

WORLD ENERGY OUTLOOK

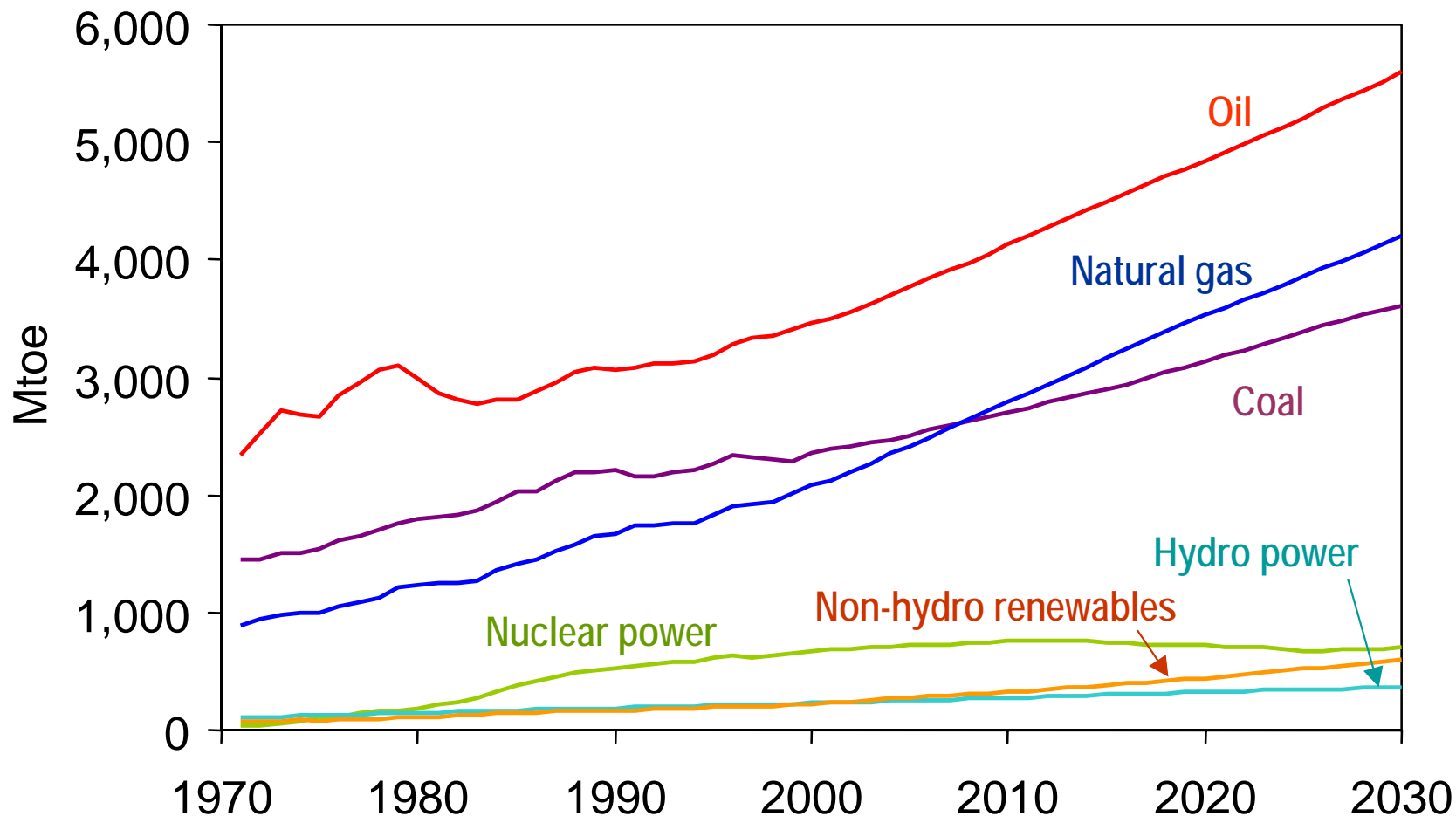
Focus on Oil & Gas

François CATTIER, International Energy Agency
Francois.cattier@iea.org

Workshop on Oil & Gas Resources
February 27, 2004
Berne

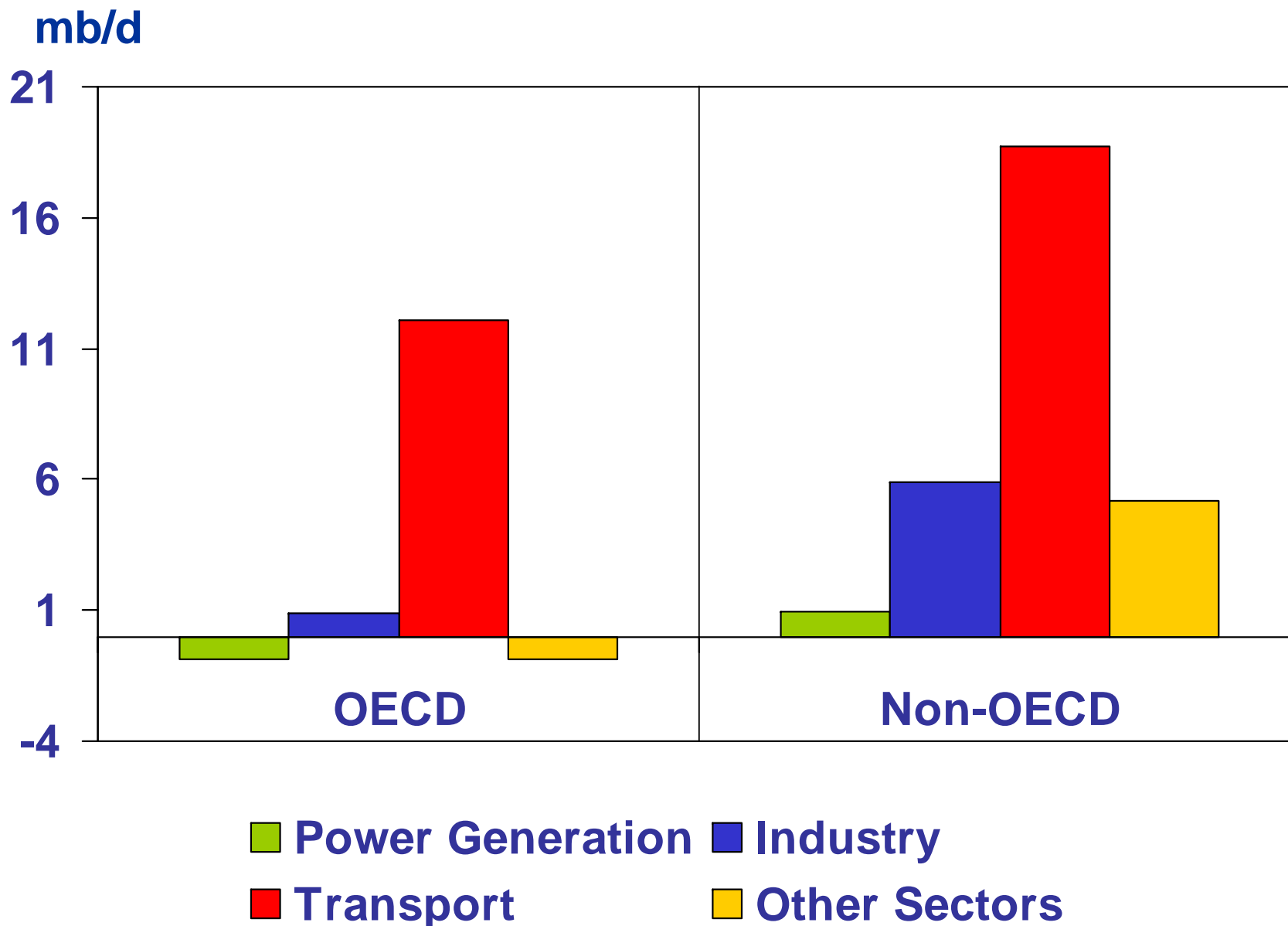


