FINANCIAL RESPONSIBILITY: OPTIONS FOR MANAGING CCS LIABILITY

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Rationale

- A successful, well-structured financial responsibility framework will ensure that developers/operators site, operate, close, and monitor their wells in a sound manner:
  - Intent. Minimize the number of orphaned/ abandoned wells
  - Intent. Minimize environmental risks from well/cavern releases

Market Impacts

- Capital Investment. Design, site, and operate wells 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.

Designing an FR Framework

- An effective CCS FR framework will rely on a clearly defined risk profile:
  - What is the nature of the risk?
  - What is the timing and probability of risk?
  - How might the risk(s) be ranked or prioritized?
  - Which risks bear managing and by whom?
- An FR program that is based on a poorly defined risk profile will yield a menu of financial instruments that are minimally effective.

Designing an FR Framework

- When factoring in the risk profile for CCS, the FR framework also should consider:
  - The evolution of the risk profile over time.
  - The array of available remediation technologies.
  - The ability of project developers/operators to manage the reservoir for sequestration safety.

Designing an FR Framework

- Essentially, an effective CCS FR program should integrate lessons learned from past frameworks, as well as:
  - Ensure funds are adequate, if and when needed.
  - Ensure funds are readily accessible.
  - Establish minimum standards for financial institutions securing funds (or underwriting risk).
  - Ensure continuity of financial responsibility, if and when sites are transferred.

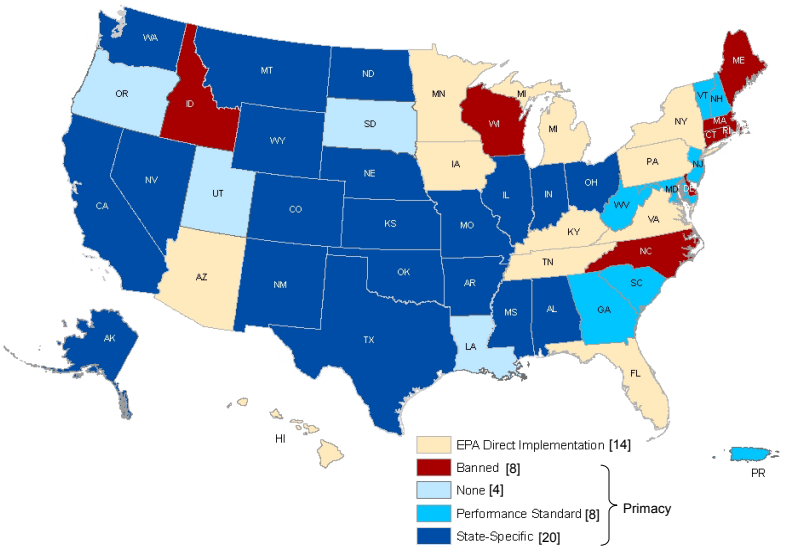
Relevant Analogs for CCS

- Several analogs exist to address public, environmental risk – Applicability to the CCS environment is not perfect.
  - RCRA
    - SDWA – UIC Class II EOR & EGR
  - CERCLA
  - Price-Anderson Act
  - National Flood Insurance Program
  - Underground Natural Gas Storage

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 II, EOR and EGR
  - Performance-based standard at 40 CFR 144.28(d).
  - Owners/Operators “must maintain financial responsibility and resources to close, plug, and abandon the underground injection operation.”

Relevant Analogs for CCS: UIC Class II



Note, Direct Implementation includes DC; and Performance Standard includes PR

Relevant Analogs for CCS: UIC Class II

- Of the 20 states with state-specific FR frameworks, the range of allowable financial instruments varies.

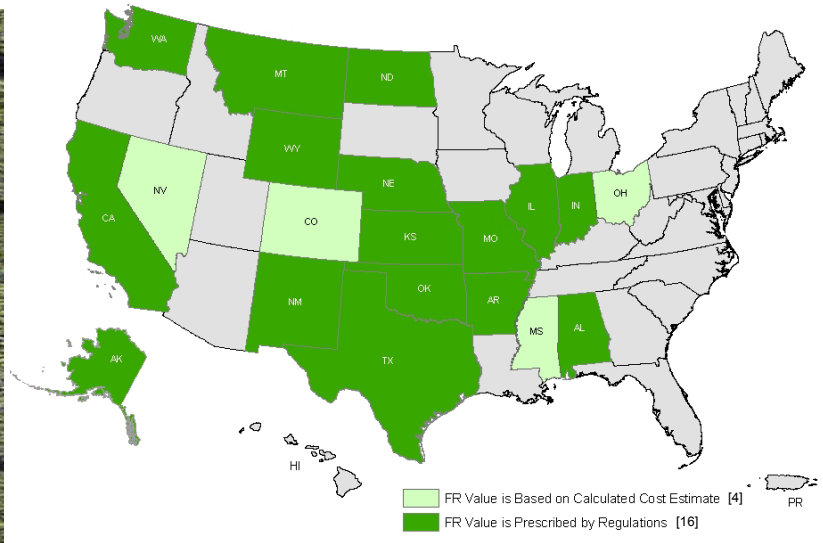
	Number of States
Surety Bond	**20**: AK, AL, AR, CA, CO, IL, IN, KS, MO, MS, MT, ND, NE, NM, NV, OH, OK, TX, WA, WY
Letter of Credit	**10**: AR, CO, KS, MS, MT, NM, OH, OK, TX, WA
Financial Test	**4**: CO, IN, OH, OK
Corporate Guarantee	**2**: CO, IN
Trust Fund	None
Insurance	**1**: CO
Other Instruments (e.g., cash, Certificates of Deposit)	**16**: AK, AR, CA, CO, IL, IN, KS, MO, MT, ND, NE, NM, OH, OK, TX, WA
Other Instruments Acceptable to the Regulator	**7**: CO, IL, KS, MS, ND, OK, NV

Relevant Analogs for CCS: UIC Class II

- Of the 20 states allowing surety bonds, the range of requirements further varies.

Surety bond specific requirements	States with Specific Requirements
Surety company required to be:	
▸ Listed on Treasury Circular 570; or	None
▸ State Authorized (i.e., certificate of authority to operate in the associated state).	**14**: AK, AL, AR, CA, IL, MO, MS, MT, ND, NM, OH, OK, TX, WA
Establishment of a Standby Trust Fund	None
Inclusion of provisions addressing such issues as cancellation	**8**: AK, AL, CA, IL, IN, NM, OK, TX
Prescribed Regulatory Wording	**8**: AK, AL, CA, IN, KS, MO, NM, OK
No Specific Requirements	**4**: CO, NE, NV, WY

Relevant Analogs for CCS: UIC Class II



Relevant Analogs for CCS: UIC Class II

- States that prescribe FR value by regulation do so based on well depth or number of wells, without any apparent cost basis.
- For example:
  - IL: $1,500 per well for wells under 2,000 feet
  - TX: sum of $2 for each foot of total well depth
  - AK: Not less than $100,000 per well, or $200,000 for all wells

Designing an FR Framework

- An effective framework should adapt to new information, and integrate lessons learned:
  - Realistic FR (indemnity) valuation – third-party cost estimate v. flat amount – clear limits of liability.
  - 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 the use of hybrid models – site characterization/injection phase v. post-injection.