

Role for coal in a cleaner world



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Global reality

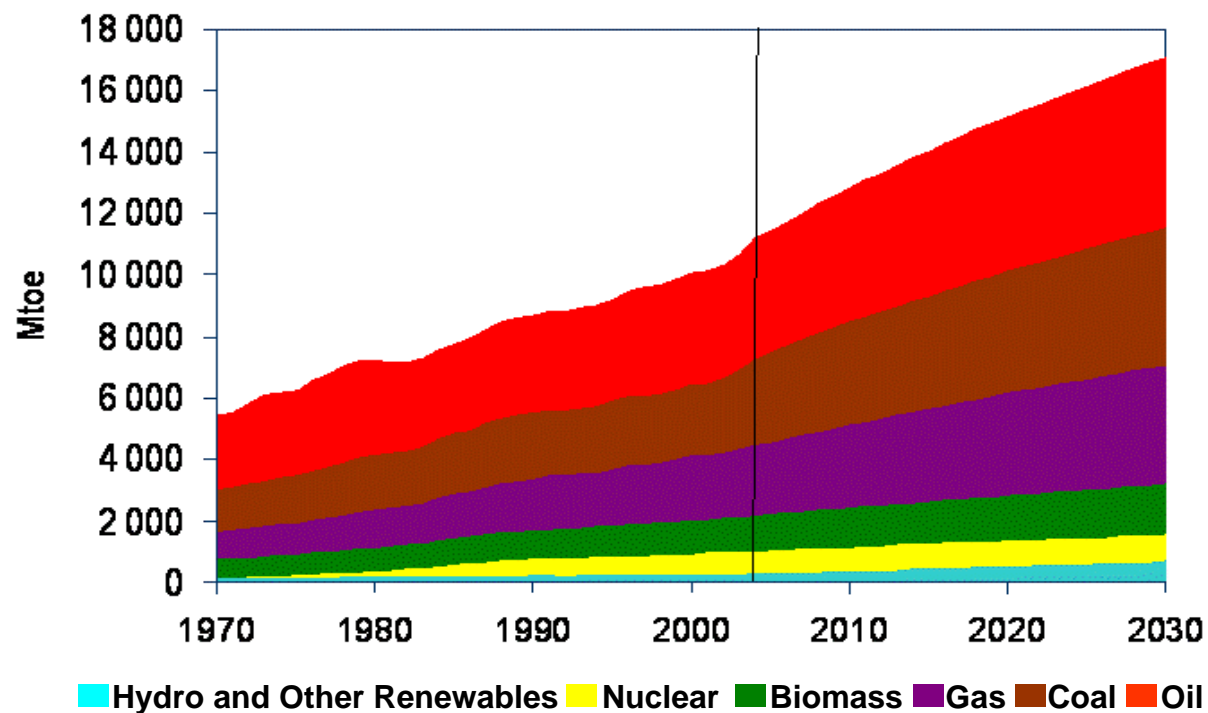
- Global energy demand to increase by 70% by 2030
 - Coal consumption to double in same period
- Emerging economies, fleet replacement needed in developed countries
- Security of supply, costs driving decisions
- Coal in abundance, seeking a low emissions future
- Global issue requiring global effort
- All pillars of mix needed – coal, oil, gas, nuclear, renewables



