



INTERNATIONAL ENERGY AGENCY

# NEAR-TERM OPPORTUNITIES FOR CARBON DIOXIDE CAPTURE AND STORAGE

Global Assessments  
**WORKSHOP**

In support of the G8 Plan of Action

21 & 22 June 2007  
*Holmenkollen*



CARBON SEQUESTRATION  
LEADERSHIP FORUM

SUMMARY REPORT

Jostein Dahl Karlsen  
Ministry of Petroleum and Energy, Norway

Report on:

G8 IEA/CSLF Assessment Workshop  
Oslo, 21 & 22 June 2007

CSLF Capacity Building Workshop  
Al Khobar, Saudi Arabia  
28 January 2008



## G8 GLENEAGLES 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.*

# International Energy Agency



## The IEA Energy Technology Network



# IEA Working Party for Fossil Fuels

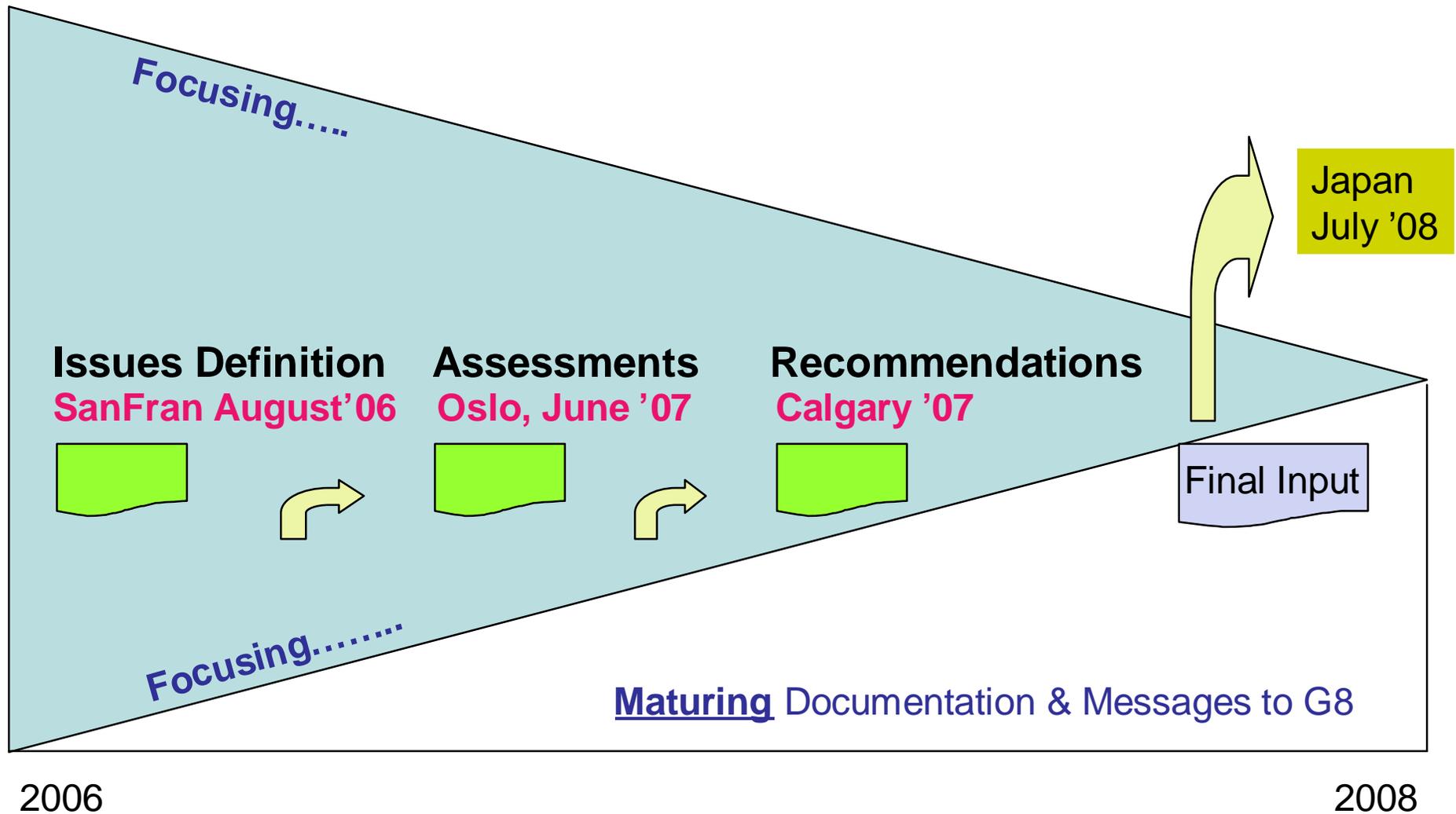


## Roles & Linkages

- Chair: Jostein Dahl Karlsen, Norway
- Vice Chair: Barbara McKee, US
- Vice Chair: Hubert Hoewener, Germany
- Vice Chair: Dr. Park, Korea