World Primary Energy Demand

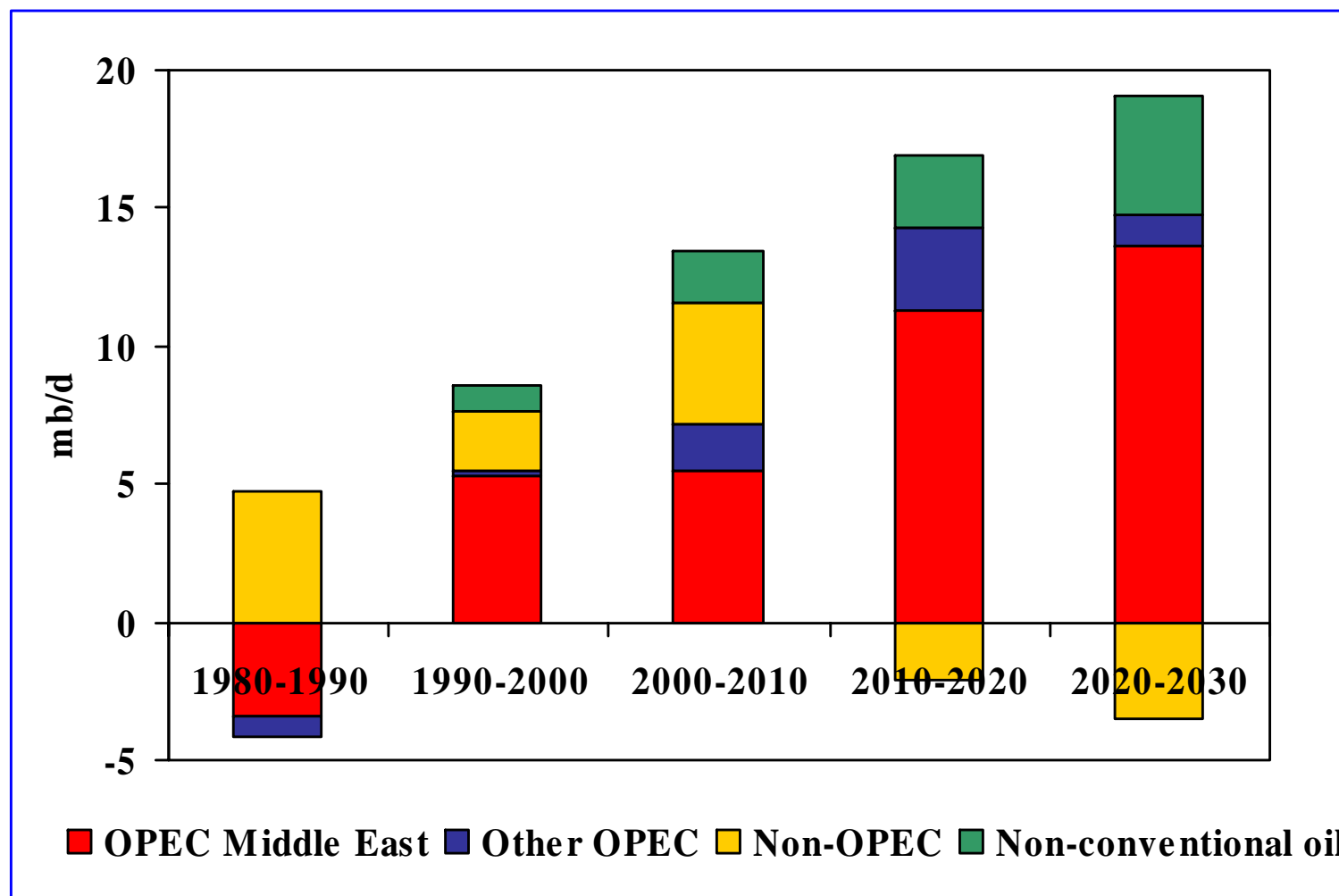


Gas grows fastest in absolute terms & non-hydro renewables fastest in % terms, but oil remains the dominant fuel in 2030

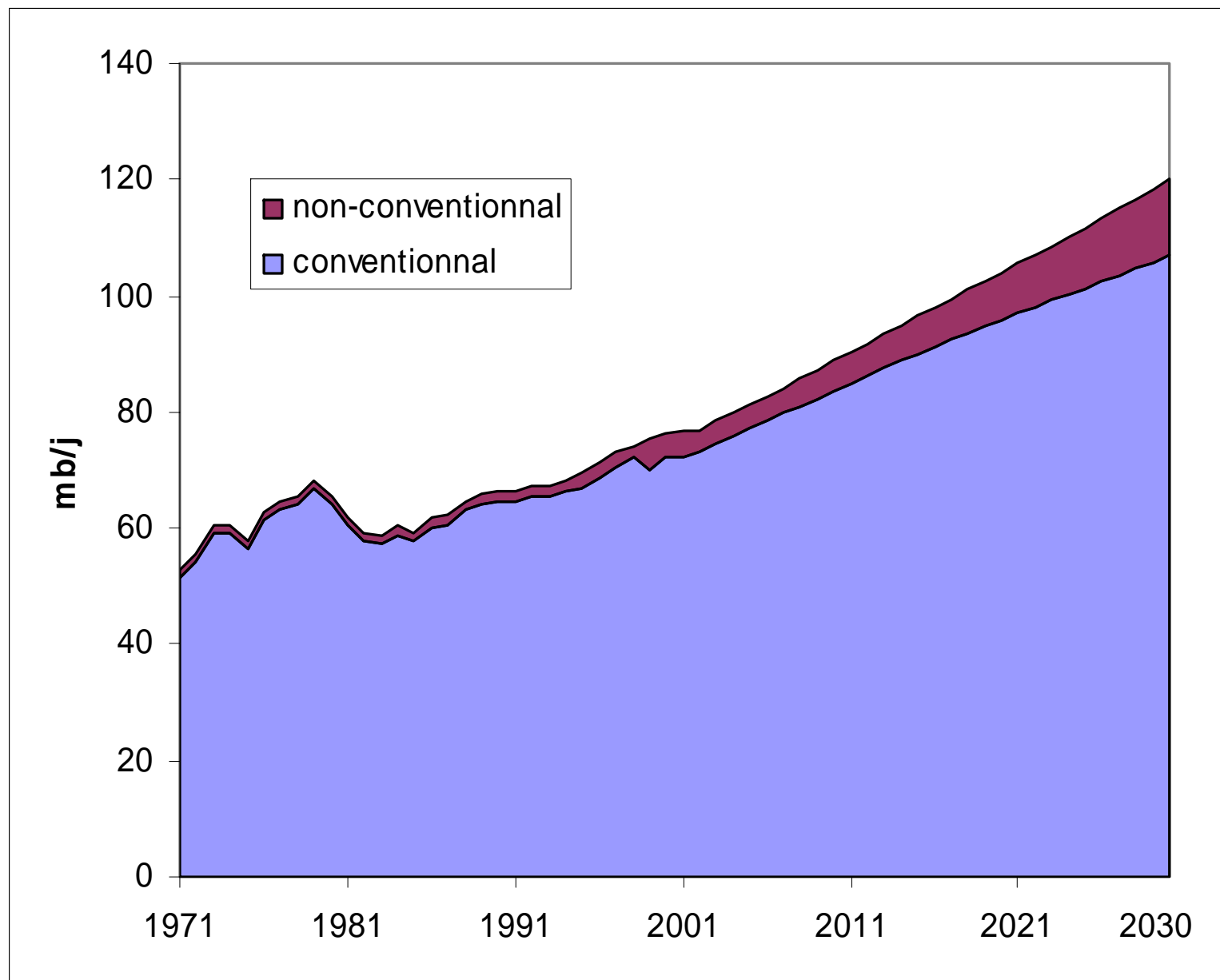
Incremental Oil Demand by Sector (2000-2030)



