

SB 905 IMPLEMENTATION
Summary of Questions and Responses
August 15, 2023, Meeting

On September 16, 2022, Governor Newsom signed Senate Bill 905 (SB 905) into law. SB 905 directs the California Air Resources Board (CARB) in consultation with other state agencies, to create a carbon capture and storage (CCUS or CCS) program in California aimed at accelerating the deployment of carbon management technologies. Under SB 905, by January 1, 2025, CARB is directed to adopt regulations for CCUS and Direct Air Capture (DAC) project operators. CARB is also directed to make available a permitting portal to allow project operators to submit all permit related information through one online platform.

SB 905 also requires the California Natural Resources Agency to establish a state framework for intrastate pipelines carrying carbon dioxide fluid, and to publish a framework for governing agreements for the purposes of managing a carbon dioxide sequestration project reservoir. The framework for the pipelines was completed in early 2023 while the governing agreements work is beginning. The California Geological Survey (CGS) is tasked with developing a Geologic Carbon Sequestration Group that will provide expertise and guidance on carbon sequestration.

The California Natural Resources Agency (CNRA), California Department of Conservation (DOC), the California Air Resources Board (CARB), and the California Energy Commission (CEC) hosted two virtual meetings on August 15, 2023. The morning and evening virtual meeting options provided all stakeholders, including community residents, with two options to listen in and participate; the meetings were recorded.

The meetings were intended to put into context the role of carbon dioxide removal and achieving the 2045 Carbon Neutrality Goal under Assembly Bill (AB) 1279 (Muratsuchi, 2022). The state agencies provided an overview of their carbon dioxide removal efforts with an emphasis on the requirements under Senate Bill (SB) 905 (Caballero, 2022).

Materials from the August 15 meeting and updates on the SB 905 Implementation effort can be found at: <https://resources.ca.gov/Initiatives/Transitioning-to-Clean-Energy>.

Below is a summary of public comments received verbally and through the question-and-answer function of the virtual meeting. The SB 905 team encourages the public, community partners, and all interested parties to get involved in future public forums that will be scheduled.

SUMMARY OF QUESTIONS & RESPONSES

Q) Where can I obtain copies of the slides that were presented at the meeting? And are the recordings of the meetings available?

The presentation slides and recordings of the meetings are available on the CNRA Transitioning to Clean Energy website at:
<https://resources.ca.gov/Initiatives/Transitioning-to-Clean-Energy>

Q) Where can I submit written comments?

Please include "SB 905" in the subject line of your email.

- California Natural Resources Agency / Department of Conservation: comments@conservation.ca.gov
- California Energy Commission: virginia.lew@energy.ca.gov
- California Air Resources Board: ccs@arb.ca.gov

Q) How do I request to be added to the listserv?

To be added to the California Natural Resources Agency listserv / Department of Conservation listserv, please send a request to comments@conservation.ca.gov.

To be added to the California Energy Commission listserv please visit:
[CEC List Serve Sign Up](#).

To be added to the California Air Resources Board listserv please visit:
https://public.govdelivery.com/accounts/CARB/subscriber/new?topic_id=ccs.
Under "subscriber preferences" tick the box for "Carbon Capture and Sequestration."

Q) How do California GHG reduction targets help mitigate the global issue?

Climate change is a global issue that must be tackled at all levels (i.e., at the international, national, state, county, city, neighborhood, and household levels) to have a meaningful impact. California's programs to reduce GHG emissions not only support reductions in global emissions, they also serve as examples that other jurisdictions within and outside of the United States can emulate to further reduce global GHG emissions.

Q) Does CARB plan to do rulemaking under 39741.1(a)(3)?

CARB will adopt multiple regulations to meet the statutory requirements of SB 905 for project operators, as described in section 39741.2. These regulations will support the objectives in section 39741.1.

Q) What do you intend to use as the distance limit from the top of the CO2 plume in modelization up to the ground to accept a project and what is the logic behind it?

For geologic sequestration of CO₂, CARB has set minimum sequestration site selection criteria (including a minimum injection depth), requirements for delineation of the storage complex where injected CO₂ is sequestered, and requirements for monitoring of the CO₂ plume. These criteria and requirements preclude the need to set a minimum distance between the top of the CO₂ plume and the ground surface. CARB will have further public discussion as part of their SB 905 rulemaking.

Q) Do you plan to inject captured Carbon Dioxide (CO2) directly from the source of capture?

Depending on the source of CO₂, captured CO₂ may need to be purified prior to compression and then injection into a sequestration reservoir. Project-specific details will be evaluated on a case-by-case basis by the appropriate permitting agencies in California.

