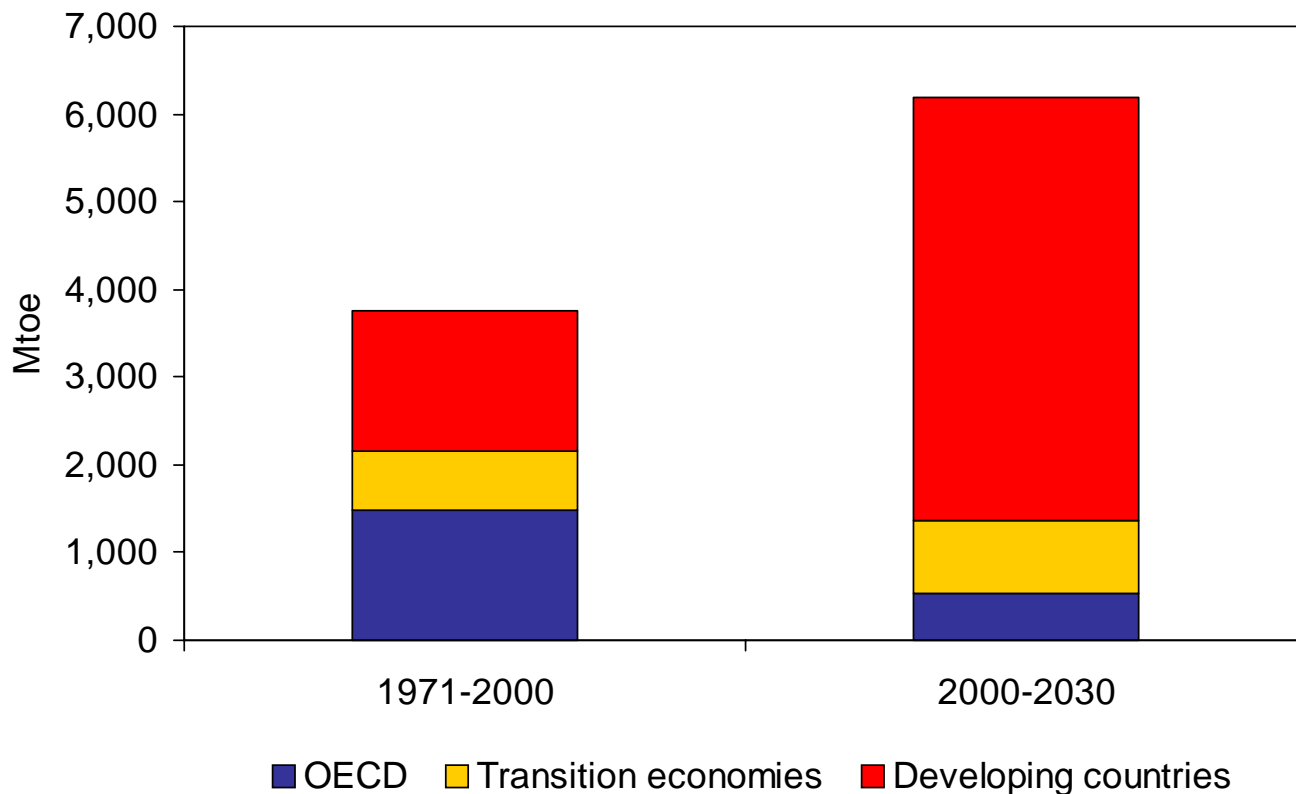
# 1. Security of Energy Supplies

# Regional Shares in World Primary Energy Demand



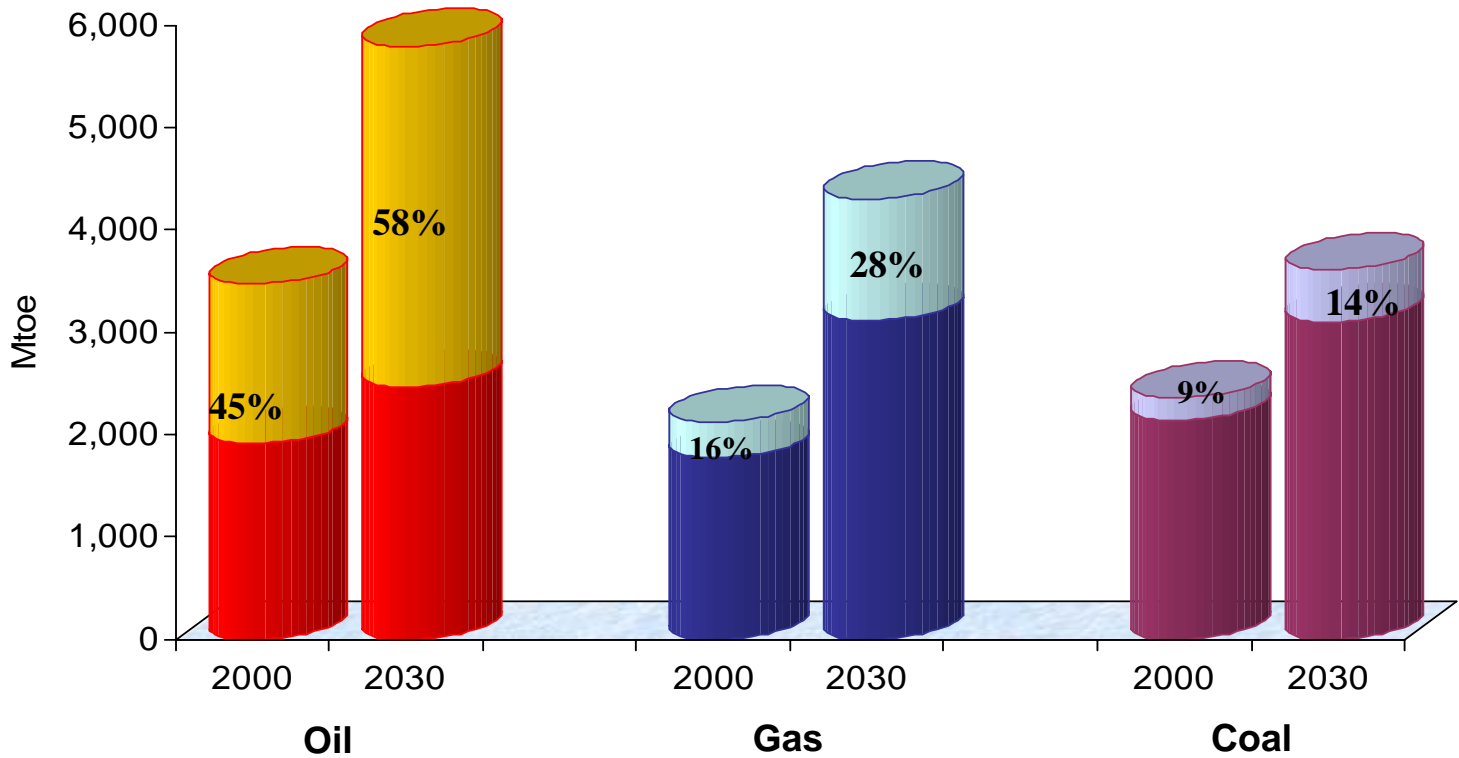
*62% of the increase in world demand between 2000 and 2030 comes from developing countries, especially in Developing Asia*

# Increase in World Primary Energy Production



*Almost all the increase in production occurs outside the OECD, up from 60% in 1971-2000*

