



Challenges and Goals

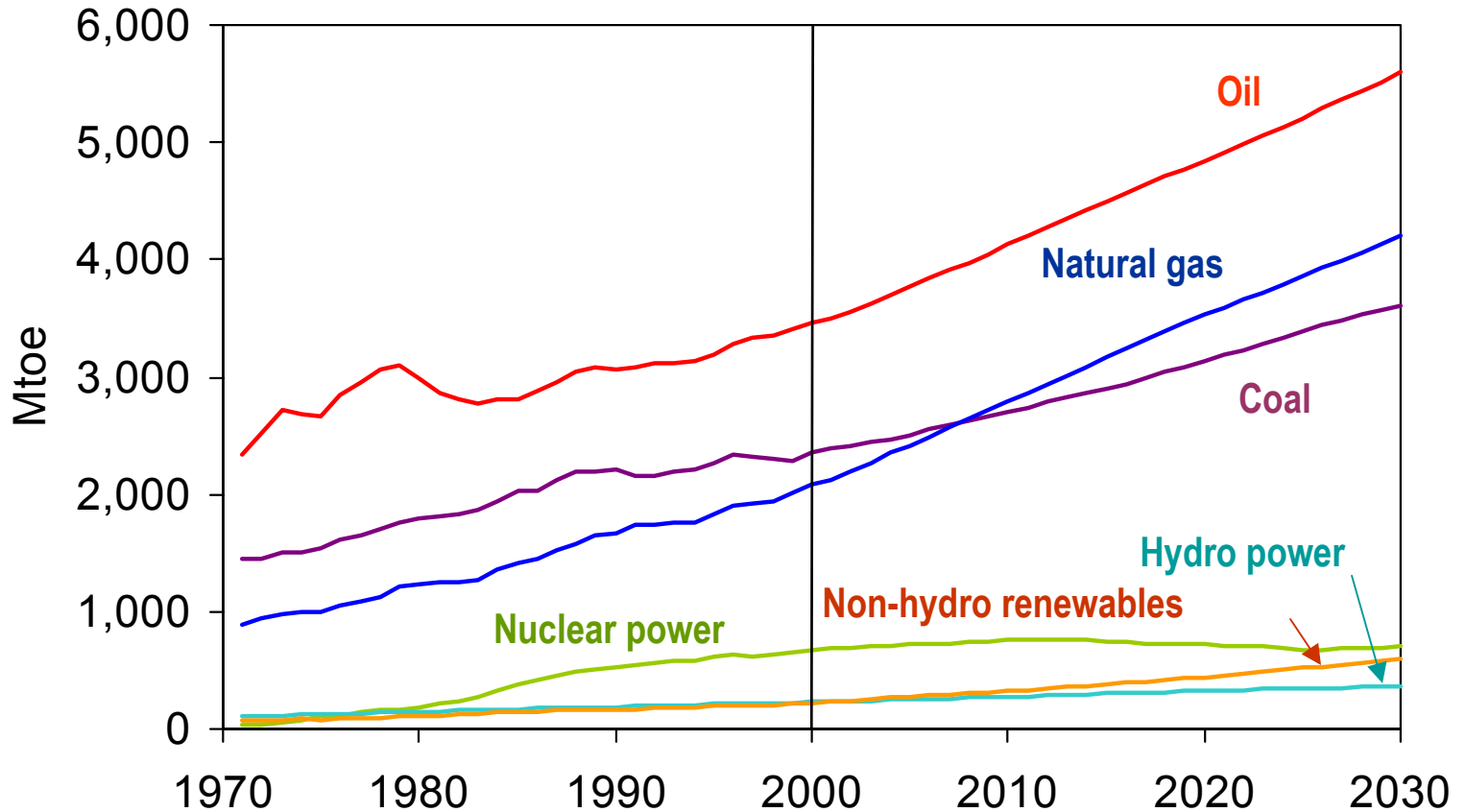
Carbon Sequestration Leadership Forum

24 June 2003

Claude Mandil
Executive Director
