California Energy Commission

Permitting—Existing Regulatory Authority and Jurisdiction in California

Presented by

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Overview

California Energy Commission

- CCS activities in CA
- Concurrent CCS-related policy activities
  - Executive Orders
  - Legislation
    - GHG Emissions Standards
    - CCS Studies
- Current regulations affecting CCS (my highlights, with more details included from the Technical Advisory Team)
- Some of the regulatory challenges/issues (my opinion)

CCS Projects in CA

California Energy Commission

- 36 (U.S. Department of Energy funded) CCS activities in the state
  - DOE funding approx. $430M, with more requested via FOAs
  - Total projects, with cost share, valued over $3B
- Injection projects include a variety of source types and sinks
  - WESTCARB California pilot: saline formation, purchased CO_2
  - WESTCARB California development phase project: saline formation, oxyfuel powerplant or refinery
  - C6 Resources: saline formation, refinery
  - HECA: CO_2-EOR in oil fields, IGCC plant with precombustion capture
- Injection project experiences have demonstrated a variety of permitting challenges

CCS-Related CA Policy Activities

California Energy Commission

- AB 1925 (Blakeslee, Statutes of 2006)

  Required the Energy Commission, with the Dept of Conservation, to prepare a report containing "recommendations for how the state can develop parameters to accelerate the adoption of cost-effective geologic sequestration strategies for the long-term management of industrial carbon dioxide"

- AB 705 (Huffman, Introduced and Amended, 2007)

  Required the California Div.. Of Oil, Gas & Geothermal Resources, Cal EPA and the Resources Agency to prescribe regulations for geologic carbon sequestration projects

- SB 1368 (Perata, Chapter 598, Statutes of 2006)

  Limits long-term investments in baseload generation by the state's utilities to power plants that meet an emissions performance standard (EPS) jointly established by the California Energy Commission and the California Public Utilities Commission. (Emission standard currently defined at 1100 lbs CO_2/MWh)

- AB 32 (Nuñez, Statutes of 2006)

  Sets an economy-wide cap on California greenhouse gas emissions at 1990 levels by no later than 2020.

AB 1925 Report

California Energy Commission

AB 1925 required the Energy Commission, with the Dept of Conservation, to prepare a report containing:

> "recommendations for how the state can develop parameters to accelerate the adoption of cost-effective geologic sequestration strategies for the long-term management of industrial carbon dioxide"

Overview of AB 1925 Report

- How much geological potential for CCS does California have and the types and locations of major CO_2 point sources?
  - Imported electricity from coal plants provides 20-30% of electricity and accounts for about half of inventoried GHG emissions from the power sector
  - Largest point sources in-state are natural gas power plants, cement plants, and oil refineries
- How well is California positioned to move forward?
  - Technical readiness
  - Regulatory and statutory readiness
  - Risks and risk management
  - Economic considerations
  - Potentially favorable early opportunities
  - Further work

Available at:
http://www.energy.ca.gov/2007publications/CEC-500-2007-100/CEC-500-2007-100-CMF.PDF

California's Energy Infrastructure and GHG emission standards

California Energy Commission

- Imported power generates more than half of power sector emissions
- SB 1368 sets an emission standard (defined at 1100 lbs CO_2/MWh) and prohibits long-term baseload power purchase agreements emissions above the standard
  - Most (all) natural gas plants in state meet with standard
  - Out of state coal plants do not without CCS
  - To meet 2050 goals will require reducing the level of the standard
- Transportation fuels are exported to neighboring states (100% of Nevada's, 60% of Arizona's, 35% of Oregon's)
- Low carbon fuel standard (LCFS) regulations require fuel producers to establish the carbon intensity of fuels
  - Reduction of at least 10 percent in California's transportation fuels by 2020.
  - CCS can be used to reduce carbon intensity

