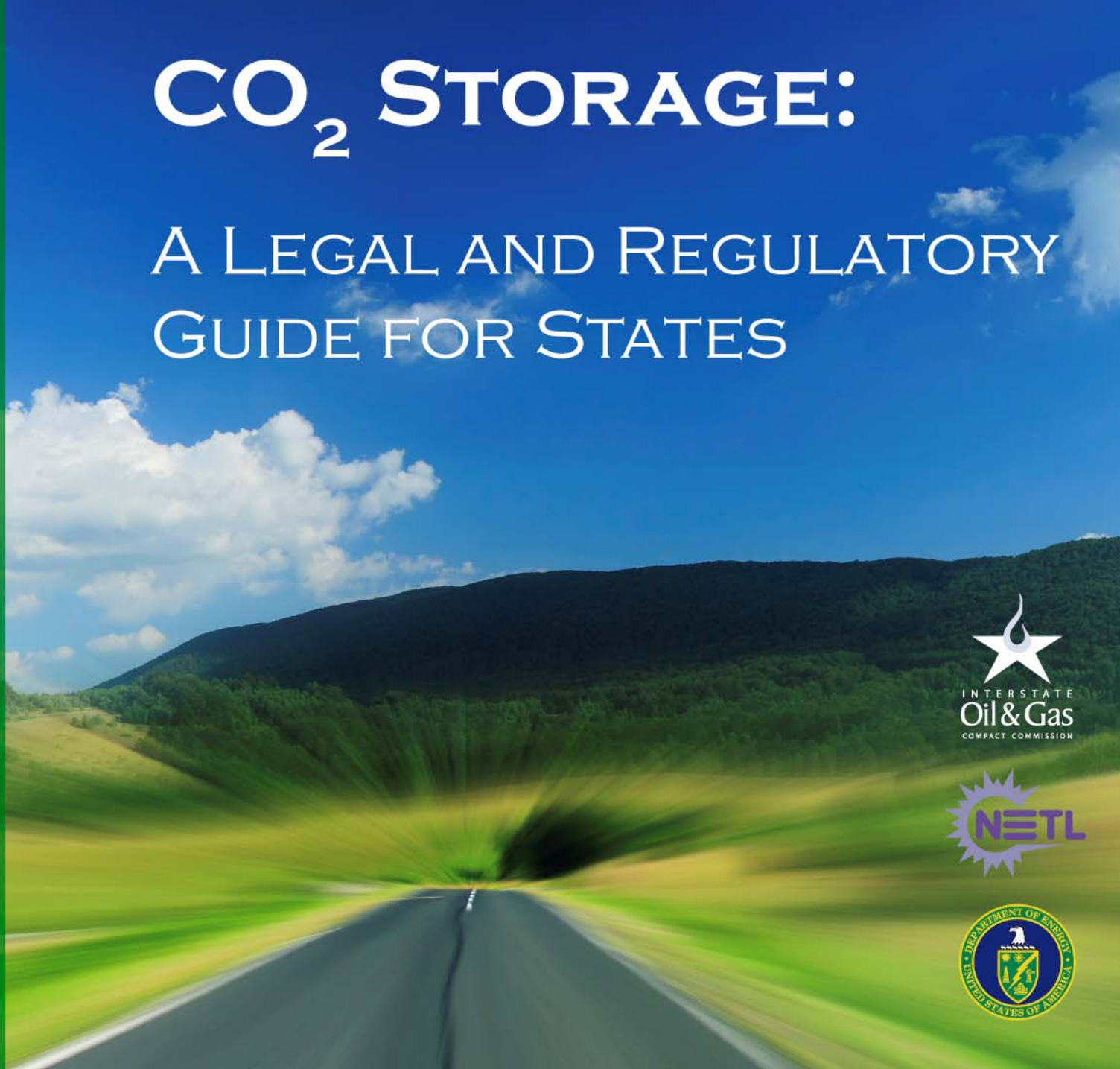
Road To A Greener Energy Future

CO_2 Storage:

A Legal and Regulatory Guide for States



Interstate Oil & Gas Compact Commission

NETL

Department of Energy United States of America

“Journey Down Memory Lane”

- **Concept conceived at what has come to be known in IOGCC CO_2 “folk lore” as the “Alta Summit” in 2001.**
- **IOGCC Geological CO_2 Sequestration Task Force created by IOGCC Resolution in December 2002.**
- **Task Force extended - with name change to the IOGCC CCGS Regulatory Task Force – in October 2004.**
- **Phase I Report – 2005**
- **Phase II Report – 2008**
- **Task Force 4th extension proposed for 2008 meeting.**
- **Funded by USDOE/NETL and worked closely with the seven DOE Regional Carbon Sequestration Partnerships.**