Change in World Oil Production



World oil Supply



**WORLD
ENERGY**

INVESTMENT

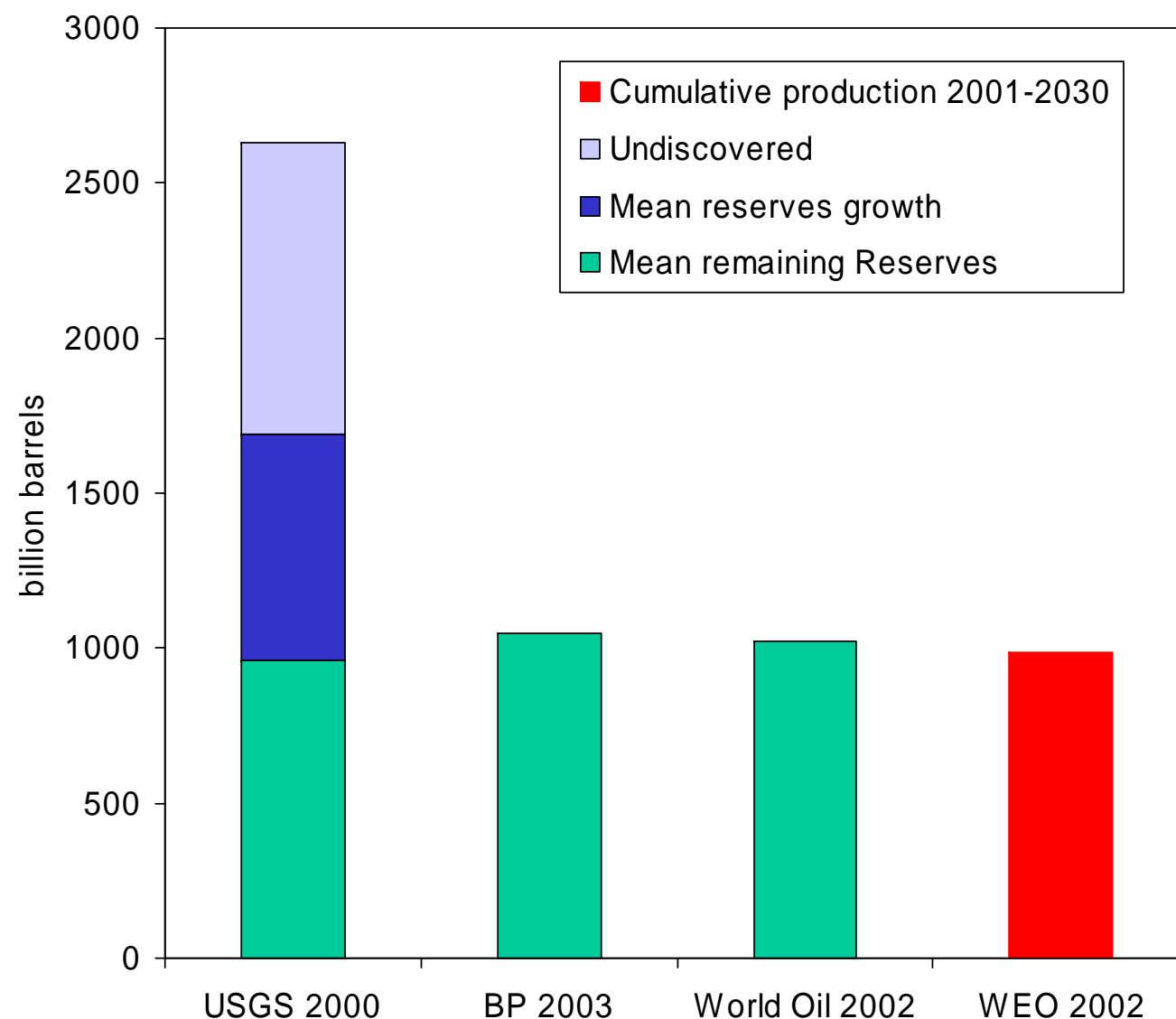
OUTLOOK

**2003
INSIGHTS**