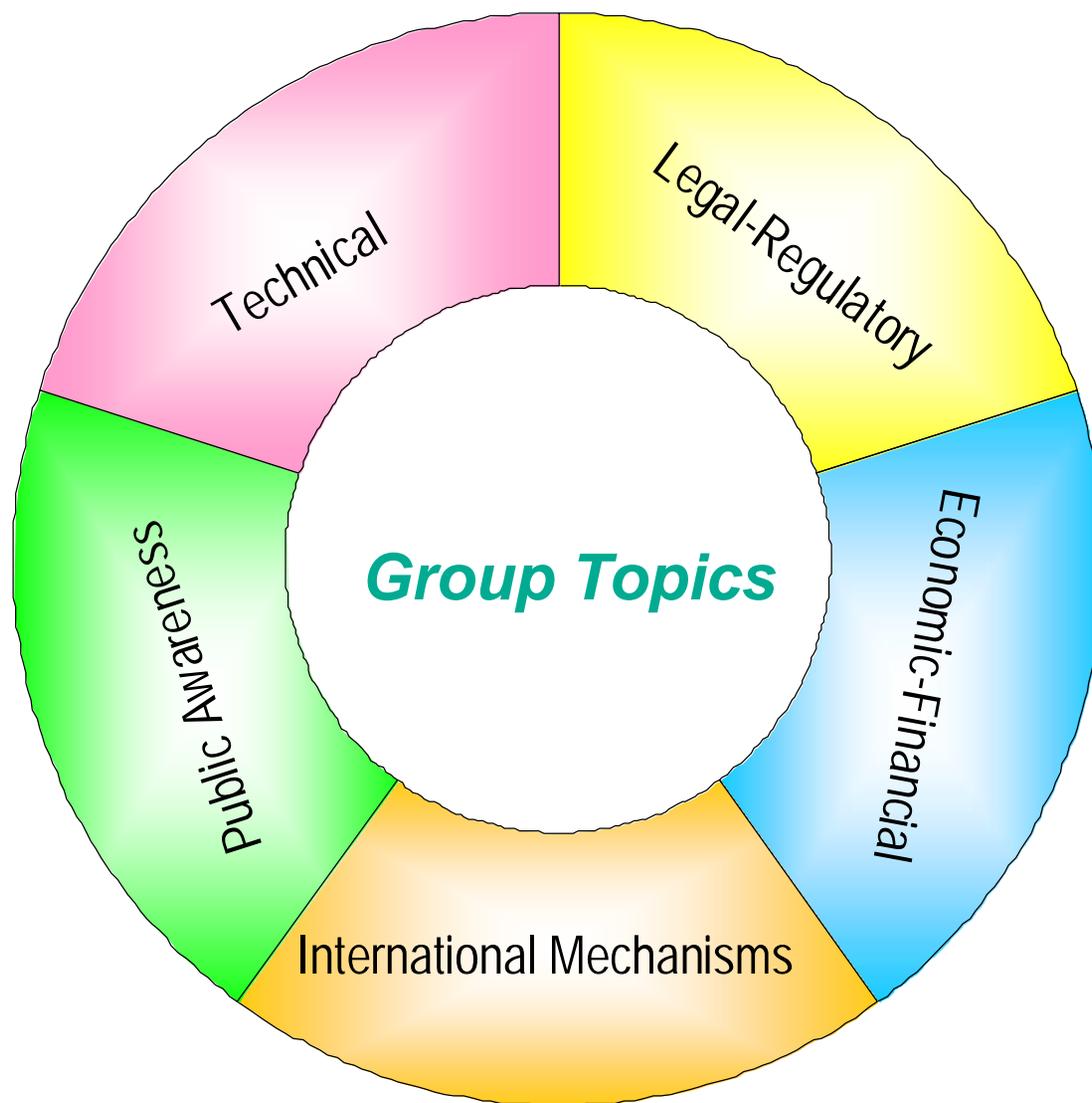


# IEA/CSLF G8 Process on CCS





# San Francisco Breakout Groups





# Near-Term Opportunities Identified in San Fransisco

EOR with  
CO<sub>2</sub> storage

High purity  