International Energy Agency



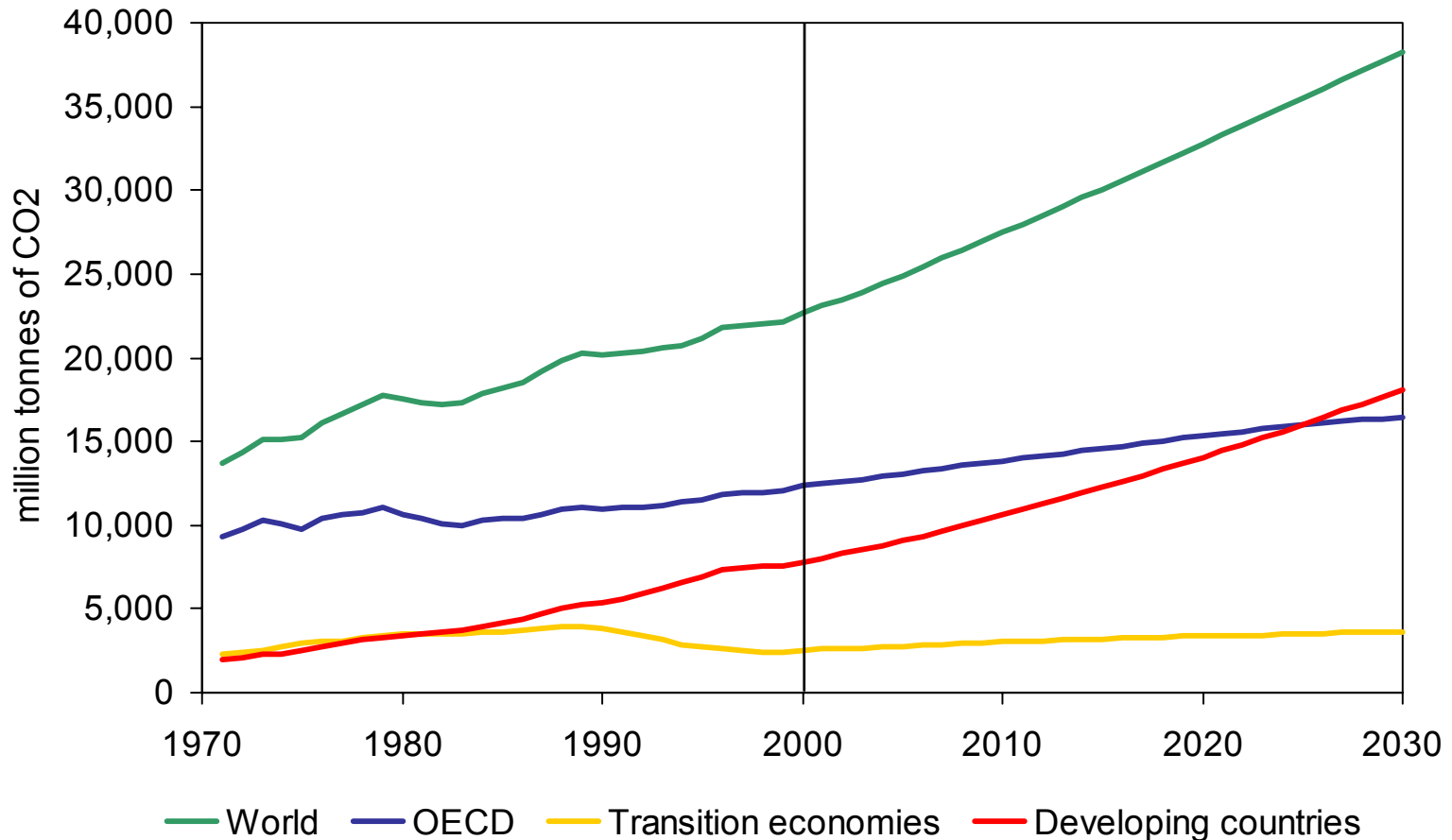
World Primary Energy Demand



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