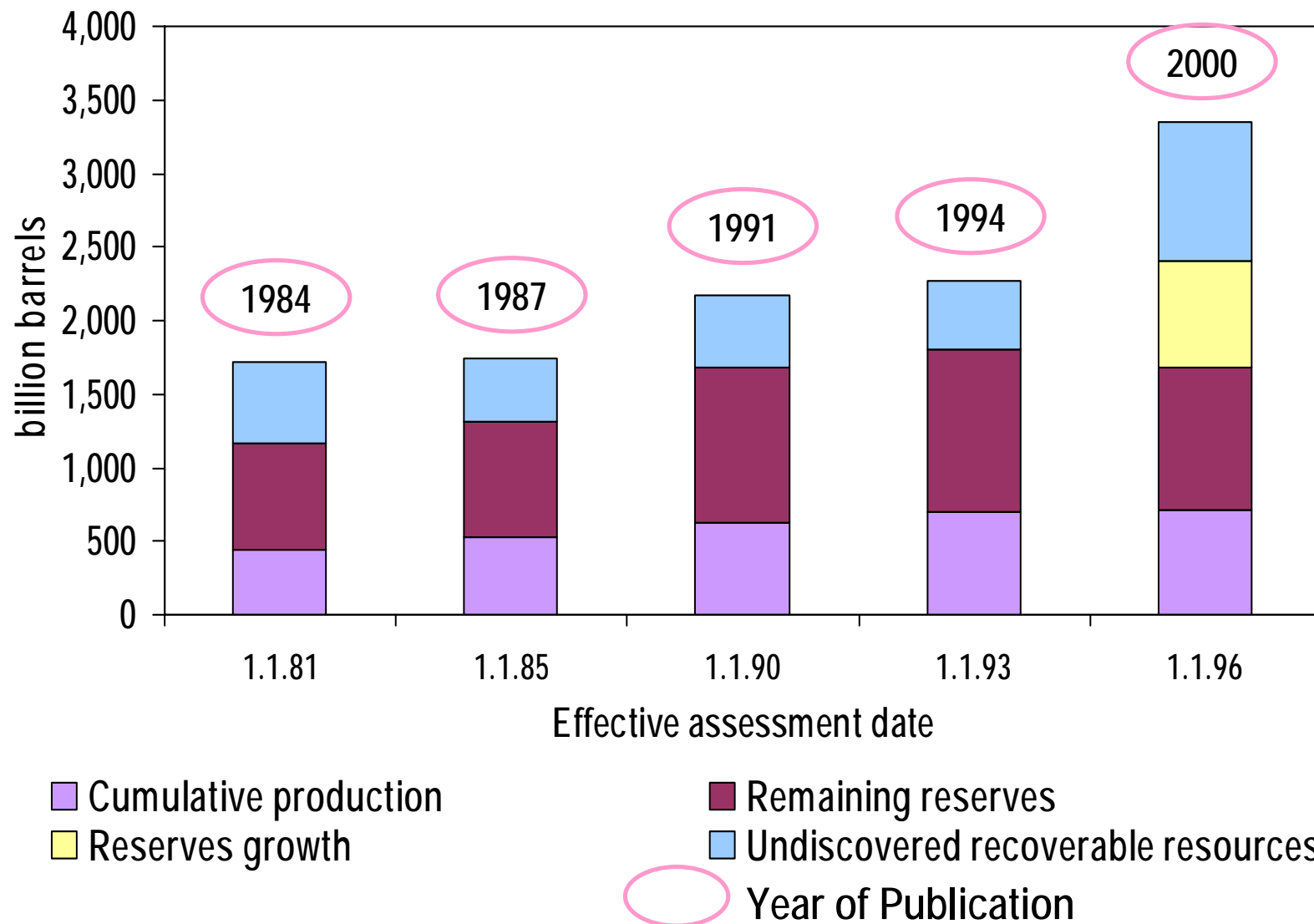


**INTERNATIONAL
ENERGY
AGENCY**

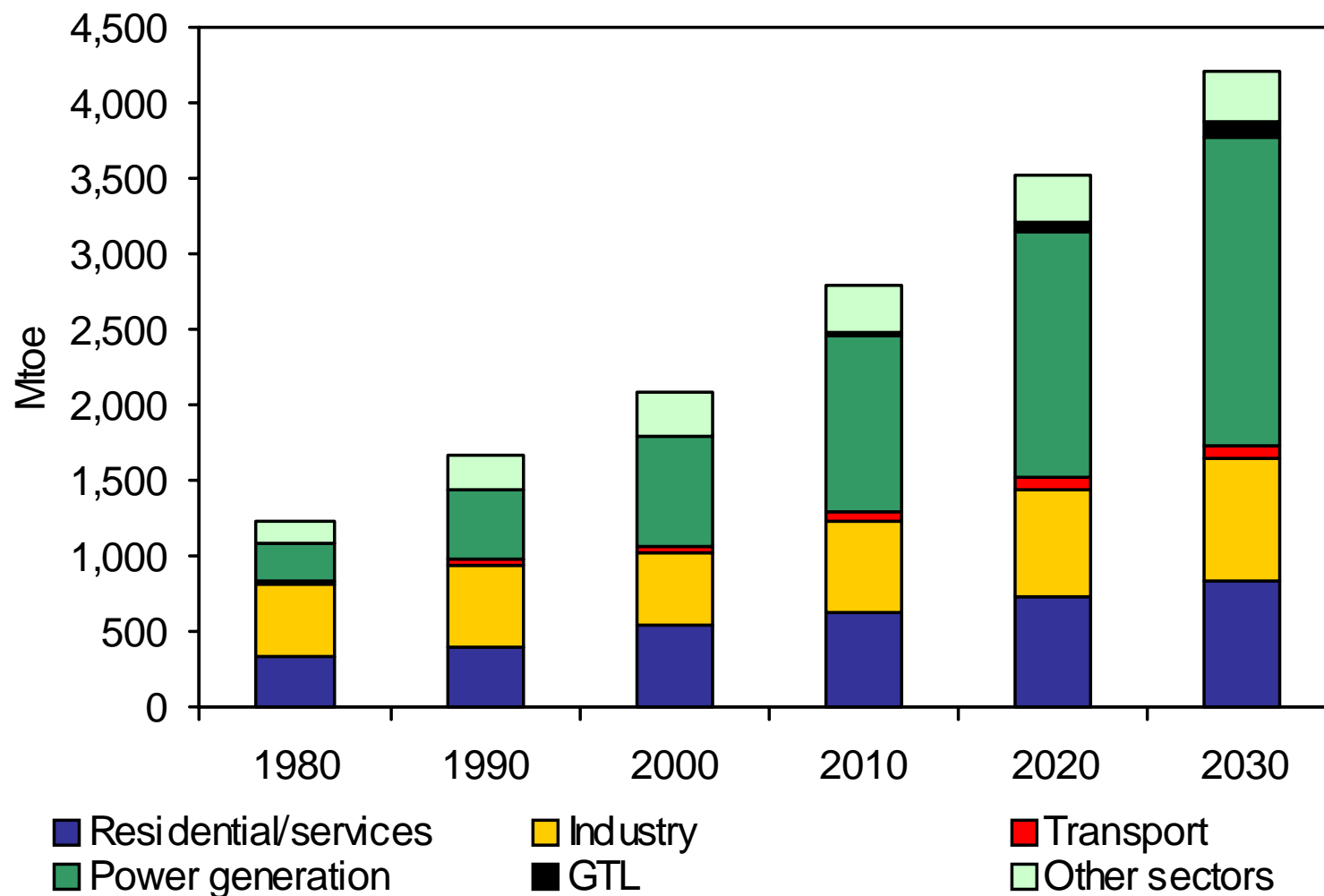
World Oil Reserves and Expected Production



