CO₂ Storage:
A Legal and Regulatory Guide for States
INTERSTATE OIL & GAS COMPACT COMMISSION

Member States
- Alabama (1945)
- Alaska (1957)
- Arizona (1955)
- Arkansas (1941)
- California (1974)
- Colorado (1935)
- Florida (1945)
- Illinois (1935)
- Indiana (1947)
- Kansas (1935)
- Kentucky (1942)
- Louisiana (1941)
- Maryland (1959)
- Michigan (1939)
- Mississippi (1948)
- Montana (1945)
- Nebraska (1953)
- Nevada (1955)
- New Mexico (1935)
- New York (1941)
- North Dakota (1953)
- Ohio (1943)
- Oklahoma (1935)
- Pennsylvania (1941)
- South Dakota (1955)
- Texas (1935)
- Utah (1957)
- Virginia (1982)
- West Virginia (1945)
- Wyoming (1955)

Associate States
- Georgia (1946)
- Idaho (1960)
- Missouri (1995)
- North Carolina (1971)
- Oregon (1954)
- South Carolina (1972)
- Washington (1967)

International Affiliates
- Alberta (1996)
- British Columbia (2002)
- Egypt (1999)
- Republic of Georgia (ZU01)
- Newfoundland and Labrador (1997)
- Nova Scotia (1997)
- Venezuela (1997)
Model Regulatory Guidance

- One of many IOGCC regulatory guidance documents for states and provinces.
- Helps ensure regulatory consistency among states and provinces.
CO₂ ENHANCED OIL RECOVERY INJECTION
CURRENT US CO₂ SOURCES and PIPELINES Industry knows how to handle CO₂

- Wyoming
- Labarge
- McElmo Dome
- Sheep Mountain
- Great Plains Coal Plant
- North Dakota
- Minnesota
- Wisconsin
- Michigan
- Ohio
- Pennsylvania
- New York
- New Jersey
- Delaware
- Maryland
- Virginia
- North Carolina
- South Carolina
- Georgia
- Florida
- Louisiana
- Mississippi

Permian Basin

Terrell, Puckett, Mitchell, Grey Ranch Plants

Bravo Dome

Jackson Dome
CO2 CAPTURE TRANSPORTATION AND GEOLOGIC STORAGE PROCESS

Existing State and Federal Regs

Existing State and Federal Pipeline Regs.

New UIC Regs

Long Term Storage Framework
Not Developed
EMISSIONS TRADING REGULATIONS

CCS REGULATORY FRAMEWORKS

Economic Drivers

Resource Management Drivers

Environmental Drivers

OWNERSHIP AND RESERVOIR PROTECTION

UIC AND HEALTH & SAFETY
Differences Between Policy, Legal, Regulatory and Liability Aspects

- **Policy**: What governments (should) do to encourage or discourage a particular activity
- **Legal**: The right to engage in a particular lawful activity on one’s property
- **Regulatory**: Permission to engage in that particular activity if certain conditions are being met
- **Liability**: Who is responsible for what in case of failure
Carbon Dioxide: Commodity, Pollutant, or Hazardous Waste?

- **Commodity**
  - Commercial value for use in EOR / EGR, already active

- **Pollutant**
  - Recent U.S. Supreme Court ruling that EPA must make this determination
  - Crude oil, coal, and natural gas, if mismanaged

- **Hazardous Waste**
  - Makes handling, injecting, and sequestering far more expensive
  - Coupled with sequestration, encumbers EOR / EGR commercial opportunities in the U.S.
Task Force Representatives

- Representing 15 States
- IOGCC member state and provincial oil and gas agencies
- DOE sponsored Regional Carbon Sequestration Partnerships
- Association of State Geologists
- US DOE
- Independent experts
- US EPA
- US BLM
- Environmental organizational observer
IOGCC Resource Management
Philosophy For CCS

• Given the regulatory complexities of CO₂ storage including environmental protection, ownership and management of the pore space, maximization of storage capacity and long term liability, the Task Force strongly believes that geologically stored CO₂ should be treated under resource management frameworks as opposed to waste disposal frameworks.

• Regulating the storage of CO₂ under a waste management framework sidesteps the public role in both the creation of CO₂ and the mitigation of its release into the atmosphere and places the burden solely on industry to rid itself of "waste" from which an "innocent" public must be "protected".

• Such an approach lacking citizen buy-in with respect to responsibility for the problem as well as the solution could well doom geological storage to failure and diminish significantly the potential of geologic carbon storage to meaningfully mitigate the impact of CO₂ emissions on the global climate.
Brief Summary of Phase I Work and Recommendations

• Industry and states have 30 years experience in the production, transport and injection of CO.

• States have necessary regulatory analogues in place to facilitate development of a comprehensive CCGS regulatory framework.

• CO$_2$ should be regulated as a commodity to allow the application of oil and gas conservation laws which will facilitate development of storage projects.

• Involve all stakeholders including general public in the development of regulatory frameworks.
New IOGCC Phase II Report

- Released in January 2008
- Summary of the report and a copy of the full report on CD-ROM.
What the Guidance Document provides to states & provinces

- Background on why states and provinces are the most logical “cradle to grave” regulators.

