



UNITED
Carbon Sequestration Council
STATES

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WANTED: A Legal & Regulatory Framework for Carbon Capture and Storage (CCS)

Current legal and regulatory frameworks are inadequate to support CCS

A legal and regulatory framework currently does exist, and can be built upon, for enhanced oil recovery (EOR) employing underground CO₂ injection into depleted oil fields. However, it does not currently deal with the varied liability issues associated with the very long- term storage of very large volumes of CO₂ captured from power plants and other sources. The Interstate Oil & Gas Compact Commission (IOGCC) proposed a model (referenced below) suggesting an approach to CCS that is very interesting in that it builds upon the EOR framework. The model, however, does not fully resolve long term liability issues -- other than conceptually suggesting a strategy could be built upon the "orphaned well" approach for plugging old abandoned oil wells. Wyoming, Illinois, Texas, Washington and other states have been discussing various approaches to CCS and some have enacted legislation, but the necessary legal and regulatory framework still does not exist.

In order for a commercial CCS project to be successful, it must have both commercially viable CCS technology and a legal and regulatory framework that provides sufficient certainty on matters relating to transport, storage, monitoring, and especially regarding long -term liability. Lack of certainty regarding potential liability renders a project essentially uninsurable and therefore (among other consequences) difficult if not impossible to finance.

A commercial scale power plant equipped with current CCS technology can easily cost over \$2 billion. Energy companies and financial institutions (including insurers) cannot risk capital of that magnitude without a clear understanding of regulatory requirements, legal risks and long-term liabilities, before they commit the capital. Today, that understanding does not exist. There is no coordinated or "one-stop" approval process for regulating CCS projects. Each project must pass through several regulatory processes, both state and Federal. Much has been written on the subject of CCS risk, liability, legal and regulatory issues, including publications by the IOGCC, the Carbon Sequestration Leadership Forum (CSLF), the Intergovernmental Panel on Climate Change (IPCC), the World Resource Institute, the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL), the Sequestration Regional Partnerships, Berkeley National Laboratory, the Energy and Environmental Research Center at the University of North Dakota, the Los Alamos National Laboratory, the Pacific Northwest National Laboratory, the Battelle Corporation, and others. Many good ideas have been put into circulation.

Current legal and regulatory frameworks that may serve as analogs or provide insight into the direction these frameworks may develop have been studied in great detail by all the parties cited above and many others, both in the U.S. and in other countries. However, currently no laws or regulations exist upon which developers of power plants and other large industrial facilities may rely to make CCS financial decisions; nor is there any reliable indication of the direction these frameworks may head.

Framing the framework

Three types of legal issues must be addressed to facilitate commercial scale CCS projects:

1. The rules to protect the environment relating to the injection of CO₂ into saline geological formations. What are the site requirements, the injection protocols, monitoring requirements, etc., needed to ensure that injection of CO₂ does not escape its intended containment region and lead to contamination of groundwater resources or surface-related damages? The IOGCC has offered a comprehensive set of protocols that may be very useful in establishing such rules. The U.S. Environmental Agency (EPA) has proposed a formal rulemaking under the Underground Injection Control (UIC) program (recognizing that the UIC program has traditionally focused only on groundwater protection). Additionally, EPA has published guidelines for “sub-commercial” scale experimental injection projects.
2. Rules may be needed to address potential adverse impacts on subsurface property rights, such as unintended movement of CO₂ into nearby oil or gas resources. In the past, such issues have been addressed with existing law, but the magnitude of CCS projects, the likely existence of multiple projects in the same geographic area, and potential involvement of multiple state governments and laws may make this area more difficult to deal with for CCS than similar problems associated with, for example, EOR injection projects.
3. The extremely long term nature of CCS projects (hundreds or thousands of years) is very difficult to address with traditional risk management mechanisms, like insurance. Additionally, the limited amount of very long term data from large CCS systems makes calculating even an appropriate short-term risk premium difficult.

A common theme to each of these problems is the limited amount of quantitative data on the behavior of CO₂ in deep underground saline formations, for different geologies, and with different types of barriers or “cap rock”. Projects cannot be permitted without data, and data cannot be obtained without projects. Nevertheless, legislators and regulators must get beyond this “Catch 22”. Operating projects are needed now to generate the necessary data for future broad deployment of CCS projects.

Options for moving forward

In order to address the first type of legal issue (rules for injection) there appear to be three basic alternatives:

- Continue with the current EPA rulemaking under UIC authorities. These rules will not be completed for several years, so this pathway, alone, does not help to accelerate the deployment of CCS technologies that project developers would like to advance now. However, it would not be difficult for EPA to issue general guidelines as to how current rules can be used or modified to address “pioneer” commercial scale CCS projects. Such guidelines for near term projects might use a thorough site selection process as a mechanism to minimize risk.

- Adopt interim regulations, again emphasizing site selection, to facilitate the construction and operation of pioneer projects, which would generate the data needed to form more global rules for later broad deployment of CCS. The IOGCC has published both a model state statute and model rules and regulations that might be useful templates for either Federal or State regulations, as they build from well functioning rules for EOR injection. Several states are already working with these models to enact legal frameworks for CCS.
- Obtain broader legal authorities via legislation aimed directly at CCS systems.

The second type of legal issue is important and merits continued review by policy makers, but it may not be an immediate “show-stopper” for near-term CCS projects, so it is amenable to study and traditional legislative/regulatory solutions.

The third type of legal issue, long-term liability, probably requires some form of government participation. A couple of options seem possible:

- For a small set of initial projects, the Federal Government might agree to accept responsibility for monitoring and remediating any containment problems beyond a fixed period after injection ceases (e.g., beginning ten years after cessation of injection). However, for a full deployment program, the cost for such monitoring and remediation probably should be borne by the project developer. To determine a fair cost, more data will be needed and that is unlikely to be generated without initial projects. The previously cited IOGCC model rules follow this general approach, and cite existing “orphaned well” programs in oil and gas producing states as a workable method to generate the funds needed for post closure monitoring and remediation.
- Alternatively, a “risk pool” could be established via coordination between project developers. Such a pool would likely need Congressional authorization to avoid conflict with anti-trust rules. If properly funded and structured, such a pool could function beyond the corporate lives of its founders. The Price-Anderson Act establishes something akin to this for the nuclear industry, so there is precedent for such an approach.

Current climate change bills, such as S. 3036, recognize the need for improvements in the legal framework for CCS technologies, but their provisions remain general and require implementing regulations by agencies such as EPA. The Senate Energy Committee is also continuing with its efforts to draft legislation for a regulatory framework to govern the capture and storage of CO₂. For a solution to be useful in fostering deployment of CCS over the next five years, it must find a way to short-circuit the typical regulatory cycle, at least for a small set of initial CCS projects.

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