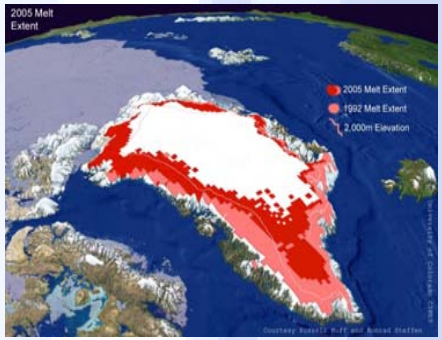
Overcoming Barriers to CCS Deployment

Y S Pillay

Anglo Coal

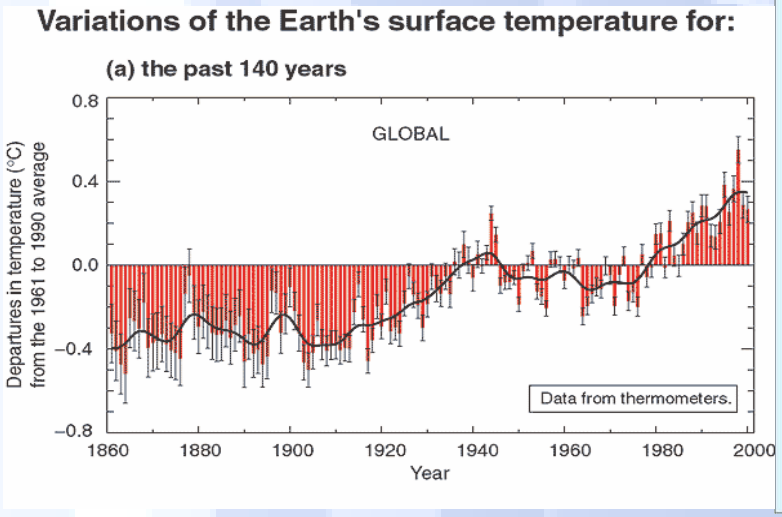
Paris - 26 March 2007

ECONOMY & ENVIRONMENT

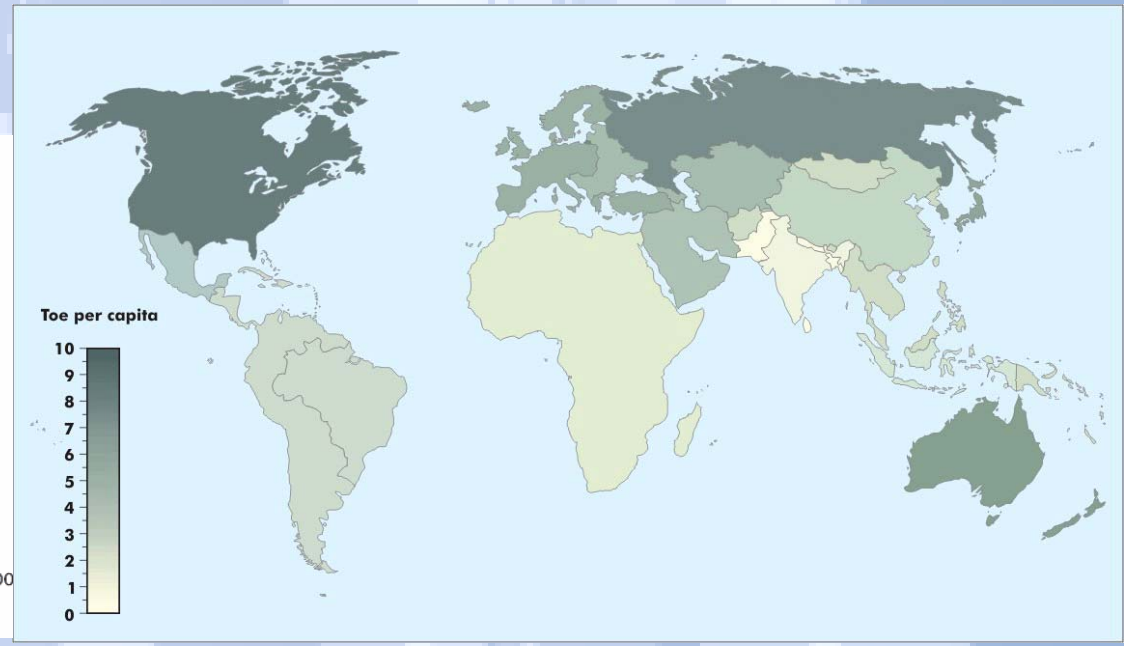


Fossil fuels & CO_2

Climate Change



Per Capita Primary Energy Use - 2030



ECONOMY & ENVIRONMENT - DEVELOPING WORLD

Sustainable Development

Climate Change

Challenges

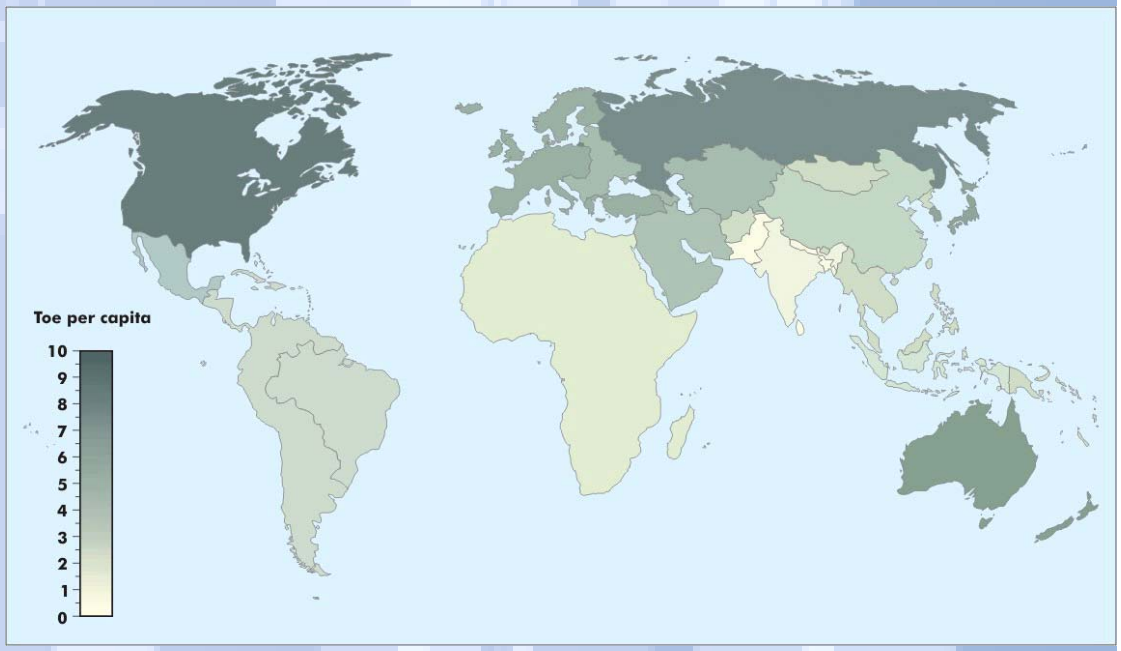
- Growing energy demand
- Clean technology
  - R&D investment
  - Tech transfer & risk
