

## Policy, Science & Technology: Paving the way for CCS Success

SPE International Conference on CO<sub>2</sub> Capture, Storage, and Utilization


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## The Texas Carbon Capture & Storage Association


"Advancing America's Energy Security with Clean Texas Technology"
























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## Outline



- I. CCS Policy Considerations
- II. Policy/Science collaboration issues.

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## State Jurisdiction



- Regulatory Oversight
- Property Rights
  - Acquisition of property rights to develop injection sites
  - Ownership of the stored CO<sub>2</sub>
  - Ownership of the subsurface pore space
- Liability
  - Operational Liability (tort/negligence)
  - Long-term stewardship


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## Passing CCS Legislation



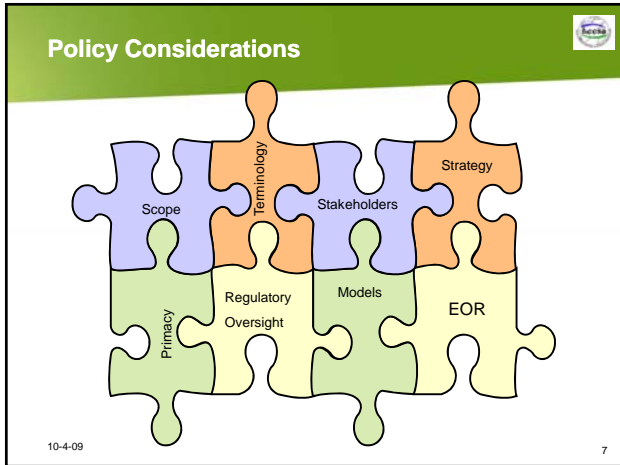
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## Policy Considerations



- To Be or Not To be
- Situs of Regulatory Authority
- Stakeholders/Interest Groups
- Models (Statutory Framework)
- Legislative Strategy
- "Posturing for Primacy"
- EOR Treatment
- Did you say "anthropogenic?"
- Other Issues

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- ### “To Be or Not to Be” (the scope of legislation)
- Regulatory Framework
    - EOR + Incidental Storage
    - Storage in saline formations w/o production capability
    - Storage with Incidental production
  - Regulatory Framework + Big Three
    - Long-term Stewardship
    - Acquisition of property Rights
    - Ownership of storage/pore space
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### Enhanced Oil Recovery

- Do no harm
  - Protect EOR business as usual
- Allow conversion
  - After operations
  - During operations
- Concurrent EOR & storage
  - Avoid creating artificial barriers

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- ### Situs of Regulatory Authority
- State Oil & Gas Regulatory Agency
    - Benefits
      - More experience with subsurface issues
      - Environmental protection/conservation mandate
      - Different EPA standard of review
      - Economies of scale with one agency
    - Disadvantages
      - Less focused on enforcement
      - Not seen as an “environmental” agency
      - Different EPA standard of review
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- ### Situs of Regulatory Authority
- Environmental Regulatory Agency
    - Benefits
      - Experienced environmental regulatory agency
      - Familiarity with hazardous waste disposal
    - Disadvantages
      - Could lead to split regulatory authority
      - Focus on regulation of carbon as hazardous waste
  - Split Jurisdiction
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### Stakeholder/Interest Groups

- Oil & Gas producers
- Electric Generating Utilities
- State Official's
- Environmental Groups
- Coalitions
- Land owners
- Trial lawyers

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## Models for Statutory Framework

- IOGCC Work  
"CO<sub>2</sub> Storage a Legal and Regulatory Framework"
- Bills and Statutes from Other states
- Existing Statutory Analogues
  - EOR/Oil & gas production
  - Natural gas storage
- EPA Proposed GS Rule



**Environmental Protection Agency**  
40 CFR Parts 144 and 146  
Federal Requirements Under the  
Underground Injection Control (UIC)  
Program for Carbon Dioxide (CO<sub>2</sub>)  
Geologic Sequestration (GS) Wells,  
Proposed Rule

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## Terminology

- Sequester – **1 a** : to set apart ; segregate, b : seclude, withdraw;  
**2 a** : to seize especially by a writ of sequestration b : to place (property) in custody especially in sequestration;  
**3** : to hold (as a metallic ion) in solution usually by inclusion in an appropriate coordination complex.
- Store - 1 : lay away, accumulate;  
2 : furnish, supply; especially : to stock against a future time;  
**3** : to place or leave in a location (as a warehouse, library, or computer memory) for preservation or later use or disposal  
**4** : to provide storage room for : hold.



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## What is "anthropogenic" CO<sub>2</sub>?

