

DOCUMENTATION OF REGULATORY/MONITORING AND VERIFICATION BREAKOUT SESSION

Barriers/Unknowns

- Verification of leakage rates/demonstration of no leakage
- Relative considerations with long-term vs. short term considerations
- Assignment of liability
- Assignment of ownership of CO₂ injected
- Identification/categorization/assessment of existing regulatory regimes/frameworks and their applicability to CO₂ sequestration
 - Industrial facilities
 - Subsurface injection
 - Water
 - Acid gases
 - Other
 - Gas storage
 - EOR
 - Pipelines
- Mitigation and remediation if incidents occur
- Definition of “permanence” or an acceptable rate/volume of “leakage” over the long-term
- Methane emissions vs. CO₂ emissions reductions for a ECBM operations
- Applicability of analytical models for long time frames
- Verification/enhancement of models given available data
- Characterization of relative risks, costs/benefits, etc., compared to alternatives, based on “expected outcomes” for both catastrophic and lesser events
- The need to communicate these risks to “define the terms of the debate” in a context that good science can help inform

Research Needs

- Development of standard verification processes using stable isotopes, noble gas tracers, or other suitable monitoring mechanisms to determine what may be happening subsurface
- Characterization of relative risks by region or geology or other factors
 - Both catastrophic and gradual
- Development of seismic methods that can assess impact of CO₂ injection and anticipate possible catastrophic events
- Ensure that adsorption of CO₂ in coalbeds occurs as theorized and is “permanent.”
- Development of methods for long-term pressure monitoring subsurface
- Establishment of a methane emissions history at selected sites as a baseline/analog for possible emissions from storage

- Remote sensing methods that can detect low levels fluxes likely to be associated with leak rates
- Establishment of technological approaches across the board that are applicable for the long times frames required for verification of sequestration.
- Methodologies/approaches for the long-term acquisition, assessment, management, and archiving of long-term monitoring data
- Development of better models for prediction sequestration behavior
 - Over long time frames
 - Based on verifiable data
 - Using appropriate analogs where appropriate
 -