- GHG - market instruments

Threats

- Adaptation costs
  - Lower capacity to respond
  - Poverty
  - Health
  - Implications for economic growth

Opportunities

- Progress with lower GHG intensity
- Technology - learning curve benefits
- Bridging technology divide



ENERGY DEMAND

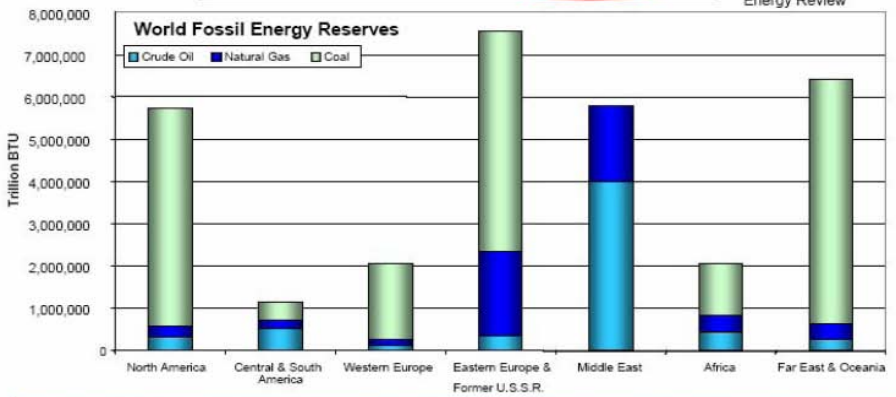
FOSSIL FUELS – GROWING DEMAND

- Abundant Resource
- Geographically dispersed
- Competitive energy price

Proven reserves of fossil fuels will sustain the world for just over 300 years at current production rates