Q) Is the California Air Resources Board (CARB) to certify carbon capture technologies?

CARB will evaluate the efficacy, safety, and viability of carbon capture technologies under SB 905. SB 905 does not include a requirement for CARB to certify carbon capture technologies.

Q) All of this discussion is for California in-state projects only? Stated another way, out-of-state projects should not be impacted, i.e. CCS at ethanol plants in other states?

Regulations developed under SB 905 will apply to California projects only.

Q) How do you see carbon capture and storage working within the context of the California Cap and Trade system? Is an interaction similar to that in the EU Emissions Trading System being considered?

Facilities subject to Cap-and-Trade cannot currently use CCUS to reduce their compliance obligations. Any changes to the Cap-and-Trade regulation to allow CCUS would have to go through the public rulemaking process.

Q) Why not address potential utilization of captured CO2?

SB 905 does not address specific potential methods of utilization of captured CO2. The CEC is evaluating potential uses of captured CO2 through their research and development efforts.

For example, one of the projects discussed at the workshop was the demonstration project at the Los Medanos Energy Center (LMEC). On March 8, 2021, LMEC filed a post certification petition for a project change with CEC to conduct a demonstration project involving the transfer of one percent of the stack gas for carbon dioxide (CO2) removal to the San Francisco Bay Aggregate facility across the street. This aggregate facility will combine the CO2 with locally sourced demolished or returned concrete to produce new CO2-sequestered and upcycled rock products. This petition was approved at a CEC business meeting on March 9, 2022.

The CEC recommends that you subscribe to the CEC list serve to be notified of future research and development funding opportunities on carbon removal and utilization: [CEC List Serve Sign Up](#).

Q) How can we ensure that Carbon Capture, Utilization & Sequestration (CCUS) on hard-to-decarbonize sectors—which may be reasonable—is not a trojan horse for CCUS on fossil fuel infrastructure, infrastructure which we know must be phased out over the next couple decades, rather than locked in now?

In the 2022 Scoping Plan, CCS is included to address emissions from limited sectors, including electricity generation, cement production facilities, and refineries, to ensure anthropogenic emissions are reduced by at least 85 percent below 1990 levels in 2045. Even if all of the actions in the 2022 Scoping Plan are fully implemented, there will remain some demand for petroleum fuels for legacy vehicles in on-road applications, and in aviation, rail, and marine applications. Petroleum refineries will need to implement technology to decarbonize their operations and reduce their emissions. If CCS is not deployed at refineries, the emissions would be directly emitted into the atmosphere, and CO2 removal by natural and working lands or direct air capture would need to increase to compensate for the refinery sector's emissions. The CARB PowerPoint presentation included a slide on emission reductions at refineries with and without CCS. The goal is to phase-down petroleum demand and supply in the state.

Q) What are the targets for 2030 that you will still plan to obtain? Everything presented here is for 2045?

California has an interim target to reduce its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in Senate Bill 32 and laid out in the 2017 Scoping Plan. The Scoping Plan also includes a number of sector-specific targets for 2030, including a CO2 removal and capture target of 20 million metric tons.

Q) There has been a bit of a logjam in getting permit certification applications through and approved, in fact there has not been one approved yet. Will any of these programs speed the approval of those applications?

Executive Order N-8-23, signed by the Governor in May 2023, is designed to streamline project permitting and accelerate the building of clean infrastructure in the state to assist California in meeting its climate goals. The Executive Order establishes a strike team and working groups that will work across state agencies to identify projects for streamlining; support coordination among federal, state, tribal, and local government to facilitate fast and effective project delivery; establish dashboards to track progress; identify potential statutory and regulatory changes to facilitate and streamline project approval and completion; identify opportunities to leverage state and federal funding to address workforce needs; and raise awareness of available state and federal funding opportunities.

Q) What is the Technology Readiness Level (TRL) of the technology that will be used in Sutter? Is it a proven technology? How about emissions (if not proven)?

The technology used at the Sutter Energy Center will be developed by ION Clean Energy (ION). This technology is currently being pilot tested at LMEC. On April 23, 2021, LMEC filed a post-certification petition with the CEC to work with ION to demonstrate, on a pilot scale, its solvent technology to capture carbon dioxide (CO₂) from a small portion of flue gas from a single turbine exhaust at LMEC. The Bay Area Air Quality Management District (BAAQMD) completed an analysis of the proposed ION pilot project and issued a draft Authority to Construct (ATC) and Engineering Evaluation on September 30, 2022. CEC staff docketed its analysis, incorporating conditions from the BAAQMD ATC, on September 30, 2022. This petition was approved at a CEC business meeting on October 12, 2022. The pilot is expected to operate for a year. The data and learnings from the LMEC project will be used to develop the commercial scale CCS facility at the Sutter Energy Center.

