COAL
A Key Stakeholder in Carbon Capture and Sequestration

Carbon Sequestration Leadership Forum

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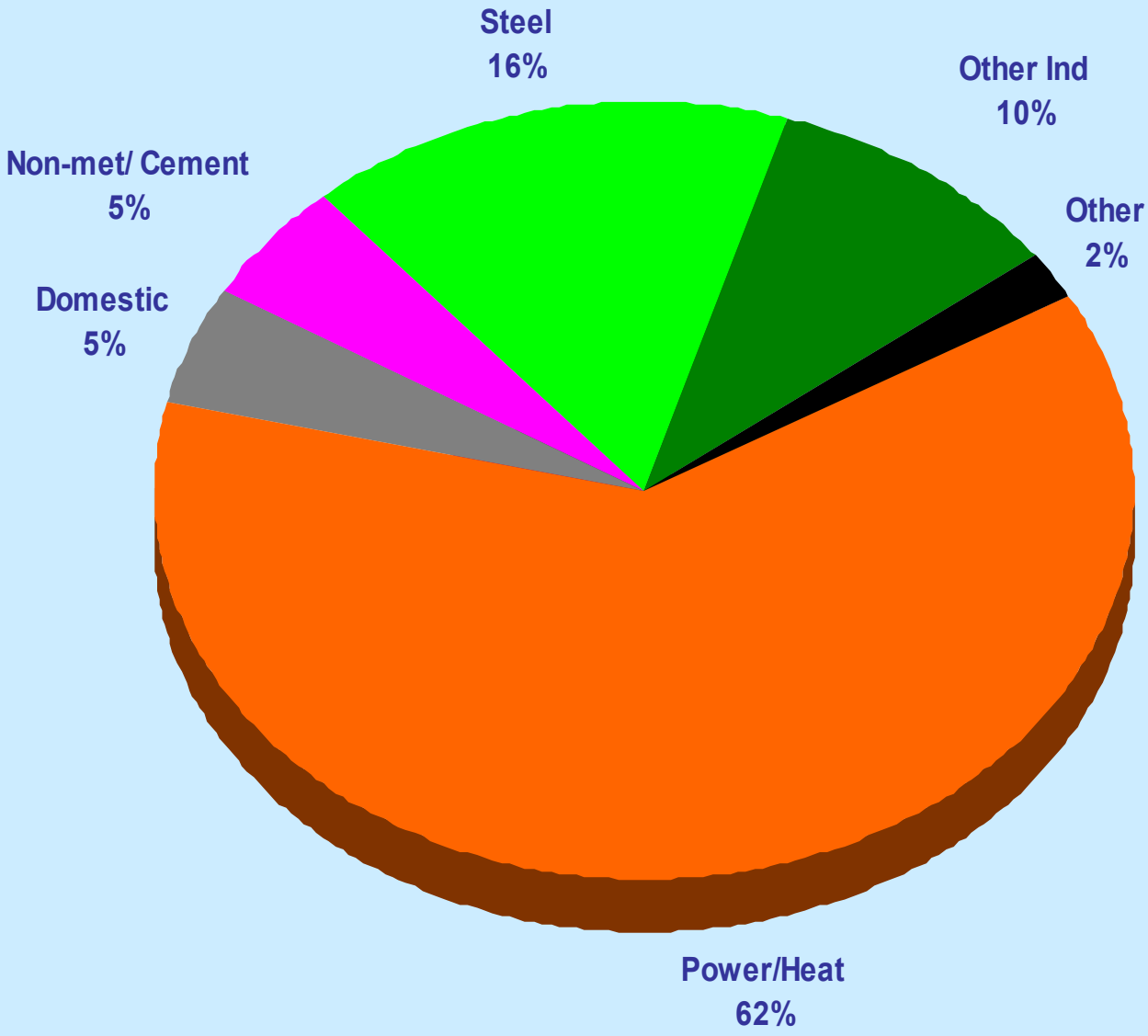
Key Statistics

Coal – Key Statistics

- Widespread, long life reserves 200 years
- Fastest growing energy source in last two years
- World production 3.8 bn tons (China 1.3)
- 83% used locally
- 17% traded internationally
- 39% of world electricity from coal
- 70% of world steel production uses coal
- Traded demand growing fastest in Asia
- Overall demand continues to grow steadily - projected to be up 50% in 25 years