CO<sub>2</sub> source

Emerging  
projects

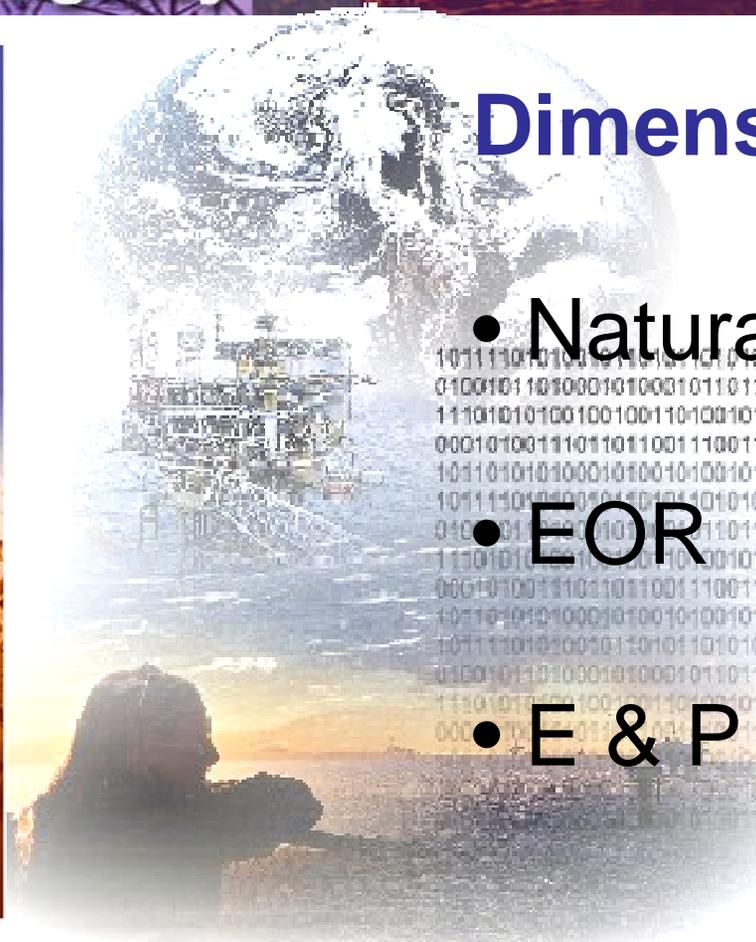
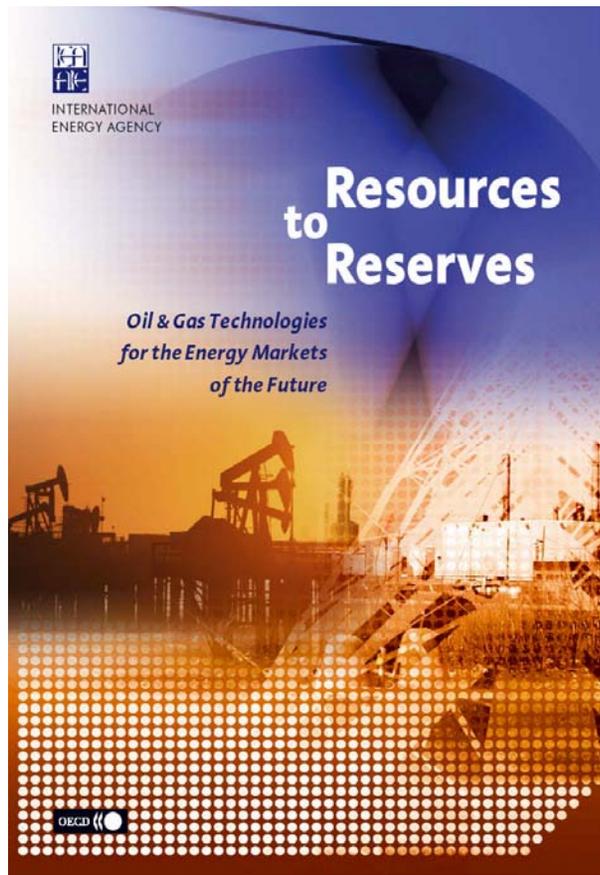
- Hydrogen, ammonia plants
- Opportunities in developed and developing countries