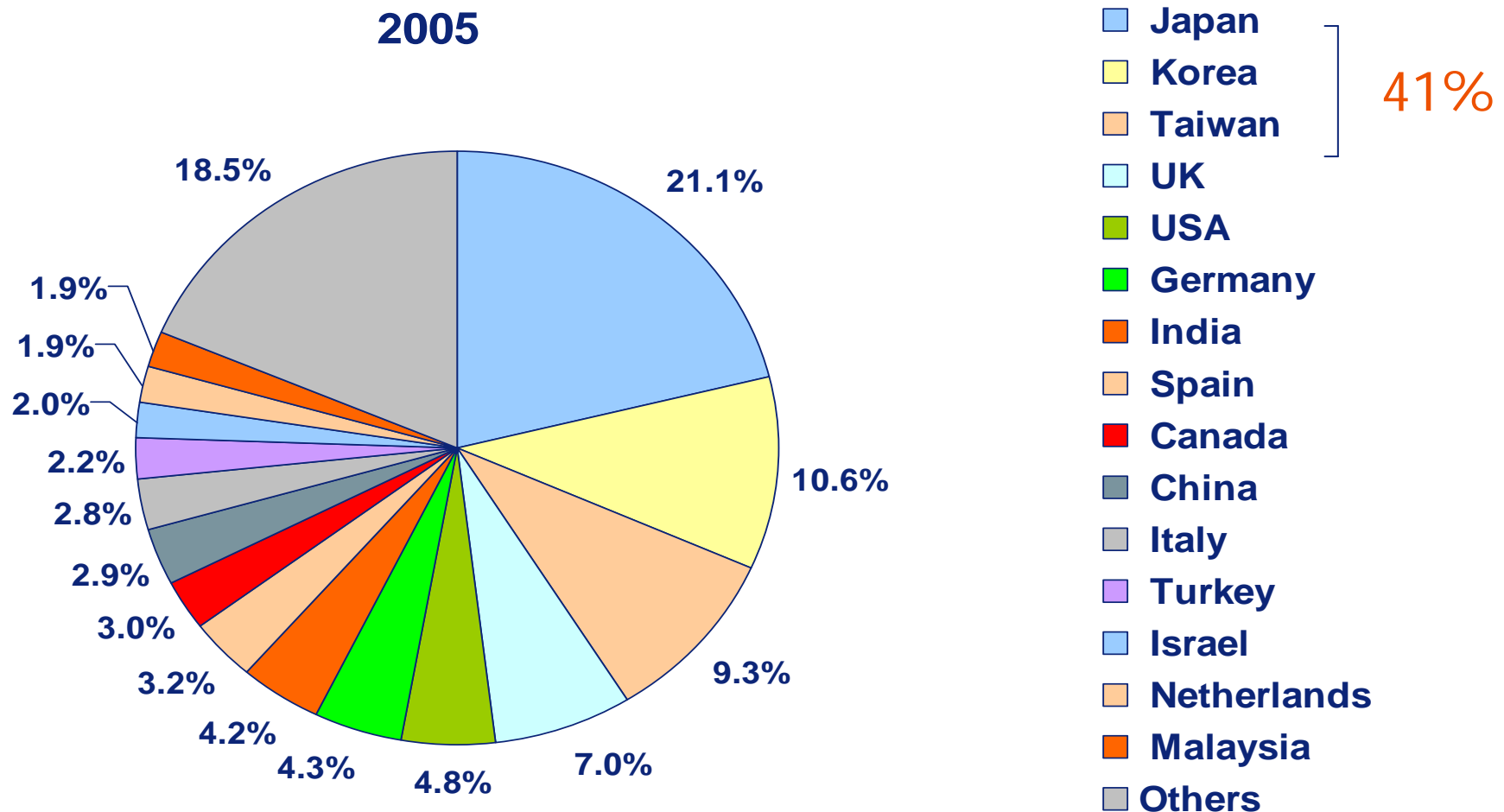
Fossil fuels to remain dominant



World Primary Energy Demand by Fuel in the Reference Scenario

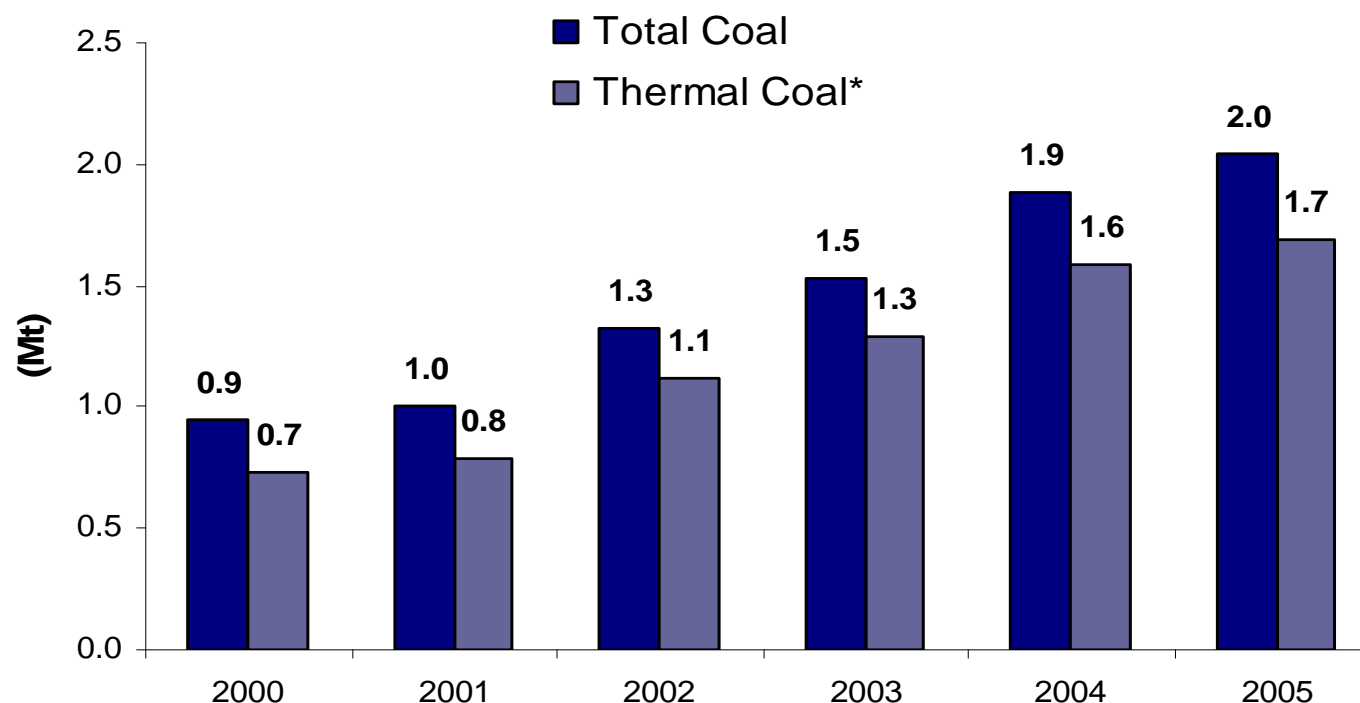


Market share of top 15 thermal coal importers



