Carbon Capture and Storage Development in Alberta

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Sandra Locke
Executive Director, CCS Development
Government of Alberta
Alberta’s Reduction Commitments

- Conservation & Energy Efficiency: 24Mt
- Carbon Capture & Storage: 139Mt
- Greening Energy Production: 37Mt
- Total Reductions: 200Mt

Net Emissions

200Mt reduction or 50% below projected business as usual and 14% below 2005 levels

Source: Alberta 2008 Climate Change Strategy

* Modified slightly from: Alberta’s Climate Change Strategy 2008
Alberta’s GHG Compliance Options

- In 2007, Alberta became the first jurisdiction in North America to regulate large industrial emissions.
- Facilities required to immediately reduce per unit GHG output by 12%
- Three compliance options:
  1) Physically reduce emissions
  2) Purchase accredited Alberta offset
  3) $15 dollar payment per tonne into Technology fund.
ecoEnergy Carbon Capture and Storage Task Force

• Formed in 2007 to recommend the best ways for Canada to implement the technology on a large scale.
• Final report on January 2008
• Recommendations include:
  • Incorporating carbon capture and storage into Canada's clean air regulations
  • Allocating new funding to projects through a competitive process
  • Targeting research efforts to lower the cost of this technology
Alberta Carbon Capture and Storage Council

- Formed in March 2008 to develop a roadmap for implementing CCS in Alberta.
- Final report on July 2009
- Issues included in the report
  - CCS strategic context
  - Business case for CCS
  - Regulatory and governance considerations for CCS
  - Longer-term R&D and Technology needs
CO₂ Capture Cost Curve

Capturable CO₂ Emissions in Alberta
(from existing and new large emitters)

Predominantly Oilsands Upgrading

SAGD and Gas Fired sources

~1/2 Coal Electricity, remainder Petrochem and Oil Refining/Upgrading
Hypothetical Economic Profile

(Facility with ~$100/t capture costs)

- CCS Costs
- Gap
- Compensation

Net $/t CO₂:
- Pipeline Capital Cost
- Capture Capital Cost
- Capture Operating Cost
- Funding Gap (Base: ~$30/6)
- EOR Revenue
- Avoided Compliance
- Corp. Tax Savings

Government of Alberta
Freedom To Create. Spirit To Achieve.
Alberta’s CCS Funding Program

• $2 billion announced July 2008
• CCS Funding Act
  – Passed in June 2009
  – Purpose of the Act is to encourage and expedite the design, construction and operation of CCS projects in Alberta.
• Will be paid out over the life of the funding agreement
We moved quickly to set up a competitive selection process

50+ Expressions of interest (September 2008)

20 projects were invited to submit full project proposals

11 Full project proposals received (March 2009)

Announced 4 projects Fall 2009
Objectives of Alberta’s CCS Program

- Demonstration of the integration of CCS technologies at a large scale
- Build public confidence in the technologies
- Contribute to the global effort to close the cost gap by learning by doing
- Reduce Alberta’s carbon emissions
- Develop a world class regulatory framework for CCS
CCS Funding Principles

• Coverage of up to 75 percent of approved incremental CCS costs
• Capped by the lower of:
  – Total funding ($) allocated for the project, or
  – 75 percent of approved costs.
• Costs increases will be ineligible for grant payments
• Payment structure in place to minimize risk to Government
CCS Funding Payments

- Maximum of 40 percent of individual grants based on project milestones during development and construction
- Maximum of 20 percent based on commencement of sustained operations
- Remaining percentage disbursed as CO$_2$ is capture and stored, over a maximum of 10 years.
- Grant reduction issues:
  - Project generates cost savings
  - Project generates excess revenues
Funding Allocation Process

• Evaluation by an internal cross-ministry government committee
• Develop an evaluation criteria and assigned weightings
  – Technical
  – Commercial
  – Portfolio
• Ranking of submissions
• Final decisions made by government
Knowledge Sharing

• Key to bringing costs down
• Knowledge sharing principles
  – Knowledge sharing is a condition of approval under the program
  – Intellectual property will be respected
• International cooperation
Perforations allow CO₂ to penetrate the formation.
TransAlta Project Pioneer
Enhance - Alberta Carbon Trunk Line
Climate Change and Emissions Management Fund

• Purpose is to strategically invest in transformative technologies
• Provides a measure of price certainty
  – Allows companies to focus on reducing emissions in response to a clear, escalating price on emissions
• Total amount of the fund currently at $123.4 million
• Puts compliance money where it is needed
  – Greening energy production (50% of funds)
  – Conserving and using energy efficiently (20% of funds)
  – Carbon capture and storage (30% of funds)
Future Considerations

• Cost reduction
• Enhanced oil recovery potential
• Emission restrictions – carbon price
Questions?