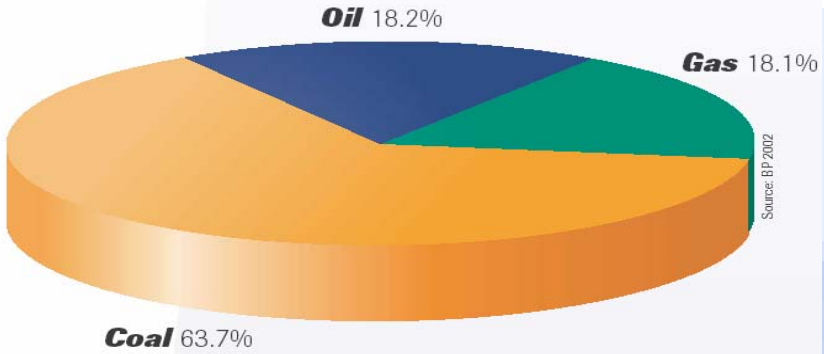
• Crude Oil	41 years
• Natural gas	67 years
• **Coal**	**192 years**

Source : BP World Energy Review



Coal will last twice as long as the combined crude oil and natural gas reserves at current usage rates

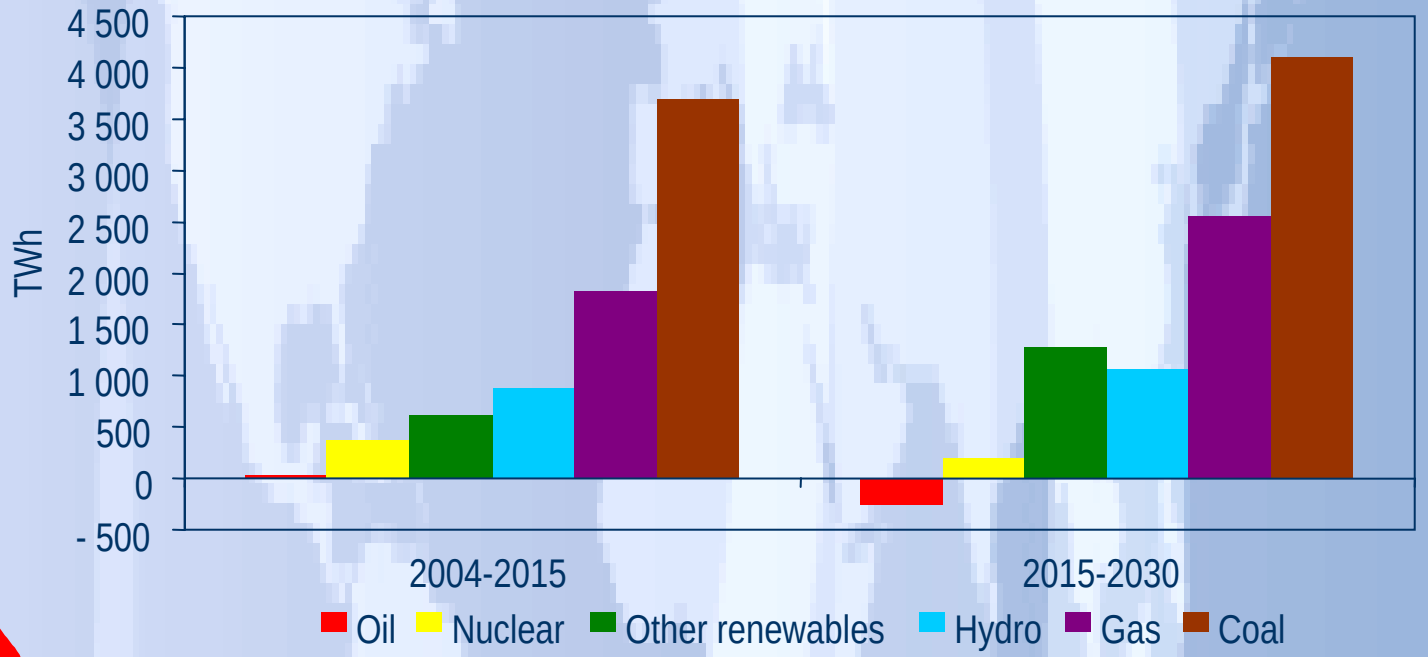
Proven reserves of fossil fuels worldwide

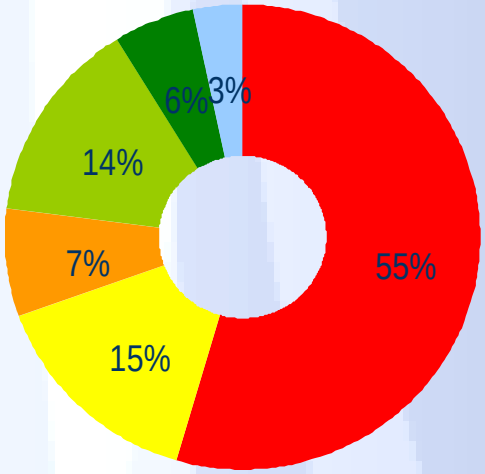


FOSSIL FUELS – GROWING DEMAND

World Incremental Electricity Generation by Fuel (2030)

