

# Outcomes of Alberta's CCS Regulatory Framework Assessment

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# The Regulatory Framework Assessment (RFA)

Well Construction

Applications/Permitting

Transportation

Environmental Impact Assessments

Site Selection

Site Closure

MMV

Post-closure Stewardship



# Participants

## Industry:

ARC Resources Ltd  
Enbridge Inc.  
Kinder Morgan Inc.  
Shell Canada Energy

BP Alternative Energy  
Encana Corp.  
Penn West Exploration  
Swan Hills Synfuels

Cenovus Energy Inc.  
Enhance Energy Inc.  
Schlumberger Ltd.  
TransAlta Corp.

## Environmental Non-Government Organization:

Pembina Institute

## Organizations and Academia:

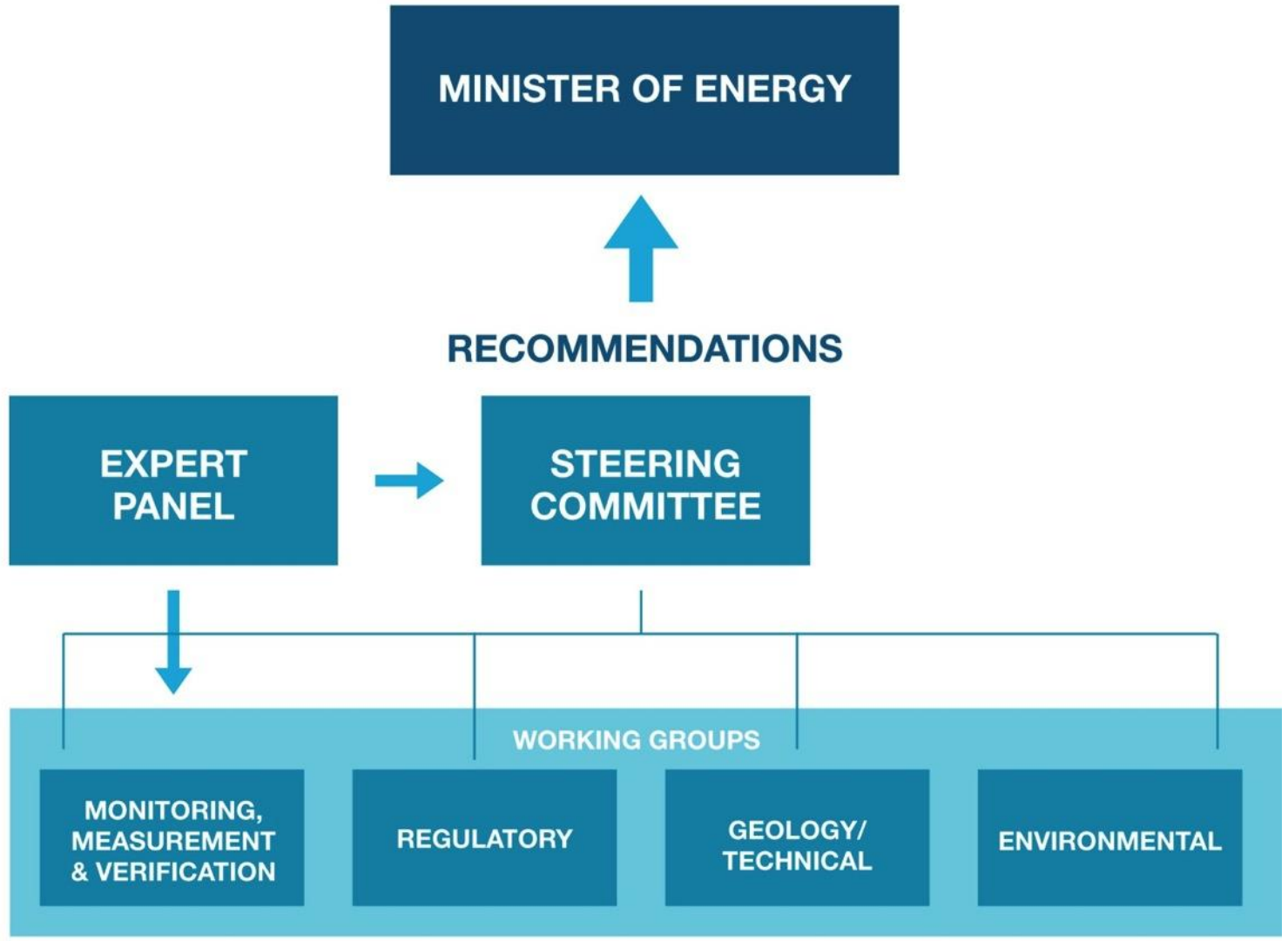
Alberta CCS Development Council  
CCS Association  
International Energy Agency  
Global CCS Institute  
University College London