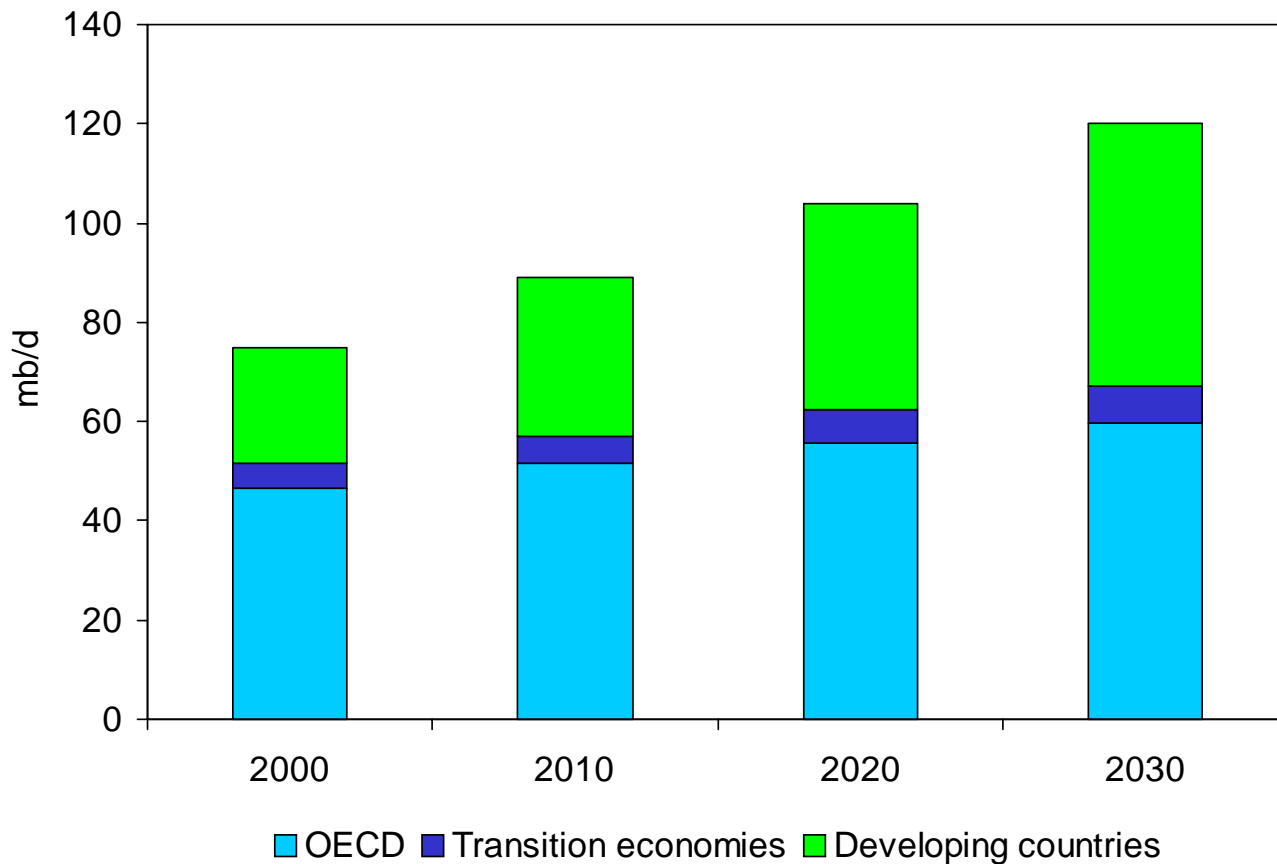
# Share of Trade in World Fossil-Fuel Production



Share of inter-regional trade (%)

*Energy trade between regions more than doubles between now and 2030, most of it in the form of oil*