- Natural gas sweetening?  
"...carbon dioxide stripped, segregated, or divided from any other fluid stream"  
Tex. Water Code § 27.002(19)(i)(a)
- Captured from a stationary source?  
"Stationary Source - a fixed-site producer of pollution, mainly power plants and other facilities using industrial combustion processes"  
www.epa.gov
- Captured from an industrial source?  
"... any building, structure, facility, or installation which emits or may emit any air pollutant."  
Clean Air Act - 42 U.S.C. §7401 et seq. (1970)

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## Legislative Strategy



- Position as Environmental Legislation
- Energy Security through increased domestic oil production
- New Source of State Revenue



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## Posturing for Primacy

- Preemption concerns
  - Will federal GS rules pre-empt state rules
- How to maintain consistency w/ proposed rules
- "WOTF" – waiting on the feds before taking action (e.g. cap & trade, GHG reporting rules, GS rules)

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## Additional Considerations

- Incentives
  - Should financial incentives be bundled with regulatory framework legislation
- Prescriptive vs. Non-prescriptive
  - Narrow regulators options
  - Give regulators latitude on rules
- Composition of CO<sub>2</sub>
  - Quality standards;
  - pipeline specifications, etc.



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## Policy and Science Collaboration = Success

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## Policy/Science Collaboration

“Models used for GS Sites should be based on accepted science...” UIC Proposed GS Rule 2008

- Policy decisions based on science
- Science will give policy makers confidence regarding
  - Stewardship issues
  - Financial responsibility




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## Policy/Science Collaboration

“Models used for GS Sites should be based on accepted science.” UIC Proposed GS Rule 2008

- Should be a seamless process to distribute scientific information to policymakers
- Science must inform policy
  - Critical w/r/t EPA GHG Reporting Rule

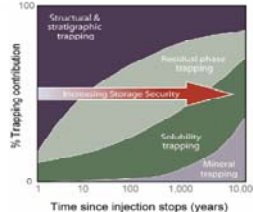


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## Policy/Science Collaboration

- Long Term Liability/Stewardship
  - studies on the safety of Geologic Storage
  - Leakage analysis & groundwater contamination
  - Trapping mechanisms

*“Managing Risk to Groundwater from Large Volume CO<sub>2</sub> Sequestration” by Sue Hovorka*

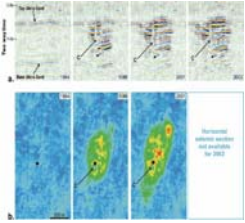


*“Sampling and interpretation of groundwater properties near the SAGROD CO<sub>2</sub> EOR offfield in west Texas” by R. Smith*

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## Policy/Science Collaboration

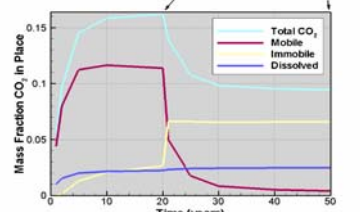
- Measurement Monitoring & Verification
  - Matching tools with reservoirs
  - Avoid one size fits all approach



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## Policy/Science Collaboration

- Site characterization
  - Site selection protocols
  - Rating of sites
- MIT, AoR, Well Construction
  - Standards
  - Modeling



*Cheng, J.W., M. W. Reed, S.J. Chipera, C. Waldbrook, P. Paster, P.C. Lashore, S.C. Walker, M. J. Bostrom, and C.D. Coakley. 2007. "Mobile and Immobile CO<sub>2</sub> in Reservoirs and the Role of CO<sub>2</sub> EOR in the SAGROD Offfield, West Texas, USA." International Journal of Greenhouse Gas Control 1: 55-61.*

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## Policy/Science Collaboration



### EPA Final Greenhouse Gas Reporting Rule

- Will require additional Information

"...on the amount of CO<sub>2</sub>...permanently and securely sequestered..."

"EPA will seek comment on [MMV] which can be used to determine the amount of CO<sub>2</sub> emitted and geologically sequestered at active EOR facilities..."

Final GHG Reporting Rule 2009

- EPA unconvinced that EOR leads to the storage of the contracted volume of CO<sub>2</sub>

"While some amount of CO<sub>2</sub> injected into oil and gas reservoirs for EOR purposes will be trapped...these... site-specific elements influence the amount of CO<sub>2</sub> securely sequestered..."

Final GHG Reporting Rule 2009

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## State Activity



- Feds vs. States

Federal Gov't	States
<ul style="list-style-type: none"> <li>• 2001 Voluntary Policy</li> <li>• Energy Policy and Conservation Act of 2005 &amp; 2007</li> <li>• Lieberman/Warner</li> <li>• Dingell Boucher</li> <li>• Economic Stabilization Bill</li> <li>• EPA Proposed GS Rules</li> </ul>	<ul style="list-style-type: none"> <li>• Washington</li> <li>• Wyoming</li> <li>• Kansas</li> <li>• Utah</li> <li>• North Dakota</li> <li>• Texas</li> <li>• Oklahoma</li> <li>• Ohio</li> <li>• IOGCC</li> <li>• WCI</li> <li>• Etc.</li> </ul>

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## Challenges and Opportunities



- Industrial product/Commodity vs. waste/pollutant
- Subsurface Ownership
- Liability Issues Unresolved
- Need for Regulatory Frameworks (State-by-State)
- Public Perception and Acceptance
- CO<sub>2</sub> Demand and Market development without Required Reductions
- Need for Large-scale commercial demonstration projects

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## Next Steps



- Educate, Influence & Inform
- Mobilize citizens and policymakers
- Unified Voice
- Policy Development and Advocacy Forums
  - North American Carbon Capture & Storage Association
  - Texas Carbon Capture & Storage Association

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## Questions?



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