IEA – WEO 2006





World Incremental Coal-Fired Electricity Generation by Region (2030)

IEA – WEO 2006

ENERGY SCENARIOS

Global primary energy scenarios

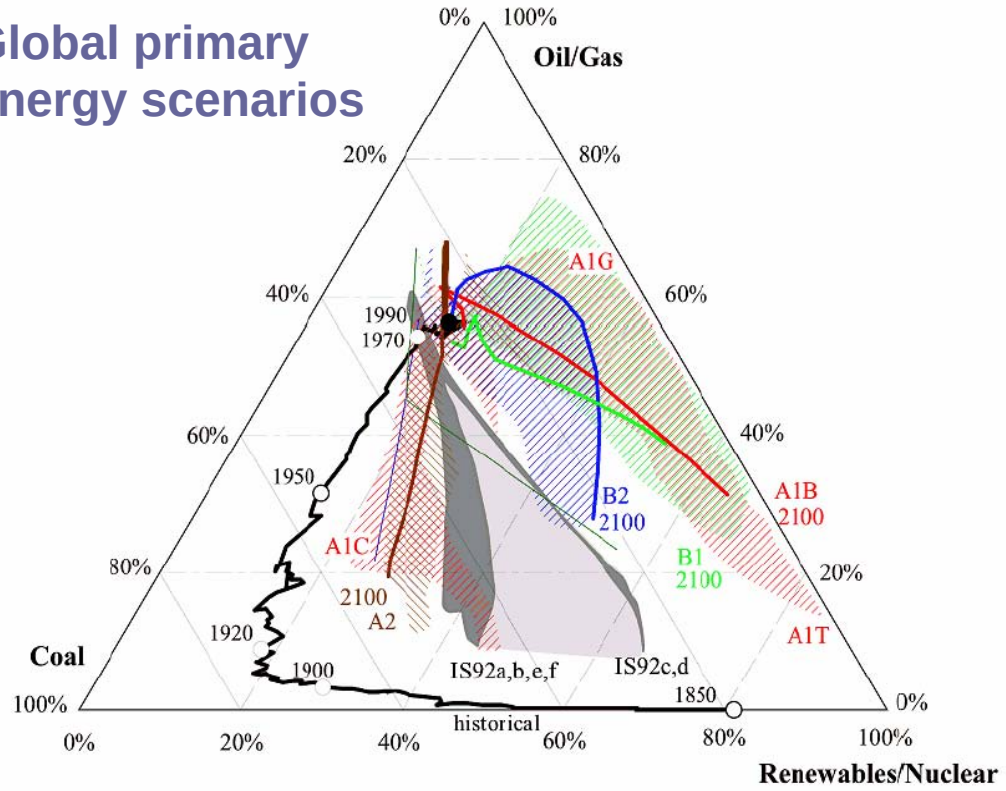


Figure 3.1 *Global primary energy sources structure, historically and in the SRES scenarios*

Source: IPCC (2000).