- Oil and gas sector
- Power projects

# Emphasis on Global CO2 EOR

Dialog through Peer Review of R t R

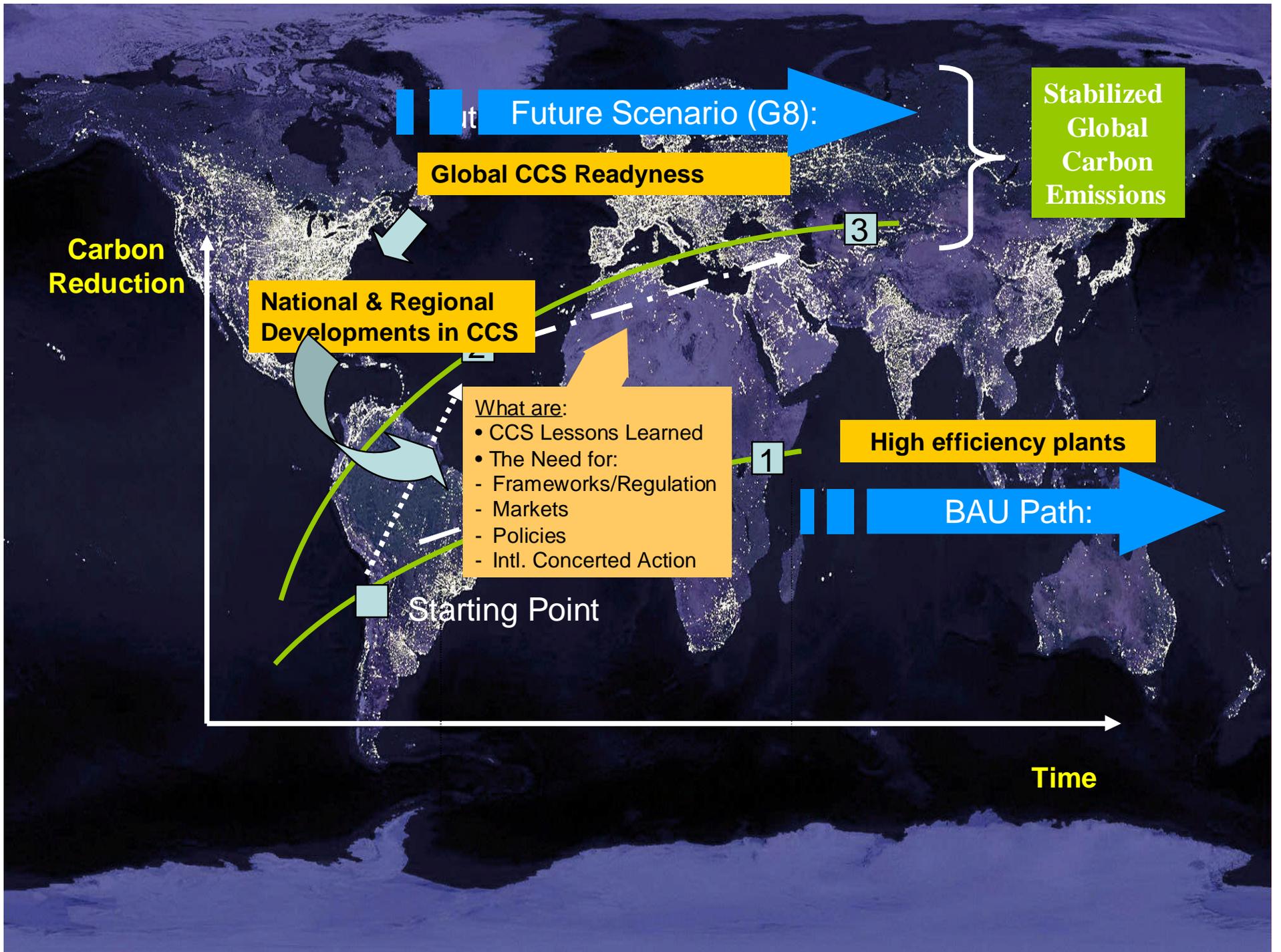
- IEA Cambridge Roundtable, 7 & 8 April



## Dimensions:

- Natural Gas
- EOR
- E & P in general

# Results of Assessments



# Conclusions & Inputs to Recommendations Workshop

## Key Messages

- **CCS can make a significant contribution to mitigate CO<sub>2</sub> emissions from energy combustion as part of a portfolio of abatement measures.**
- **The G8 focus on CCS adds a political imperative to accelerate CCS developments.**
- **Governments and industry need to co-operate to overcome the cost and regulatory uncertainty hurdles for near-term CCS opportunities.**

# Cross – Cutting Themes

- Value needed for CO<sub>2</sub>
- Size matters – on the order of 6 000 Sleipners
- Urgency is called for to make meaningful CO<sub>2</sub> emission reductions by 2050
- Infrastructure is a critical enabler for CCS.

# Global CCS Deployment – Lessons Learned

## Key Messages

- **Incentives are needed for early action to advance CCS as there is currently no market. Price is the best signal.**
- **Political will is fundamental to drive the needed legal and regulatory frameworks. However, early developments should be facilitated through existing, complimentary regulations which will help to inform the development of specific CCS procedures.**
- **Need to conduct assessments for source/sink correlation and infrastructure requirements, as well as for core early opportunities.**
- **Public/private partnerships are key for R&D technology advances and to support a variety of demonstration projects in the coming decade.**

# Assessment of Regional CCS Policies & Industry Experience

## Key Messages

- **Insufficient economic value for CO<sub>2</sub> is a principal deterrent for CSS. Lacking a market signal, there is little rationale or reward for capturing and storing carbon other than in niche areas such as EOR.**