# World-Oil Demand

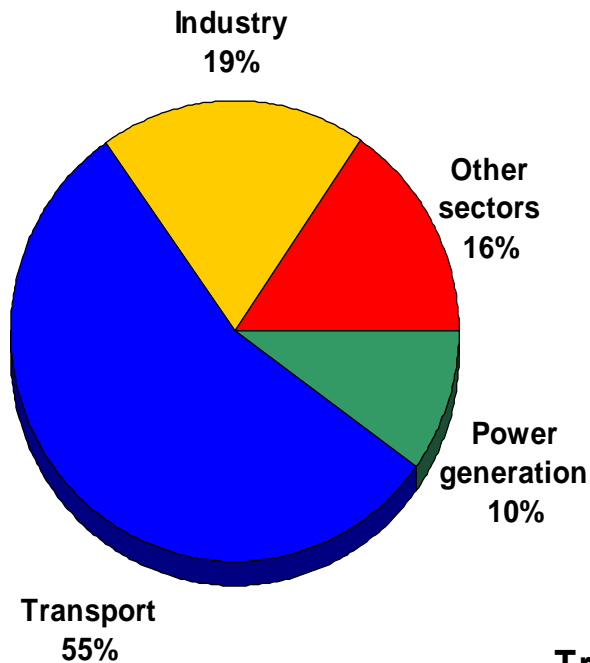


*Oil demand grows in every region,  
fastest in the developing countries*



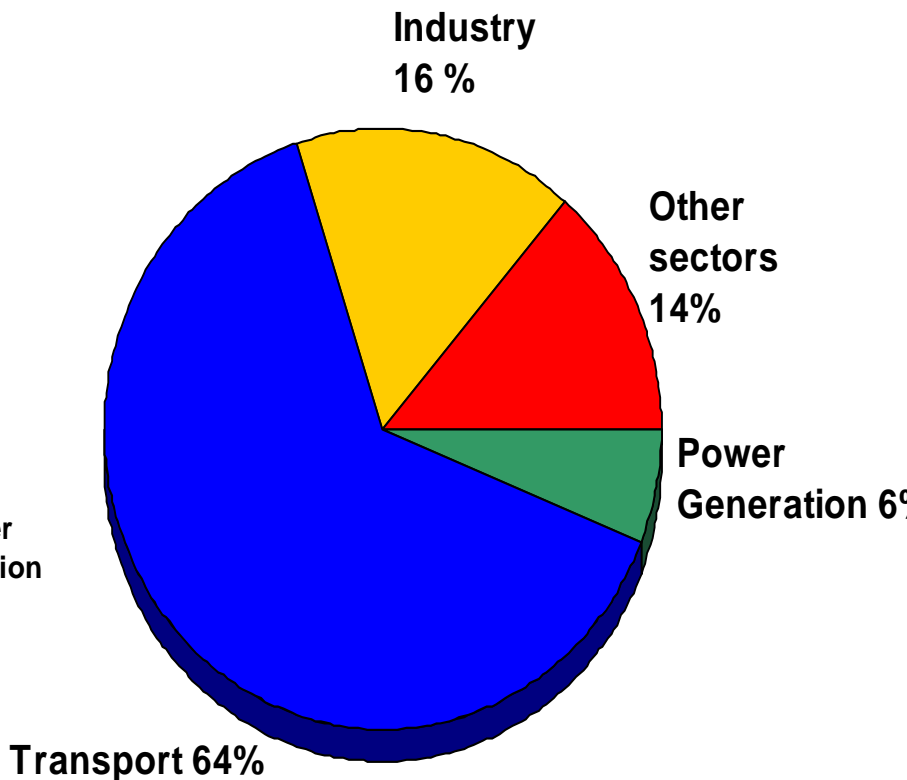
# World Oil Demand by Sector

**2000**



**75 mbd**

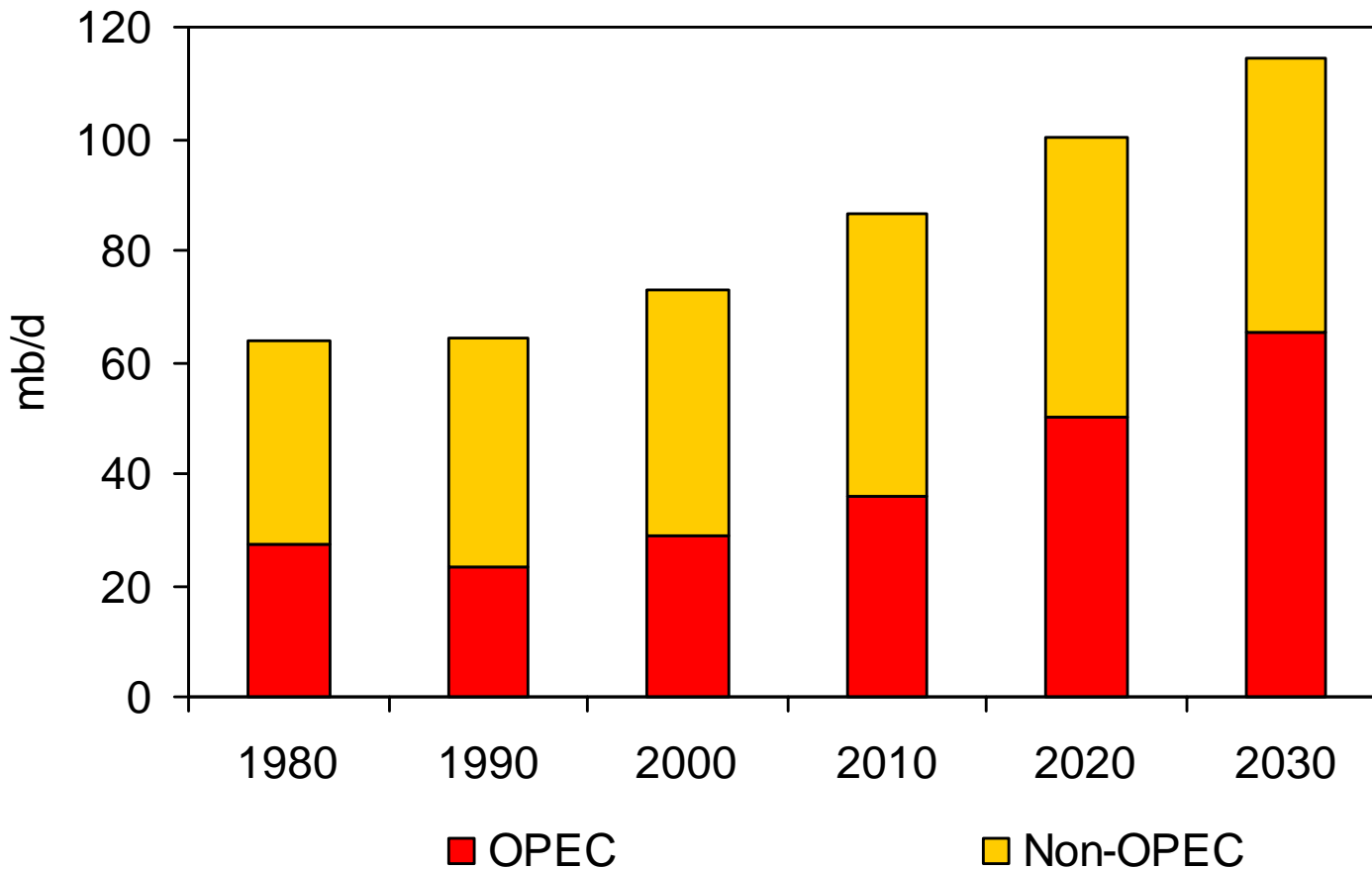
**2030**



**120 mbd**

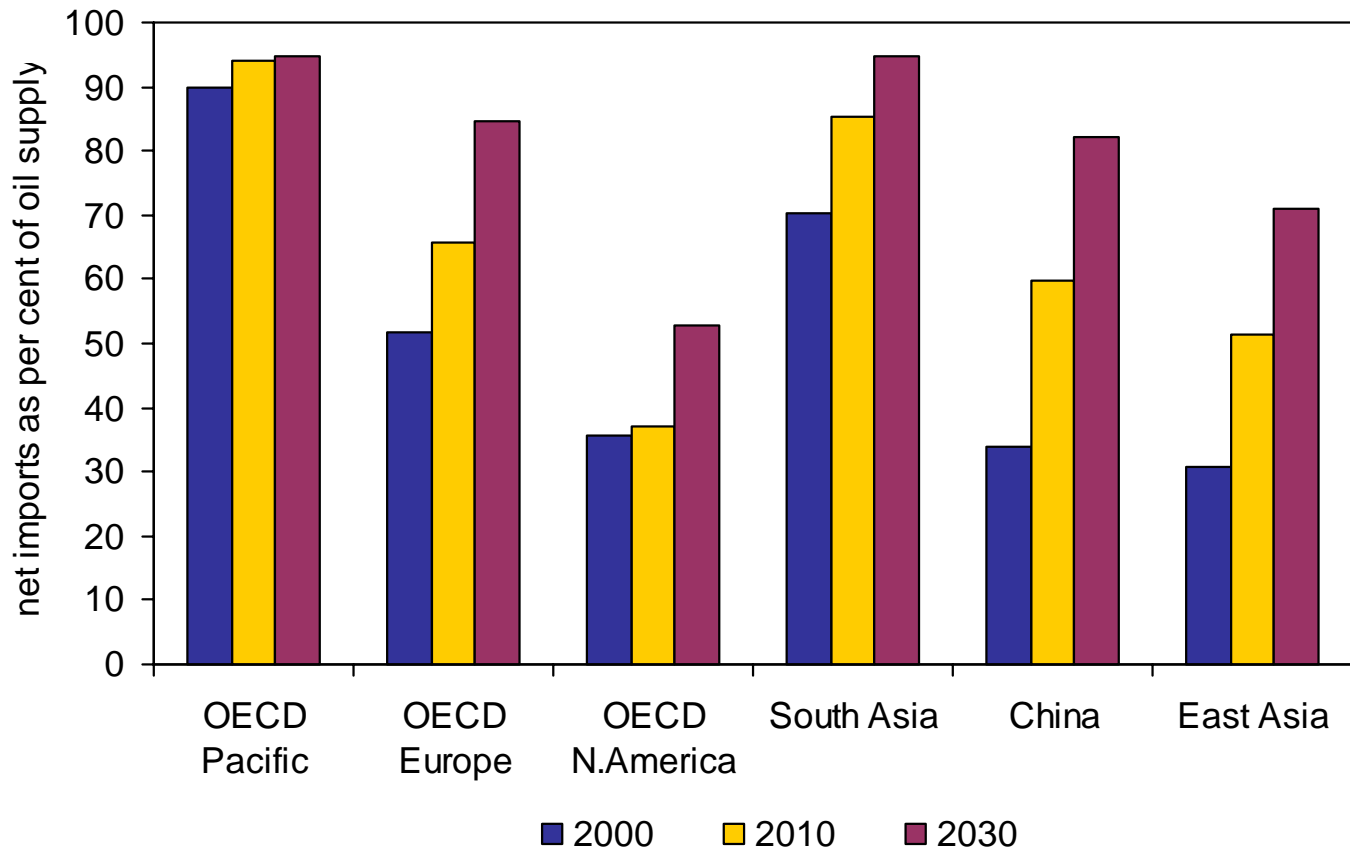
*Around three-quarters of the increase in demand for oil will come from the transport sector.*

# World-Oil Production



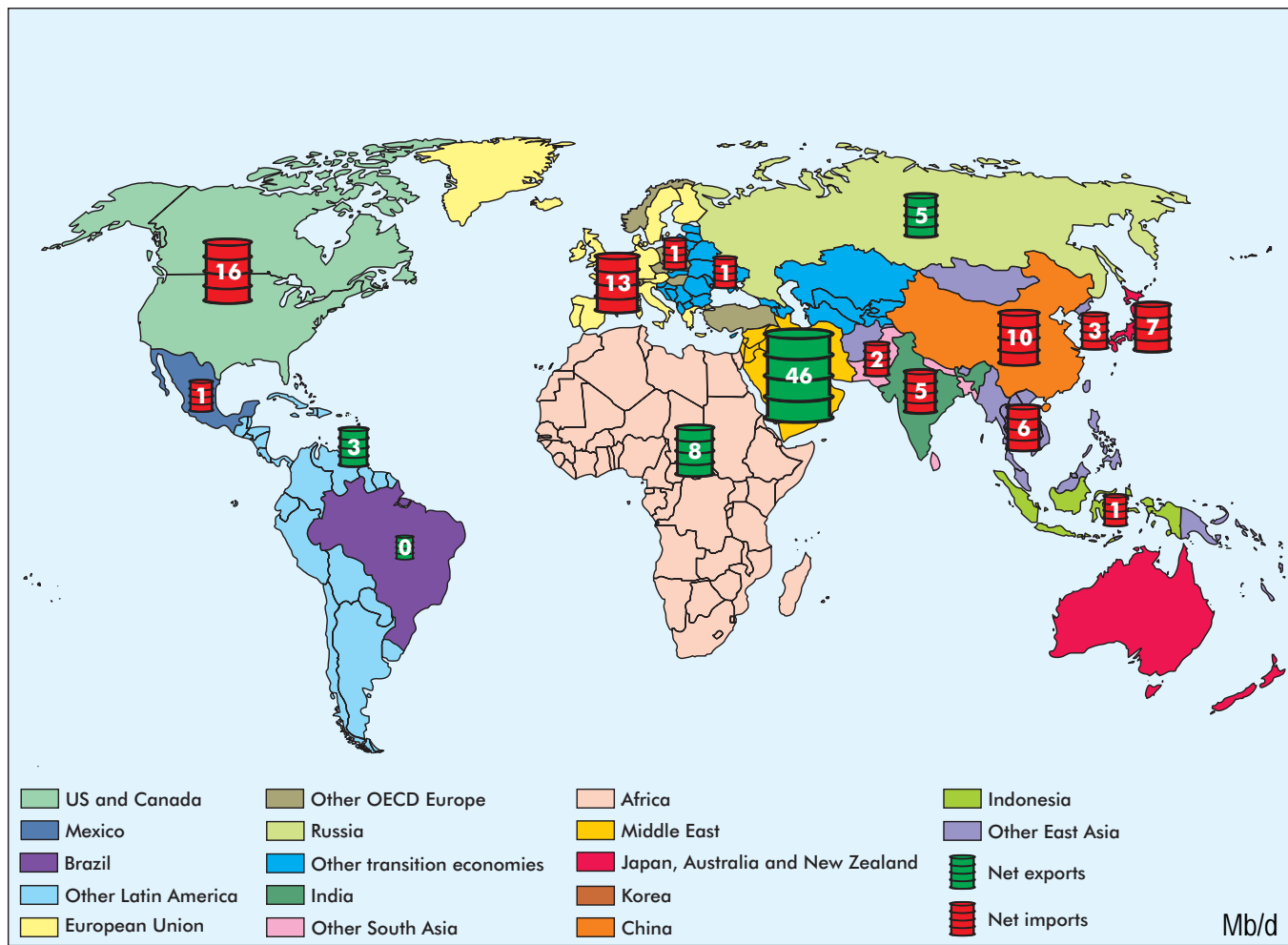
*Reliance on OPEC oil progressively increases*