US - energy scenarios

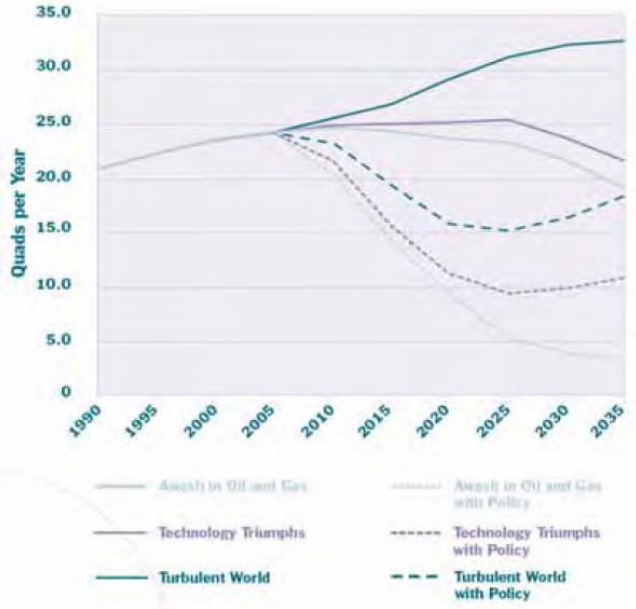
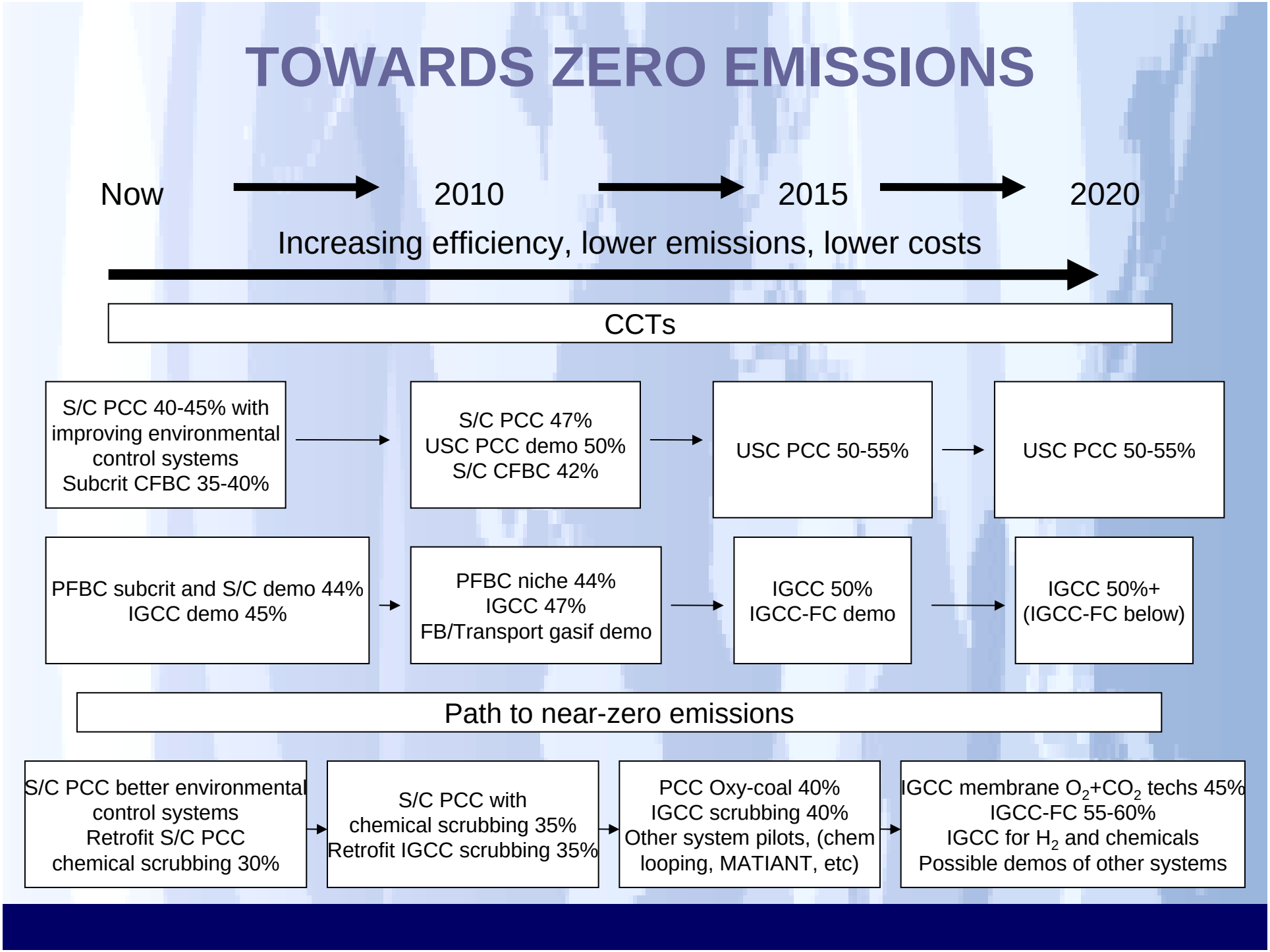


Table 3.1 *Emission projection in the SRES scenarios.*

Scenario	Global CO_2 emissions (Gt CO_2/a)			
	2050		2100	
A1C	94	6%	116	14%
A1G	84	9%	108	2%
A2	61	4%	108	2%
B2	49	13%	61	18%
A1B	75	27%	59	6%
A1T	42	4%	24	38%
B1	48	42%	19	55%