China's market growth

Chinese Coal Consumption 2000-2005

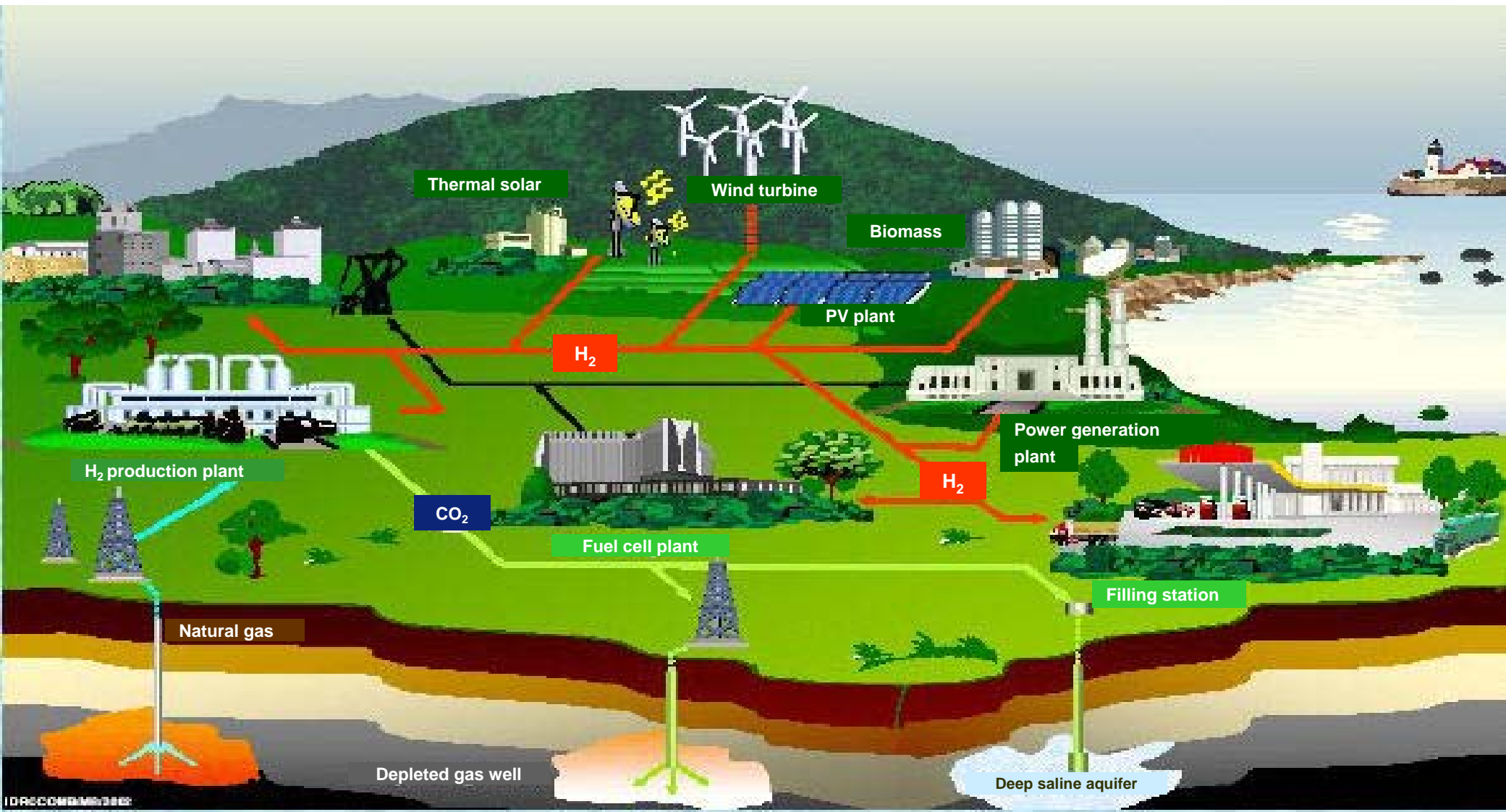


Chinese coal consumption has doubled over the past 5 years and this growth has been driven by thermal coal demand