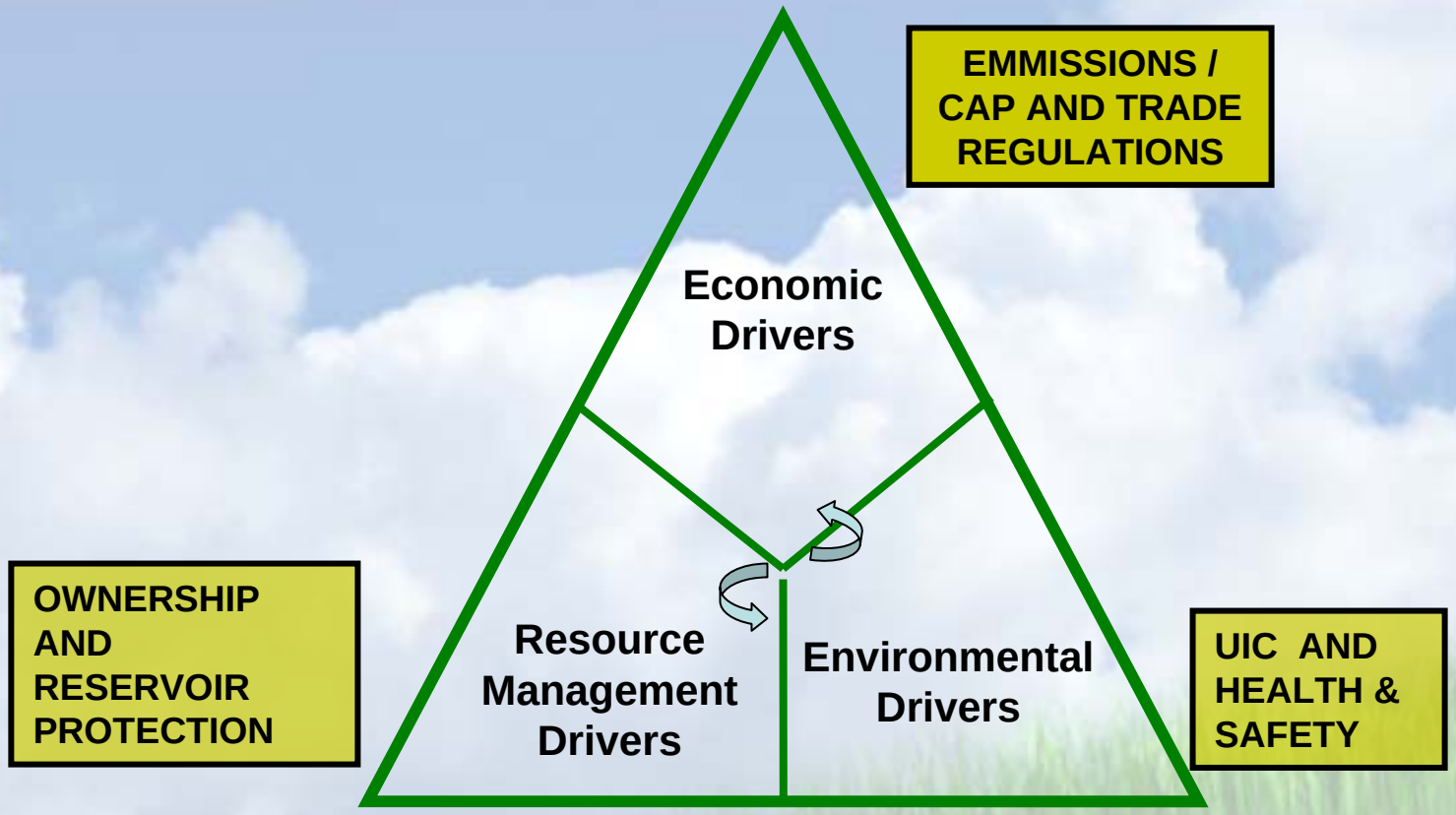
INTERSTATE Oil & Gas COMPACT COMMISSION

Task Force Participants Represented 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 organization observer
- Kevin Bliss