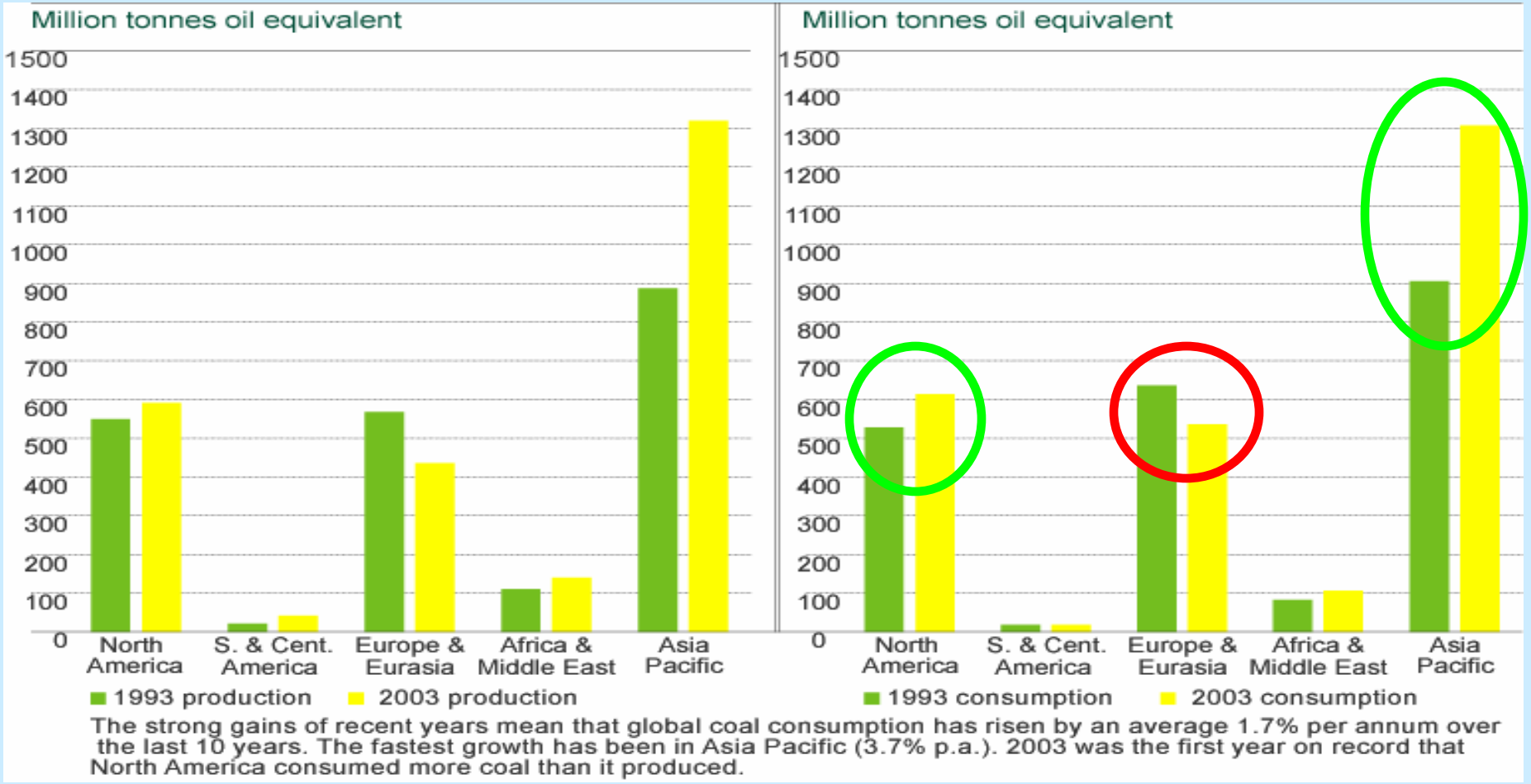
Coal Utilisation

Coal Usage


Steel
16%
Other Ind
10%
Non-met/ Cement
5%
Other
2%
Domestic
5%
Power/Heat
62%

Coal Production and Consumption

Coal -1993 to 2003 Production & Consumption

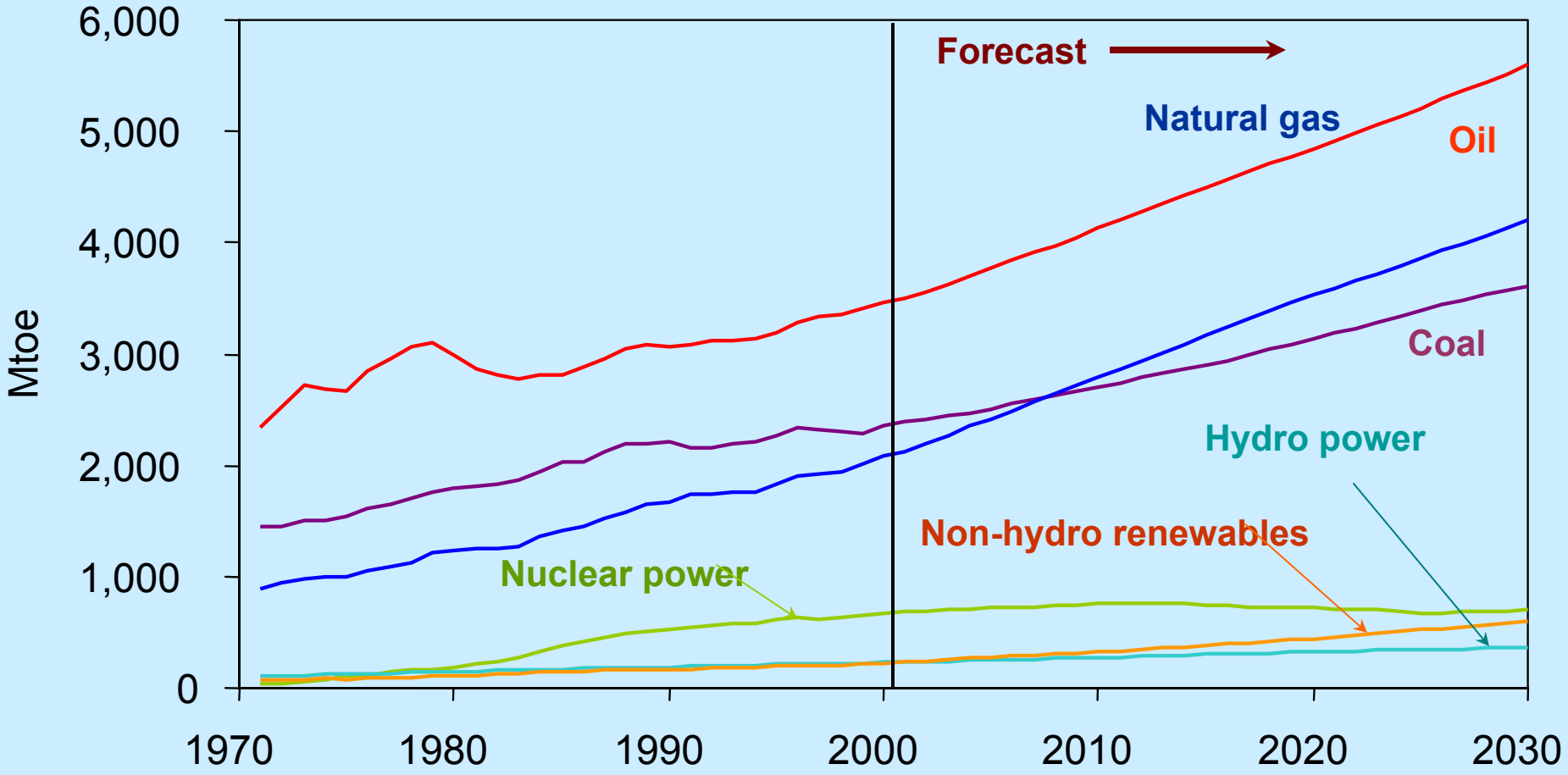


The strong gains of recent years mean that global coal consumption has risen by an average 1.7% per annum over the last 10 years. The fastest growth has been in Asia Pacific (3.7% p.a.). 2003 was the first year on record that North America consumed more coal than it produced.