USGS Resource Estimates

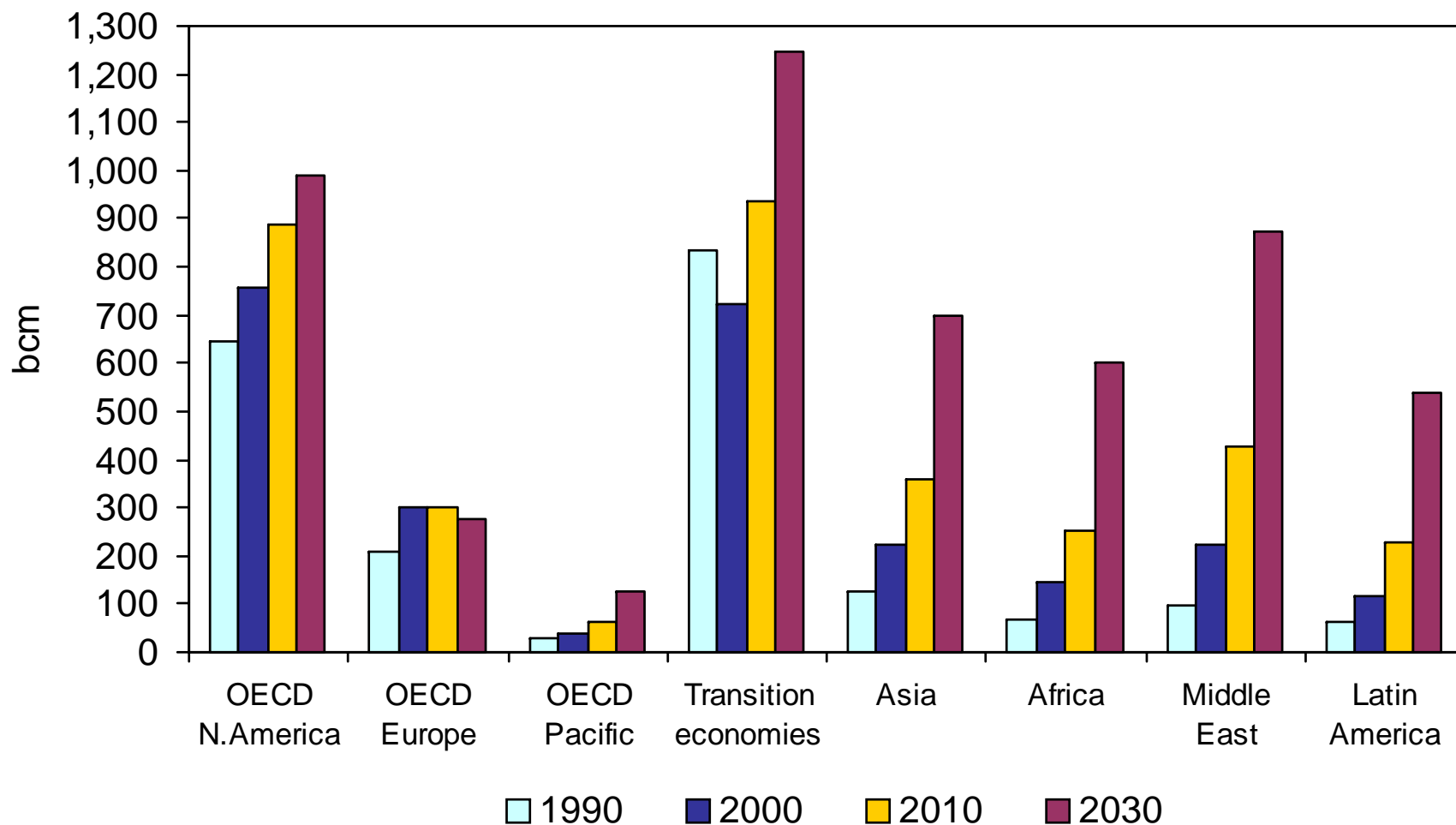


World Natural Gas Demand



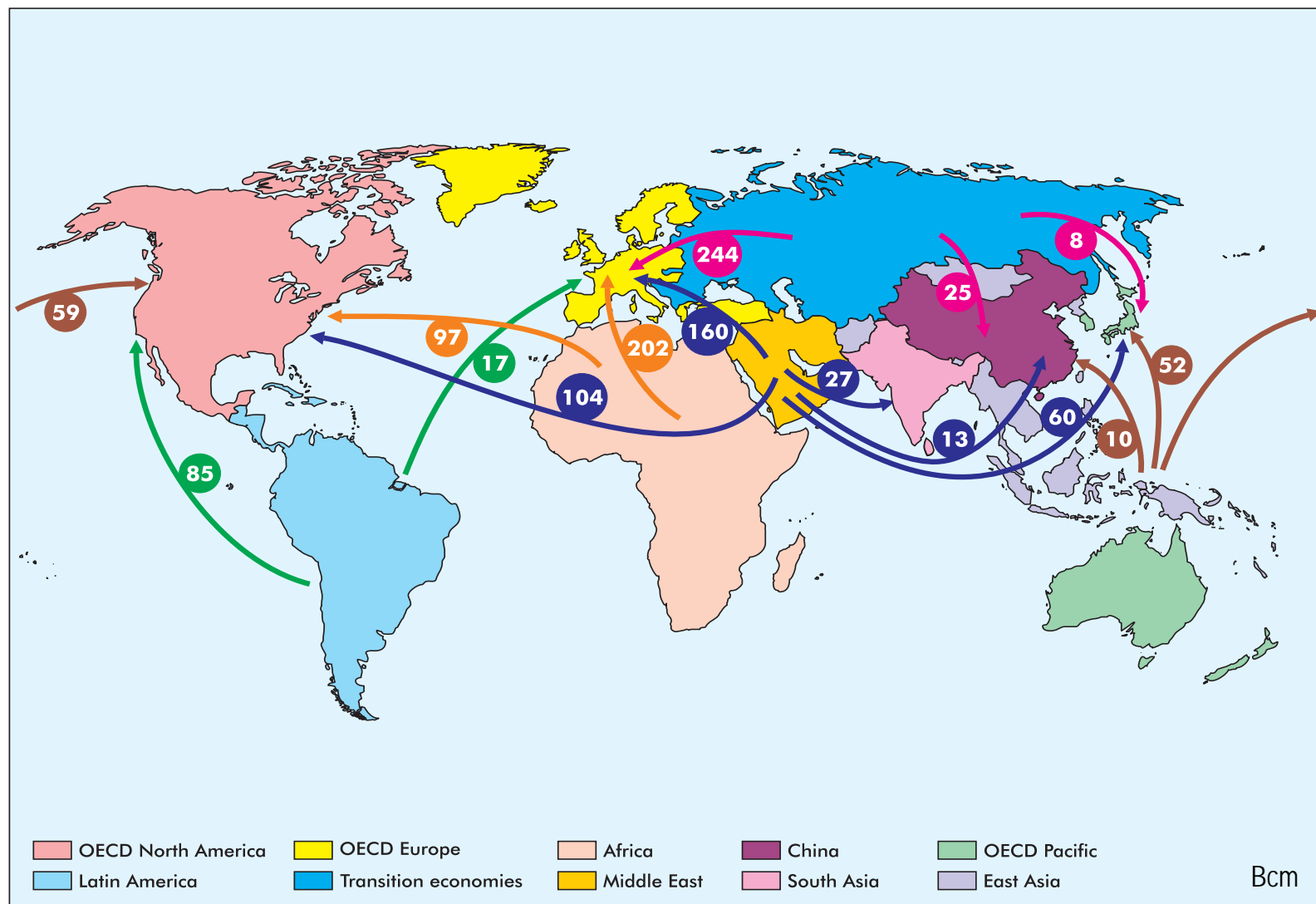
Most of the projected increase in gas demand comes from the power sector, while GTL plants emerge as a new outlet

Gas Production by Region



The Middle East sees the biggest jump in production, but the transition economies remain the largest producing region