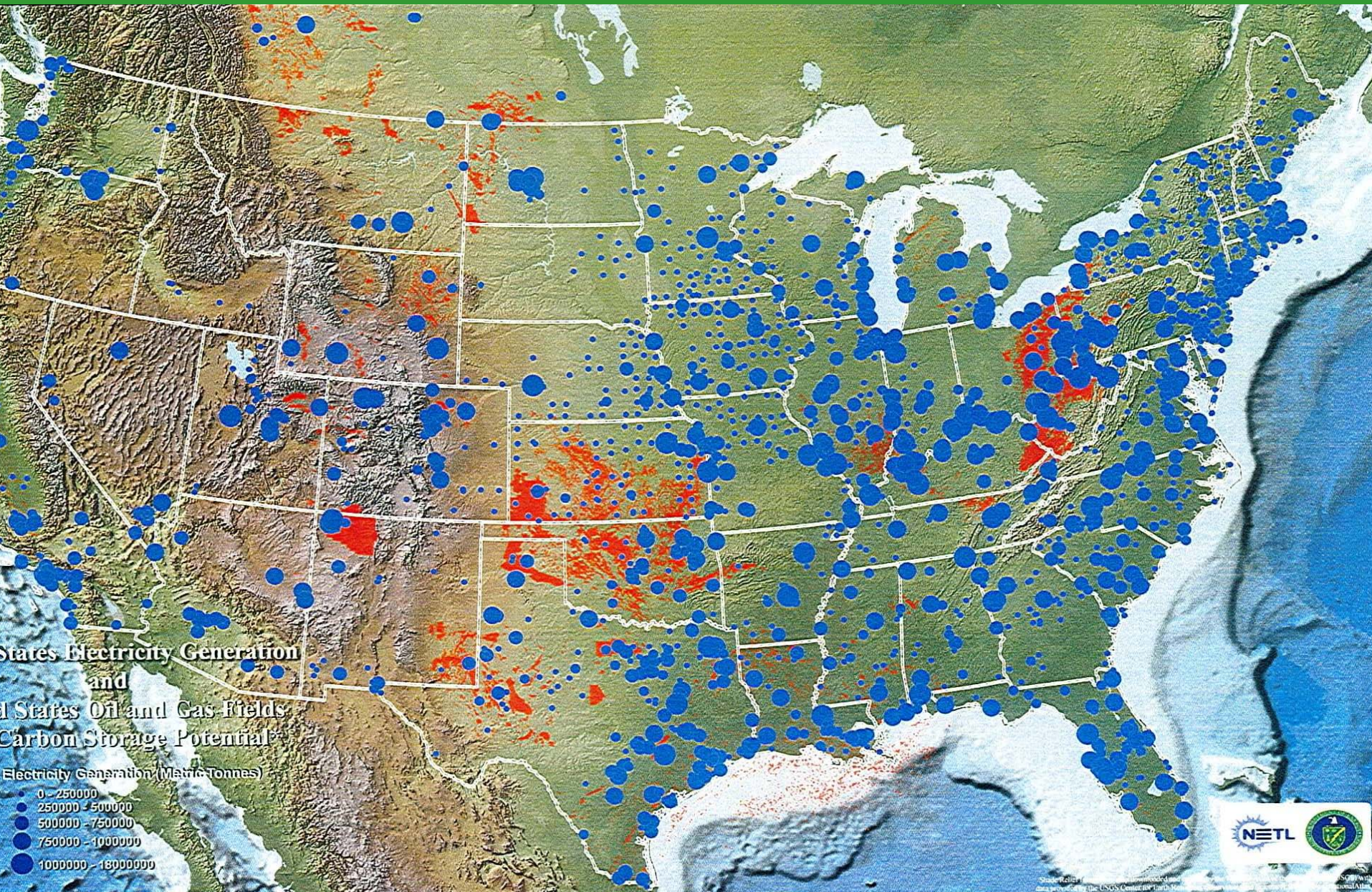
INTERSTATE Oil & Gas COMPACT COMMISSION

CCS REGULATORY FRAMEWORKS

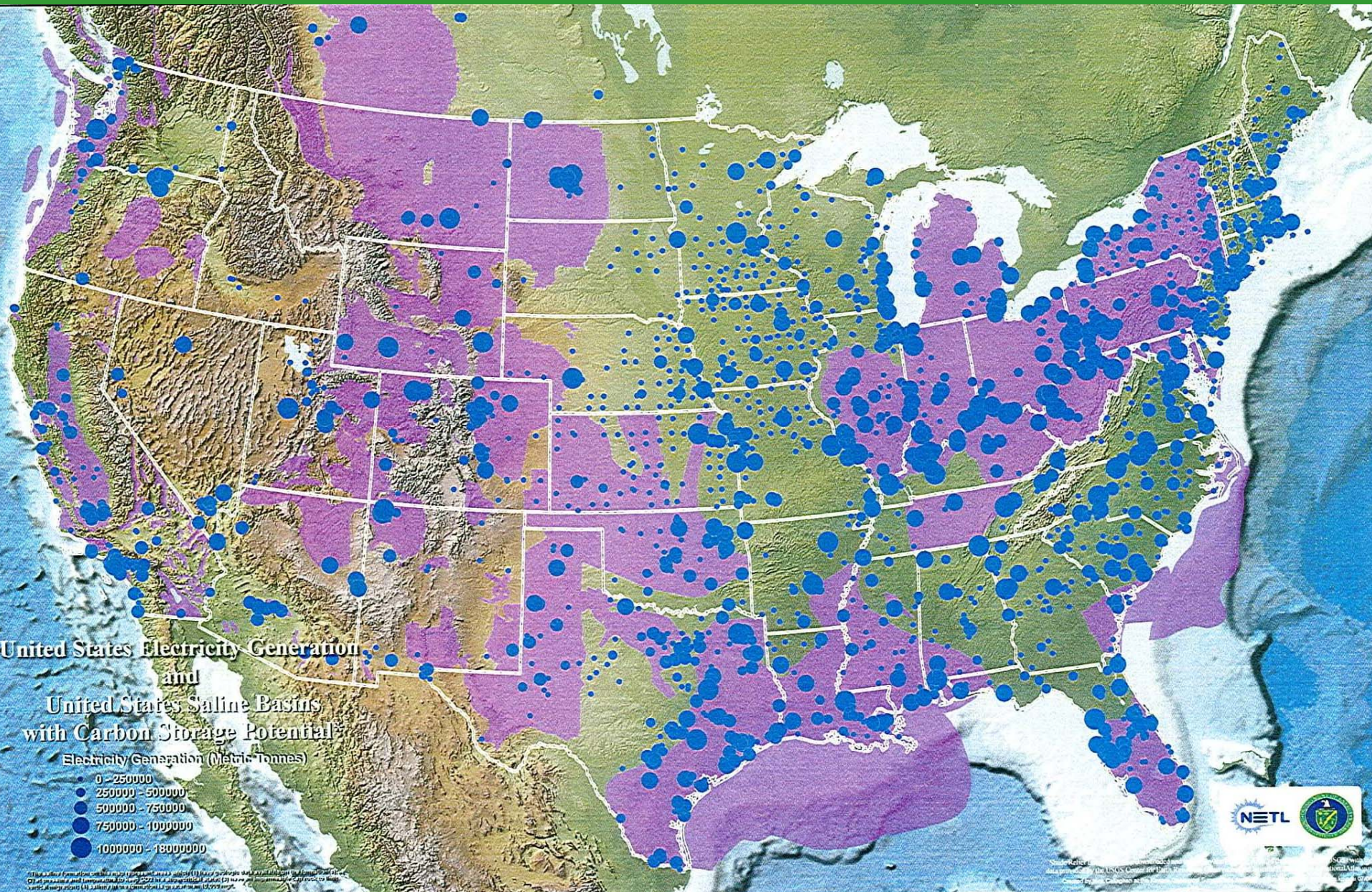


INTERSTATE Oil & Gas COMPACT COMMISSION

Oil and Gas Fields Storage Fairway and Electric Generation Plants



Saline Formation Storage Fairway and Electric Generation Plants



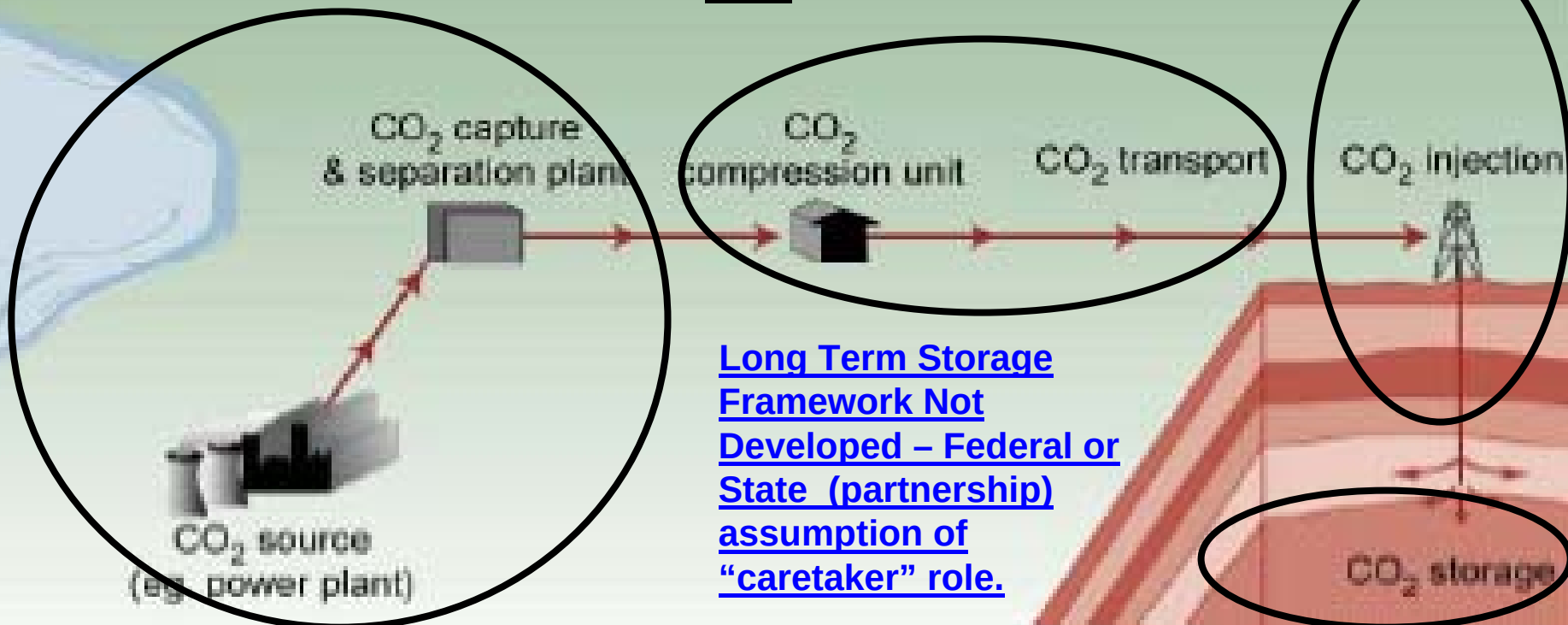
CO_2 Pipeline Network in the U.S. - Industry knows how to handle CO2

CO2 CAPTURE, TRANSPORTATION AND GEOLOGIC STORAGE PROCESS

Existing Regs Administered by State and Federal Environmental Agencies and State PSC

Existing Regs Administered by State and Federal Pipeline Agencies (USDOT/ State PSC)

New UIC Regs administerd under federal partnership with State Environmental or Oil and Gas Agency



Long Term Storage Framework Not Developed – Federal or State (partnership) assumption of "caretaker" role.

Carbon Dioxide: Commodity, Pollutant or Hazardous Waste?

- **Commodity:**

  -commercial use in EOR, industrial and food processes.

- **Pollutant:**

  - recent Supreme Court ruling that EPA must make this determination.

  - complicate commodity use of carbon dioxide.

- **Hazardous Waste:**

  - makes handling, transporting and storing far more expensive and will negatively impact use of EOR for storage purposes.