# Oil-Import Dependence



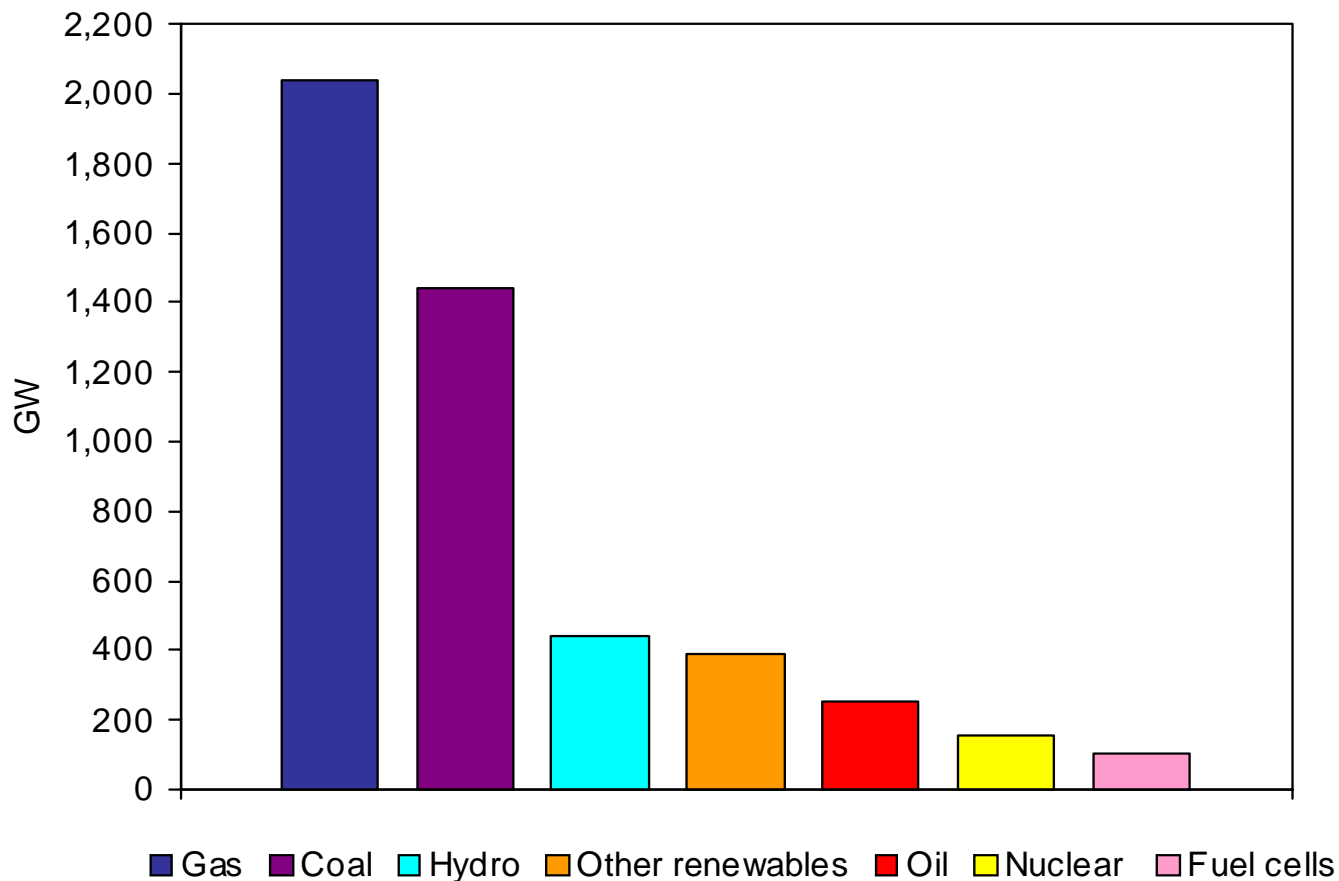
*Asia sees the biggest jump in import dependence, while OECD imports also continue to rise, especially in Europe*

# Net Oil Trade, 2030



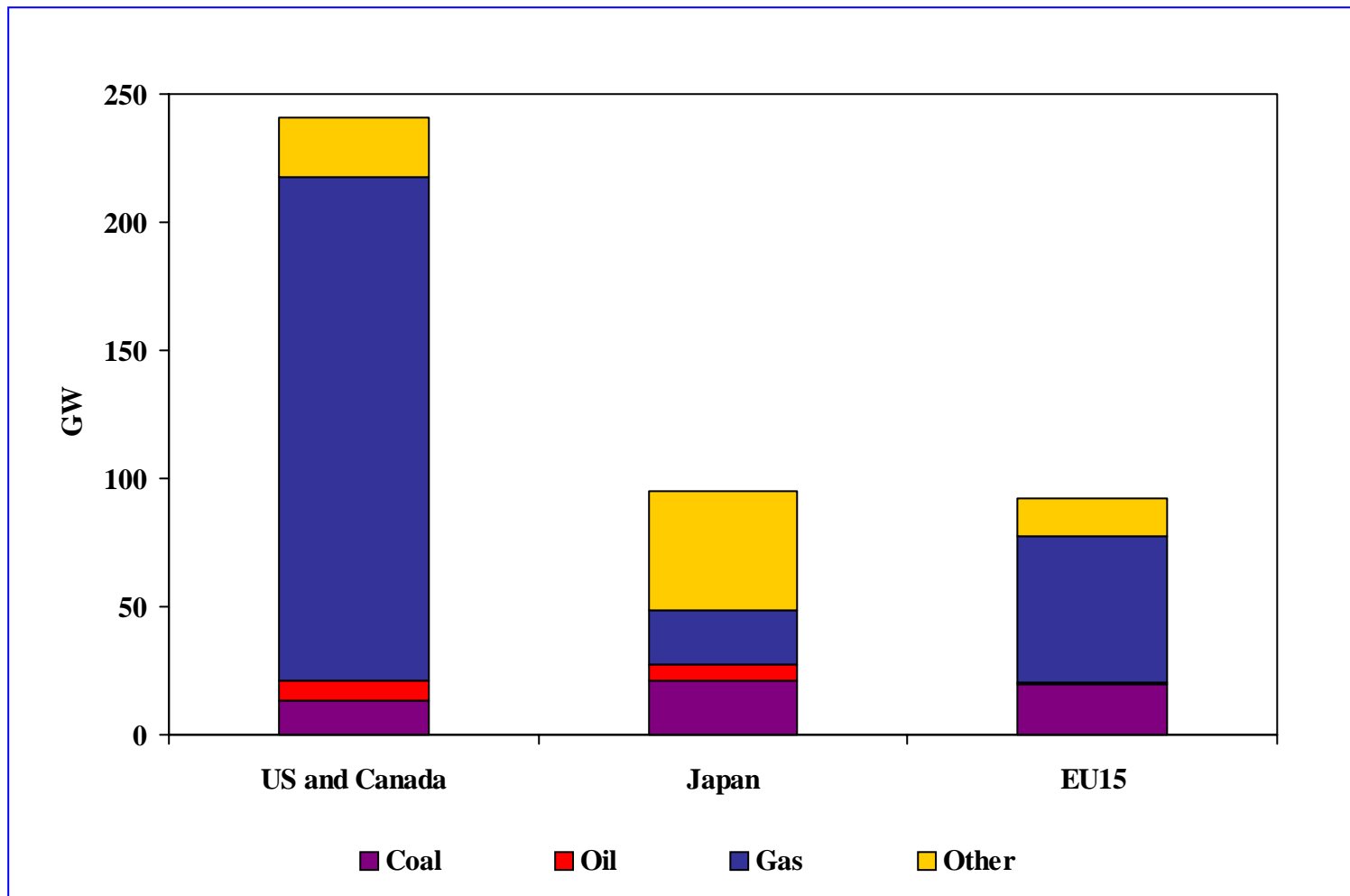
*The Middle East strengthens its position as the world's largest oil exporter*