BP Statistical Review 2004

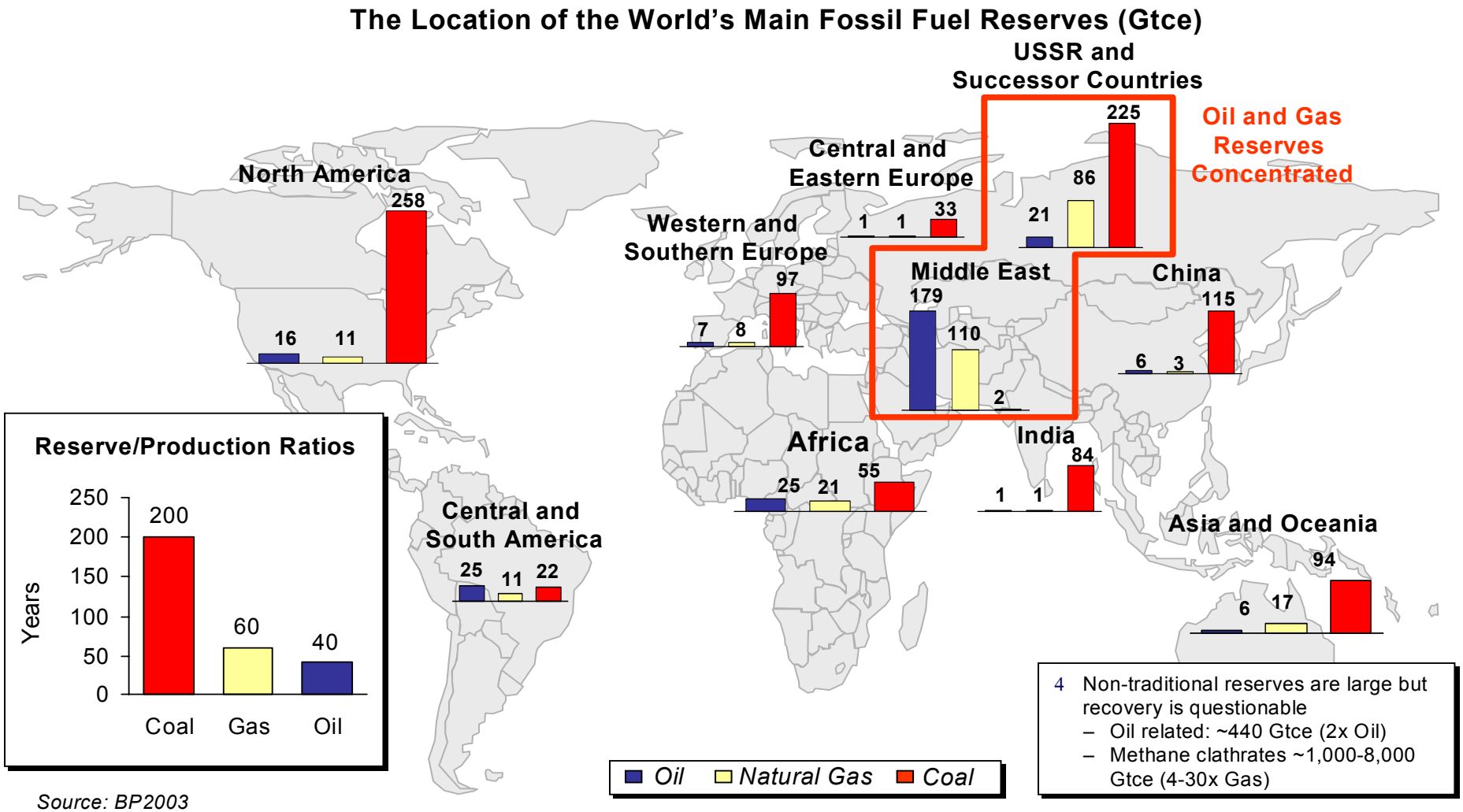
Future Energy and Coal Demand

World Primary Energy Demand
IEA – Reference Scenario



Coal Reserves

Who owns fossil energy reserves and how long might they last?

