



**International Conference for Renewable Energies
Bonn 2004**

***IEA Side Event
Technology, Market and Policy Trends for Renewables***

***Renewables – an Issue of International
Collaboration on Policy and R&D***

**Antonio Pflüger
Head, Energy Technology Collaboration Division
International Energy Agency**

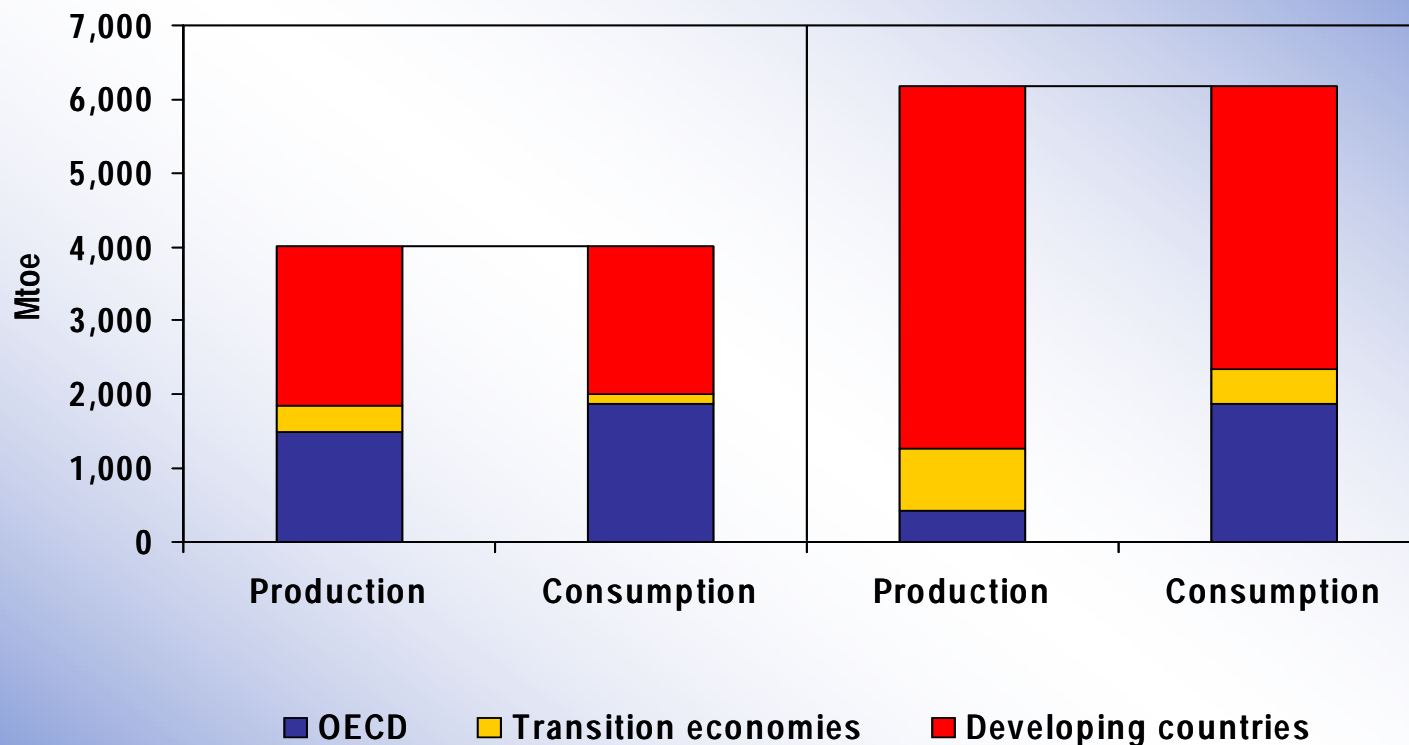


Strategic Challenges

- ◆ **Secure supply**
- ◆ **Reduce growing energy-related greenhouse gas emissions**
- ◆ **Overcome lack of access to modern energy for more than a quarter of the world's population**
- ◆ **Create framework for investment**