Agencies with Major Regulatory Roles in CCS

California Energy Commission

- California Air Resources Board
- California Division of Oil, Gas & Geothermal Resources (Dept. of Conservation)
- California Energy Commission
- California Public Utilities Commission
- California Water Boards
- U.S. EPA Region 9

California Energy Commission

- The California Energy Commission has the statutory responsibility for **licensing thermal power plants 50 megawatts and larger** and the plants' related facilities such as transmission lines, fuel supply lines, water pipelines, etc. The Energy Commission acts as **lead state agency and its process is a certified regulatory program under the California Environmental Quality Act (CEQA)** (Pub. Res. Code, §§ 25519 (c), 21000 et seq.). The Commission's regulatory process, including the evidentiary record and associated analyses, is functionally equivalent to the preparation of an Environmental Impact Report. (Pub. Res. Code, § 21080.5.)
- The Siting Committee believes that, as the lead agency in the power plant licensing process, the **Energy Commission has a responsibility to determine if these proposed projects have a significant adverse environmental impact resulting from their greenhouse gas emissions (GHG), and if so, to mitigate such impacts if feasible.**

California Energy Commission: Power plant Emission Standard

California Energy Commission

- **To address SB 1368, the Energy Commission has designed regulations (Chapter 11. Greenhouse Gases Emission Performance Standard Article 1. Provisions Applicable to Power plants 10 MW and Larger)**

  § 2904 Annual average carbon dioxide emissions

  (c) For covered procurements that employ geological formation injection for CO2 sequestration, the annual average carbon dioxide emissions shall not include the carbon dioxide emissions that are projected to be successfully sequestered. The EPS for such power plants shall be determined based on projections of net emissions over the life of the power plant. Carbon dioxide emissions shall be considered successfully sequestered if the sequestration project meets the following requirements:

  - (1) Includes the capture, transportation, and geologic formation injection of CO_2 emissions;
  - (2) Complies with all applicable laws and regulations; and
  - (3) Has an economically and technically feasible plan that will result in the permanent sequestration of CO_2 once the sequestration project is operational.

California Public Utilities Commission

California Energy Commission

- **If a <50 MW CCS facility is built by a regulated utility, CPUC may be the lead agency for CEQA.** If a CCS facility is built by an otherwise regulated utility, it may require a Certificate of Public Convenience and Necessity (see: Public Utilities Code §1001-1005). A CPCN authorizes the utility to spend ratepayer funds to construct a facility. If CPUC is not the lead agency, pursuant to CEQA, CPUC would be a responsible agency. Scoping of the CEQA document would be an important element of making sure the entire project is properly studied.
- Via its economic regulatory authority over investor owned utilities, **the CPUC has discretion to approve or deny ratepayer funding for CCS activities including feasibility studies and power purchase agreements, which are a key vehicle for financing new power plants.** Currently, (Spring, 2010) CPUC has approved ratepayer funding of two CCS feasibility studies. While not a requirement, CPUC-authorized ratepayer funding would significantly increase the likelihood of a prospective CCS plant receiving the financing necessary for construction.

California Public Utilities Commission

California Energy Commission

- **CPUC has economic regulatory authority over pipelines that offer "transportation services" to the public and qualify as a "common carrier utility." If any CO_2 pipelines qualify as a utility, they will be regulated by the definitions in this authority.** This economic regulation entails setting rates or ensuring market based rates and terms of service. CPUC may also require such a pipeline utility to post liability bonds in order to ensure that residents and businesses near the pipeline are appropriately compensated for any undue damages. See: Public Utilities Code § 211, 212, 216, 227, and 228.
- **CPUC has existing safety regulation oversight authority of some intrastate natural gas pipelines; it is possible that this authority would be extended to cover CO_2 pipelines in the future**. In this oversight role, the CPUC sets and monitors standards of gas quality and pressures as well as pipeline materials. CPUC General Order 112-E adopts federal standards from 49 CFR § 191, 192, and 199 and further adds some reporting requirements in addition to the federal standards.