INTERSTATE Oil & Gas COMPACT COMMISSION

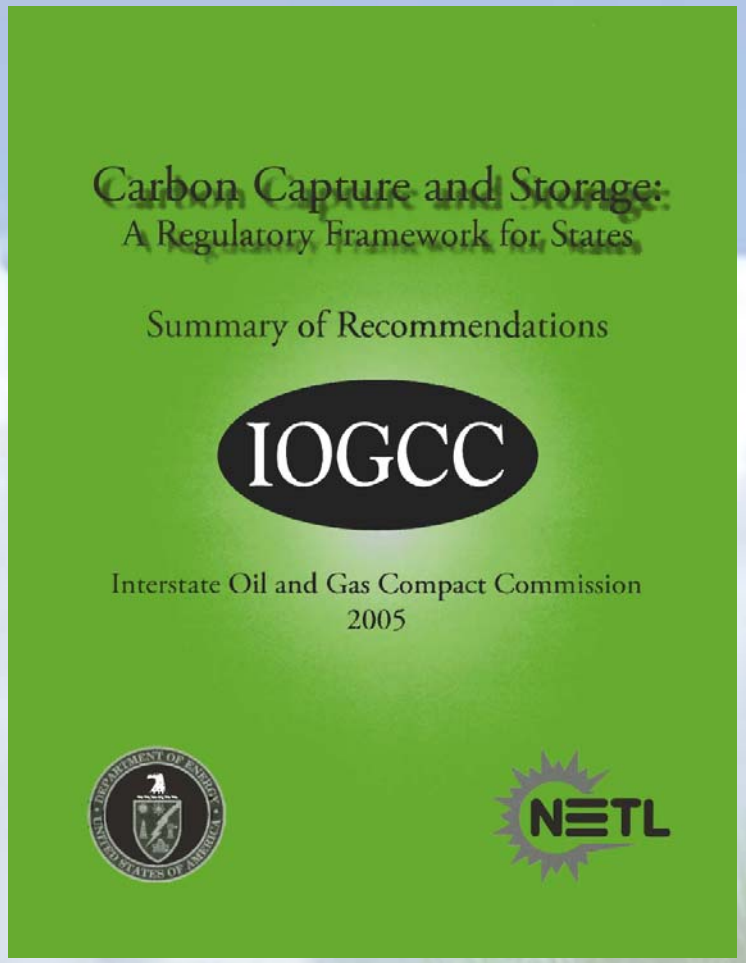
New Paradigm Needed: IOGCC Resource Management Philosophy For CCS

- Given the regulatory complexities of CO_2 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 CO_2 should be regulated under a resource management framework as opposed to using existing waste disposal frameworks.**

- Regulating the storage of CO_2 under a waste management framework will unnecessarily complicate the management of CO_2 emissions and **could well doom geological storage to failure** and diminish significantly the use of geologic carbon storage as a viable mitigation strategy for reducing CO_2 emissions.

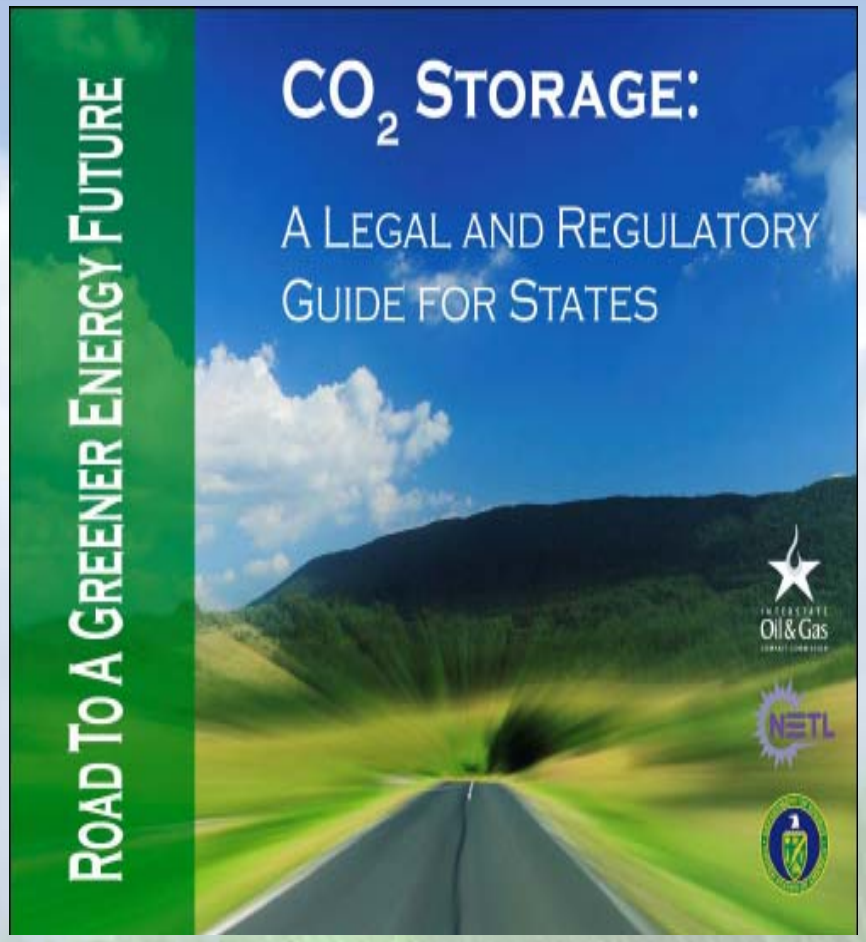
INTERSTATE Oil & Gas COMPACT COMMISSION

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 under a resource management framework 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.

