



Emerging Regulatory Frameworks for Carbon Capture & Sequestration

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(standing in for Scott Anderson, Environmental Defense)

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Outline



How is CCS regulated now?

Is the current framework adequate?

Recent regulatory developments

Conclusions



The elements of CCS

- Capture
 - Same as for standard facility siting
- Transportation
 - Mature regulatory framework
 - Department of Transportation Office of Pipeline Safety (49CFR195)
 - State agencies can be certified to enforce, inspect and add consistent requirements
 - In CA: Office of State Fire Marshall
- Underground Injection?



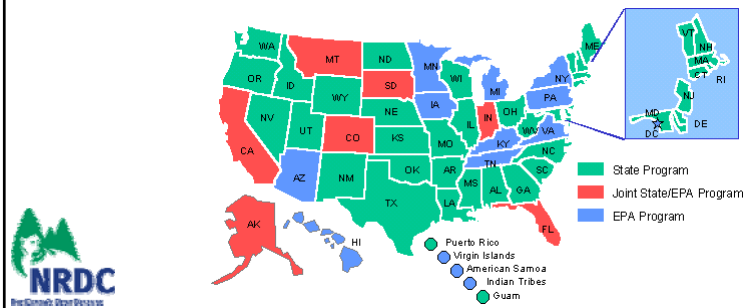
Underground injection of CO₂

- Underground Injection Control Program
 - Under the Safe Drinking Water Act
 - Five well classes: I-V
 - Class I: Hazardous wastes, industrial non-hazardous liquids, or municipal wastewater beneath the lowermost USDW (549)
 - Class II: Brines and other fluids associated with oil and gas production, and hydrocarbons for storage beneath the lowermost USDW. (143,951)
 - Class III: Inject fluids associated with solution mining of minerals beneath the lowermost USDW. (18,505)
 - Class IV: Hazardous or radioactive wastes into or above USDWs. Banned unless authorized under a federal or state ground water remediation project. (32 sites)
 - Class V: everything else (400,000 – 650,000)



Underground injection of CO₂

- UIC program administered by USEPA and/or state agencies
 - States can request primacy for regulating well classes
 - State regulations must be at least as stringent, except for Class II
 - In CA: Primacy for Class II since 1983



CCS under the UIC Program

- In March 2007, USEPA issued UIC Program Guidance #83 “Using the Class V Experimental Technology Well Classification for Pilot Geologic Sequestration Projects”
 - Encourages sound criteria and practices for site selection, operation, monitoring and decommissioning, as well as information sharing
 - *“This guidance does not, however, substitute for the SDWA or EPA’s UIC regulations; nor is it a regulation itself. Thus, it cannot change or impose legally binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances. The use of non-mandatory words like “should,” “could,” “would,” “may,” “might,” “encourage,” “expect,” and “can,” in this guidance means solely that something is suggested or recommended, and not that it is legally required, or that the suggestion or recommendation imposes legally binding requirements, or that following the suggestion or recommendation necessarily creates an expectation of EPA approval.”*



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Is the Guidance enough?

- UIC regulations were not written with CCS in mind
- Existing regulations administered properly by regulators are sufficient to safeguard human health and environment for large pilots projects
- Large volume CO₂ injection is already common
- CCS-specific requirements need to be tailored and codified



Is the Guidance enough?

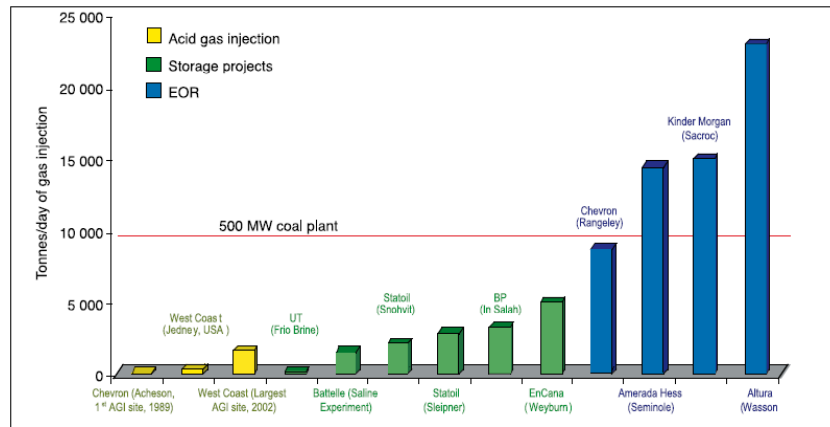


Figure 5.22 Comparison of the magnitude of CO₂ injection activities illustrating that the storage operations from a typical 500-MW coal plant will be the same order of magnitude as existing CO₂ injection operations (after Heinrich *et al.*, 2003).



What needs doing?

- Site characterization and selection criteria
- Modeling standards: geomechanics, geochemistry, hydrogeology
- Monitoring, measurement and verification techniques
- Construction, operation and maintenance standards
- Property rights: mineral, pore space
- Decommissioning procedures
- Long term stewardship for sites
- “Liability” issues
- Regulatory continuity, split authority, project conversion from EOR to CCS



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Recent developments – States

- IOGCC released model rules for CCS in late 2007
 - Very useful starting point but not final word
 - Governance: State vs. Federal
- Several states considering CCS-related regulations
 - KS: To adopt regulations by summer 2008
 - ND: Consider legislative/administrative action in 2009, regulations by 2010
 - NM: Published recent report with recommendations/analysis
 - WA: To publish proposed rule in Mar 2008, effective mid 2008
 - WY: Bills in current session to authorize regulations, clarify ownership and liability
 - AL, OK, MT: considering action



Recent developments – Federal

- In late 2007, USEPA announced that it would propose CCS regulations by summer 2008
- Agency is receiving permit applications for initial pilot and demonstration projects
- Agency is conducting two public workshops to engage stakeholders
- Basic decisions regarding the nature of the proposed rule will be made in the next few weeks
- Interagency review of proposed rule scheduled for late May – early June
- Goal for Administrator's signature on proposed rule is July
- Federal Register public comment planned for July to October
- Agency expects to adopt final rule in late 2010 or early 2011



Unknowns

- USEPA rule: a new Class VI?
- Content of regulations
- Promulgation timing, interim measures
- Ownership, financial responsibility, long-term stewardship: state role
- Compatibility of state frameworks with USEPA rule
- Authority outside the SDWA
- Accounting under a carbon cap
- Other agencies' role: offshore, Federal lands



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- CCS is an activity that can be permitted today
- We need to codify best practice into regulations
- EPA process under way, still issues for States to clarify
- *“Although technical challenges remain, the primary barriers to progressing with initial geologic sequestration projects concern economic viability and statutory and regulatory issues”* [AB 1925 report to the CA legislature, November 2007]



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