



Workshops on Near-Term Opportunities for Carbon Capture and Storage

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Presentation to

United Nations Economic Commission for Europe
Committee on Sustainable Energy

30 November, 2007





Request from the G8: Gleneagles Plan of Action, July 2005

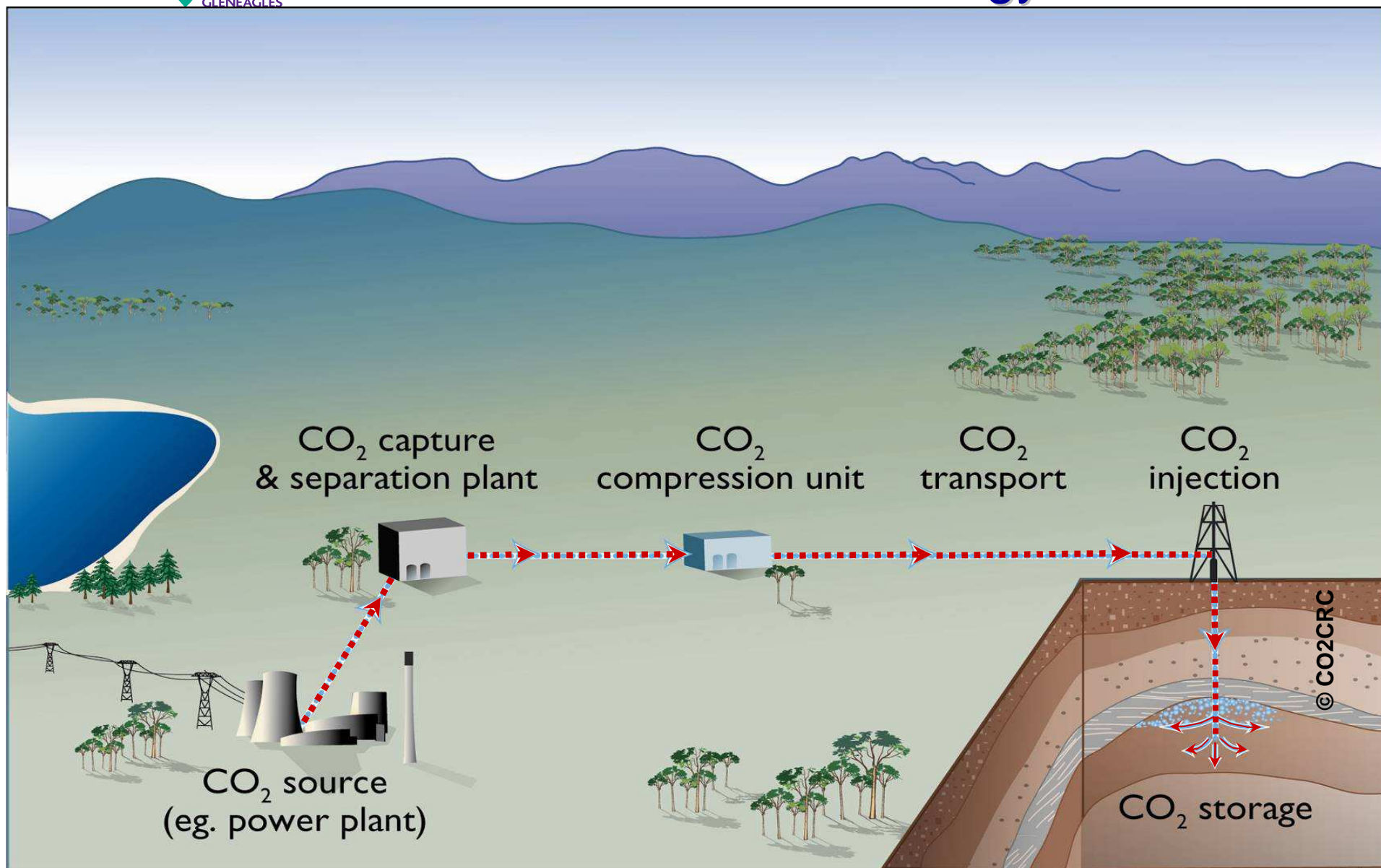
We will work to accelerate the development and commercialization of Carbon Capture and Storage technology by:

...inviting the IEA to work with the CSLF to hold a workshop on short-term opportunities for CCS in the fossil fuel sector, including from Enhanced Oil Recovery and natural gas production.