# World Power-Generation Capacity Additions, 2000-2030

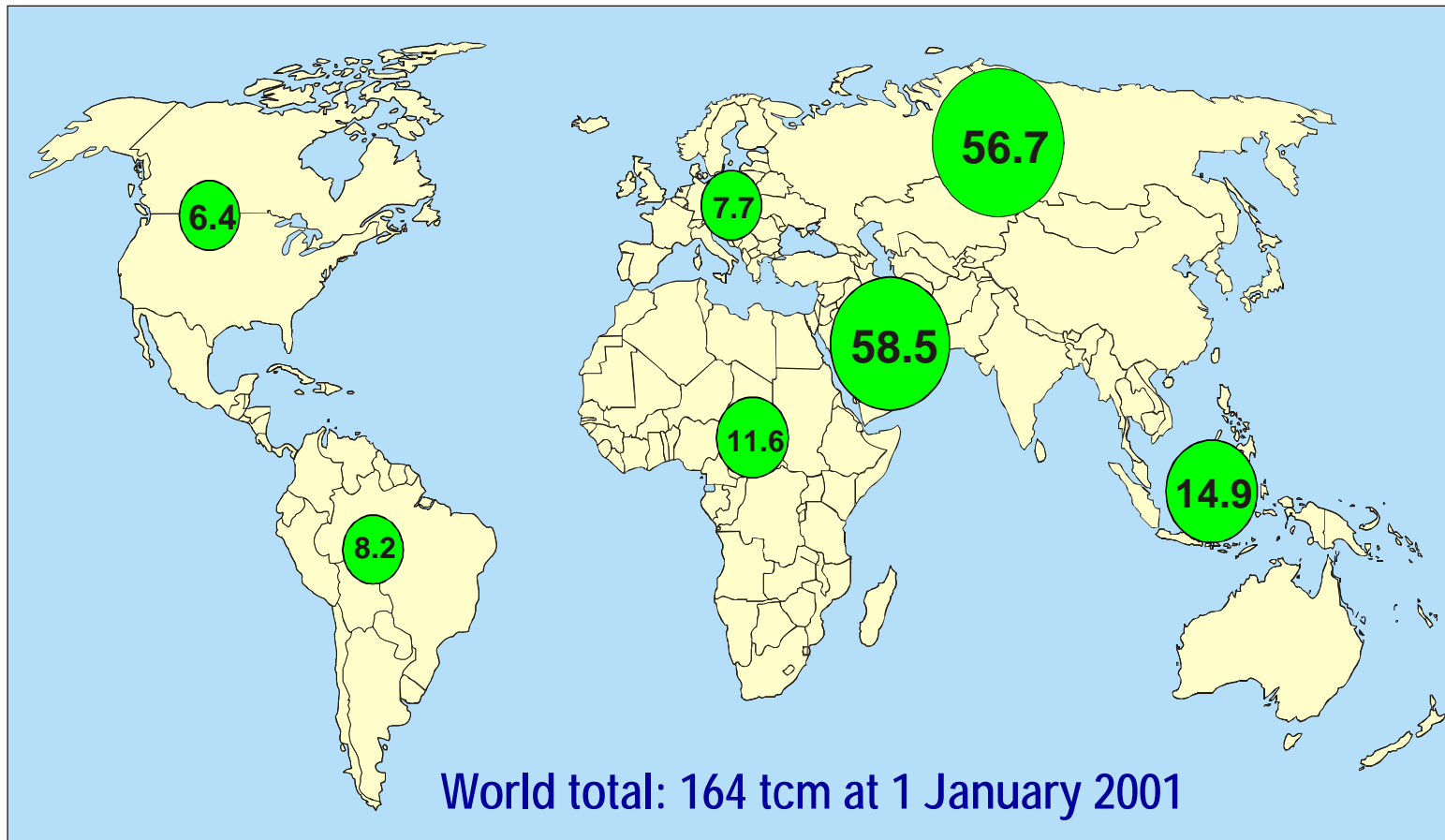


*More than 40% of new capacity worldwide is gas-fired*

# Ordered Power-Generation Capacity Additions to 2010

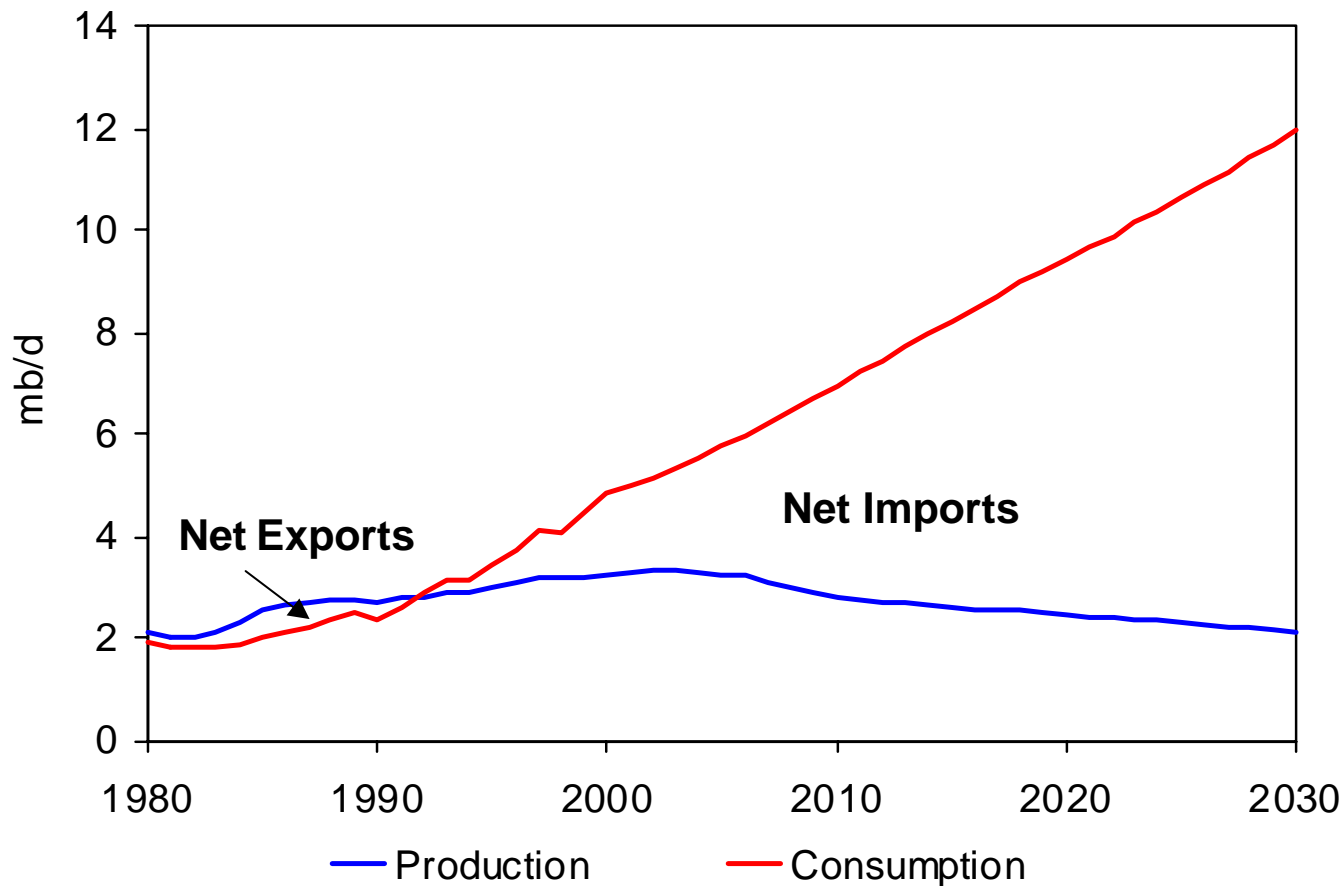


# Proven Gas Reserves



*Ultimate remaining resources (including proven reserves) are an estimated 453 - 527 tcm*