Energy-Related CO₂ Emissions

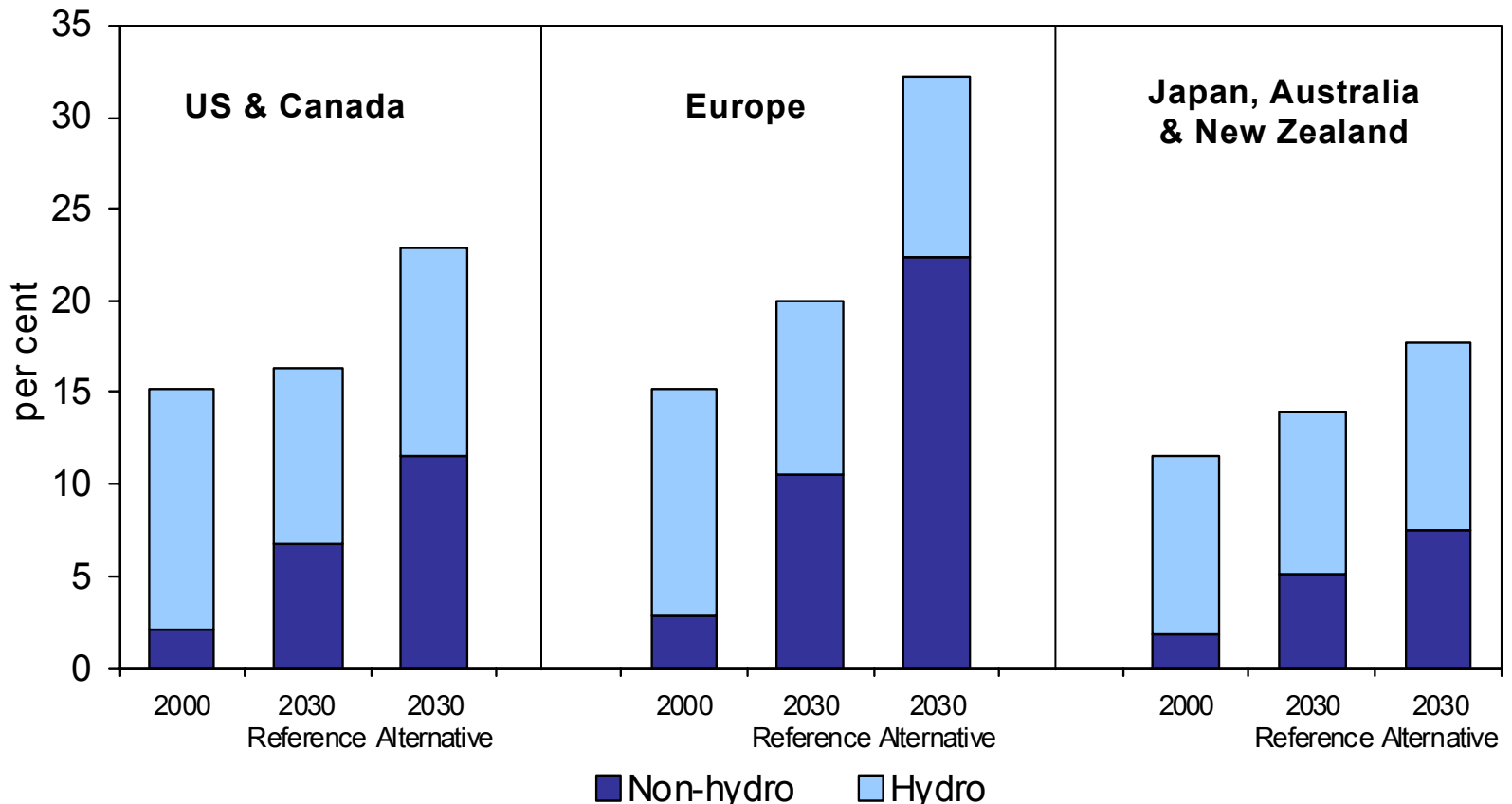


World emissions will increase by 1.8 % per year to 38 billion tonnes in 2030 – 70% above 2000 levels



