



CCS R & D – Activities of the IEA GHG R & D Programme

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IEA Greenhouse Gas Programme



Overview of this talk

IEA Greenhouse Gas R&D Programme

- Membership
 - Current work
 - Strategy for Phase 5
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IEA GHG R & D Programme



Rationale

- Deep reductions in greenhouse gas emissions will be needed to combat climate change
 - Effective strategy will involve a portfolio of measures for reducing emissions
 - CO₂ capture and storage has an important role to play as one of these options
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IEA Greenhouse Gas Programme




















Role

- An objective source of information on technologies capable of achieving deep reductions in greenhouse gas emission
 - Emphasis on Capture and Storage of CO₂
 - More than 13 years experience
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IEA Greenhouse Gas R&D Programme



	Australia		Netherlands
	Canada		New Zealand
	CEC		Norway
	Denmark		Sweden
	Finland		Switzerland
	France		UK
	India		USA
	Japan		Venezuela
	Korea		

Sponsors: Alstom Power Technology, BP, ChevronTexaco, EniTecnologie SpA, EPRI, ExxonMobil, RWE AG, Shell International and TotalFinaElf, Repsol

Where is AUSTRIA?

Austria - member of another IEA EPL project



IEA Clean Coal Centre - Membership



Austria



Sweden



Canada



United Kingdom



CEC



United States

Korea coming in



Italy



Japan



Netherlands

Sponsors

ACIC, Australian Coal Industry

CANZ, N Zealand Coal Ass'n

DPG, Denmark - Elsam & E2

BHEL, India

Eskom, S Africa

Anglo Coal, SA

BRICC, China

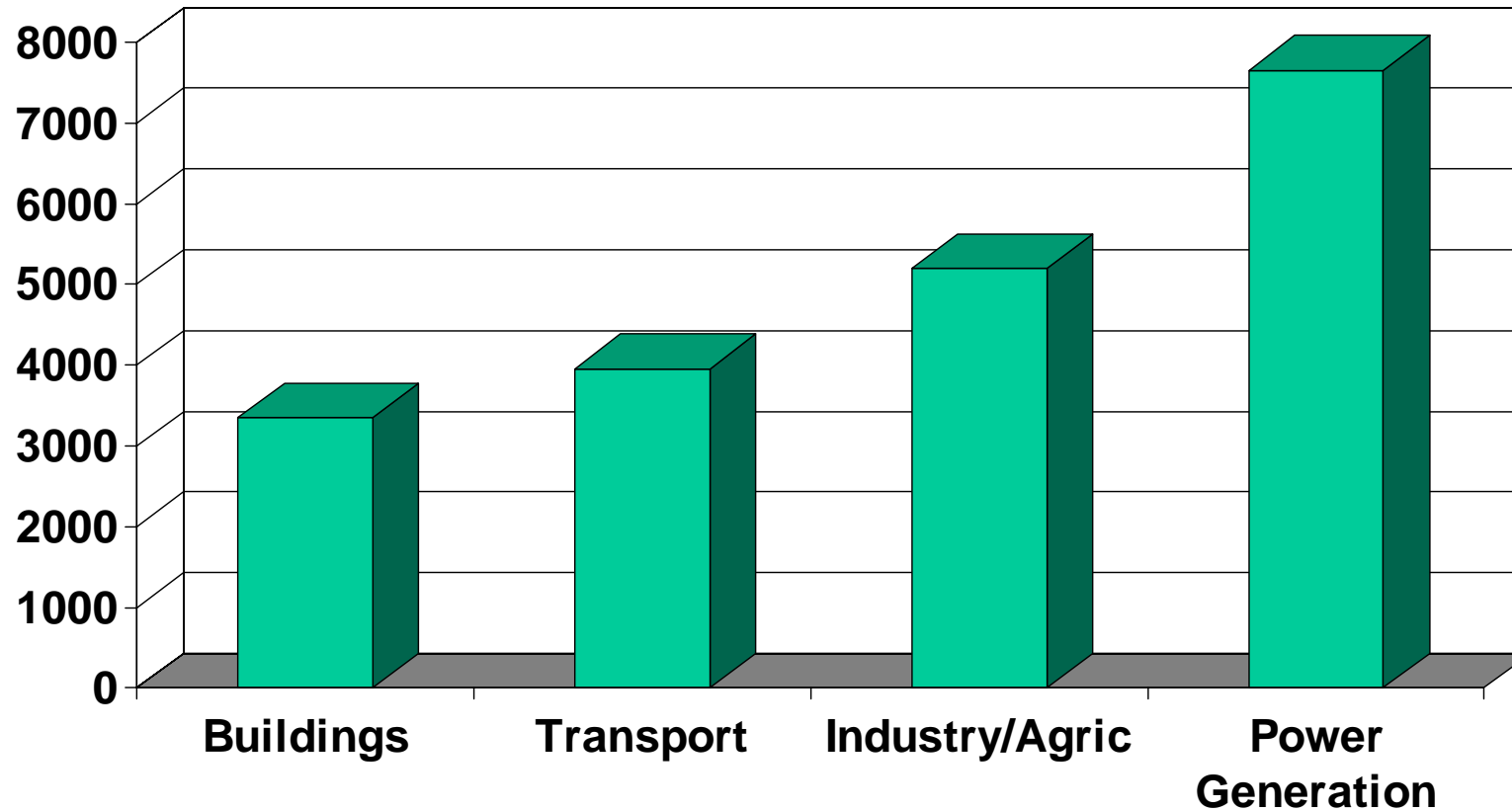


Sources of CO₂



Based on primary fuel at point of use

Emissions, Mt CO₂/y



1997 data from IPCC TAR

Current Studies: Phase 4



- Capture of CO₂,
 - Retrofit of capture to coal power plant - completed
 - IGCC with capture, technology stretch - completed