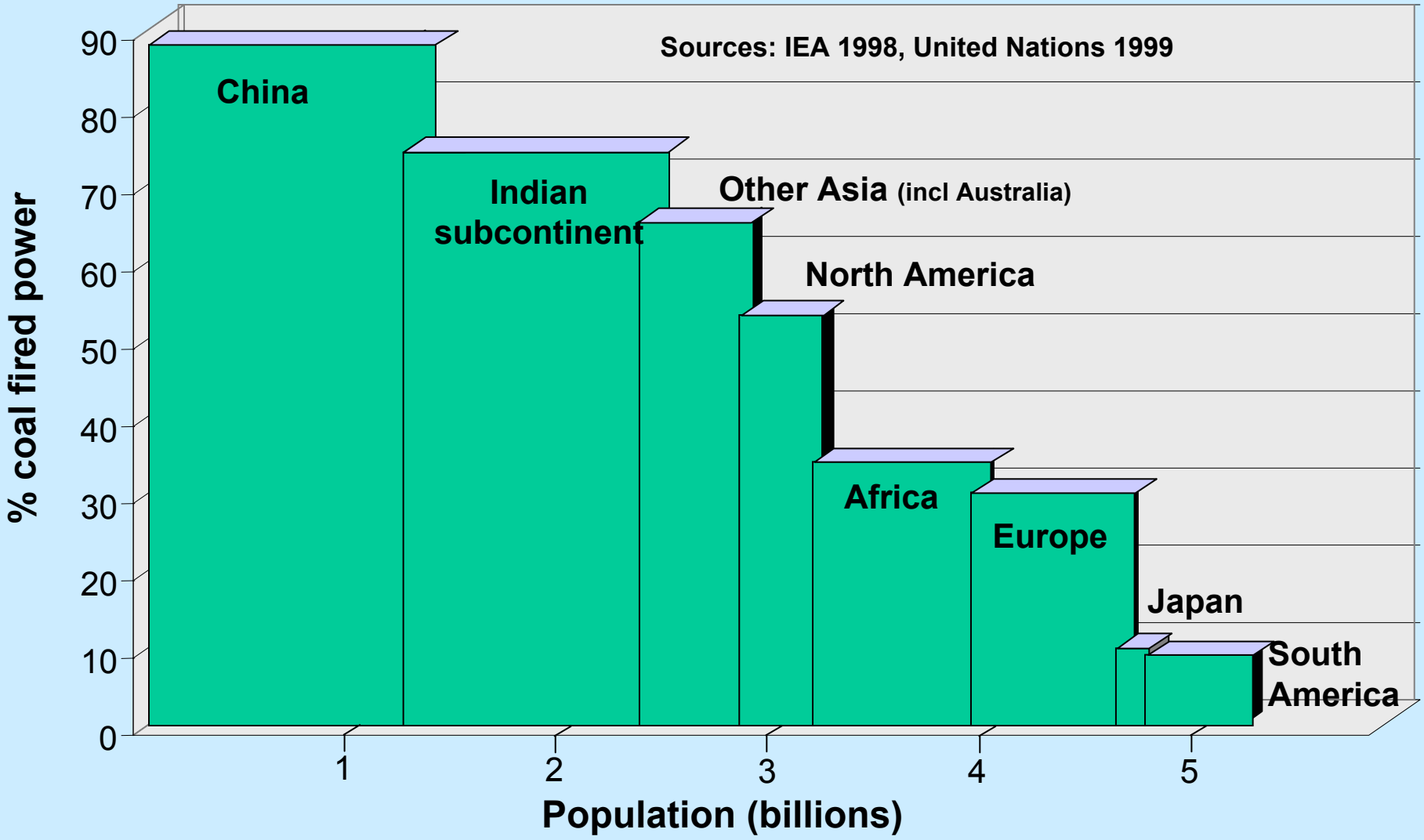


4 Non-traditional reserves are large but recovery is questionable
- Oil related: ~440 Gtce (2x Oil)
- Methane clathrates ~1,000-8,000 Gtce (4-30x Gas)

Source: BP2003

Coal and Developing Countries

Coal & Power Generation



Developing countries - Need for low energy cost

- 1.6 billion have no access to electricity
- 2.4 billion rely on primitive biomass for cooking and heating
- In 30 years time (without new policies) these numbers will be 1.4 billion and 2.6 billion respectively.