CLEAN TECHNOLOGY

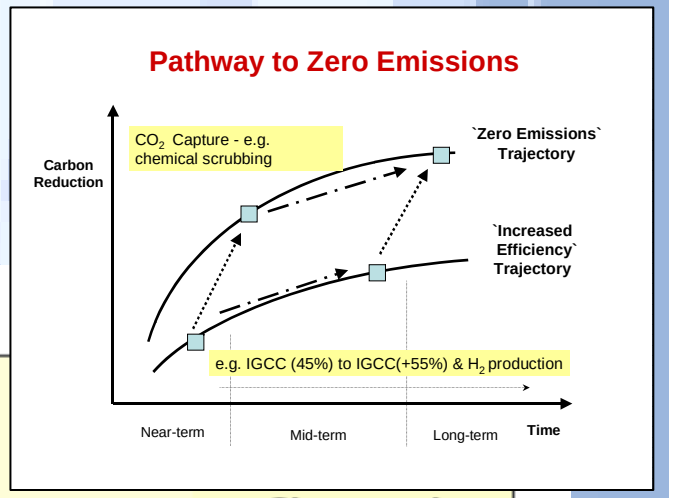
TOWARDS ZERO EMISSIONS

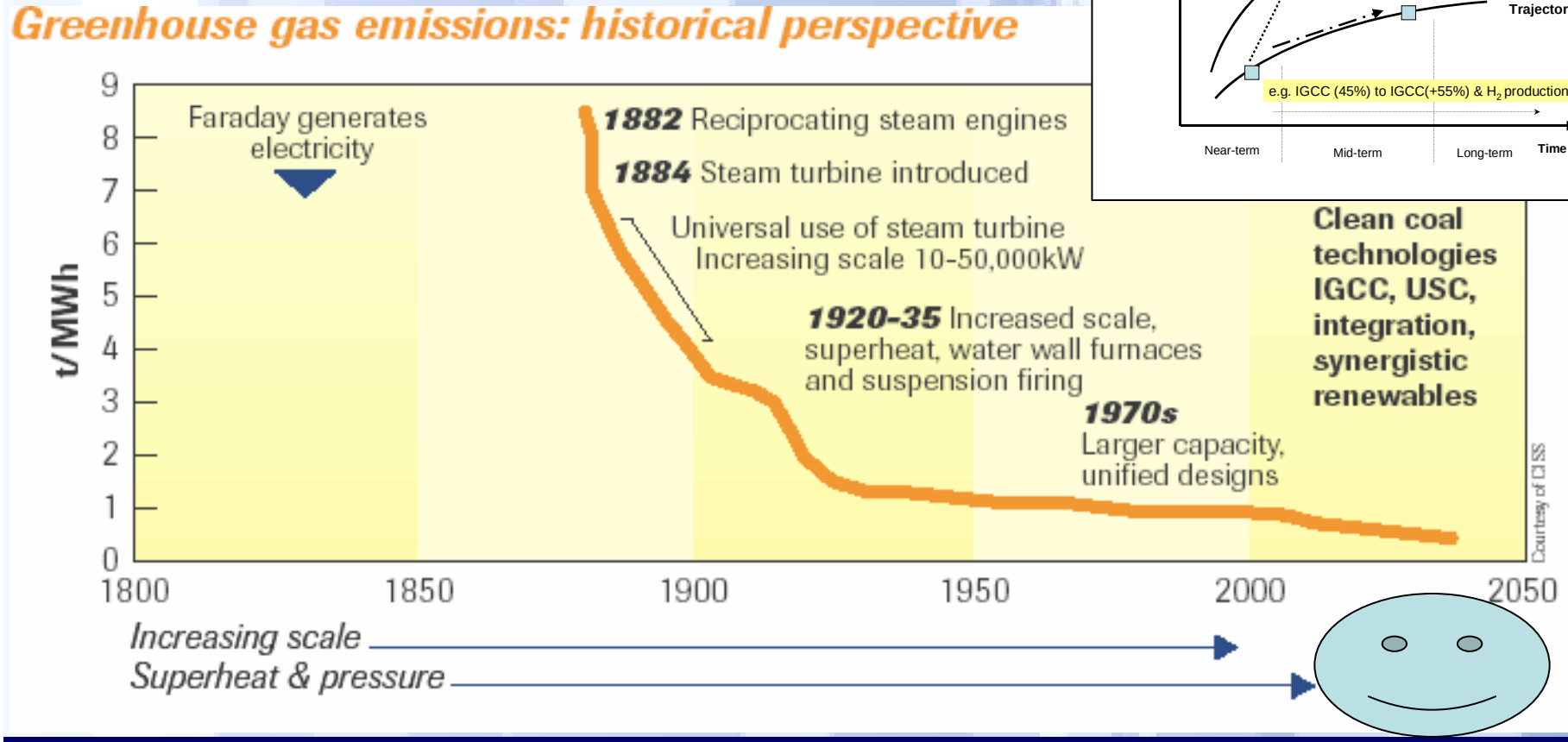


TOWARDS ZERO EMISSIONS

Clean Coal Technology - Challenges

- Learning curve - simultaneous learning
- Cost performance
- Skills shortages





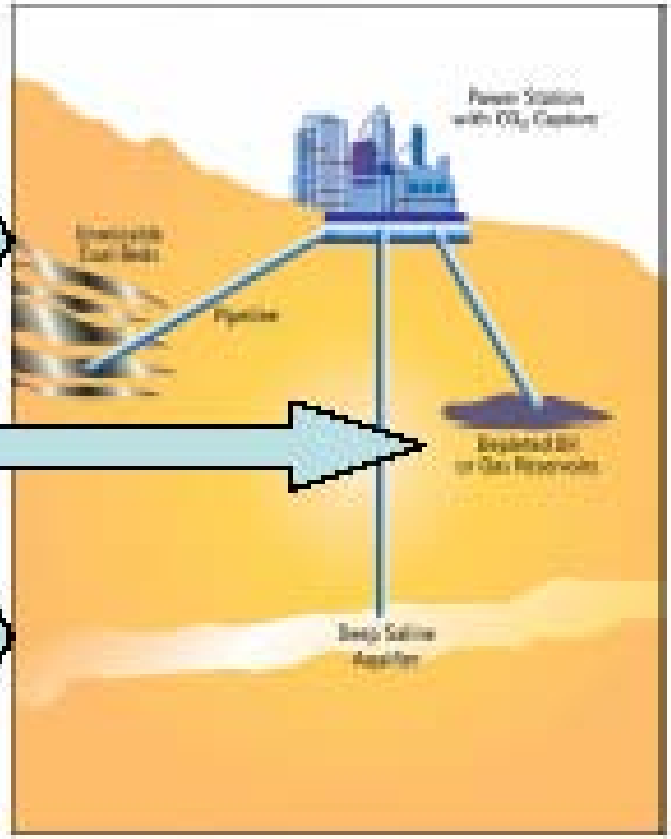
CCS – MAKES A DIFFERENCE

Geological Storage Options

Unminable Coal Seams
30 Gt CO_2
Able to store <2 Years of 2030 Emissions

Depleted Oil & Gas Fields
930 Gt CO_2