INTERSTATE Oil & Gas COMPACT COMMISSION

What the Guidance Document provides to states & provinces

Storage of Carbon Dioxide in Geologic Structures
A Legal and Regulatory Guide for States and Provinces

Topical Report

Reporting Period Start Date: April 14, 2006
Reporting Period End Date: August 20, 2007

Prepared by the IOGCC Task Force on Carbon Capture and Geologic Storage.
Principal authors: Lawrence E. Bengal, Berry H. Tew, Jr., Michael D. Stettner and Kevin J. Bliss

Report Issued: September 20, 2007

DOE Award No. DE-FC26-05NT42591

Interstate Oil and Gas Compact Commission
P.O. Box 53127
Oklahoma City, OK 73105

- **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 statute and regulations**
- **Legal analysis of ownership issues**

INTERSTATE Oil & Gas COMPACT COMMISSION

Model Statutes and Regulations

Model Statute [1]

Geologic Storage of Carbon Dioxide

Section 1. Legislative declaration; jurisdiction. [2]

(a) The Legislature of the State of _____ declares that (1) the geologic storage of carbon dioxide will benefit the citizens of the state and the state's environment by reducing greenhouse gas emissions; (2) carbon dioxide is a valuable commodity to the citizens of the state; and (3) geologic storage of carbon dioxide gas may allow for the orderly withdrawal as appropriate or necessary, thereby allowing carbon dioxide to be available for commercial, industrial, or other uses, including the use of carbon dioxide for enhanced recovery of oil and gas (EOR).

(b) The State Regulatory Agency 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 exercising such jurisdiction and authority granted to it, the State Regulatory Agency may conduct hearings and promulgate and enforce rules, regulations, and orders concerning geologic storage of carbon dioxide.

Section 2. Definitions.

(a) ***Carbon dioxide.*** Anthropogenically sourced carbon dioxide of sufficient purity and quality as to not compromise the safety and efficiency of the reservoir to effectively contain the carbon dioxide.

(b) ***Oil or gas.*** Oil, natural gas, or gas condensate.

(c) ***Reservoir.*** Any subsurface sedimentary stratum, formation, aquifer, or cavity or void (whether natural or artificially created) including oil and gas reservoirs, saline

[1] Canadian provinces should replace "state" with "province" as appropriate.
[2] The purpose of this section is to make clear that the primary goal is to permanently store carbon dioxide to mitigate its impact on global climate change, however, given the commodity status of carbon dioxide, under certain circumstances states need statutory authority to regulate withdrawal of previously stored carbon dioxide for EOR and other uses that do not involve release to the atmosphere.

General Rules and Regulations

GEOLOGIC STORAGE OF CARBON DIOXIDE

Section 1.0. Applicability

The following rules and regulations shall govern the geologic storage of CO_2 in geologic reservoirs. These rules apply to all CO_2 storage operations occurring within the territorial jurisdiction of the state. [1]

Section 2.0. Definitions

The following terms, as used in these regulations for geologic CO_2 storage facilities, shall have the following meanings:
(a) **CO_2** means anthropogenically sourced carbon dioxide of sufficient purity and quality as to not compromise the safety and efficiency of the reservoir to effectively contain the CO_2.
(b) **CO_2 Facility** (CF) means, all surface and subsurface infrastructure including wellhead equipment, down hole well equipment, compression facilities and CO_2 flow lines from injection facilities to wells within the Geological Storage Unit (GSU), monitoring instrumentation, injection equipment, and offices. CF does not include the main transportation pipeline to the GSU and pump stations along that pipeline.
(c) **CO_2 flow lines** means the pipeline transporting the CO_2 from the CF injection facilities to the wellhead.
(d) **CO_2 injection well** means a well used to inject CO_2 into and/or withdraw CO_2 from a reservoir.
(e) **CO_2 Storage Project** (CSP) means the project in its entirety, including CF and GSU.
(f) **CSP Closure Period** means that period of time (10 years unless otherwise designated by the State Regulatory Agency (SRA)) from the permanent cessation of active CSP injection operations until the expiration of the CSP performance bond, unless monitoring efforts following the operational period demonstrate to SRA that a different time frame is appropriate.
(g) **CSP Operational Period** means the period of time in which injection occurs.
(h) **CSP Operator** means that entity required by SRA to hold the permit.
(i) **CSP Permit** means the permit issued by the state or province to operate a CSP.
(j) **CSP Post Closure Period** means that period of time after the release of the CSP performance bond.

[1] This document is drafted using the word "state". Canadian provinces should substitute either the word "province" or "provincial" as required. Similarly, Canadian provinces should substitute as appropriate the definitions of Underground Sources of Drinking Water (USDW) and Safe Drinking Water Act (SDWA) here and in the following text.

Interstate Oil & Gas Compact Commission

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 work has been accomplished by the Task Force's Model Regulations Working Group. The Task Force began its work June 28-30, 2006, in Dallas, Texas, at which time the tasks and responsibilities of the Model Regulations Working Group were defined. The group held three meetings: a kick-off meeting on September 5-8, 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 5, 2007, in Point Clear, Alabama.

The guidance document is being prepared for IOGCC member states, including its affiliate member provinces. Although references throughout this document are, for the most part, to "state" or "states", it is the intent of the Task Force that the comments and provisions are equally applicable to Canadian provinces. Specific notation of this is made in both the Model Rules and Regulations and Model Statute attached. Additionally, in Canada, protection of both groundwater resources and deep injection fall entirely within provincial jurisdiction, and there is no federal equivalent of the U.S. Safe Drinking Water Act and the UIC program. Accordingly, regulations may vary from province to province, but their essence is the same and comparable with the U.S. regulations.