Access to electricity

China

- 700 million in 2 decades
- 98% electrification
- 84% coal

South Africa

- Doubled electrification rate in a decade
- 90% coal

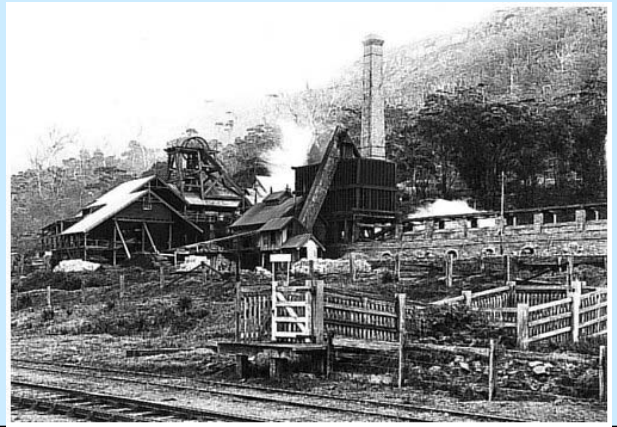
The Sustainable Development Challenge

Challenges

Economic Development

Social Development

Environmental conservation



Public perception

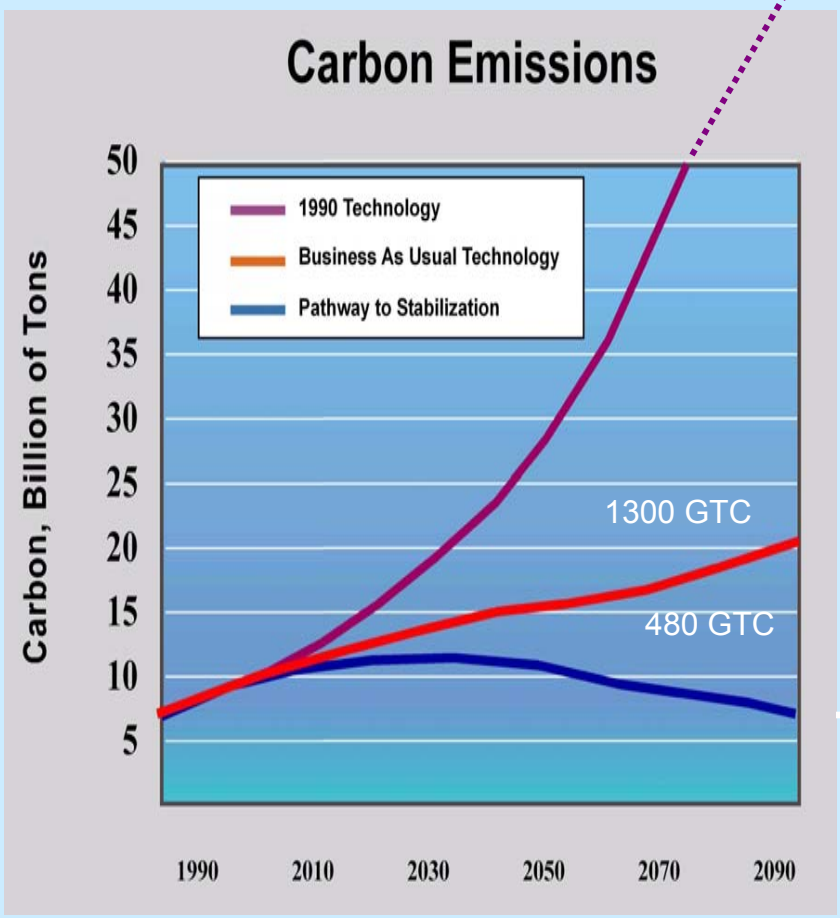
The Environmental Challenge

Key Environmental Challenges

Emissions from power generation

- SOx, NOx and Particulates
- Trace Elements
- Greenhouse gases

GHG Stabilisation a Huge Task



1990 Technology

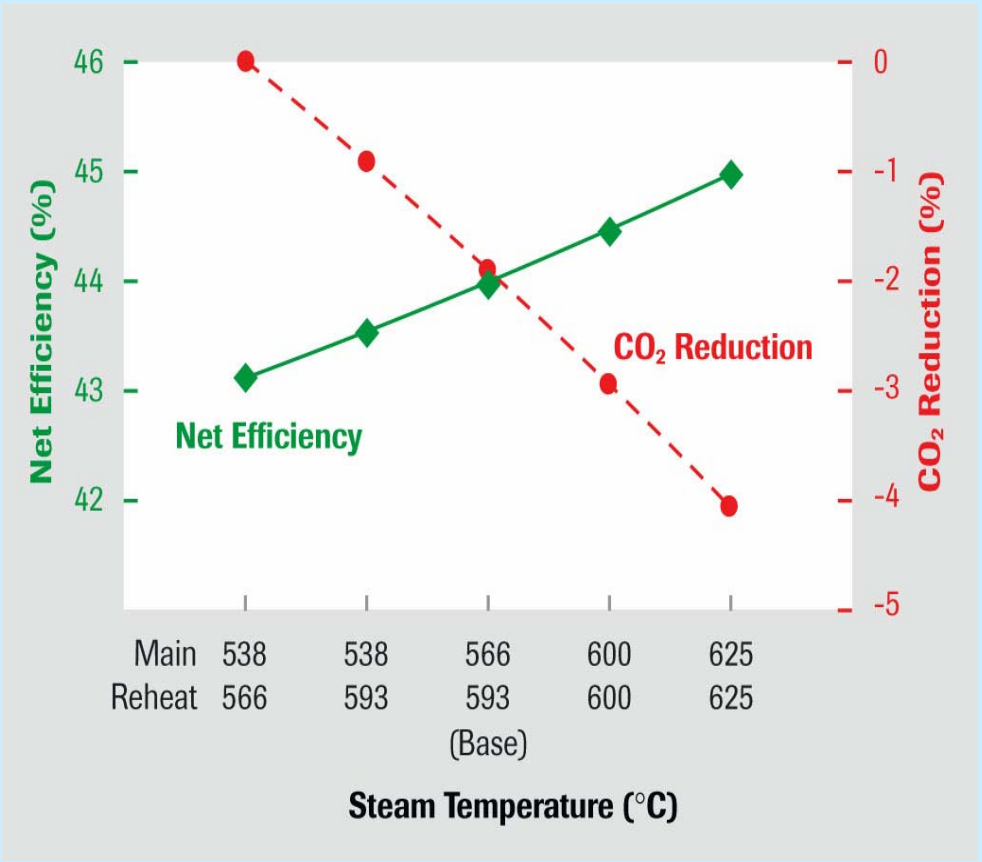
Technologies in current R&D pipeline are not enough

