Alberta’s approach to managing long-term liability

Prepared by Alberta Energy

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Overview

- Alberta’s CCS development program
- Alberta’s approach to long term liability management
- Post Closure Stewardship Fund
- Lesson’s learned
Alberta’s CCS Development Program

• CCS Funding Program
  – Enable development of commercial-scale CCS

• CCS Policy and Regulatory Development
  – Reduce regulatory barriers. Ensure comprehensive & transparent regulatory framework.
  – Build public confidence

• Engagement & Knowledge Sharing
  – Contribute to Global Effort
  – Learn from others
Alberta’s CCS Funding Program

- Objective is to sequester 2.76 Mt CO2 annually, with projects starting to come online in 2015
- CAD$1.3 billion allocated to two commercial-scale projects:
  - Alberta Carbon Trunk Line
  - Quest Project
- Reduce oil sands emissions
- Knowledge sharing
The Quest Project

• Partners: Shell Canada, Chevron, Marathon.
• 1.08 Mt/year into deep saline formation.
• Funding ($1.3 Billion):
  – $745 Million – Alberta
  – $120 Million – Canada
  – $485 Million – Quest Partners
• Commercial Operation: 2015
The Alberta Carbon Trunk Line

- Partners: Enhance Energy, NWRP.
- 1.68 Mt/year via CO₂-EOR.
- Capacity of 14 Mt/year
- Funding ($1.2 Billion):
  - $495.0 Million – Alberta
  - $63.3 Million – Canada
  - $640 Million – ACTL Partners
- Commercial Operation: 2017
Long term liability

• Issue for today’s discussion:
  – long-term liability for sequestered CO2 is a key regulatory issue facing CCS proponents and Governments

• Alberta’s Path:
  – Alberta will assume long-term liability once a closure certificate is issued.
CCS Legislation

**CCS Statutes Amendment Act, 2010**

- Pore space ownership
- Tenure agreements
- Long-term liability
- Established the Post Closure Stewardship Fund (PSCF)
CCS Legislation

**CCS Statutes Amendment Act, 2010**

- Upon issue of closure certificate, the Crown:
  - Becomes owner of captured CO2 site
  - Assumes obligations of the lessee
  - Indemnifies lessee against tort damages
Regulatory Framework Assessment

- 18-month review of Alberta’s framework
  - Assessed regulatory system:
    - Applications, Approvals and Regulatory Framework
    - Risk Assessment, Monitoring, and Technical Requirements
    - Public Consultation and Notification, Surface Access and Public Safety
    - Site Closure and Long Term Liability
  - 71 recommendations to consider toward closing regulatory gaps or enhancing current requirements
CCS Project Timeline

Managing Long Term Liability

Site Selection & Permitting → Injection Period → Closure Period → Post Closure

Responsible for CO₂ storage site

CCS Operator Government of Alberta
Site Selection and Permitting

- **Carbon Sequestration Tenure Regulation**
  - Evaluation Permit  5 year, non-renewable
  - **Carbon Sequestration Lease**  15 year, renewable
    - Require MMV and Closure plans – (renewed every 3 years)

- Site selection
  - Adequate storage volume capacity, injectivity, suitable containment

- 1000m minimum depth

- Various approvals through Regulator
Site Selection and Permitting

• RFA Recommendations
  – Risk Assessments
    • Should form the basis of Closure and MMV plans
  – Closure plans criteria
    • Project overview, storage performance criteria for site closure (as per MMV submission), storage performance evidence, operating plan updates, proposed closure activities.
  – MMV
    • Use of best available technologies to monitor each domain of review
    • Risk based, site specific
    • Shallow groundwater monitoring plans
Injection Phase

- Ongoing updates to MMV, Closure plans.
- Reporting and data
- Payments into the Post Closure Stewardship Fund (PCSF)
Closure

• Closure Period
  – Ongoing monitoring
  – Abandonment and reclamation

• Closure Point
  – Issuance of a Closure Certificate once all closure requirements are fulfilled
  – Point when long-term liability for sequestered C02 transfers to the Crown
Closure

• RFA Recommendations
  – Minimum closure period of 10 years.
  – Closure criteria:
    • Conformance
    • Containment
    • Predictable CO2 behaviour
    • Decreasing risk profile
    • Decommissioning and surface reclamation complete
  – Closure certificate application
    • Include a final closure report
      and MMV report (evidence and data)
Post-Closure

• Ongoing maintenance and monitoring

• Post Closure Stewardship Fund
  – Uses:
    • Monitoring of injected CO2
    • Fulfilling obligations assumed when closure certificate issued
    • Suspension, abandonment, remediation and reclamation of orphaned facilities (not capture or pipelines)

• Work to Date:
  – CCS RFA
  – PCSF Working Group
Post Closure Stewardship Fund

**RFA Recommendations**

- Elements to consider when determining the rate
  - Risk-based and probability-weighted basis
  - Project specific
  - Not increase due to withdrawals from the PCSF, or risks associated with other projects
  - Be reviewed every three years

- Funds should be pooled amongst all PCSF payees
PCSF Working Group

• Members from government agencies, NGOs, academia and industry

• Goals of the Working Group:
  – Assist in development of robust procurement process for Fund rate consultant
  – Review consultant progress over the duration of the contract
  – Provide detailed principles that can be used to set the Fund rate
Methodology

• Statistical model
  – Commissioned DNV GL to produce a replicable, defensible and quantitative methodology.
  – Risk based, probability weighted, and project specific
    • Statistical Model (Monte Carlo Simulation)
  – Inputs include
    • Monitoring, measurement and verification
    • Risk events
    • Interest and Inflation rate
    • Orphan levy
    • Admin Cost
Lessons learned

• Collaboration has been key
  – Global experts
  – RFA has provided a future look
  – Project Proponents

• Approach allows for refinement
  – Learn by doing
  – Roles and responsibilities
  – PCSF - Ability to review
Knowledge Sharing

- Knowledge sharing reports focus on:
  - Capture, transport and storage;
  - Regulatory Approvals; and
  - Costs and Revenues.

- What would valuable be for you?

- Alberta’s first knowledge sharing reports are publically available at:
Thank you