# China: Oil Balance



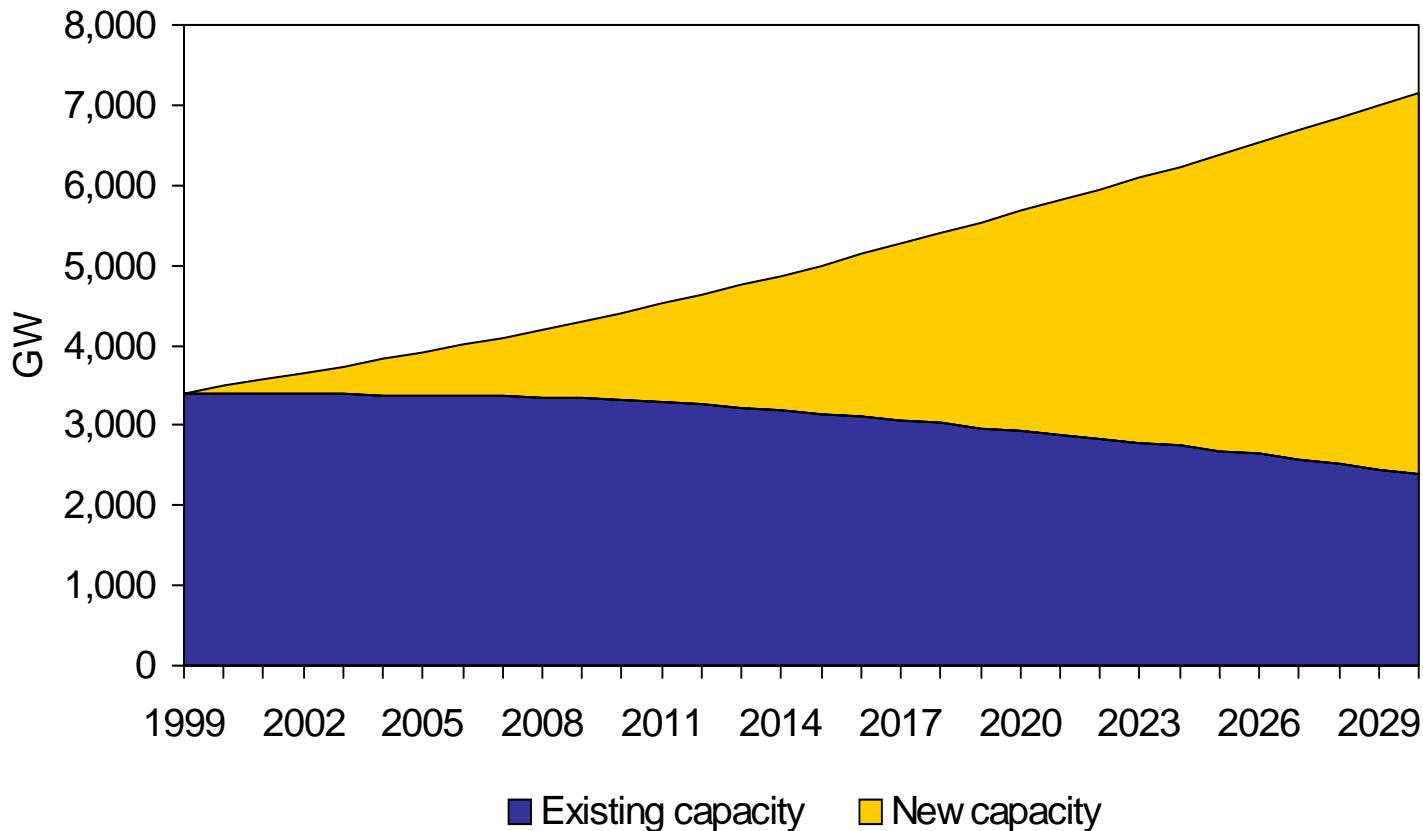
***Net oil imports surge from 1.7mb/d in 2001  
to 9.8mb/d in 2030***





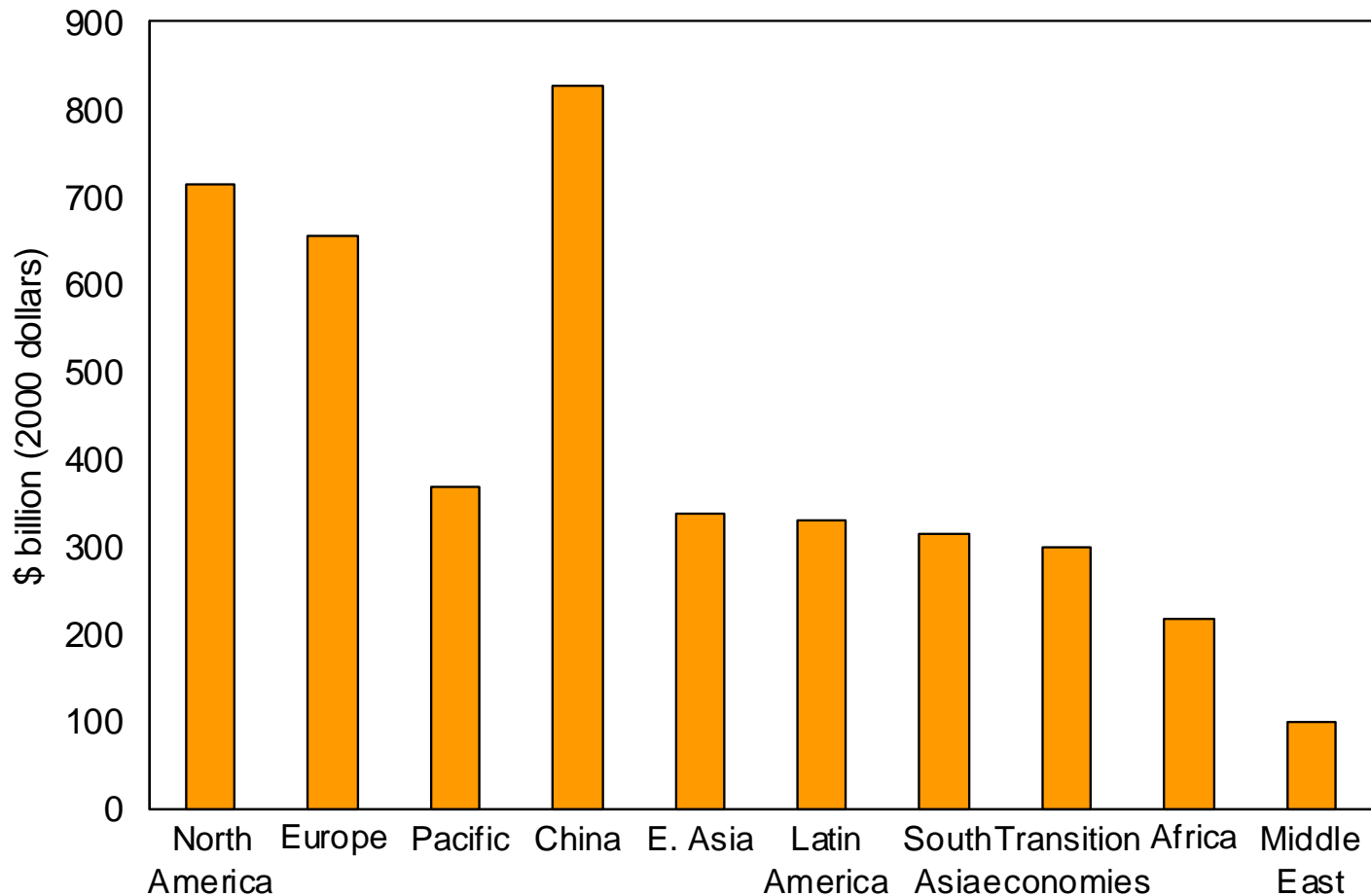
## 2. Investment in Energy Infrastructure

# World Installed Power- Generation Capacity



*Nearly 5,000 GW of capacity is built in 2000-2030,  
almost half in developing countries*