Net Gas-Trade Flows, 2030

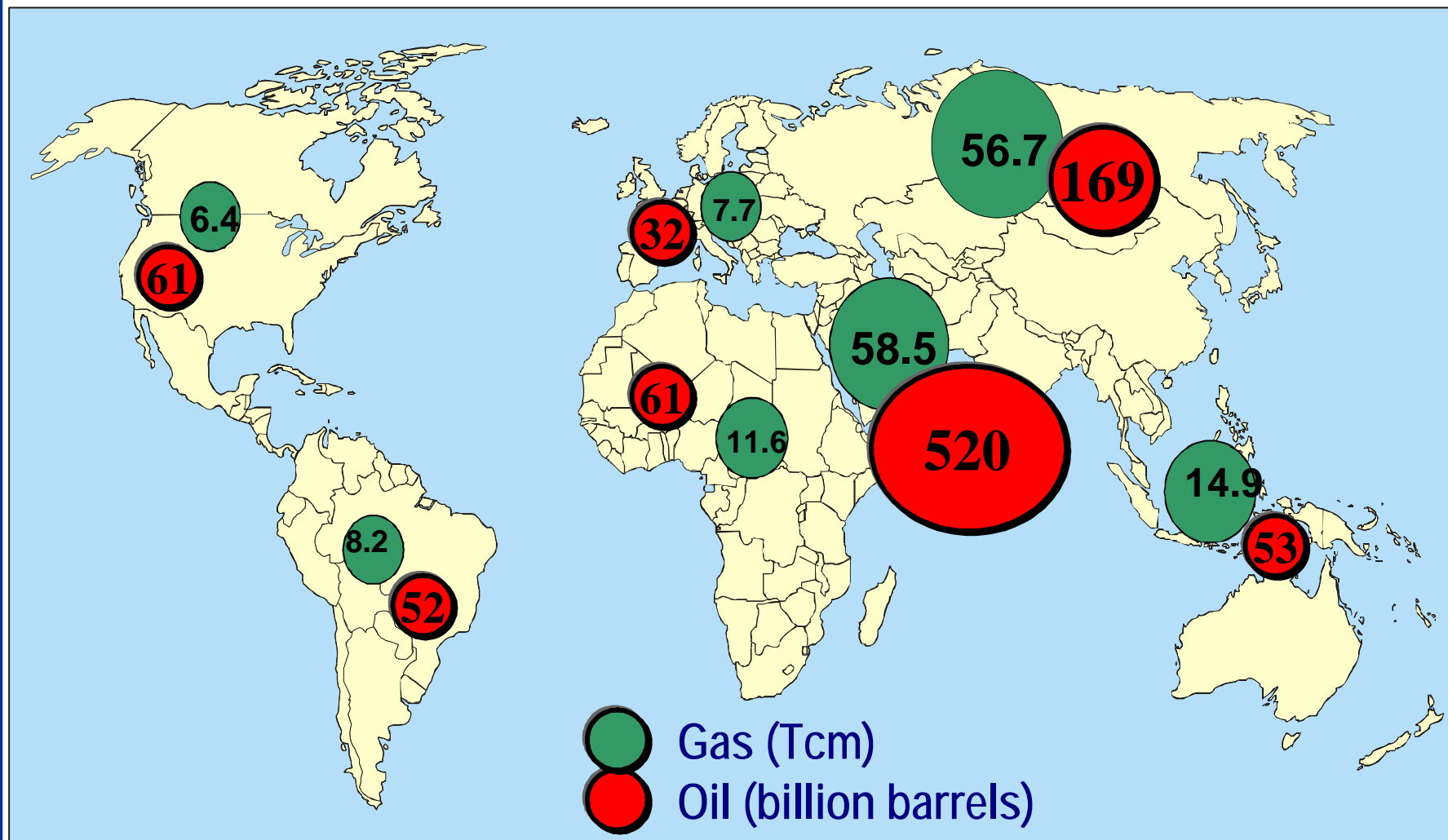


The Middle East overtakes the transition economies as the world's biggest gas-exporting region

Resources are sufficient **BUT** The Energy Sector will have to face 4 major Challenges :

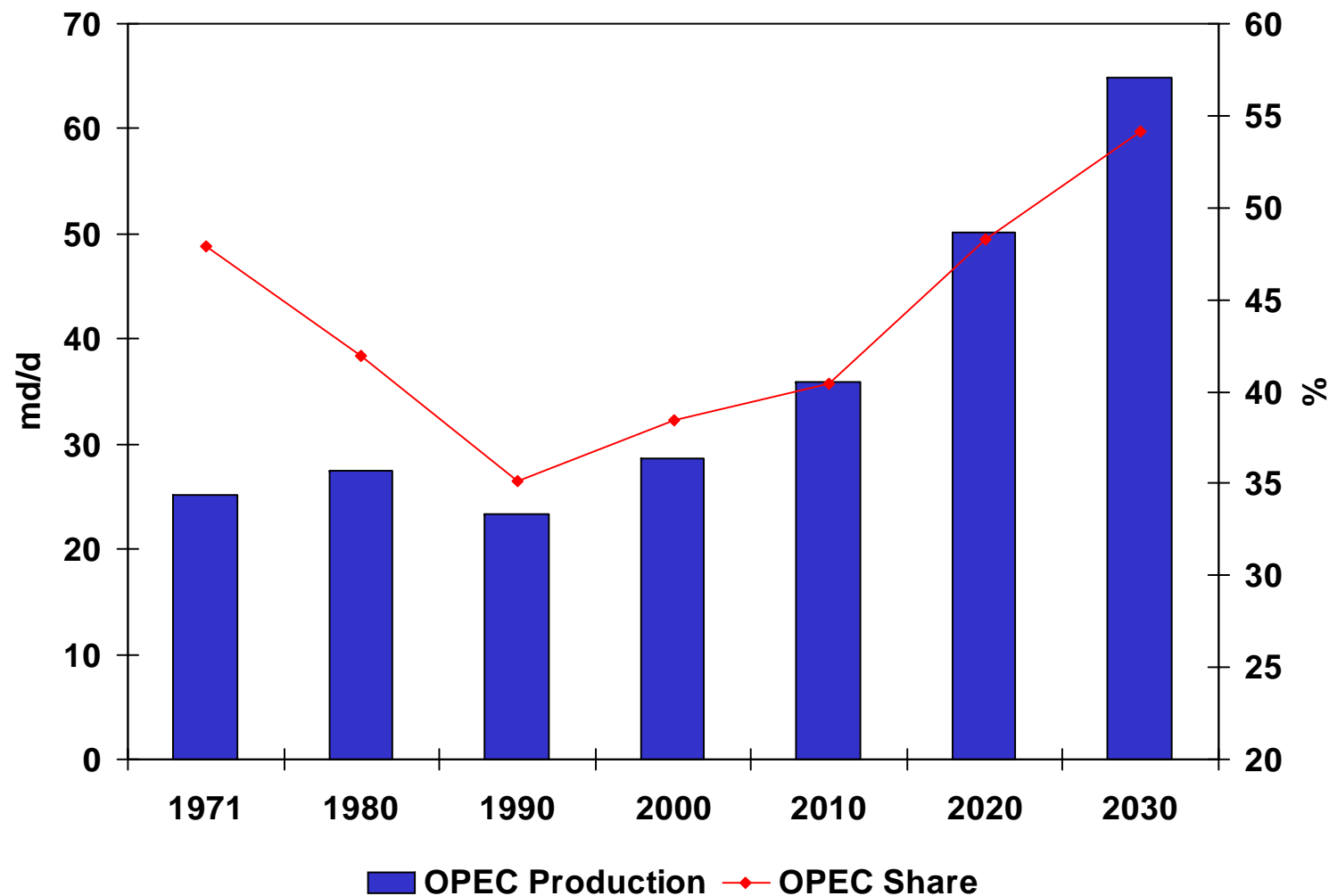
- Security of energy supplies
- Threat of environmental damage caused by energy use
- Uneven access of the world's population to modern energy
- Investment in energy-supply infrastructure