This overview section is followed by an appendix consisting of three parts. Appendix I provides a draft model statute for the Geologic Storage of Carbon Dioxide. It contains legislative language necessary to enable a State Regulatory Agency to implement the draft model rules and regulations. Appendix II contains the draft model rules and regulations for geologic CO_2 storage. Taken together, Appendices I and II are the principal deliverable work products of the Task Force. Appendix III contains background material on the "Analysis of the Ownership of Storage Rights Relating to the Storage of CO_2 in Geologic Structures".

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

Section 1.0. Applicability

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

Prepared by

David Cooney

IOGCC Task Force on Carbon Capture and Geologic Storage
Subgroup of State Oil and Gas Attorneys
Marvin Rogers, David Cooney, Cammy Taylor

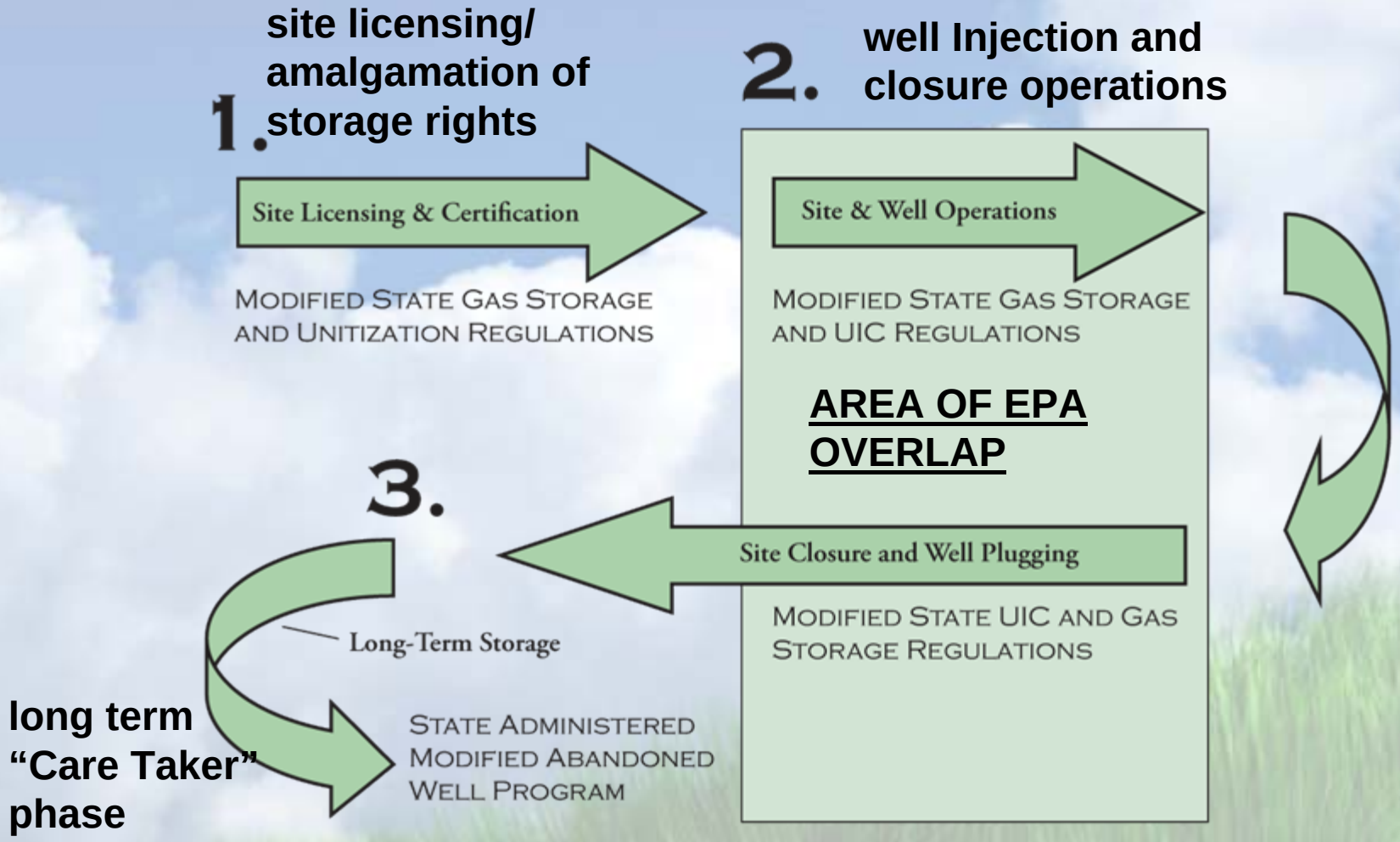
Several legally recognized interests might exist in property where underground pore space in a particular interval or intervals is to be used for geological storage (GS). Surface owners, mineral owners, lessees of solid minerals, oil and gas lessees, and owners of non-operating interests in production all might have legal rights that could be affected by GS.[1] Because the law recognizes an ownership interest in subsurface pore space, a regulatory program that manages storage (as opposed to water protection) should include clear rules about how these rights will be recognized and protected, as well as a process for assuring that the storer secures the legal property right to store CO_2.

The Interstate Oil and Gas Compact Commission (IOGCC) Geological CO_2 Sequestration Task Force identified three working models that can provide technological and regulatory guidance for GS: (1) injection of CO_2 into underground formations for enhanced oil

[1] *See* Williams and Meyers, Oil and Gas Law Vol. 1, §222 (Matthew Bender, 2006), for identification of property interests related to storage of natural gas in geologic reservoirs.