California Air Resources Board

California Energy Commission

- **ARB has statutory authority under AB 32 to reduce greenhouse gases to 1990 levels and CCS may be a tool to achieve that goal**. CCS can be used under certain limited circumstances in the Low Carbon Fuel Standards.
- **If CCS is to play a role in AB 32 regulations, measurement, monitoring and verification are key.** Under AB32, GHG reports must follow reporting guidelines including protocols that contain measurement, monitoring, and verification requirements and must be verified by a third party verifier. We do not currently have any protocols in place, but the authority exists.
- **CCS may be incorporated in future regulations as well, such as mandatory reporting, cap and trade or refinery-based regulations, but there are no other ARB regulations beyond the Low Carbon Fuel Standard that specifically mention CCS.**
- **ARB does not currently have a protocol for quantifying reductions and emissions related to CCS.** This also affects the interaction between authority at CEC, DOGGR, CPUC, and ARB as each has a need to quantify reductions but could use different protocols/standards, leading to a project meeting the emission performance standard but not an AB 32 related goal or vice-versa. There are processes moving forward that may result in a protocol.

California Air Resources Board: Low Carbon Fuel Standard

California Energy Commission

- **LCFS reductions include not only tailpipe emissions but also all other associated emissions from production, distribution and use of transport fuels, that is the fuel's full life cycle, also known as the "well to wheels“**
- A “high carbon-intensity crude oil” (HCICO) means any crude oil that has a total production and transport carbon-intensity value greater than 15.00 grams CO2e/MJ.
- Determining the **intensity value for HCICO-derived products may include consideration of CCS**:
  - “The regulated party may, upon written Executive Officer approval pursuant to section 95486(f), use the average carbon intensity value in the Carbon Intensity Lookup Table for CARBOB, gasoline or diesel fuel, provided the GHG emissions from the fuel’s crude production and transport steps are subject to control measures, such as carbon capture-and sequestration (CCS) or other methods, which reduce the crude oil’s production and transport carbon-intensity value to 15.00 grams CO2e/MJ or less, as determined by the Executive Officer.” (Section 95486(b)(2)(A)(2)(a)(ii)(III)

U.S. EPA Region 9

California Energy Commission

- **US EPA Region 9 has authority to regulate non-Class II wells (all other classes) in California. "Non-Class II" wells include Class V Experimental and Class I Nonhazardous wells used for Geologic CCS.** EPA will **have authority for Class VI wells** when those proposed regulations become final, however California (and other states) will have the opportunity to apply for Class VI authority.
- The **California Division of Oil, Gas, & Geothermal Resources (DOGGR) has been delegated primacy for Class II wells** within the Underground Injection Control (UIC) program of the Safe Drinking Water Act (SDWA).
- **EPA proposed additional subparts to the Mandatory GHG Reporting Rule. Subpart RR is for Geologic Sequestration and is described as complementary to, and building upon, the proposed UIC regulations.** The proposed rule, preamble, fact sheet, etc is available at: http://www.epa.gov/climatechange/emissions/subpart/rr.html

California Division of Oil, Gas, & Geothermal Resources

California Energy Commission

- Has primacy from U.S. EPA to implement Class II UIC wells. California rules governing Class II wells are found in CA Code of Regulations, Title 14, Division 2, Chapter 4.
- **Definitions of a well** in the Public Resources Code include "any well drilled for the purposes of injecting fluids or gas **for stimulating oil or gas recovery,** repressuring or pressure maintenance of oil or gas reservoirs, or disposing of waste fluids from an oil and gas field; any well used to inject or withdraw gas from an underground storage facility."
- Approval must be obtained from the division before any subsurface injection or disposal project can begin. This includes all EPA Class II wells and air- and gas-injection wells. The operator must provide…any data that…are pertinent and necessary for the proper evaluation of the proposed project.
- **AB 705 proposed to** add a Chapter 8 to Division 3 of the Public Resources Code **to require the DOGGR, the California EPA, and the Resources Agency to prescribe regulations for geologic carbon sequestration** projects to provide regulatory guidance for those performing these projects and to minimize the health and safety risks to the public.