Alberta Innovates  
Integrated CO<sub>2</sub> Network (ICO<sub>2</sub>N)  
IEAGHG R&D Programme  
Petroleum Technology Research Centre  
University of Calgary

## Governments:

Energy Resources Conservation Board  
Federal Government of Canada  
Government of Saskatchewan  
Government of British Columbia

# The RFA Structure



# Expert Panel

- Stefan Bachu - Alberta Innovates-Technology Futures (co-Chair)
- Don Thompson - formerly of the Oil Sands Developers Group (co-Chair)
- Andy Chadwick - British Geological Survey
- Peter Cook - Cooperative Research Centre for Greenhouse Gas Technologies in Australia
- Ed Rubin - Carnegie Mellon University

# Steering Committee

- Nigel Bankes - University of Calgary
- Jeff Chapman - Carbon Capture and Storage Association (UK)
- Ian Havercroft - Global CCS Institute

... among many others from governments, industry and non-governmental organizations

# Overview of Selected Recommendations

# Environmental Impact Assessments

- Government to determine the conditions under which an EIA should be required
  - Injection thresholds?
  - Integrated projects?
- In the interim, EIAs should be mandatory



Source: Stock Photo



# Post Closure Stewardship Fund

- Project-specific
- Rate components:
  - Long-term monitoring and maintenance
  - Unforeseen events - climate liability
  - Administration
- Pooled funds



Source: Stock Photo

# MMV and Closure Plans

- Based on project-specific risk assessment
- Use of best available technologies to monitor atmosphere, surface, ground and surface water, and subsurface
  - Shallow groundwater monitoring plans
- Be submitted in tandem with other regulatory approvals



# Site Closure

- Performance criteria:
  - Conformance to regulatory requirements
  - Containment
  - Predictable CO<sub>2</sub> behaviour
  - Decreasing risk profile
  - Decommissioning is complete
  - Surface reclamation adequately complete
- Minimum 10 years



# Outcomes of the RFA Process

- 71 recommendations to close regulatory gaps or enhance current requirements
- CCS project developers will have a high level of certainty about regulatory requirements
- Will help facilitate development of CCS in Alberta
- The high level of support from stakeholders should streamline implementation

# Stakeholder Support

“...can be held as an example, both for process and outcome, to any other jurisdiction in the world...”

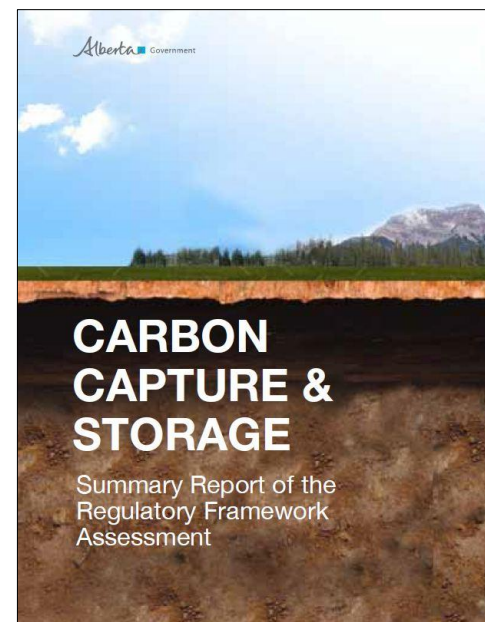
“The product and the pathway there are something everyone involved should be quite pleased with... This process sets a ‘bar’ that will be hard to meet in subsequent multi-stakeholder efforts.”

“...a very positive experience from [our] perspective - and represents a good process that we collectively should replicate in future for the right policy issues.”

“...in my presentations I am using Alberta as the template for the way things should be done.”

# Path Forward

- Public release of final report
- Implementation of recommendations
  - PCSF rate
  - Improve inventory of pore space
    - Northern Alberta
  - Review EIA requirements
  - Survey of amine usage
    - Post-combustion
- Knowledge sharing



# Path Forward: ISO CCS Standard (TC 265)

- Building from work of the CSA and ANSI
  - CSA Z741: Geological Storage of Carbon Dioxide
- Integrated CCS standard
  - 5 Subcommittees
- Canada is chair (lead secretariat) with China
  - Sandra Locke, Assistant Deputy Minister, Alberta Energy
  - Began in June 2012



# Thank You

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