# World Power-Generation Investment, 2000-2030

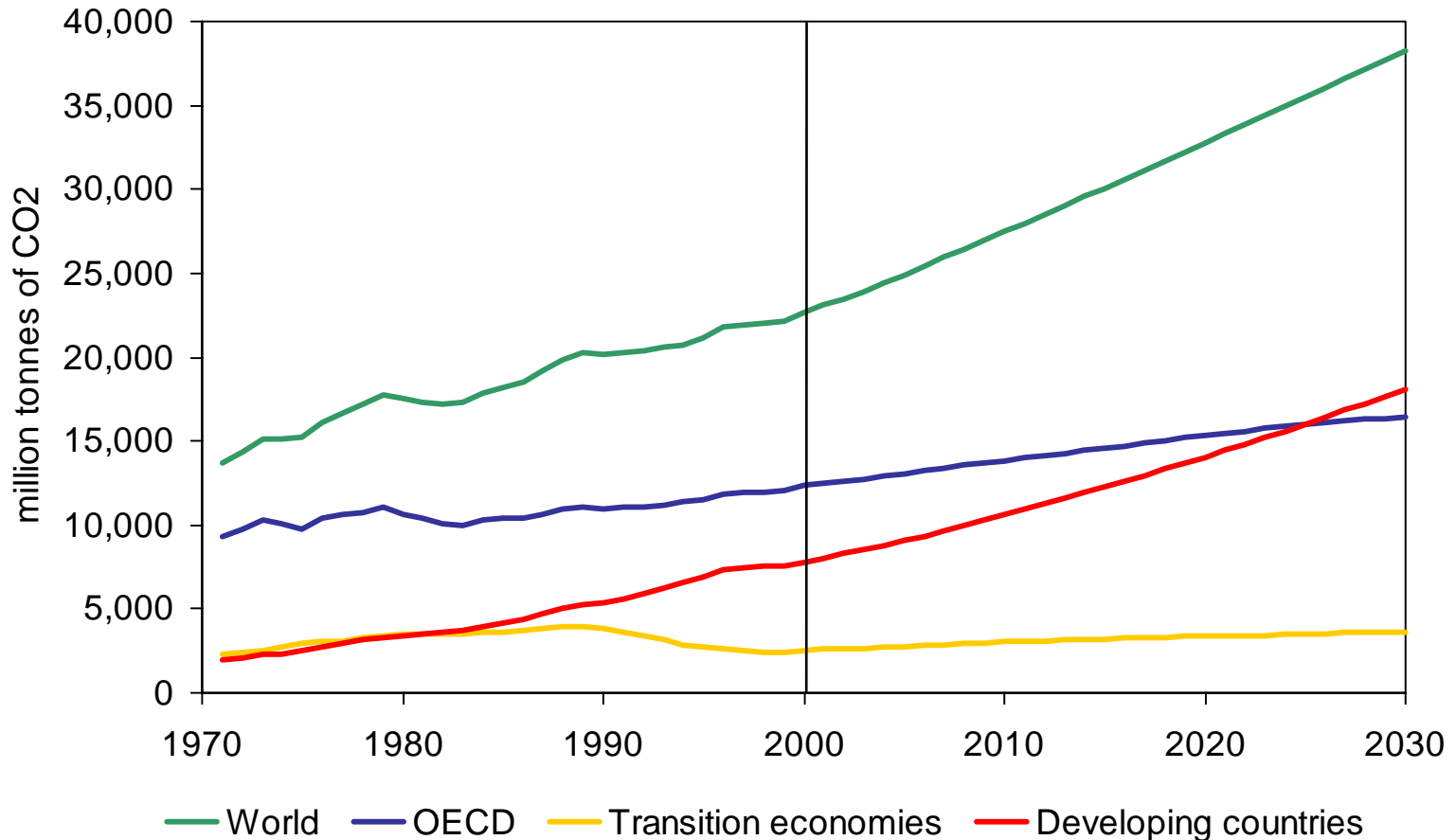


**Cumulative worldwide investment in new power plants amount to \$ 4.2 trillion, more than half in developing countries**