State Water Boards

California Energy Commission

- **Issue and enforce permits for any discharge that may affect surface or groundwater quality**
- **Coordinated water quality and water rights responsibility** (Wat. Code, § 174)
  - Responsible for water rights
  - State water pollution control agency for all purposes under the Clean Water Act (Wat. Code, § 13160)
  - Establishes state requirements on water quality control
- **State Water Quality Law: Porter-Cologne Water Quality Control Act (Water Code, § 13000 et seq.)**
  - "**The quality of all the waters of the state shall be protected** for use and enjoyment by the people of the state."
  - "**Activities and factors which may affect the quality of it shall be regulated** to attain the highest water quality which is reasonable." (WC § 13000)
- Nine regional water boards, semiautonomous (budget and legal controlled by State Board), responsible for day-to-day implementation of Porter-Cologne and Clean Water Act in California

State and Regional Water Boards

California Energy Commission

- **Injection well is defined in the California Water Code: WC 13051. As used in this division, "injection well" means any bored, drilled, or driven shaft, dug pit, or hole in the ground into which waste or fluid is discharged,** and any associated subsurface appurtenances, and the depth of which is greater than the circumference of the shaft, pit, or hole.
- **In the case that DOGGR or another state agency applies for administration of federal proposed Class VI injection well permitting, it is relevant that the Water Boards and the Department of Conservation have a 1988 Memorandum of Understanding related to Class II injection wells.** The Water Boards review the Class II injection well applications forwarded by DOGGR and provide water quality information to be addressed in the permit, and generally do not choose to issue separate WDRs except related to surface discharges. The concept of expanding that MOU to include Class VI injection wells might be discussed.

State and Regional Water Boards

California Energy Commission

- Permissive issuance of Waste Discharge Requirements (WDRs) for certain injection wells, and **limitation on Water Board application for UIC Class II program administration**:
  - WC 13263.5.
  - (a) When the regional board issues waste discharge requirements pursuant to Section 13263, or revises waste discharge requirements pursuant to subdivision (g) of Section 25159.17 of the Health and Safety Code, for any injection well into which hazardous waste is discharged, the waste discharge requirements shall be based upon the information contained in the hydrogeological assessment report prepared pursuant to Section 25159.18 of the Health and Safety Code and shall include conditions in the **waste discharge requirements to ensure that the waters of the state are not polluted or threatened with pollution.**
  - (b) If the state board applies to the federal Environmental Protection Agency to administer the Underground Injection Control Program pursuant to Part 145 (commencing with Section 145.1) of Subchapter D of Chapter 1 of Title 40 of the Code of Federal Regulations, that **application shall not include a request to administer the Underground Injection Control Program for any oil, gas, or geothermal injection wells supervised or regulated by the Division of Oil and Gas** pursuant to Section 3106 or 3714 of the Public Resources Code.

Challenges in Defining a Regulatory Framework

California Energy Commission

Assuring protection of human health, safety, environment, and property, but at the same time not discouraging adoption of CCS technology for GHG reduction

1. Maintaining consistency in state requirements across a variety of sources (power plants, refineries, etc) and storage reservoir types (EOR, oil and gas, saline), for which regulatory authority resides at numerous agencies, and while federal regulations are still evolving
2. Defining MVA requirements that will assure regulators of the long-term performance of storage reservoirs (HSE risk) and also verify permanent GHG reduction to meet standards or other metrics
3. Defining regulations that work for early projects and that are still workable for widespread CCS (e.g., one injection site may provide storage for many sources feeding a pipeline network, or one source may provide CO_2 to multiple storage/re-use applications).