Able to Store 50 Years of 2030 Emissions

Deep Saline Aquifers
400-10 000 Gt CO_2
Able to store 20 - 530 Years of 2030 Emissions



Note: CO_2 Storage capacity at cost of 20 US $ per tonne of CO_2

CCS – PUBLIC ACCEPTANCE

ANGLO COAL

Storage reservoirs

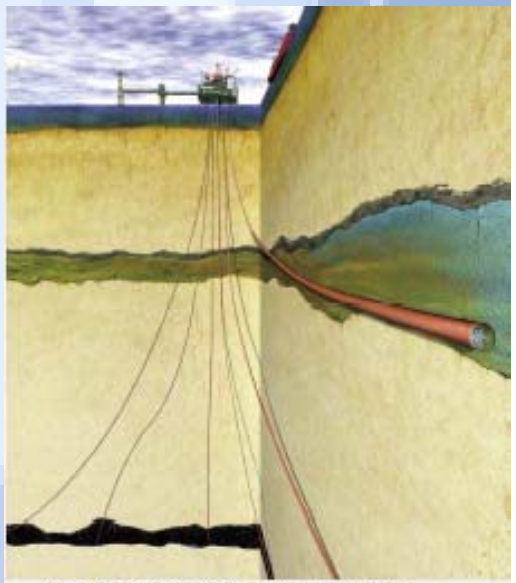
- Verifiable as safe and secure natural reservoirs
- Sufficient capacity to make a difference

Public engagement

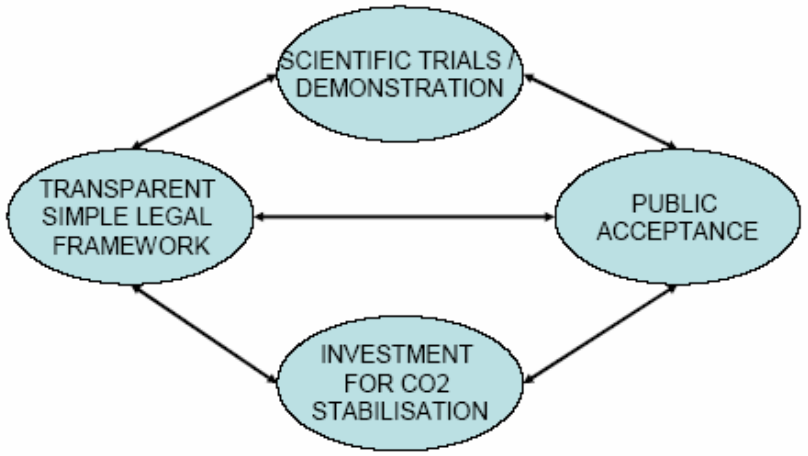
- Understanding the technology
- Confidence in the technology