 - Post-combustion capture, technology stretch - underway
 - Oxyfuel combustion in power generation - underway
 - Retrofit of capture to gas-fired power plant - underway
 - Capture of CO₂ from brown coal-fired power plants – underway
 - Trends in costs of CO₂ capture – underway
 - Rapid assessment of novel concepts with CO₂ capture – underway
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Current Studies: Phase 4



- Storage of CO₂
 - Review of acid gas injection operations - completed
 - Impurities in capture, transport and storage – completed
 - Database of CO₂ sources – completed
 - Assessing regional capacity and costs of CO₂ storage, Europe and US – underway
 - Overview of monitoring techniques – underway
 - Safe storage of CO₂, analogies with the practice and experience of the natural gas industry – underway
 - Remediation of leakage from CO₂ storage – underway
 - Public perception of natural releases of CO₂ - underway
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Studies in Progress: Phase 4



- Transmission of CO₂
 - Ship transport of CO₂ – completed
 - Barriers to use of capture/storage technology
 - Monitoring of OSPAR and London conventions
 - Rules and standards for CO₂ transmission - completed
 - Overview of long-term framework for capture and storage – underway
 - Permitting of CO₂ capture and storage – underway
 - Flexible mechanisms
 - CCS under emissions trading/CDM – underway
 - Early opportunities
 - Opportunities for early application of CCS - completed
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Studies in Progress: Phase 4



- Infrastructure
 - Adding H₂ to natural gas – completed
 - Non-CO₂ greenhouse gases
 - Cost curves for non-CO₂ gases – completed
 - Emissions of GHG's from transport
 - Use of gas-to-liquids processes- completed
 - Comparison of low GHG transport fuels – underway
 - Other CO₂ abatement options
 - Evaluation of C-storage in soils - underway
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Future Studies