INTERSTATE Oil & Gas COMPACT COMMISSION

CGS Regulatory Framework



INTERSTATE Oil & Gas COMPACT COMMISSION

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

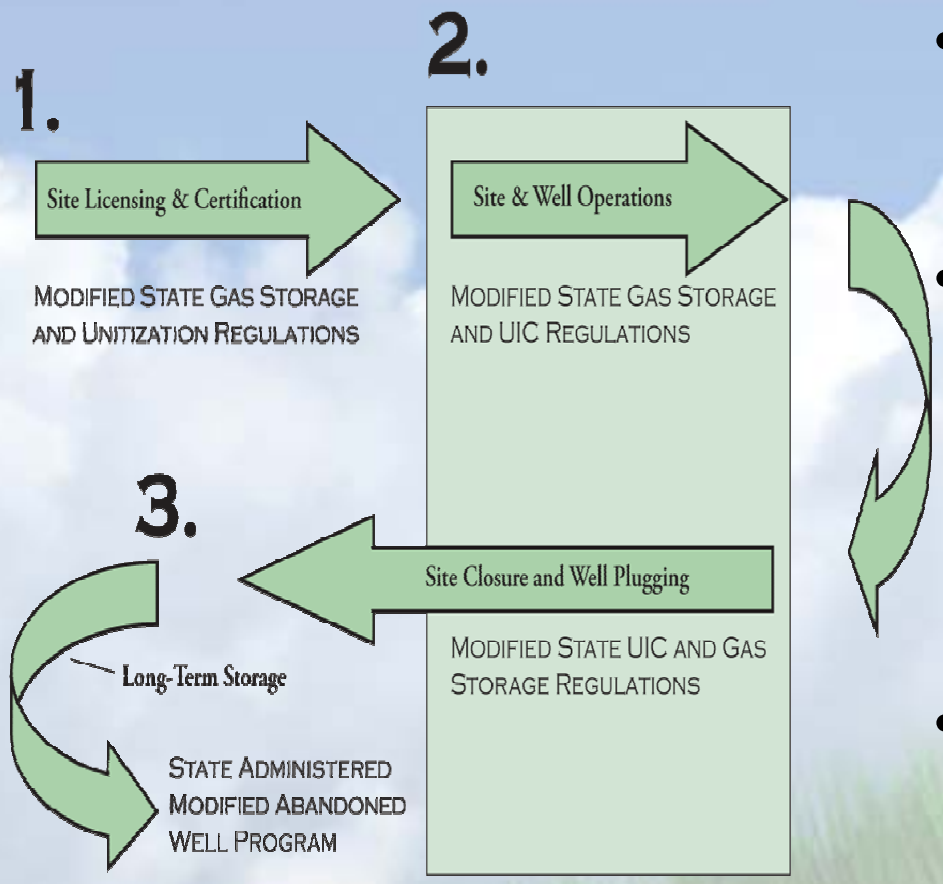
INTERSTATE Oil & Gas COMPACT COMMISSION

States Which Have Enacted CO2 Storage Legislation

- **Illinois**
- **Kansas**
- **Ohio**
- **Utah**
- **Washington (also has adopted rules)**
- **West Virginia**
- **Wyoming**

INTERSTATE Oil & Gas COMPACT COMMISSION

EPA Regulatory Overlap



- **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".**

INTERSTATE Oil & Gas COMPACT COMMISSION

IOGCC ACTIVITY - USEPA RULE

- **IOGCC Phase II Report used** as beginning framework for EPA rule development effort.

- **Late 2007- spring 2008** - Two (2) IOGCC members (representing states) part of EPA internal work group developing proposed rule. GWPC also provided additional 2 state representatives.

- **October 2008 –** IOGCC members states provided comments to EPA proposed rule.

INTERSTATE Oil & Gas COMPACT COMMISSION

ISSUES USEPA PROPOSED RULE WILL NOT ADDRESS

Due To Limitations in Federal Safe Drinking Water Act

- **CO2 will not be classified as waste or pollutant**

- **Overall site licensing, property right issues, eminent domain not addressed** - (AOR/Permit Area 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 - (Rule proposes 50 years). **Industry or state role at present time if projects undertaken.**

- **Will not determine if CO2 storage will qualify for a CO2 emission credit – future federal or market based system**

Oil & Gas
COMPACT COMMISSION

Major Barriers to Deployment

- **Policy Development**
  - Resolve waste vs. resource management framework issue
  - Provide policy support (acceptable approach)
- **Public Acceptance**
  - Education/positive outreach
- **Economic and Financial**
  - Who will pay (rate payers, share holders, gov't incentives)
- **Legal and Regulatory**
  - Long term care taker/liability determination
- **Scientific and Technical**
  - Large scale demo for necessary experience
- **Capacity**
  - Realistic available site assessments

INTERSTATE Oil & Gas COMPACT COMMISSION

IOGCC Task Force – Next Steps

- **The Guidance Document continues to be used by states and provinces as a beginning framework.**
- **DOE funding sought to continue work of the Task Force in Phase III – liability, site selection criteria, storage rights, cross border issues.**
- **Task Force is continuing public outreach efforts and assisting states with legislation and rule development.**

INTERSTATE Oil & Gas COMPACT COMMISSION