Source: TEX report, Xstrata Analysis

* Thermal coal figures include Anthracite burned in power stations

Vision of the low emissions future

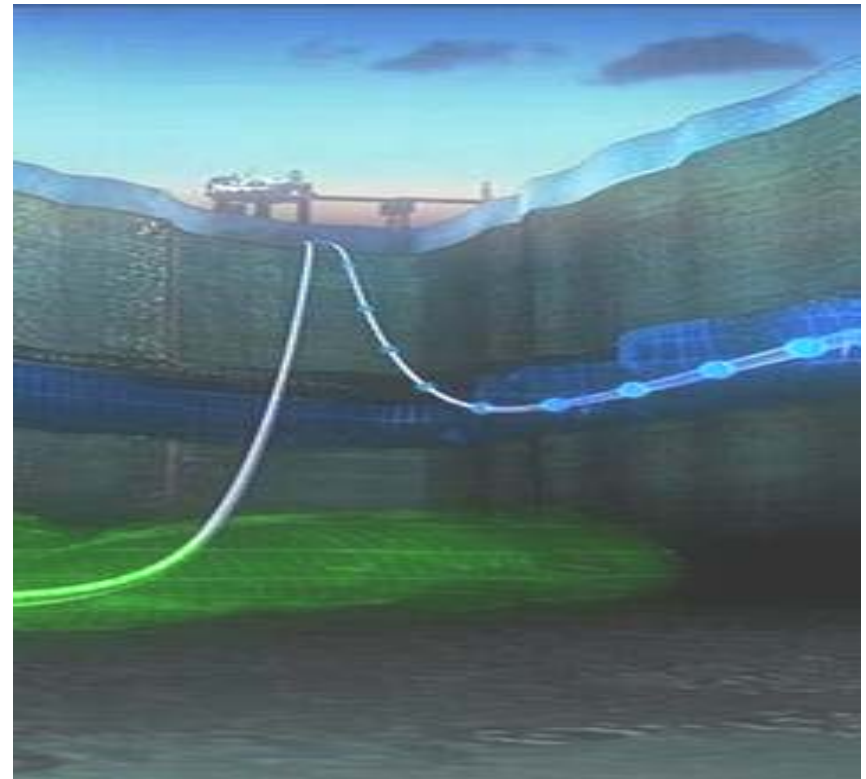


Where to from here?