Importance of Increased Renewable Energy in Power Generation

WEO 2002 Alternative Policy Scenario



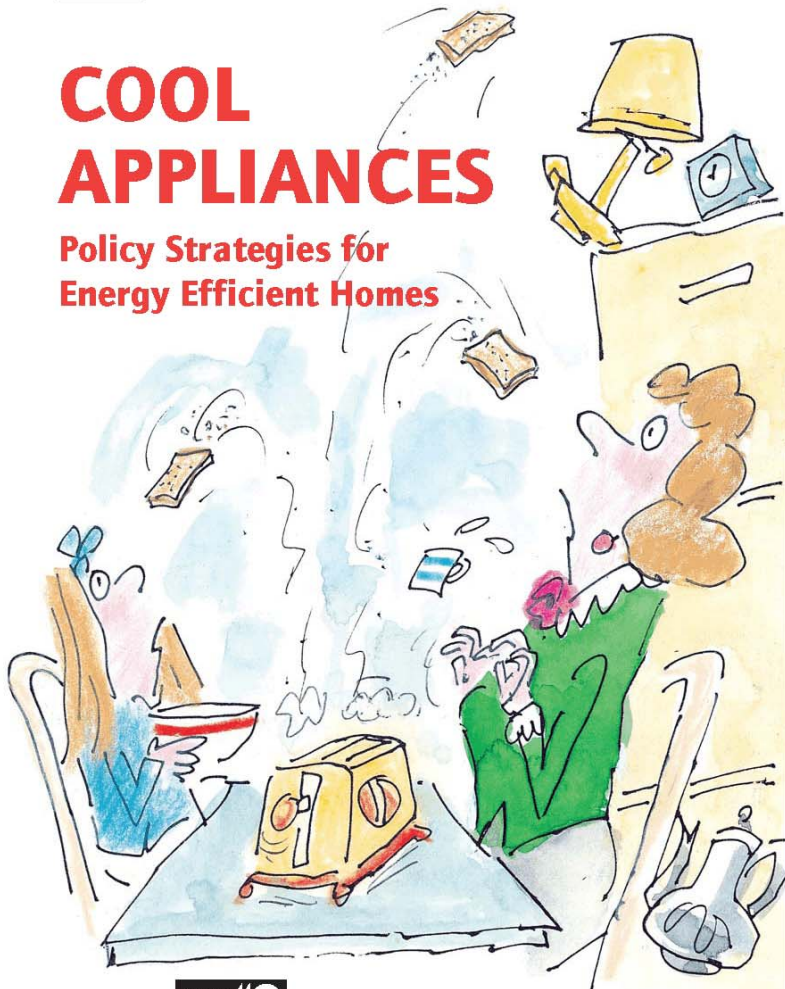
Non-hydro renewables can be greatly increased with additional policies.



