FINANCIAL RESPONSIBILITY: CHALLENGES & ANALOGS FOR CCS

World Resources Institute
Washington, DC
September 29, 2006

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Key Points

- Overview
- Discussion of Analogs
- Implications for CO_2 Capture and Storage (CCS) Technologies

Overview

- Nearly all industries operate facilities that have finite physical lives.
- Congress has mandated that owners/ operators provide guarantees for the safe management of their facilities.
  - Intent. "Polluter Pays" principle
  - Intent. Minimize the number of orphaned/ abandoned facilities
  - Intent. Minimize environmental risks from facility releases

Market Impacts of Effective Financial Responsibility

- Capital Investment. Design, site, and operate facilities that minimize environmental costs and reduce the likelihood of environmental injury.
- Deterrence & Precaution. Encourage operating decisions that consider the risk of environmental costs.
- Optimal Pricing & Consumption. Stimulate firms to appropriately internalize costs, thereby minimizing excessive consumption of environmentally damaging goods.

Implications for CCS Technologies

- Regulatory/financial framework will depend on:
  - The nature of risks from CCS operations, failures.
  - The ranking/prioritizing of risk.
  - Who bears responsibility for mitigating risk.
- Different frameworks require different investments with respect to regulatory oversight.
- Several analogs exist, each of which is in response to specific risk profiles – Applicability to CCS is not perfect, all have limitations.

A History of Financial Responsibility

1954 | AEA Amendments
Nuclear Decommissioning

1957 | Price-Anderson
Nuclear Indemnity

1974 | SDWA
Underground Injection
Control Program

1976 | TSCA/RCRA
Subtitles C, D, & I

1977 | SMCRA
Mining & Reclamation

1980/1986 | CERCLA/SARA
Superfund

1990 | OPA
Offshore Facility Oil Spills

Notable Regulatory Frameworks

1983 | SMCRA
30 CFR 800

1988/1998 | AEA
10 CFR 30, 40, 70, 72

1998 | OPA
30 CFR 253

CERCLA/SARA
108(b)

1982 | RCRA
Subtitle C, 40 CFR 264/265

1984 | SDWA
40 CFR 144

1991 | RCRA
Subtitle D, 40 CFR 258

Natural Gas Storage
State Specific

Notable Regulatory Frameworks

- Prospective in nature, RCRA establishes a regulatory structure for managing solid and hazardous wastes.
  - Subtitle C provides "cradle-to-grave" requirements; Subpart H details financial responsibility.
  - All but two states are authorized to implement RCRA.
- Retrospective in nature, CERCLA, establishes requirements for abandoned hazardous waste sites, including a trust fund for clean up of these sites.
  - The Superfund tax, which expired in 1995, included a petroleum excise tax, a chemical feedstock tax, and a corporate environmental income tax (CEIT).
  - CERCLA 108(b) provides EPA with the authority to promulgate regulations for financial responsibility.

Relevant Analogs for CCS

RCRA [Prospective]

Strengths

- Preventative in nature – Presumes risks/attendant costs are manageable
- Defined liabilities – Lends itself to "risk transfer" instruments
- Offers a hedge against bankruptcy/ corporate dissolution

Lessons

- Prescriptive, inflexible
- 1982 – Omits recent changes in financial reporting/accounting standards
- Miscellaneous Receipts Act
- McCarran-Ferguson Act

CERCLA [Retrospective]

Strengths

- Hybrid financial instruments (third party/self insurance)
- Ability to shift with rapidly changing market environments

Lessons

- "Legacy" releases – Contamination is a certainty
- Inconstant cost estimation/disclosure
- No hedge – Financial distress/ bankruptcy may lead to unfunded liabilities (Superfund)
- Inconsistent application

Relevant Analogs for CCS

- The Price-Anderson Act caps accident liability for entire nuclear industry at a PV of < $7 billion (~$10b nominal).
- Indemnity program relies on premiums from individual operators, and industry-wide retrospective charges.
  - Government may delay further collections to mitigate financial hardship to the industry.
- While aspects of the indemnity program (risk pooling) may be appropriate, a measured approach is necessary.

Relevant Analogs for CCS

- Underground natural gas storage may be an appropriate physical analog to CCS; Lack of consistent framework poses notable limitations.
- UIC Class I, Hazardous Waste Prescriptive regulations at 40 CFR 144.63 that mirror the RCRA framework.
- UIC Class II, Oil- and Gas-Related Performance standard at 40 CFR 144.28(d).
  - "Federal Financial Responsibility Demonstrations for Owners and Operators of Class II Oil- and Gas-Related Injection Wells" EPA 570/9-90-003, May 1990.

Implications for CCS Technologies

- Flexible system that is self-implementing, transparent and integrates lessons learned:
  - Realistic bond valuation; Third-party cost estimation.
  - Adequate collateralization of aggregated liabilities.
  - Self-guarantees may not respond well to the sudden impact of external (market) shocks.
  - Appropriate risk diversification in (re)insurance markets.
  - Consider hybrids – Sinking fund.

Discussion Questions

- Is financial responsibility necessary?
  - CO_2 – Commodity or Waste
- What is the nature of the risk/liability?
  - Capping & Sealing/Plugging & Abandoning
  - Measuring, Monitoring, and Verification (MMV)
  - Catastrophic Releases
  - Legacy Liabilities from Pre-Existing Wells
  - Long-Tailed – Uncertain Risk Profile
- Can the liability be reasonably estimated?