- Need to first stabilise and then reduce carbon dioxide emissions – technology path
- Global collaboration happening – Europe, China, US, Japan, Australia all involved
- Increased investment, rapid deployment needed
- Carbon pricing and global trading scheme
- Technology is the silver bullet

Carbon Capture & Storage

- Potential for 2,000 Gt CO₂ storage
- Ocean storage could add thousands Gts
- Power plants with CCS could reduce CO₂ emissions by 80-90% net
- Majority of CCS technologies either *economically feasible under specific conditions* or part of a *mature market* now
- Potential leakage:
 - likely < 1% over 100 years; and
 - very likely <1% over 1,000 years



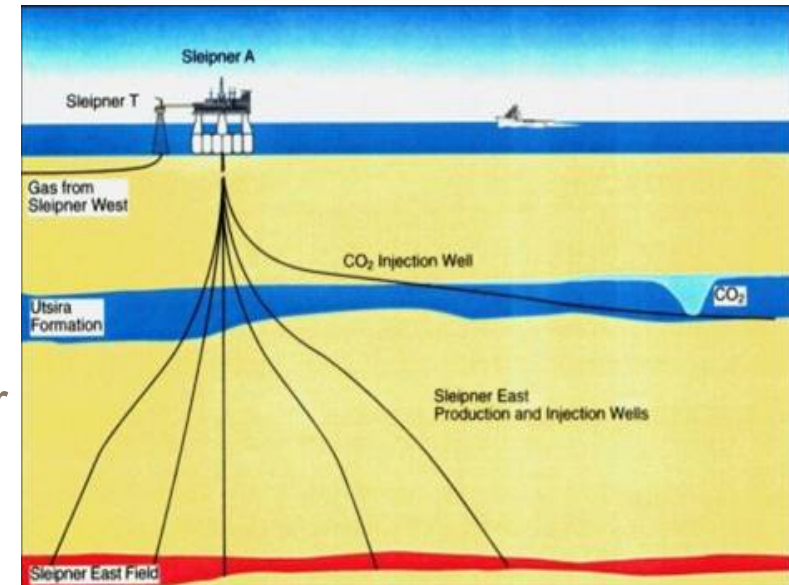
Global CCS projects

Examples of industrial scale projects currently in operation:

Sleipner – North Sea where Norway's Statoil sequesters 1 million tonnes CO₂ pa

Weyburn - located in an oil reservoir discovered in 1954 in Weyburn, Canada. The CO₂ will also be used for enhanced oil recovery with an injection rate of about 1.5 million tonnes per year

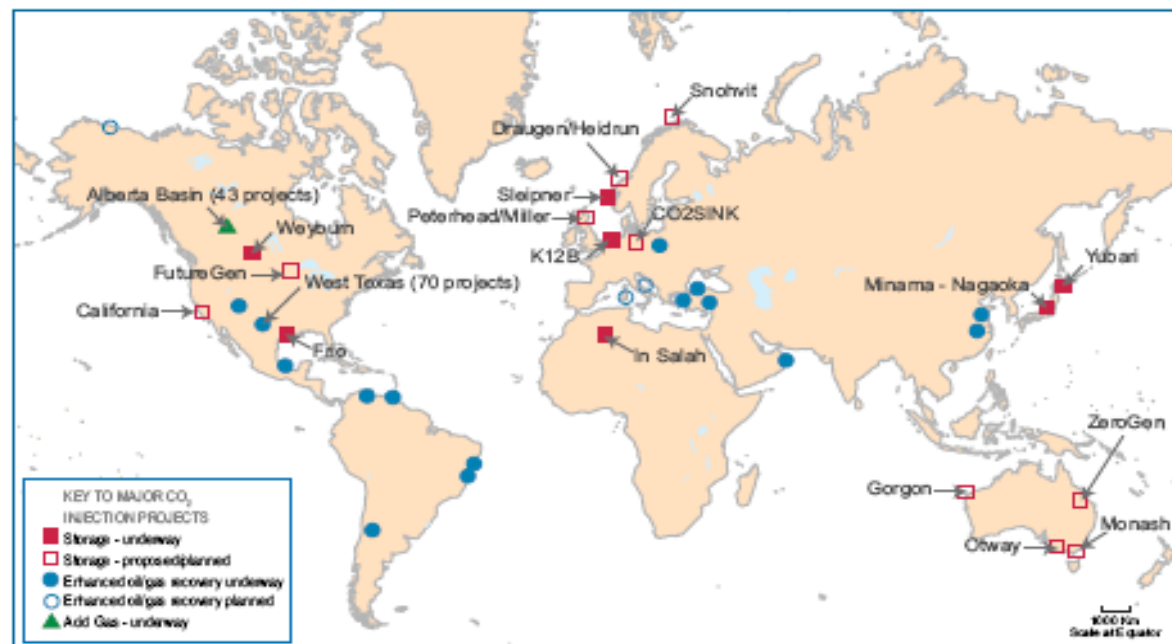
In Salah - Algeria. CO₂ separated from natural gas and re-injected into the subsurface at about 1.2 million tonnes per year