INTERNATIONAL ENERGY AGENCY

COOL APPLIANCES

Policy Strategies for Energy Efficient Homes



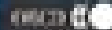
ENERGY EFFICIENCY POLICY PROFILES



INTERNATIONAL ENERGY AGENCY

SAVING OIL AND REDUCING CO₂ EMISSIONS IN TRANSPORT

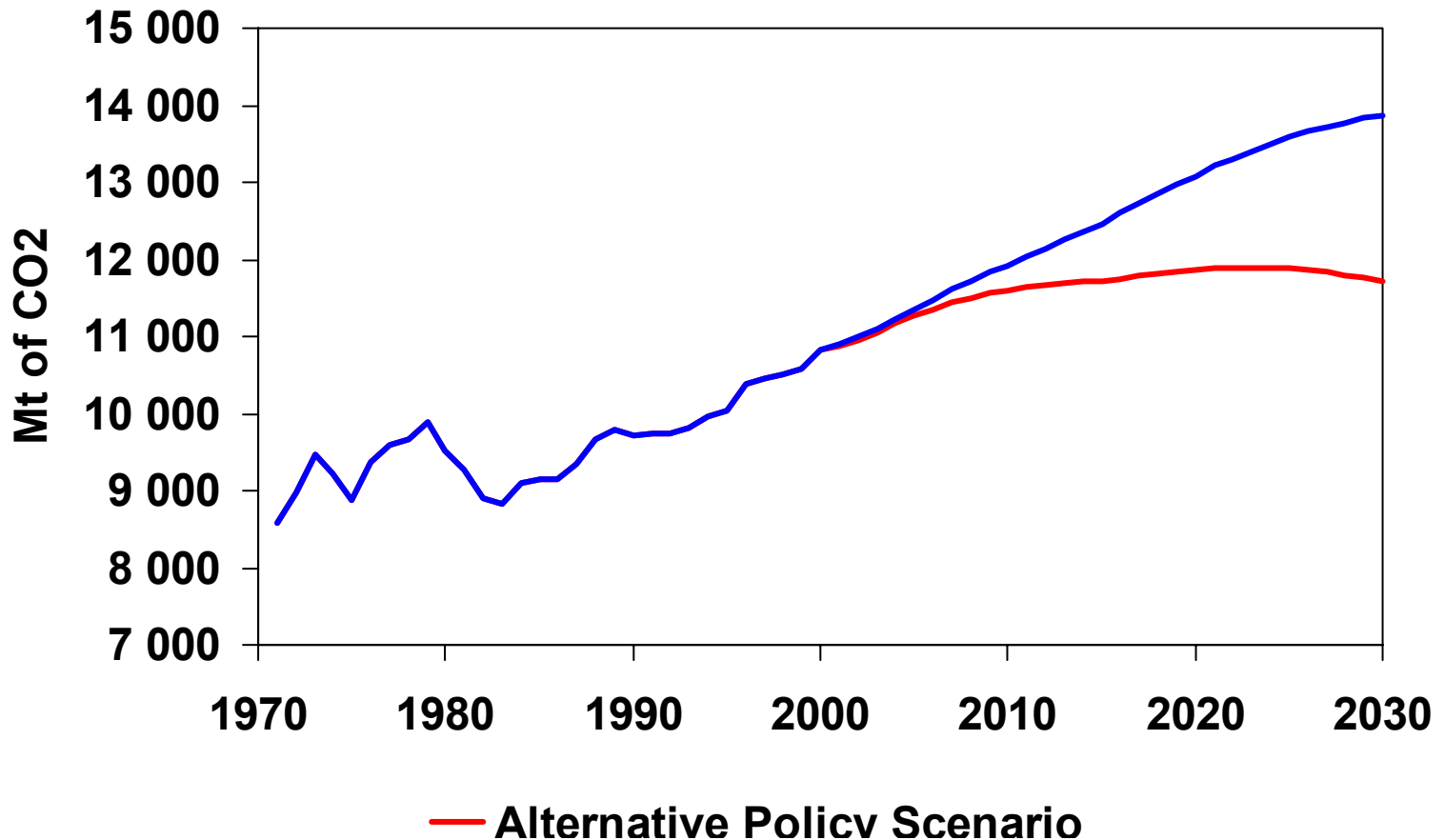
Options & Strategies





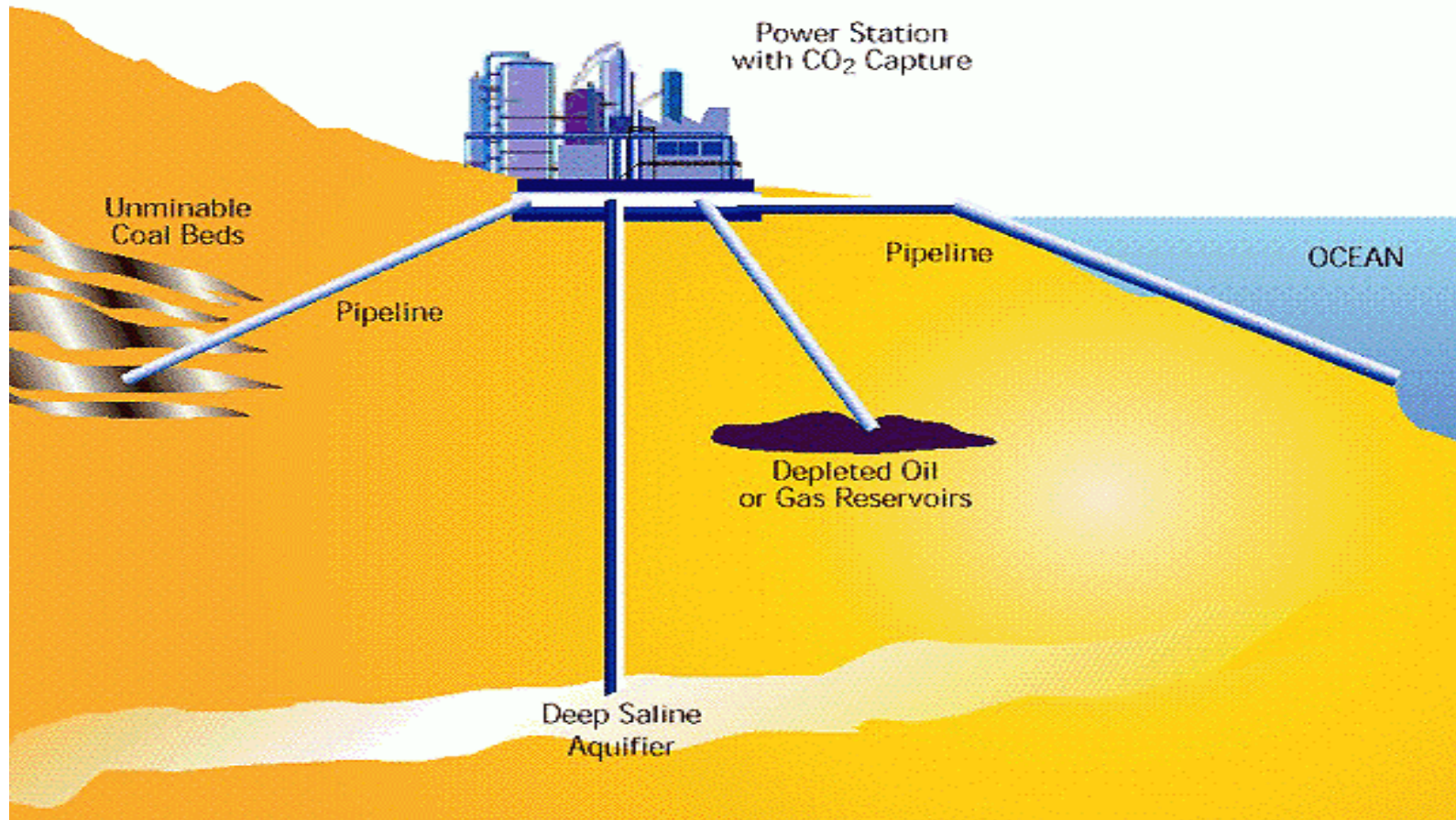
OECD CO₂ Emissions

WEO 2002 Alternative Policy Scenario Effect of Increased Efficiency + Renewables





CO₂ Capture and Storage



From IEA Greenhouse Gas Programme



Costs of Hydrogen \$/GJ

Hydrogen from Natural Gas with CCS	8-10
Hydrogen from Coal with CCS	10-13
Hydrogen from On-Shore Wind	15-25
Hydrogen from Off-Shore Wind	20-30
Hydrogen from Solar PV	25-50
Hydrogen from Nuclear	15-20
Hydrogen from HTGR Cogeneration	10-25