Increase in World Energy Production and Consumption



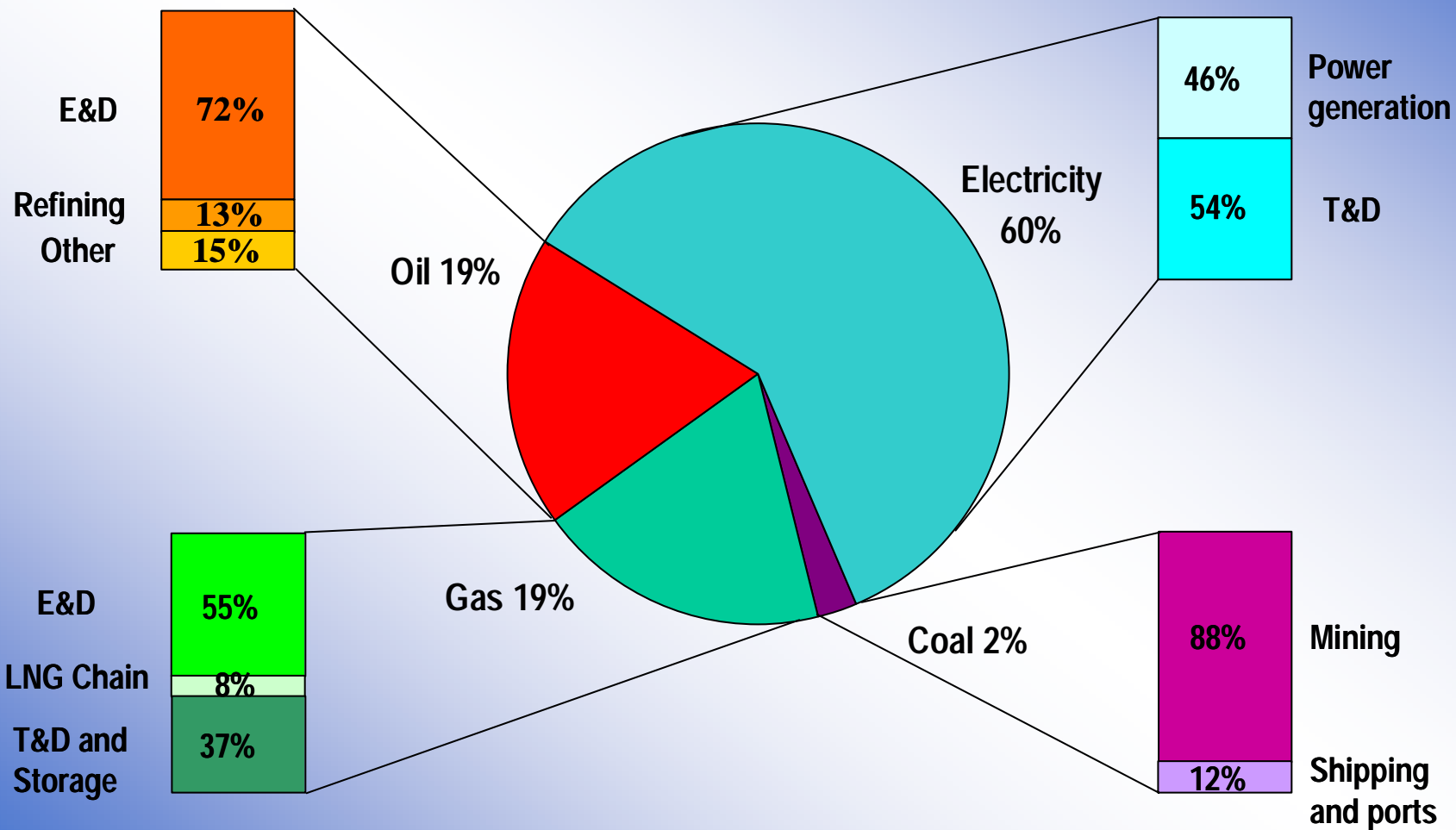
Almost all the increase in production occurs outside the OECD, compared with 60% in 1971-2000. Fossil Fuels account for more than 90% of the 2000-30 increase in demand.

Source: IEA World Energy Investment Outlook 2003



World Energy Investment - 2001-2030

Total investment: 16 trillion dollars



Source: IEA World Energy Investment Outlook 2003



Energy Policy Dilemma

- Create access to energy,
→ increase energy demand
challenges:
 - ◆ Attract investment
 - ◆ Affordable energy prices
 - ◆ Energy security
 - ◆ But: CO₂ emissions likely to increase
2000-2030 by 70%
- The climate challenge (IPCC): Global
emissions need to be 50%-60% lower
in 2020-2050 timeframe than in 1990



Advanced technologies for meeting future requirements

- Increased efficiency
- Renewable energy technologies, biofuels
- CO₂ capture and storage
- And many others

No single technology can meet the CO₂ challenge alone



How Did Renewables Perform? **Energy Production**

- **Good news:**
142 Mtoe in 1970 / 281 Mtoe in 2001
- **Bad news:**
Share shrunk from 6 % in 1992
to 5.5 % in 2001



How Did Renewables Perform? **Policy Efforts**

- **Good news:**
Almost all IEA countries have enacted support schemes by end 90ies
- **Bad news:**
86 % wind energy capacity concentrated in 4 countries (Germany, Denmark, Spain, USA)
84 % of PV concentrated in 3 countries (Germany, Japan, USA)



How Did Renewables Perform?

R&D Funding

- **Good news:**
R&D budgets set up after first oil price crisis have led to remarkable technological progress
- **Bad news:**
After 1982 R&D budgets shrunk to 1/3
→ lack of availability of technologies close to market conditions

IEA Renewable Energy Publications





IEA Renewables Network



- (REWP) Renewable Energy Working Party
- Technology Collaboration Programmes (Implementing Agreements)
 - ◆ Bioenergy
 - ◆ Geothermal
 - ◆ Hydropower
 - ◆ Photovoltaic
 - ◆ Solar Heating and Cooling
 - ◆ SolarPACES
 - ◆ Ocean Energy
 - ◆ Wind



Extent of the Programme

- **41 current Agreements**
(8 focusing on renewables)
 - ◆ over 100 tasks
 - ◆ nearly 500 participating institutions
- **Average 12 countries per Agreement**
- **US\$ 120-150 m spent each year**
under the collaborative programme
- **Non-IEA Member countries and industries can and do participate**