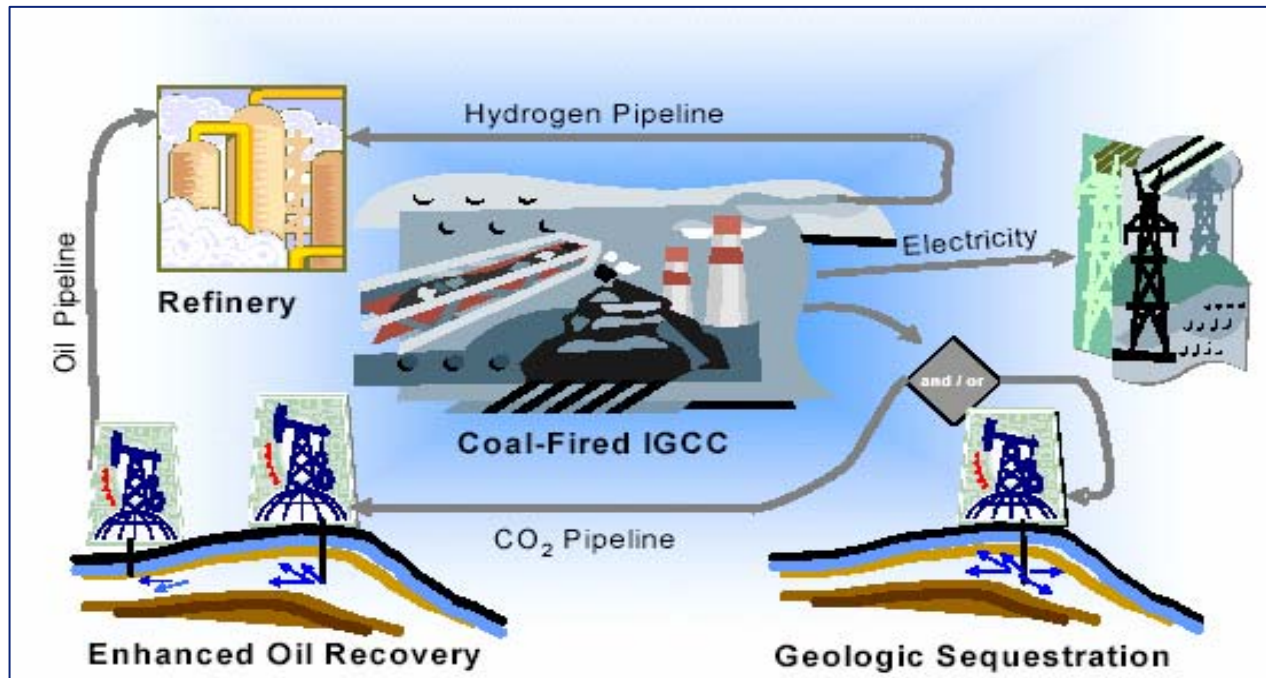
CO₂ storage underway

Distribution of major CO₂ injection projects underway or proposed globally

- 7 exist
- 8 planned
- 15 enhanced
 - oil/gas
 - recovery



FutureGen - USA



275 MW IGCC with Hydrogen production and 1Mtpa of CO₂ sequestered

- Coalition of electric utilities, coal companies and US DOE
- Construct and operate world's first near-zero emissions coal-based power plant at US\$1 billion

Greengem - China

- 250MW IGCC plant operational by 2009
- 300 – 400MW IGCC plant scale up by 2012
- To be followed by integrated IGCC/CCS plant by 2018

It will aim to have:

- ✓ 55-60% efficiency
- ✓ Low NO_x and SO_x
- ✓ >80% CO₂ removal

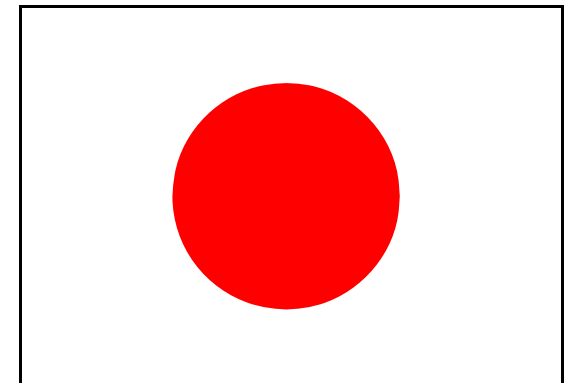
- Collaboration with FutureGen, CSIRO



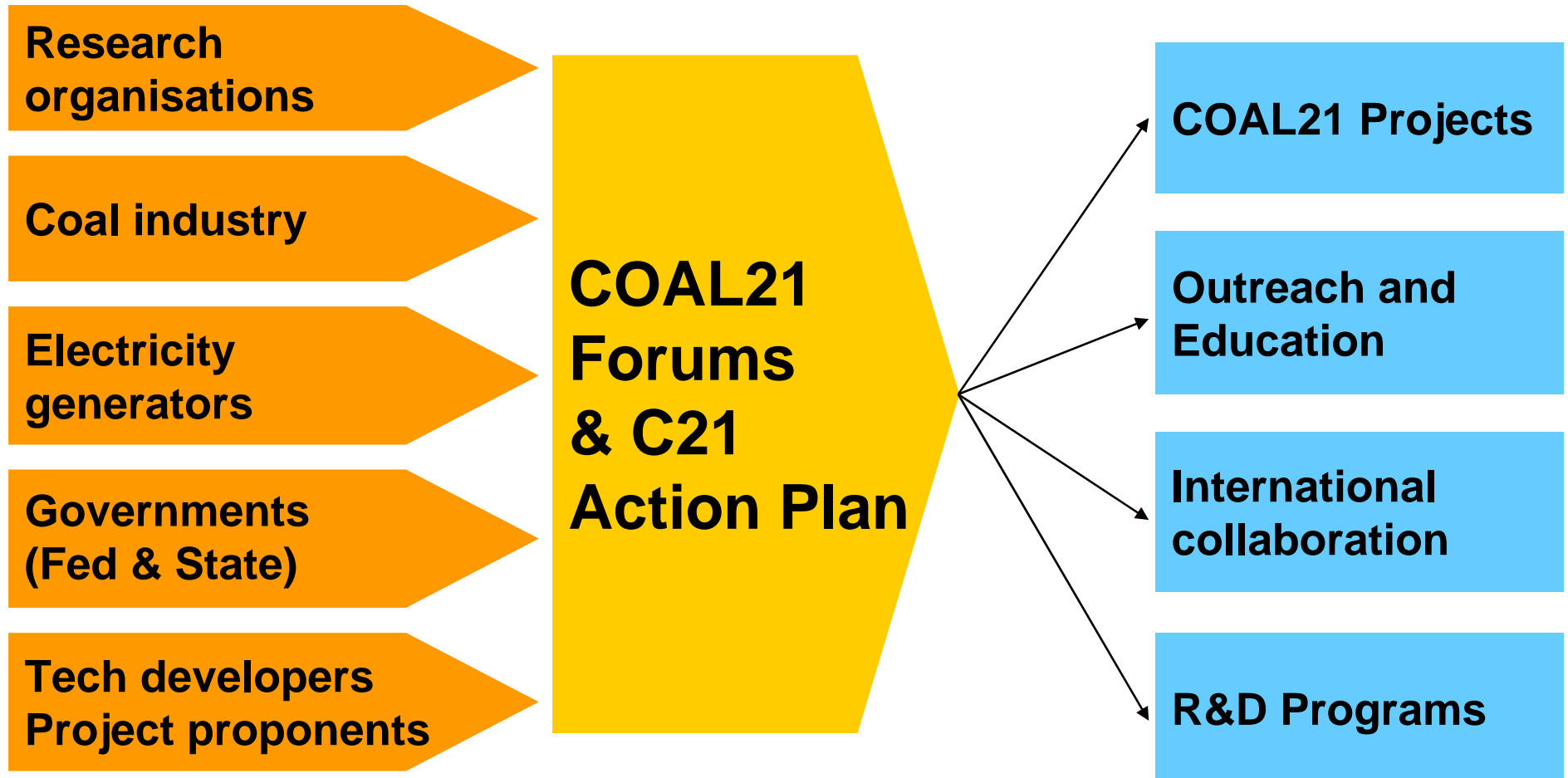
Oxy-fuel

A\$150million demonstration project in Queensland

- Consortium of clean coal proponents from Japan and Australia
- Global significance
- Potential retrofit technology to standard pf power plants globally
- Potential to significantly lower cost of capturing CO₂