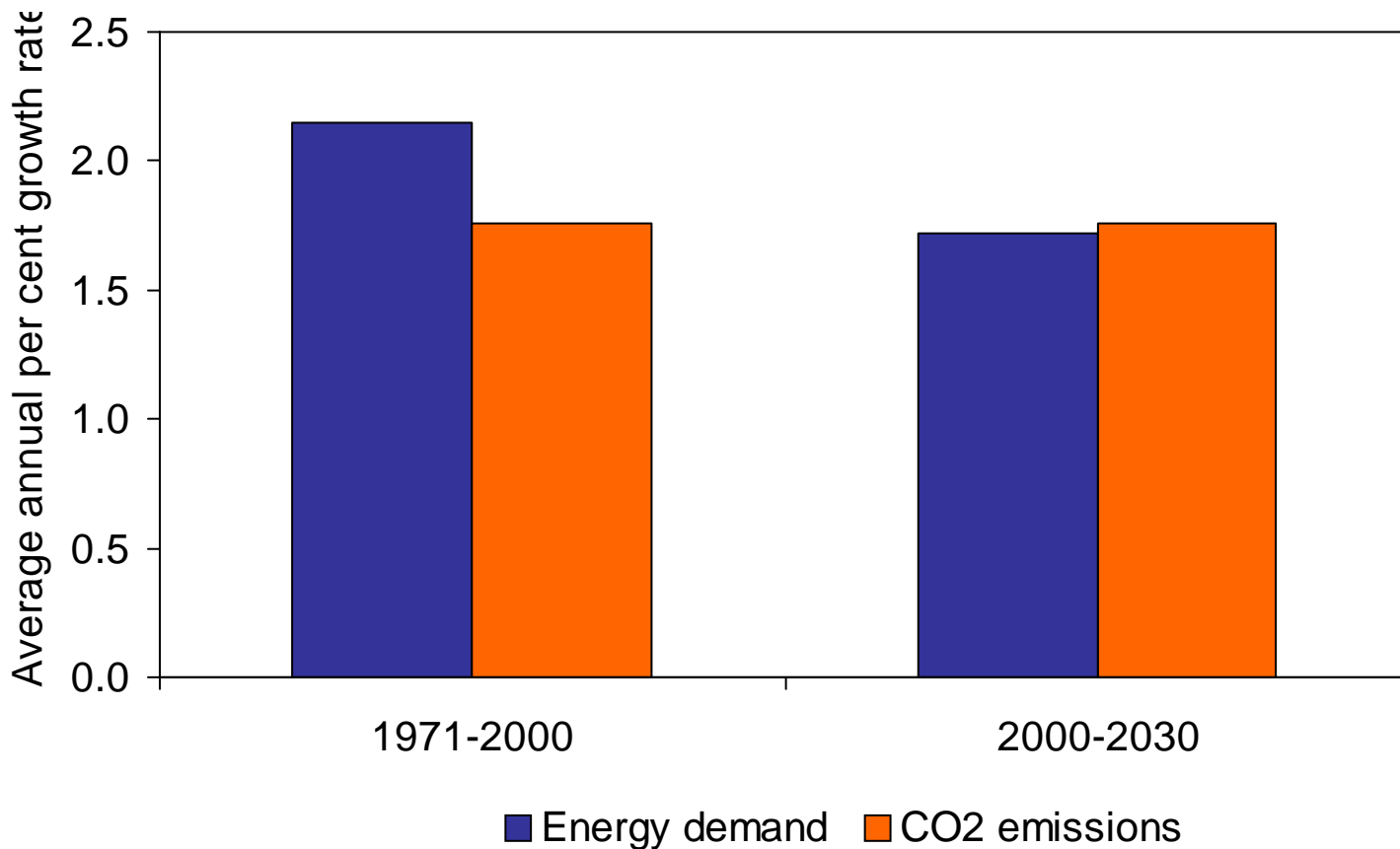
## 3. Environment

# Energy-Related CO<sub>2</sub> Emissions



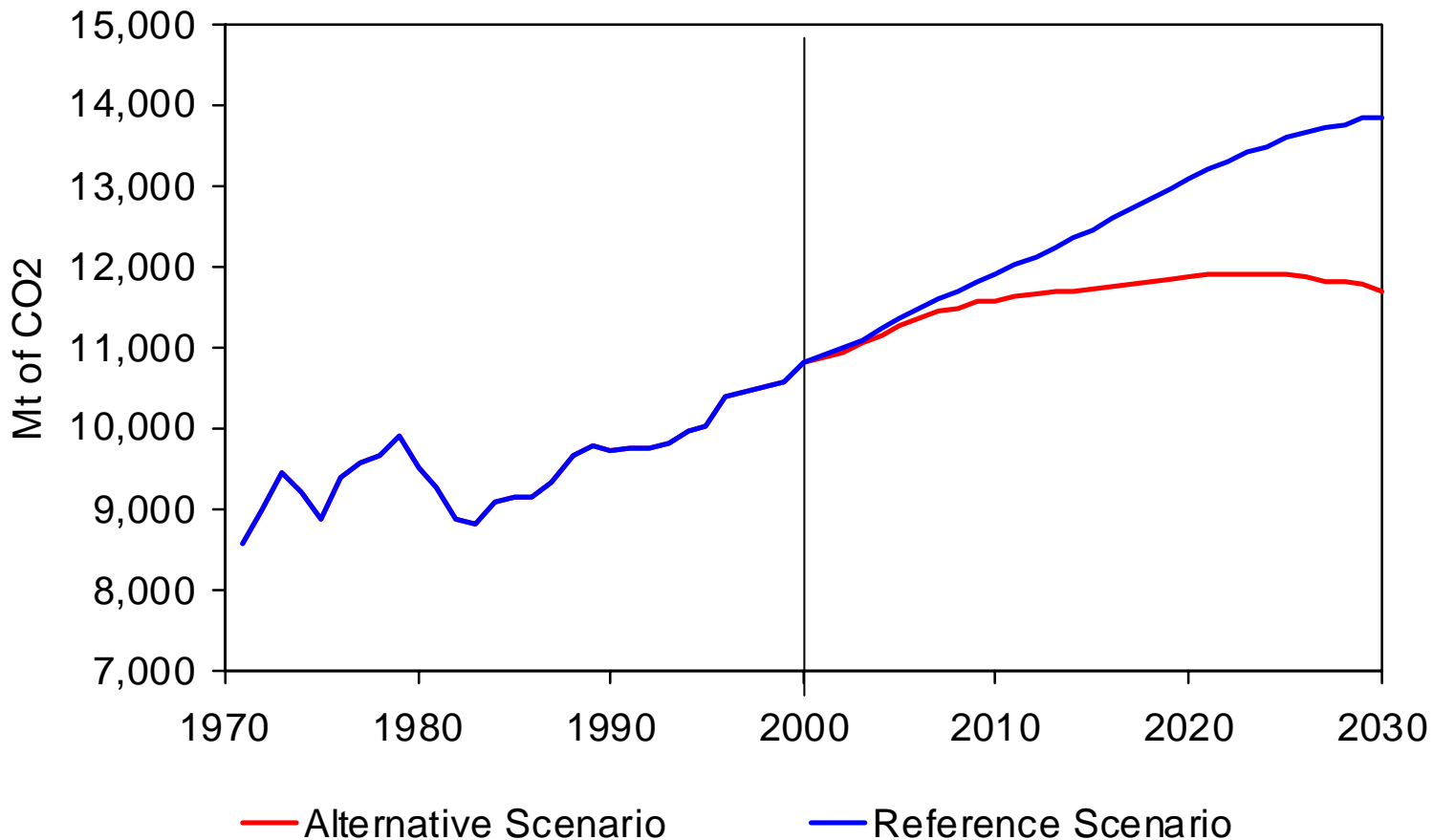
***World emissions increase by 1.8 % per year to 38 billion tonnes in 2030 – 70% above 2000 levels***

# World Primary Energy Demand and CO<sub>2</sub> Emissions



***Emissions increase faster than demand over the next 30 years,  
because the share of fossil fuels in the energy mix grows***

# OECD CO<sub>2</sub> Emissions



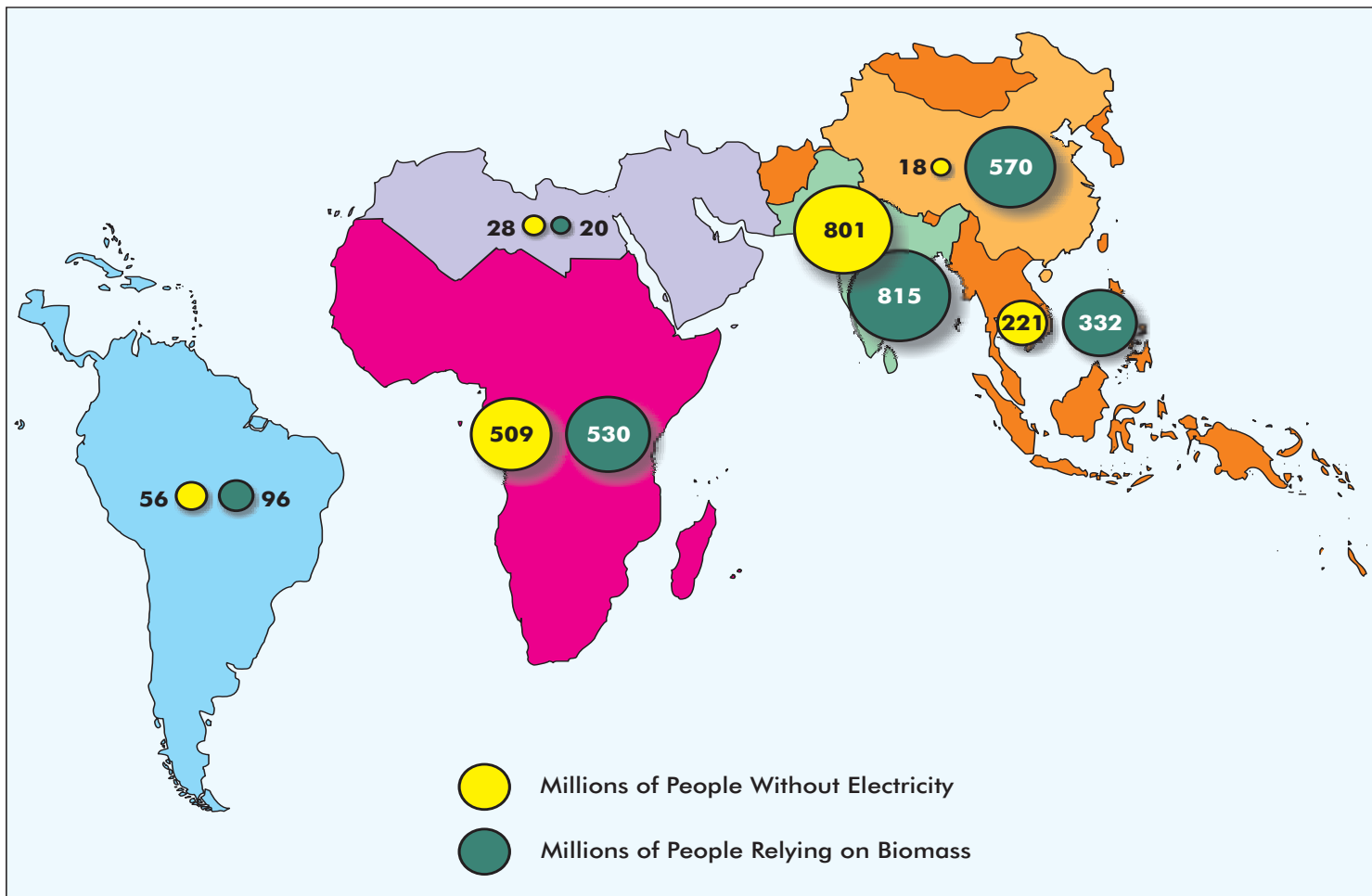
***Emissions in the Alternative Scenario stabilise towards the end of the projection period***



## 4. Energy Poverty



# Map of Global Energy Poverty



***1.6 billion people have no access to electricity,  
80% of them in South Asia and sub-Saharan Africa***

# Energy and Poverty - Access to Electricity

- **1.6 billion people today have no access to electricity**
- **About 80% of these people are located in India (580 million) and sub-Saharan Africa (500 million)**
- **Four out of five people lacking access to electricity live in rural areas**
- **By 2030, in the absence of radical new policies, 1.4 billion will still have no electricity**

**2002**



# Energy and Poverty - Traditional Biomass Use

- **Today 2.4 billion people in developing countries rely heavily on traditional biomass for cooking and heating.**
- **The use of biomass in traditional and inefficient ways have significant implications:**
  - **Productivity**
  - **Health**
  - **Gender**
  - **Environment**
- **By 2030, over 2.6 billion people in developing countries will continue to rely on biomass.**

# Implications of the WEO 2002 Projections

- **The projections highlight 4 strategic energy challenges:**
  - **security of energy supplies**
  - **investment in energy infrastructure**
  - **threat of environmental damage caused by energy use**
  - **uneven access of the world's population to modern energy**
- **Governments will have to take strenuous action if these concerns are to be addressed**