- Useful background on climate change and the importance of geologic storage.
Model Statutes and Regulations

Model Statutes

GEOLGIC STORAGE OF CARBON DIOXIDE

Section 1. Legislative declaration, jurisdiction.
(a) The Legislature of the State of [State name] hereby declares that: (1) the geologic storage of carbon dioxide will benefit the citizens of the state and the state’s environment by (i) carbon dioxide is a valuable commodity to the citizens of the state, and (ii) geologic storage of carbon dioxide may allow for the reliable withdrawal or sequestration of carbon dioxide in subsurface reservoirs.

(b) The State Regulatory Authority shall have the jurisdiction and authority over all persons and property necessary to administer and enforce effectively the provisions of this article concerning the geologic storage of carbon dioxide. In assessing such jurisdiction and authority granted to it, the State Regulatory Authority may consider licensing and permit programs, geologic storage facilities, and carbon dioxide storage.

Section 2. Definitions.
(a) Carbon dioxide. A naturally occurring carbon dioxide of sufficient purity and quality as to not compromise the safety and efficiency of the reservoirs to effectively store the carbon dioxide.
(b) Oil and gas. Oil, natural gas, or gas condensate.
(c) Reservoir. Any subsurface geologic formation, aquifer, or cavity or void (whether natural or artificially-created) including oil and gas reservoirs, carbon dioxide storage facilities, and other uses that do not involve carbon dioxide storage.

General Rules and Regulations

GEOLGIC STORAGE OF CARBON DIOXIDE

Section 1.8. Applicability.
The following rules and regulations shall govern the geologic storage of CO2 in geologic reservoirs. These rules apply to all CO2 storage operations occurring within the territorial jurisdiction of the state.

Section 1.9. Definitions.
The following terms, as used in these regulations for geologic CO2 storage facilities, shall have the following meanings:
(a) CO2 Storage Project (CSP) means the project in its entirety, including CF and CSS.
(b) CSP Control Period means the period of a CSS project, subject to approval designated by the State Regulatory Authority (SRA) that the permittee establishes to assure CSP injector operations until the expiration of the CSP Performance Bond, unless monitoring efforts following the operational period documents to SRA that a different time frame is appropriate.
(c) CSP Performance Period means the period of time during which injection occurs.
(d) CSP Operations permit required by SRA to build the project.
(e) CSF Permit means the permit issued by the State permitting the operation of a CSP.
(f) CSF Permit Period means the period of time after the expiration of the CSP Performance Bond.

*The document is divided into sections and contains definitions and regulations for geologic storage of carbon dioxide. The text is formatted in a logical manner, with sections titled as “Model Statutes” and “General Rules and Regulations.” The content includes declarations, definitions, and rules governing the storage of carbon dioxide in geologic reservoirs. The text is interspersed with footnotes for additional context and legal considerations.*
Overview and Storage Rights

Part 2: Overview and Explanation of the Model General Rules and Regulations

Regulations Overview

The Interstate Oil and Gas Compact Commission’s Task Force on Carbon Capture and Geologic Storage has prepared this guidance document. Much of the reader has been captured by the Task Force’s Model Regulations Working Group. The Task Force began its work June 20, 2006, in Dallas, Texas, at which time the initial and subsequent meetings of the Model Regulations Working Group were held. This group held three meetings: a kick-off meeting on September 5, 2006, in St. Louis, Missouri; a mid-point meeting on October 18, 2006, in Austin, Texas; and a joint wrap-up meeting with the entire Task Force on May 7, 2007, in Point Clark, Alabama.

The guidance document is being prepared for IOGCC member states, including its affiliate member provinces. Although references throughout the document are for the most part to “states” or “states,” it is the intent of the Task Force that the comments and provisions are equally applicable to Canadian provinces. Specific sections of the guidance document is made to be both the Model Rules and Regulations and Model Service Agreements to add.

Additionally, the purpose of these model regulations is to help expand the number and number of jurisdictions and is to provide guidance for the U.S. Safe Drinking Water Act and its UIC program. Accordingly, regulations may vary from province to province, but their essence is in the same and consistent with the U.S. regulations.

This document section is followed by an appendix consisting of a few parts. Appendix II provides a draft model statute for the Geologic Storage of Carbon Dioxide. It contains the legislative language necessary to create a model Regulatory Agency to implement the draft model rules and regulations. Appendix III contains the draft model rules and regulations for geologic storage. Taken together, Appendices I and II are the principal deliverable products of the Task Force. Appendix IV contains a background article on the “Overview of the Model Rules and Regulations: Drafting on the Storage of CO2 in Geologic Structures.”

The following provides an overview, explanation, and rationale for the various sections in Appendix II (Model Rules and Regulations).