World oil and gas proven reserves



Source : USGS 2000, cedigaz 2001

OPEC Share in World Oil Production

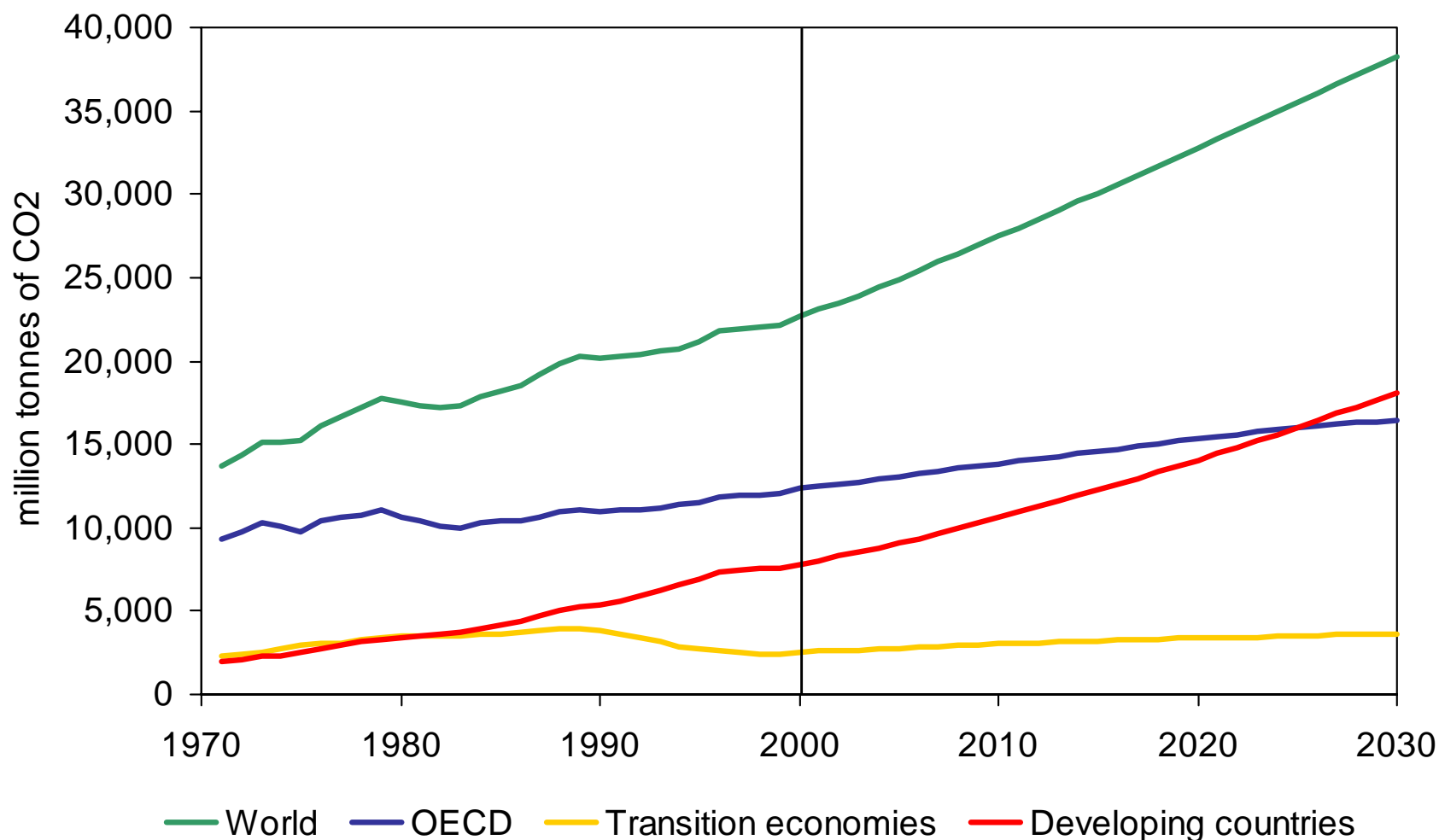


*OPEC Share in world oil production will reach 54% in 2030
from 38% today*

Resources are sufficient **BUT**
The Energy Sector will have to face 4
major Challenges :

- Security of energy supplies
- Threat of environmental damage caused by energy use
- Uneven access of the world's population to modern energy
- Investment in energy-supply infrastructure

Energy-Related CO₂ Emissions

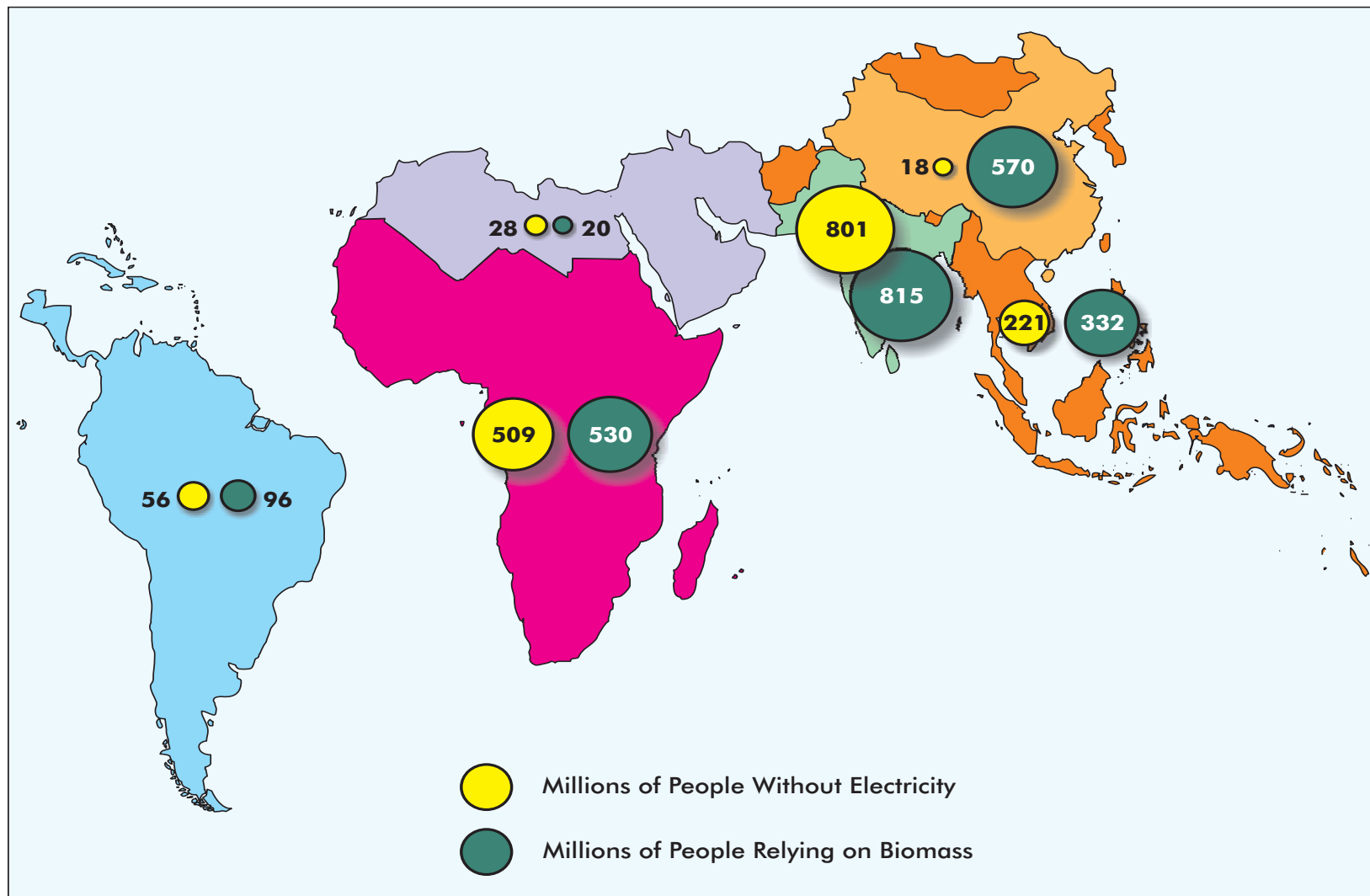


World emissions increase by 1.8 % per year to 38 billion tonnes in 2030 – 70% above 2000 levels

Resources are sufficient **BUT** The Energy Sector will have to face 4 major Challenges :

- Security of energy supplies
- Threat of environmental damage caused by energy use
- **Uneven access of the world's population to modern energy**
- Investment in energy-supply infrastructure

