Monetizing Stored CO2

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Outline

- OIGCC approach
- Risk of Non-performance -- Leakage
- When Does a Developer Cash Out?
- National Cap & Trade Regulation
- Time Scales
- Commercial Mechanisms
OIGCC Approach

- **Focus on commercial implementation with government oversight**
  - don’t get in the way
  - facilitate maximum use of CCS
  - implement sensible oversight rules and regulations

- **Desire to evolve pre-existing regulatory structure**
  - appreciate what we’ve already got
  - add needed components

- **Retain state control**
CO2 CAPTURE TRANSPORTATION AND GEOLOGIC STORAGE PROCESS

Existing State and Federal Regs

Existing State and Federal Pipeline Regs.

Existing UIC Regs

Long Term Storage Regs Missing

CO2 source (eg. power plant)

CO2 capture & separation plant

CO2 compression unit

CO2 transport

CO2 injection

CO2 storage
The Non-Performance Issue: Leakage
Leakage & Commercial Framework

- **Payment for Performance**
  - Non-Performance means no payment

- **How & When is Performance Certified?**

- **Timing**
  - up-front?
  - upon completion… what’s completion?

- **Bonding**
  - for health and safety threats
  - for non-performance
STATE ADMINISTERED “CRADLE TO GRAVE”
CGS REGULATORY FRAMEWORK

PAYMENT OF STORAGE FEE

OPERATIONAL BOND

SITE LICENSING AND CERTIFICATION

SITE AND WELL OPERATIONS

INDIVIDUAL WELL BONDS

BONDS RELEASED AS WELLS PLUGGED

LONG TERM

SITE CLOSURE AND WELL PLUGGING

STATE ADMINISTERED TRUST FUND ASSUMES RESPONSIBILITY FOR OVERSIGHT AND LIABILITY

BOND RELEASED 10 YEARS AFTER INJECTION CEASES

STATE ADMINISTERED TRUST FUND ASSUMES RESPONSIBILITY FOR OVERSIGHT AND LIABILITY
The risk timeline for leakage is heavily-laden in early times.

Why does it look like this?
- Pressure driver during and post injection
- Most “changes” occur in early phase
- Long-term effects trap larger quantities of CO₂
- Seals may be affected over long-term
Time Frames #1

- 60-80 years before payback begins is a long-time!
- Do we know enough sooner for any payback to occur?
  - Is there a commercially viable model for assessing expected value accomplished?
Time Frames #2

- Sequestration must last hundreds of years... beyond the life-span of any commercial entity.

- Therefore the government must assume financial responsibility.
  - e.g., MIT Coal Study
  - others, too

Source: Sally Benson, Stanford.
Time Frames #2

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- Commercial structures can be made more flexible than this admits
  - developers can cash out
  - new cash is injected by new investors
  - residual monitoring and liability is the business of the new owners
  - the life of the original entity is not relevant
Conclusions

- Financial regulation of CCS must be integrated with a national carbon regulatory structure
- Full payment is unlikely to be upfront; large portion of the credit may be delayed substantially
- Timing of payouts must be thoughtfully structured to assure performance without discouraging action
- Commercial and financial structures are very flexible, and there is little need to invoke a government backstop