IEA Carbon Sequestration Activities

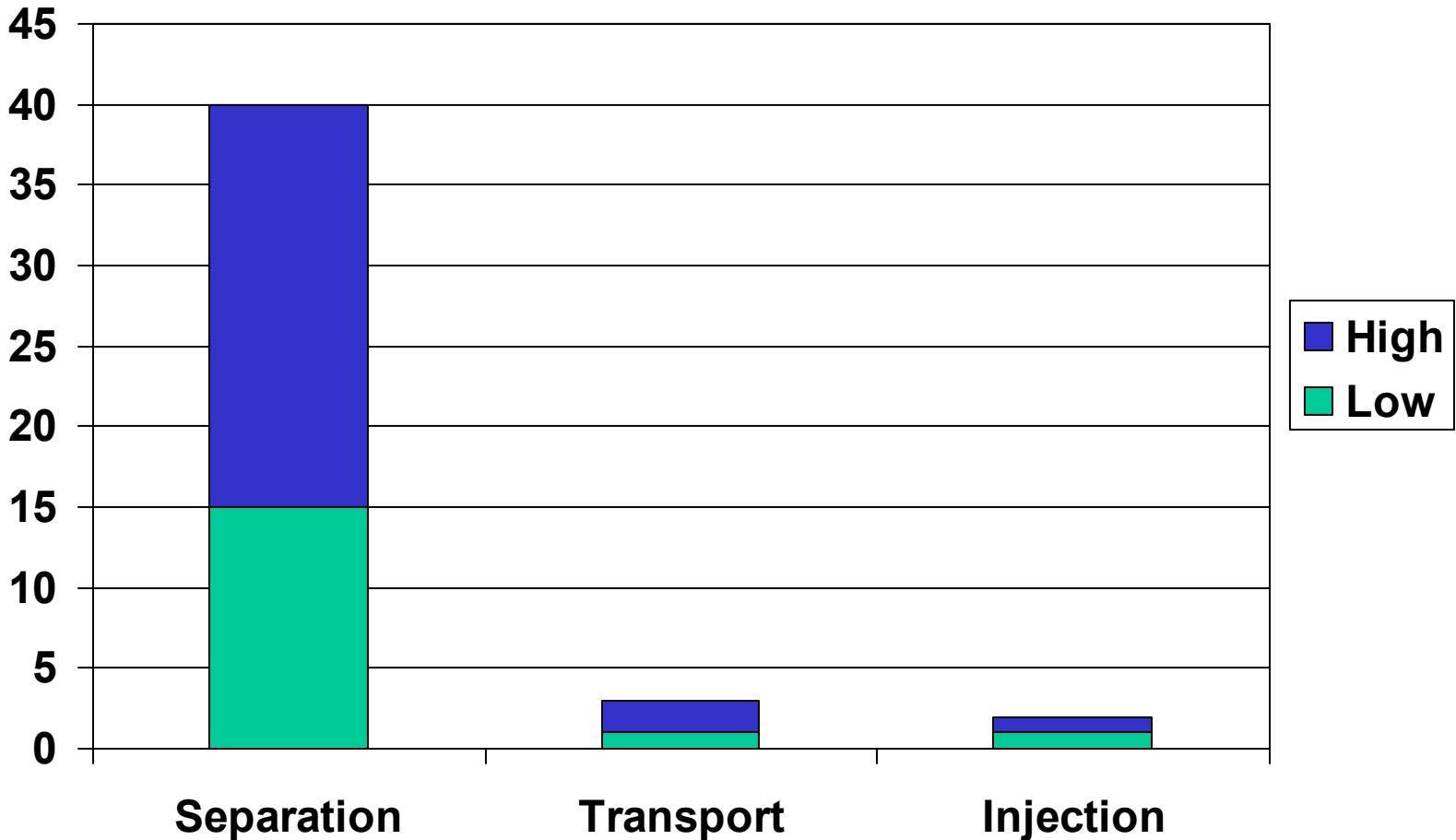
- **IEA Greenhouse Gas R&D Programme (Implementing Agreement)**
- **Working Party on Fossil Fuels**
 - ◆ **Technology Status Report**
 - ◆ **Zero Emission Technology Strategy**
- **Secretariat Technology Analysis**



IEA Cost Estimates

\$/tonne of CO₂

(\$/tonne of CO₂/100 km for transport)





Leadership and Collaboration

- **Leadership**
 - ◆ by governments, &
 - ◆ by industry.
- **Collaboration**
 - ◆ among governments,
 - ◆ with industry,
 - ◆ the scientific and environmental community, &
 - ◆ involving multinational organizations.
- **The Carbon Sequestration Leadership Forum is the right approach.**
- **The IEA stands ready to help.**