Carbon 1.8. Applicability

Part 1: Analysis of Property Rights Issues Related to Underground Space Used for Geologic Storage of Carbon Dioxide

Prepared by

David Canary

FORC Task Force on Carbon Capture and Geologic Storage

Arkansas, Idaho, and New Mexico

Mark Regan, David Canary, Cassady Taylor

Several legally recognized interests might exist in property whose underground pore space is a particular resource or interest to be used for geologic storage (GSR). Carbon storage, mineral resources, leases of oil and gas leases, and various state-operating interests in production might have legal rights that could be affected by GSR. Because the law recognizes the ownership interest in subsurface pore space, regulatory programs that manage storage (as opposed to waste treatment) should include plans about how these rights will be managed and protected, as well as a process for ensuring that the owner exercises the legal property right to store CO2.

The Interstate Oil and Gas Compact Commission (IOGCC), Geologic CO2: Sequences Task Force identified these working goals that can provide technological and regulatory guidelines for GSR (1) injection of CO2 into underground formations for enhanced oil

1 See Williams & Eagleson, Pfleegor Vol. 1, 202 (Matthew Bender, 2018), for identification of property interests to storage of naturally gas in geologic reservoirs.
CGS Regulatory Framework

1. Site Licensing & Certification
   - Modified State Gas Storage and Unitization Regulations

2. Site & Well Operations
   - Modified State Gas Storage and UIC Regulations
   - Site Closure and Well Plugging
   - Modified State UIC and Gas Storage Regulations

3. Long-Term Storage
   - State Administered Modified Abandoned Well Program
Phase I: Site Licensing including amalgamation of storage rights

- Licensing of entire reservoir (purchase &/or eminent domain)
- Submission of detailed engineering and geological data along with a CO₂ injection plan
- Operational bond
- Primarily State jurisdiction
Phase II: The Storage and Closure Phase

- The phase where the project is developed, operated and closed
- Regulation to safeguard life, health, property and the environment
- EPA regulatory overlap in this phase under Safe Drinking Water Act (UIC)
Phase III: Long Term “Care Taker” Phase

• When the operator is no longer the responsible party and the long term care taker role is assumed by government.
• Costs in this phase covered by state-administered trust fund.
• Funded by injection fee assessed to operator on per ton basis of CO₂ injected over life of project.
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 CO$_2$
- Seals may be affected over long-term
Relation between Pressure Behavior and Risk and Legal-Regulatory Aspects in CO\textsubscript{2} Geological Storage

<table>
<thead>
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<th>Operational Period</th>
<th>Active</th>
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<th>Post-Closure</th>
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<td>Increasingly Secondary</td>
<td>Decreasing</td>
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<tr>
<td>Liability</td>
<td>Operator and/or Emitter</td>
<td></td>
<td>State Agency</td>
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</table>
• EPA authority under SDWA in green box

• Will ensure national consistency and protection of drinking water for operational phase

• State and EPA regulatory frameworks systems can work “seamlessly”.
PROJECTED USEPA RULE DEVELOPMENT TIMELINE

• **JULY 2008** - PROPOSED RULE PUBLISHED - FOLLOWED BY 90 – 120 DAY PUBLIC COMMENT PERIOD

• **2009 (date uncertain)** – PUBLISH NOTICE OF DATA AVAILABILITY (NODA) – FOLLOWED BY 60 – 90 DAY PUBLIC COMMENT PERIOD

• **2010 (late) or 2011 (early)** – FINAL RULE PUBLISHED
ISSUES USEPA PROPOSED RULE WILL NOT ADDRESS
Due To Limitations in Federal Safe Drinking Water Act

• **Overall Site Licensing, Property Right Issues, Eminent Domain** - (AOR modified to extend over entire area projected to be impacted by total volume of CO2 to be stored)

• **Long Term “Caretaker” Responsibility** (Post Closure Liability) for the time period beyond the established regulatory post closure period - (Class I 30 years most likely analog)
Observations concerning Proposed EPA CS Regulations

- CO2 EOR will remain Class II under UIC
- CS wells will most likely be a new class, for which states will apply for primacy
- Regulations will allow for conversion from Class II to new storage classification – rule will define when storage begins and EOR ends
- Regulations will not determine if CO2 EOR will qualify for CO2 credit – future federal or market based system
- Long-term “caretaker” role will not be addressed – Industry or state role at present time if projects undertaken
- At present a state with UIC primacy can permit CS wells under UIC using existing or combination of UIC well classes.
Barriers to Deployment

- Policy development
- Public acceptance
- Economic and financial (high cost)
- Legal and regulatory
- Scientific and technological
- Capacity
States and Provinces Currently Developing Regulatory Systems Using IOGCC Model Legislation and Regulations

California, Indiana, Michigan, Montana, New Mexico, New York, North Dakota, Oklahoma, Texas, Alberta, British Columbia, Nova Scotia, Saskatchewan

[Image of clouds and grass]
States Which Have Enacted CO2 Storage Legislation

- Illinois
- Kansas
- Ohio
- Utah
- Washington (also has draft rules out for public comment)
- West Virginia
- Wyoming
• The Guidance Document will continue to be perfected based on experience of the states and provinces.

• DOE and other funding sources sought to continue work of the Task Force.

• Task Force is continuing public outreach efforts and assisting states with legislation and rule development.
CONTACT INFORMATION

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