Carbon Capture and Storage (CCS): A transformational technology.



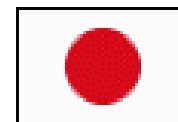


The G8

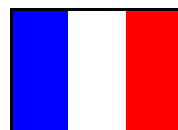
- The G8 (“Group of 8”) is an unofficial forum of the heads of the leading industrialized democracies.
- Members account for 51% of industrial output and 49% of global exports.
- G8 presidency/summit venues rotate
- The G8 was designed to harmonize attitudes to acute international problems.
- Climate change was a focus of the 2005 summit in Gleneagles, Scotland.



Canada



Japan



France



Russia



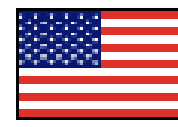
Germany



United Kingdom



Italy



United States

... and the +5



Brazil



China



India



South Africa



Mexico





The International Energy Agency (IEA)

- The IEA is an autonomous agency linked with the Organization for Economic Cooperation and Development (OECD). The IEA has 27 Member Countries.
- IEA Objectives:
 - Maintain and improve systems for coping with oil supply disruptions;
 - Promote rational energy policies in a global context;
 - Operate permanent information system on international oil market;
 - Improve the world's energy supply and demand structure;
 - Assist in the integration of environmental and energy policies.
- The IEA Working Party on Fossil Fuels (WPFF)
 - Advises IEA on fossil fuel technology-related trends, projects and programs and on strategies to address priority environmental and energy security interests
 - Executes activities to meet members' needs, including response to this G8 request

www.iea.org





Carbon Sequestration Leadership Forum (CSLF)

- An international climate change initiative with a focus on new technology development for separation, capture, transport, and long-term storage of CO₂
- Objectives:
 - Make new technologies broadly available internationally
 - Identify and address wider issues relating to carbon capture and storage
- Members include 21 countries and the European Commission
 - All G8+5 countries are members

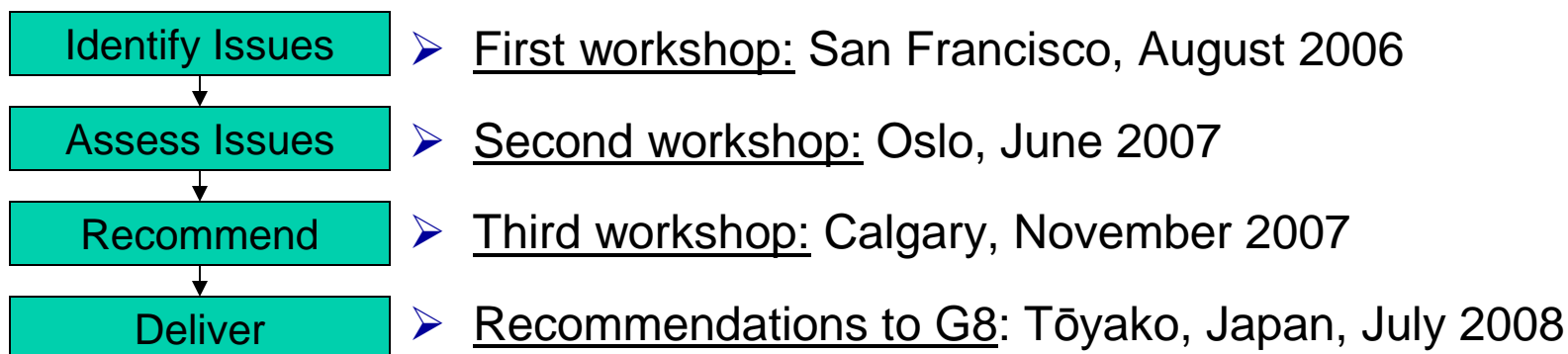
www.cslforum.org





IEA WPF- CSLF Response

A systematic process of three workshops incorporating the views of experts from around the world to develop well-considered recommendations that takes into account diverse perspectives.



Who are the experts?