Map of Global Energy Poverty



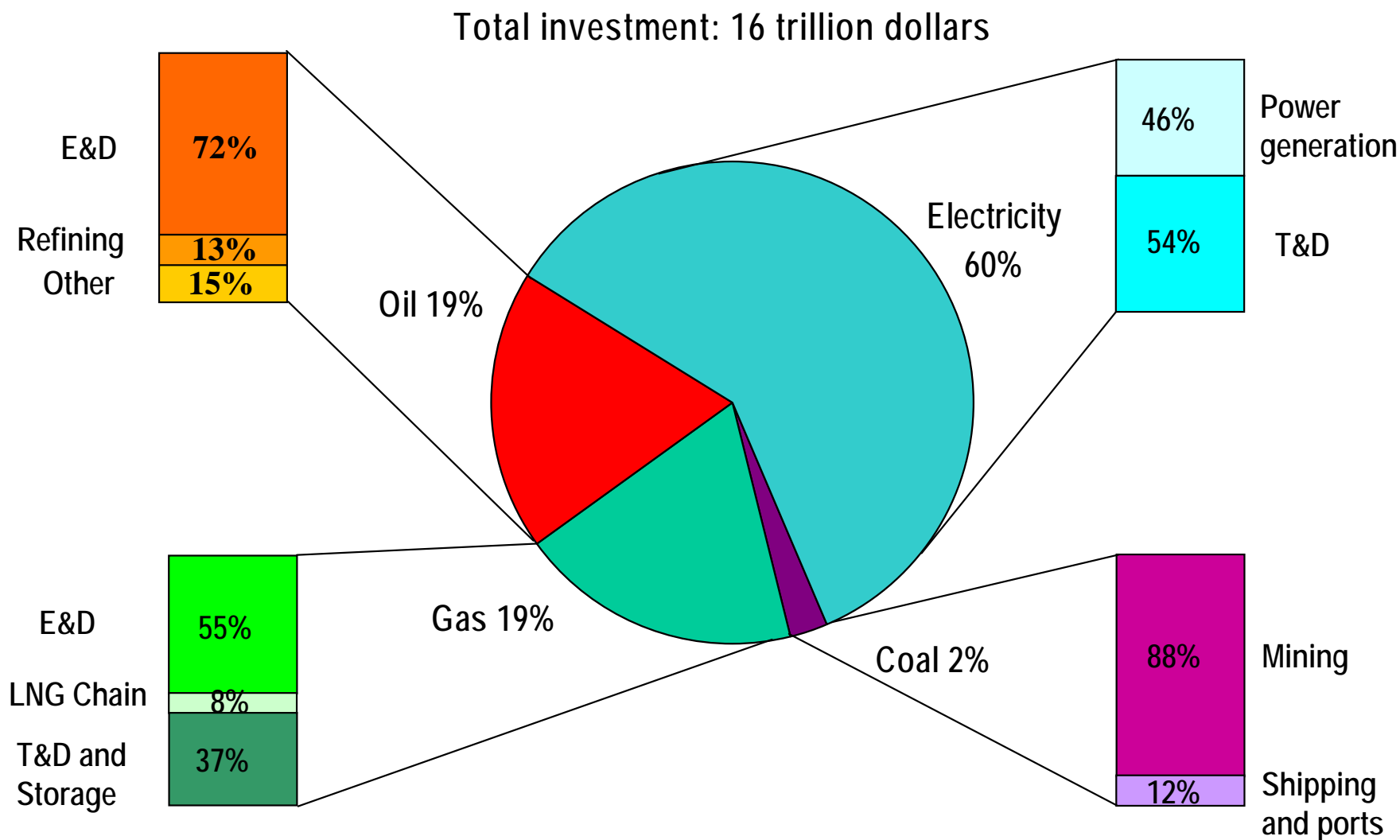
***1.6 billion people have no access to electricity,
80% of them in South Asia and sub-Saharan Africa***

Resources are sufficient **BUT** The Energy Sector will have to face 4 major Challenges :

- Security of energy supplies
- Threat of environmental damage caused by energy use
- Uneven access of the world's population to modern energy
- **Investment in energy-supply infrastructure**

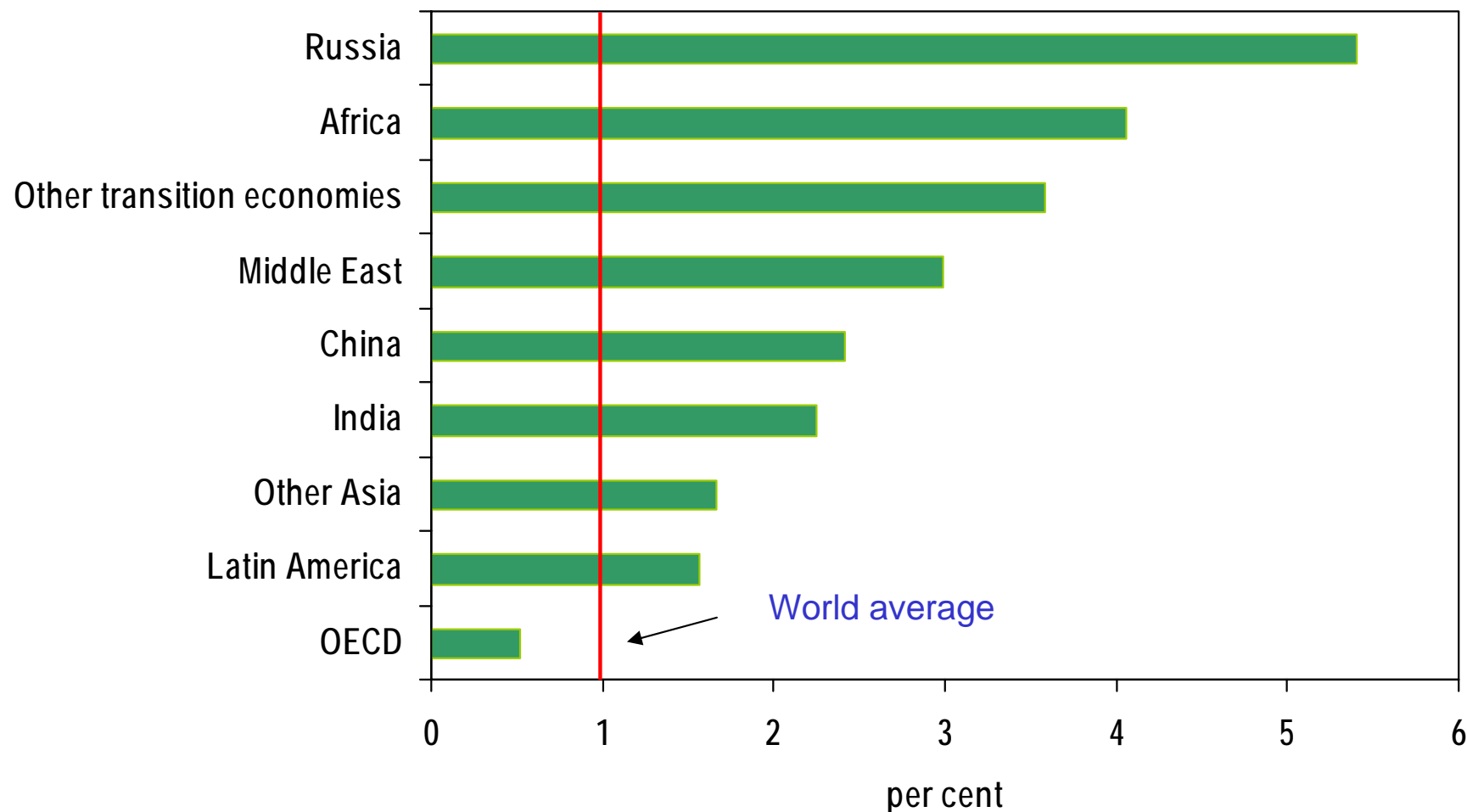
World Energy Investment

2001-2030



Global investment of \$3 trillion needed in 2001-2030 for oil and gas, respectively

Energy Investment Share in GDP 2001-2030



The share of energy investment in the economy is much higher in developing countries and the transition economies than in the OECD

Conclusions

Resources are adequate in the 30 coming years but supply reliability depend on :

- ***Access to reserves and production policies - OPEC (and Iraq) & Russia***
- ***massive, timely investment in new production capacity and transport infrastructure***
- ***Investment risks : macro-economic conditions (Oil/gas prices and rate of returns), Environmental policies, geopolitics...***
- ***However, resources are not unlimited and longer term prospects will have to take into account this constraint***