Business-As-Usual Technology Gap 1300 GTC

Stabilization Technology Gap 480 GTC

Power Generation – Benefits of efficiency

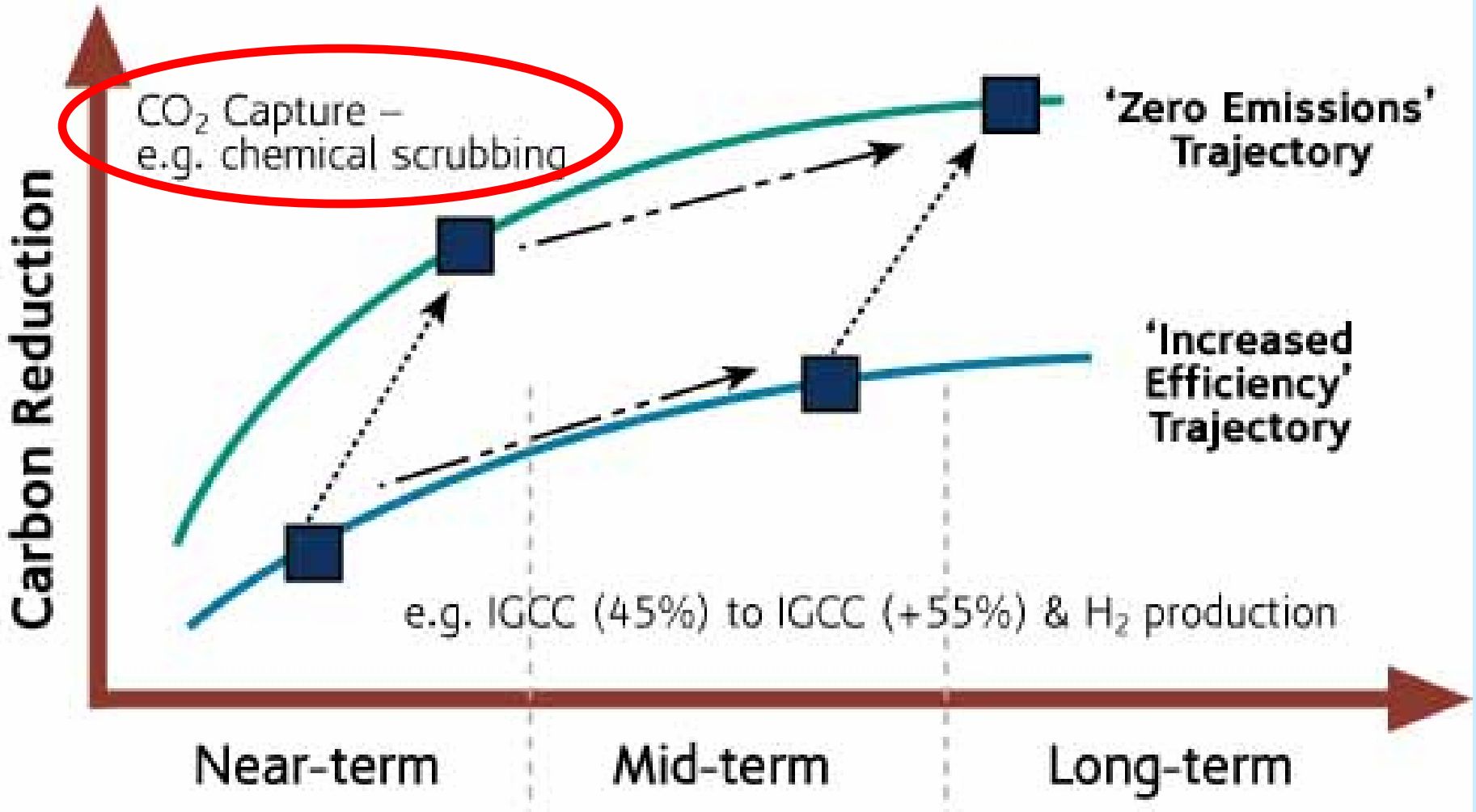
- World average - c 30%
- European average - c 36%
- BAT - c 43% (15%+ CO_2 reduction)
- 2010 - c 50% (25%+ CO_2 reduction)