COAL21

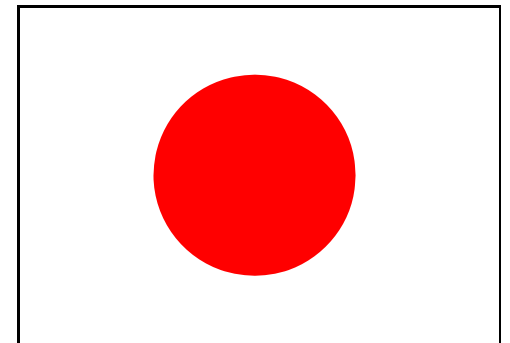
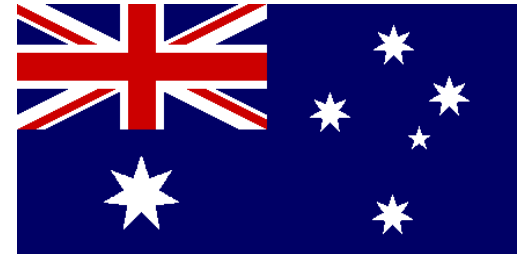


RD&D phase initiatives for CCTs in Australia

- Significant R&D programs (CSIRO, CRCs, cLET, ACARP)
- Australian Government \$500 million Low Emissions Technology Demonstration Fund
 - Support for pre-commercial technologies at demonstration stage
 - Open to fossil fuels, renewables, energy efficiency
- Queensland government \$300m and Victorian Government \$80m support initiatives
- Australian coal industry \$300m COAL21 Fund
- More than A\$1 billion on low emissions demonstration projects in Australia

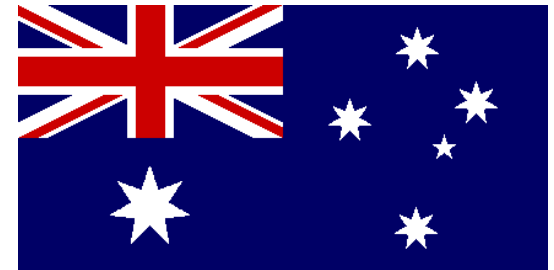
Australia–Japan collaboration

- Long term common interest in working together on development of coal related technologies
- JCOAL, CSIRO and Australian Coal Research enhanced framework signed Tokyo last September
- Focus on CCTs, mine safety, coal utilisation technologies to share in A\$68 million annual budget



Australia–China collaboration

- Australia-China Joint Coordination Group on Clean Coal Technology formed January 2007
- High level membership from government, industry and research communities of both countries
- Recognition both countries continue to rely on coal as reliable, low cost source of power
- In addition to AP6 and Australia-China Climate Change Partnership
- Focus is on clean coal technology, RD&D and technology transfer



Asia-Pacific Partnership

Clean Fossil Energy Task Force
action plan focus on:

- IGCC
- Oxy-fuel
- Post Combustion Capture
- Ultrasupercritical
- Coal mine methane
- Hydrogen production



Canada looking to join

Key messages

- Technology development and commercialisation
- Reducing GHG emissions and energy use requires both incremental and step change technology improvements
- Cost effective, large scale CO₂ capture and storage is ***the*** key technology requirement
- International action, collaboration, demonstration underway
- A global issue that demands global solutions
- We are in a period of transition from business as usual to low or near-zero emissions future
- Transition acknowledged – CSLF, G8, AP6
- Coal is not a sunset industry – will remain a crucial source of energy throughout the world

Our response



- Oxy-fuel demonstration, Queensland
- US\$25 million to FutureGen
- Large scale energy efficiency programme
- Power generation from methane
- Investing A\$15M on coal seam methane gas drainage trials at underground operations
- A\$75 million to COAL 21 Fund
- Greenhouse Challenge
- CO₂CRC
- CRC for Coal in Sustainable Development
- Otway Basin CO₂ storage