**Technology
Firms**



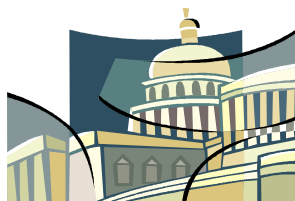
**Energy
Companies**



**Financial
Institutions**



Governments



**Environmental
NGOs**



**Academic
Institutions**





Near-Term Opportunities

- EOR with CO₂ storage
- High purity CO₂ sources
 - Hydrogen, ammonia plants
 - Opportunities in developed and developing countries
- Emerging projects in oil and gas sector and power projects
- Demonstration projects





CCS Issue Areas

1. Technical
2. Economic-Financial
3. Legal-Regulatory
4. Public Awareness
5. International Mechanisms





Issues and Assessment Workshops

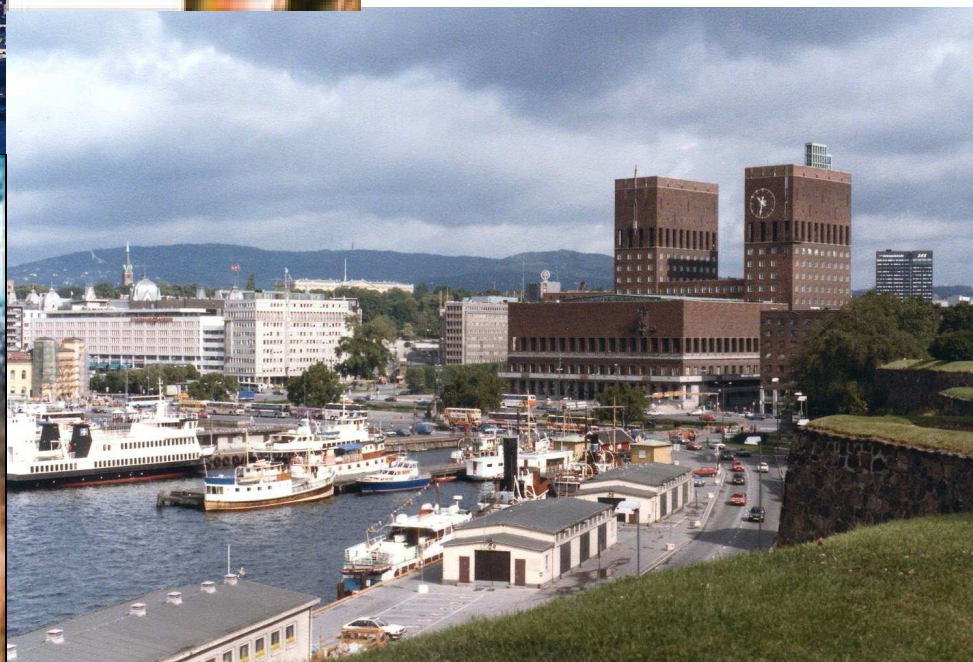


**Issues Workshop
San Francisco
August 2006**

**Assessment Workshop
Oslo
June 2007**



Report
Forthcoming





Critical Challenges

Technical

- High capture costs (early opportunity: high purity sources with lower capture costs)
- Undeveloped CO₂ transport infrastructure (early opportunity: use existing infrastructure, where available)
- Storage
 - Availability and capacity of long-term storage possibilities (early opportunity: proximity to source, EOR, EGR perhaps ECBM)
 - Potential leakage pathways
 - Monitoring for leakage
 - Remediation methods
 - Technical aspects of safety risks and risk reduction

Economic/Financial Group

- Where is the value from CCS?
- What is an appropriate government role?
- How can viable markets related to CCS be created?
- How can commercial risks be managed?
- How can cost be reduced along the value chain?
- How can we build the necessary commercial expertise?





Critical Challenges (Continued)

Legal/Regulatory Group

- Ownership/liability
- Regulatory treatment of CO₂
- Property rights/Intellectual property
- Monitoring and remediation
- Jurisdictional concerns

International Mechanisms

- No incentives for CCS
- Uncertainty about targets and mechanisms after 2012
- Absence of int'l. framework for funding
- Insufficient legal/regulatory framework



Public Awareness

Key Challenges:

- Very limited public awareness
- Need for public acceptance

Opportunities:

- Convergence of interests
- Early demonstrations
- Communication strategy
- NGO engagement
- International architecture





Recommendations Workshop Calgary, November 2007





Top-Level Recommendations to the G8

Expeditious deployment of CCS requires immediate actions:

- Demonstrating CO₂ capture and storage
- Taking concerted international action
- Addressing the financial gap
- Establishing legal and regulatory frameworks
- Raising public education and awareness





2009 G8 Summit Tōyako, Japan, July 7-9, 2008