Legal concerns

- Enabling international>national regulatory framework
- Liability - risk and insurance



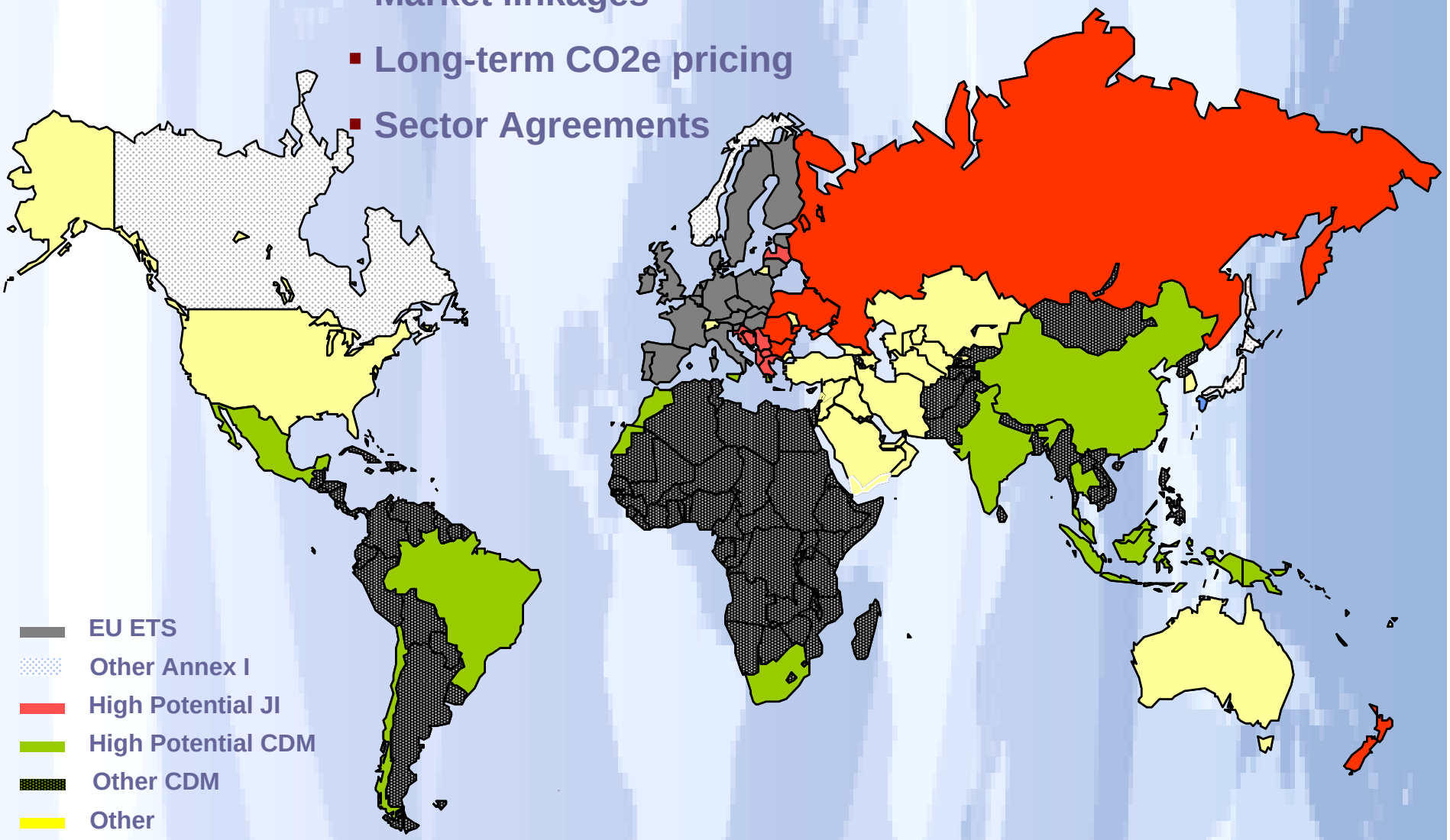
Sleipner CO2 storage in operation



GHG MARKET

CO_2 TRADE

- Market linkages
- Long-term CO2e pricing
- Sector Agreements



PATH AHEAD

CHANGING CULTURE