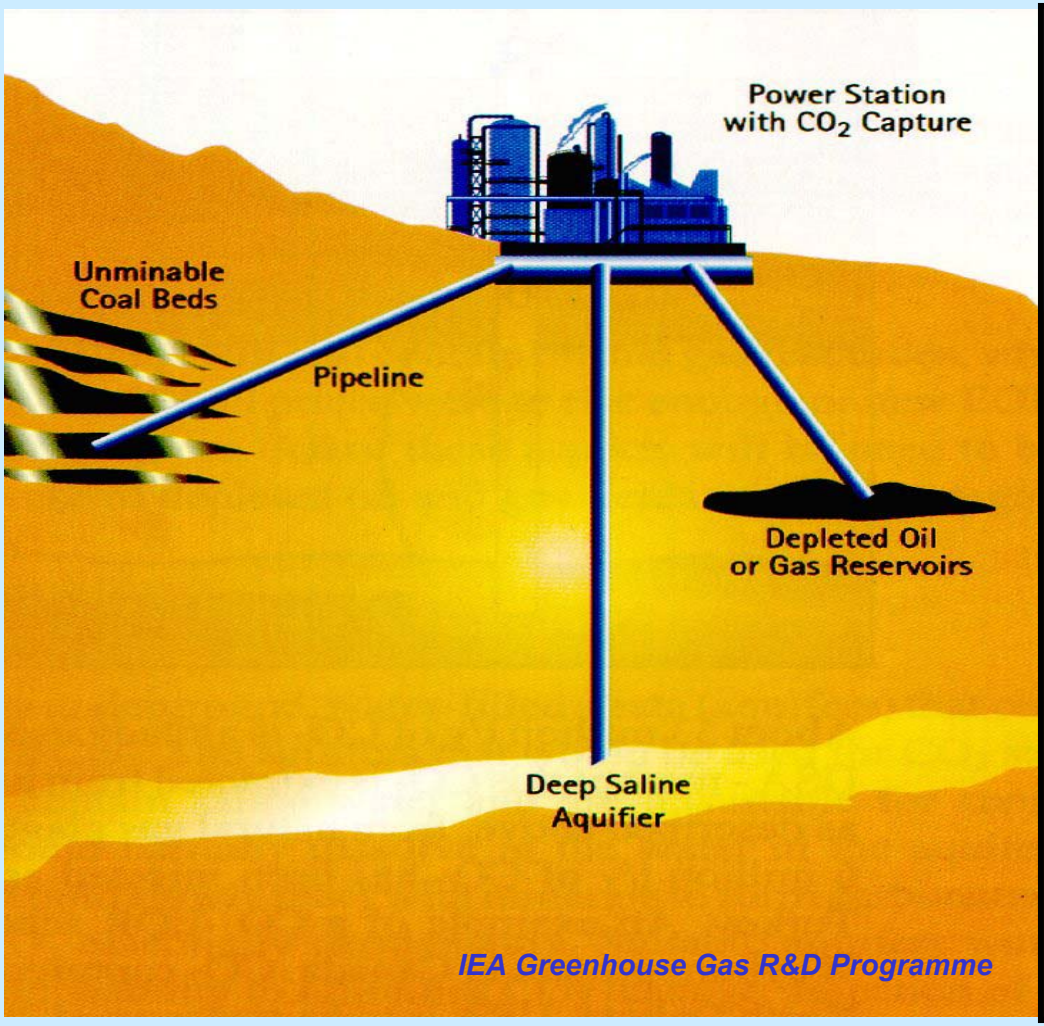
Carbon Capture and Storage

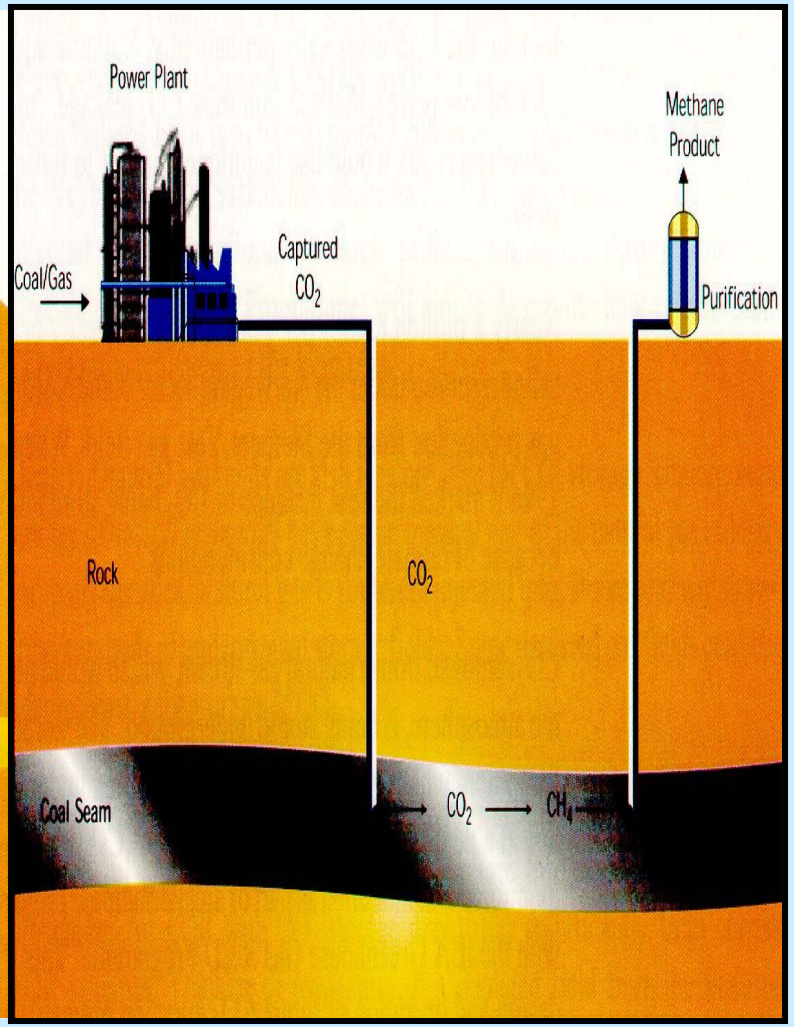
Clean coal technology (CCT)

The pathway to near-zero emissions



Geological Storage Options





Conclusions

- CCS is a vital element in the technological response to CO2 emissions and the wider environmental challenge facing the coal industry
- The role of the CSLF is vital to maintaining the necessary momentum worldwide to advance the research effort – now of increasing importance to all fossil fuels – as evidenced at WEC
- Research and project development programmes need to be carefully structured and located to ensure the developing countries are not left behind