



**IEA-CSLF Workshop on Near-term Opportunities for  
Carbon Capture and Storage  
San Francisco, California, 22–23 August 2006**

Report by the CSLF Secretariat

Carbon Sequestration Leadership Forum  
Technical Group Meeting  
14–15 November 2006  
London, United Kingdom



## 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.*

Three workshops are planned:

1. San Francisco, August 2006 - Issues and Opportunities
2. Oslo, June 2007 - Assessment
3. Canada, late 2007 - Recommendations

Recommendations to be delivered to the G8 during the 2008 meeting in Japan.



## What are near-term opportunities for CCS?

Opportunities that are technically and economically viable or ready for demonstration or commercialization in the near term and include both sources and sinks and all fossil fuels.

Examples include:

- High concentration sources,
- Hydrogen production,
- Enhanced oil recovery,
- Gas Production,
- “Capture-ready” power plants and other facilities, and
- Early demonstrations.



## **Breakout Groups Raised Critical Issues:**

- Technical
- Economic-Financial
- Legal-Regulatory
- Public Awareness
- International Mechanisms



## Issues raised by the Technical Breakout Group:

### Storage Issues

- Availability and capacity of long-term storage possibilities  
(Early opportunity: proximity to source, EOR, EGR, perhaps ECBM)
- Credible risk assessments – technical aspects of safety risks/risk reduction
- Sub-surface characterization – integrity, potential leakage pathways
- Best practices for monitoring and verification
- Well bore integrity – field data vs. modeling
- Remediation methods

### Capture Issues

- Capture costs (early opportunity: high purity sources)
- System integration / optimization
  - Compatibility – power generation versus CCS
  - Source to sink

### CO<sub>2</sub> Transport Issues

- Early opportunity: existing infrastructure



## Cross-Cutting Issues:

### Technical issues for other Breakout Groups

- Permanence
- Standard costing methodology
- Finance – value chain characterization
- Sustainable development (environmental, water usage)

### External factors affecting technical issues

- Financing Issues (long-term liabilities, facilitating commercialization)
- Communication – risk, standards, costs & benefits
- Permitting processes



## Technical issues raised by other breakout groups:

- **Commercial/Financial**
  - Closing the gap in government funding
  - Enabling the linking of sources and sinks
  - Addressing long-term liability for storage
  - Cost reduction to make projects economically viable
  - Incentives to learn by doing
- **Legal and Regulatory**
  - Insurance for earliest projects
  - Need to protect other resources (e.g., minerals, risk of CO<sub>2</sub> seepage)
  - Tolerance for contaminants (cost and technologies to reduce)
  - Need for system to monitor possible seepage over time
  - Need for regulation to cover technology development and be science-based
  - Need for tight linkage between regulatory and technical programs
- **Public Education and Outreach**
  - Need for early demonstrations and driving the cost down
  - Handling failures/adverse impact could permanently damage prospects



## San Francisco Workshop: Impressions of Issues Raised

- Interest in CCS opportunities is high and growing.
- CCS technology is advancing, but more must be done.
- The commercial challenges are large, but can be met.
- Realizing near-term CCS opportunities will require:
  - Sustained effort to develop and deploy technology
  - Cooperation between governments and industry
  - Viable legal and regulatory frameworks
  - Public understanding and acceptance
  - Governments collaborating to address international mechanisms