- Studies agreed at 24/25th Exco meetings
 - Comparison of renewables and capture and storage
 - Assessment of subsea ecosystems
 - Gasification and H₂ production - comparison of different technologies
 - “World CO₂ Map” for Public Outreach
 - Studies agreed at 26th Exco meeting
 - Further assessment of regional capacity & costs for CO₂ storage (India)
 - Public outreach for sequestration technologies
 - Environmental impact of solvent scrubbing
 - Small scale capture and transportation of CO₂
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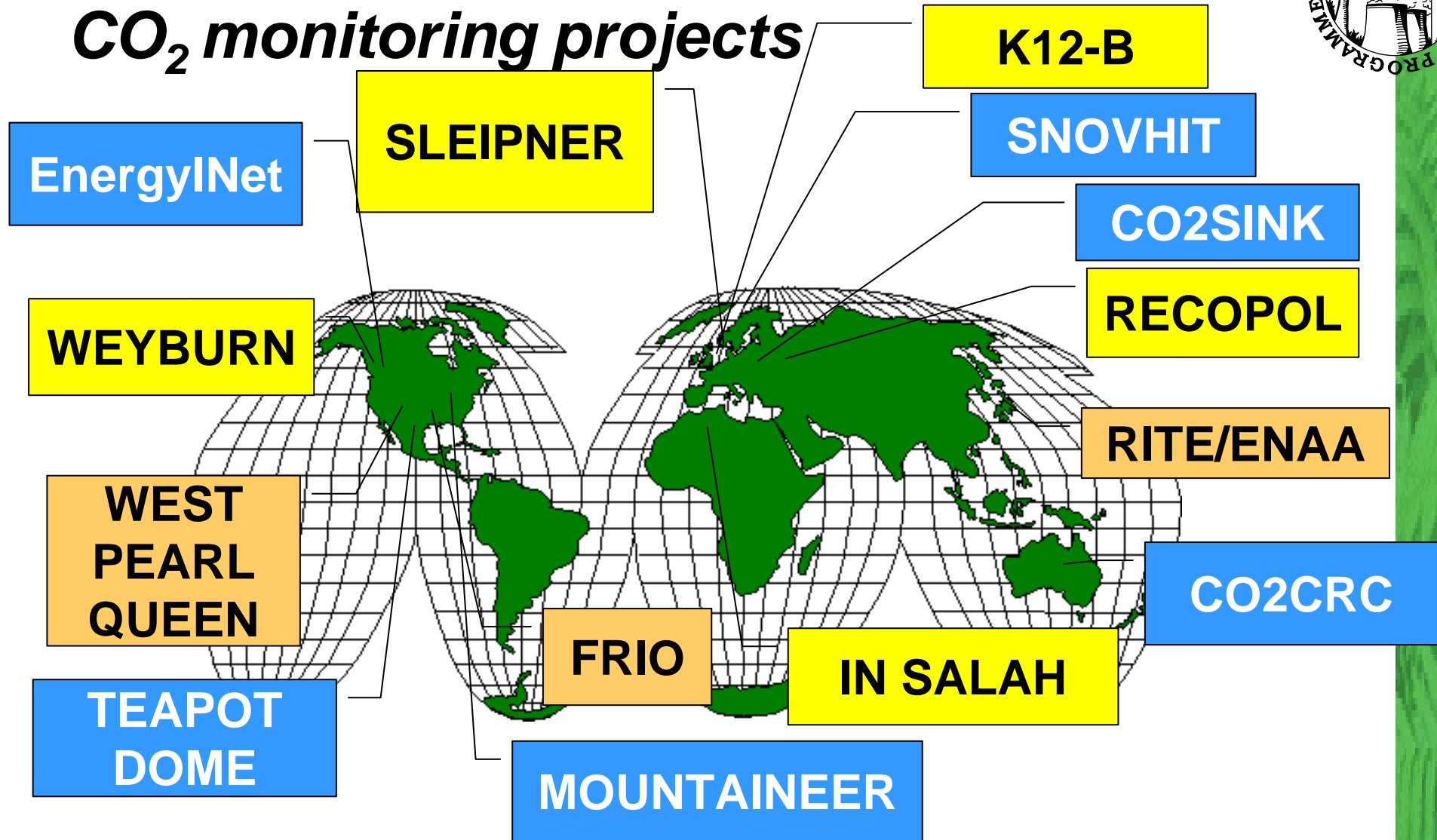
R & D Networks



- Established networks
 - CO₂ capture test network
 - Non-CO₂ greenhouse gases
 - Microalgae biofixation
 - Network being set up
 - Risk assessment of CO₂ storage
 - Monitoring of CO₂ storage
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Research Underway

CO₂ monitoring projects



R & D Projects



European

SACS

CO2STORE

CO2SINK

RECOPOL

NASECENT

NGCAS

GESTCO

Canadian

Weyburn

CCPC

ITC

US

GEO-SEQ

COAL-SEQ



Keeping up-to-date

Website www.co2sequestration.info



- Aims of site:
 - Information on practical work on CO₂ capture and storage
 - Help promote awareness of R&D underway
 - Help facilitate cooperation between projects.
 - R&D Database
 - Currently has 98 entries
 - Each entry is a current or completed project.
 - Data records from publicly available information.
 - Database updated on a six monthly basis.
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Future strategy



3 themes:

- Generating technology and market information on CO₂ capture and storage (CCS) and related options
 - ◆ Technology Evaluation
 - ◆ Awareness of developments
 - ◆ Helping move mitigation technologies towards application
 - Building confidence in mitigation technology
 - ◆ Facilitation of practical research, development and demonstration (R,D&D)
 - Improving availability of information about CCS
 - ◆ Communications, includes encouraging a broad, diverse membership
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