- **Natural resource endowments and levels of economic development mean that CCS opportunities differ between countries and regions.**
- **Common barriers to CCS deployment are high costs, uncertain legal and regulatory frameworks for CO<sub>2</sub> transport, storage and liability, project risks and a lack of economic incentives.**
- **Government, industry and public collaboration is an effective partnership model to share risks, lessons learned and avoid duplication to accelerate CCS deployment.**
- **Infrastructure issues need to be addressed more thoroughly.**
- **Public awareness and support for CCS as a climate change abatement option require significant efforts to provide credible messages on the benefits and risks of CCS. Experience gained in Norway, the EU Zero Emissions Platform, Australia's regional partnership forum and FutureGen can be instructive.**

# CCS Pathways & Policy Options

## Key Messages

- **What is needed is political will, money, collaboration and research, development and demonstration.**
- **Increasing public awareness and gaining acceptance for CCS is critical.**
- **Relevant national and international legal and regulatory frameworks for CCS are needed that adequately deal with the classification of CO<sub>2</sub> and liability issues for storage.**
- **Prioritise national and international R&D efforts and encourage technology collaboration to reduce costs and minimise efficiency losses of the different carbon capture technologies and to clarify geo-technical conditions for secure CO<sub>2</sub> storage.**
- **Create a value for carbon emissions and a global market.**
- **Foster an effective international framework to support CCS development.**

Assessment Report at:

[www.g8-ccs-assessment.com](http://www.g8-ccs-assessment.com)