With the implementation of the proposed modification, the Sutter Energy Center would need to continue to comply with all permitted emission limits, unless amended in its petition to amend. It is not expected that the modification would result in emissions from the Sutter Energy Center above its current permitted emission limits for criteria pollutants. However, the proposed project would result in a small increase in emissions of ammonia and Volatile Organic Compounds (VOCs), including acetaldehyde and formaldehyde, which are by-products produced during the ION process and are emitted from the absorber stacks.

An analysis will be performed to ensure that the implementation of the carbon capture and storage systems do not result in significant environmental impacts and that the proposed project would comply with applicable laws, ordinances, regulations, and standards ("LORS"). As a result, amendment of existing Conditions of Certification ("COCs") and new COCs may be required for the modification.

Information on the Sutter Energy Center project can be found at: [Sutter Energy Center](#).

Q) What happens if the project does not meet a 95% capture rate?

Operators of capture equipment are incentivized to maintain high capture efficiencies to maximize the net amount of CO₂ sequestered and corresponding financial incentives. The CEC's certification of jurisdictional power plants does not require a

minimum capture efficiency rate. However, if the Sutter Energy Center is applying for federal funding for its project, there could be minimum capture efficiency rates required for the funding. For instance, U.S. DOE solicitation DE-FOA-0002962 provides federal funding for carbon capture projects at gas fired power plants and requires the technology to be at TRL7 with a minimum capture efficiency of 90%.

Q) Regarding landowner pore space agreements, there are several existing pore space agreements. Will these agreements be subject to an approval process?

For the Sutter Energy Center project, the CEC does not require that the entity sequestering the carbon own the pore space but requires that there be agreements in place between the party owning the pore space and the sequestering party. The agreement should clearly specify the responsibilities of each party pertaining to the monitoring and verification of the sequestered carbon. In addition, the agreement should specify the financial responsibilities of each party both during the operation of the system and for closure and post-closure care of the site. Any existing agreements must be reviewed and approved by the CEC.

The framework for unitization of pore space that will affect landowner agreements is still in development. For more information on these governing agreements, and the public engagement process around the framework, please visit: <https://resources.ca.gov/Initiatives/Transitioning-to-Clean-Energy>.

Q) How long is the CEC approval process for installing capture equipment at power plants?

The timing of approval for CCS projects is variable and depends largely on receiving a complete application submittal from the project owner, including permits to operate from the local air quality management district. Delays in responding to CEC staff's data requests related to the application will also prolong the approval process. As an example, the previously mentioned LMEC petitions took 12-18 months for approval. CEC staff consideration of the amendment is governed by the following laws:

- California Code of Regulations, title 20, section 1769 requires the project owner to petition the CEC for approval of any change it proposes to the project design, operation, or performance requirements.
- California Code of Regulations, title 20, section 1769(a)(4)(A) requires the CEC to issue an order approving, rejecting, or modifying the petition or assign the matter

for further proceedings before the CEC or an assigned committee or hearing officer and, additionally if applicable, requires the CEC to approve the proposed change only if it can make the findings specified in California Code of Regulations, title 20, section 1748(b).

In considering the amendment, the CEC staff may hold public workshops and will consider public input and comments. California Code of Regulations, title 20, section 1769(a)(3)(C) states "Staff shall file a statement summarizing its actions taken pursuant to subdivisions Title 20, CCR section 1769(a)(1). Any person may file an objection to a staff action taken pursuant to subdivisions (a)(3)(A) or (B) within 14 days of the filing of staff's statement. A docket has been established for receiving public comments: Sutter Energy Center.

Q) Will the United States Environmental Protection Agency (US EPA) still have primary on Class VI wells?

The US EPA will retain primacy on Class VI wells unless and until a specific agency for the state applies for and is granted primacy after a lengthy review process.

Q) Will some existing wells be used to sequester CO₂ or only new wells? If existing wells are allowed for use, what agency will provide oversight and criteria development of suitability testing and risk assessment prior to usage?

Existing injection wells may be Class II or Class VI wells. Most existing injection wells are Class II wells and are not permitted for carbon sequestration. The US EPA retains jurisdiction over Class VI wells in California.

Q) Are there conceptual CO₂ geological storage projects or Class VI permit applications under consideration now? Where can we access this information?

The US EPA website listing approved and pending Class VI applications in Region 9: <https://www.epa.gov/uic/uic-permits-epas-pacific-southwest-region-9>.

Q) Is a Common Resources Operating Plan (CROP), only pertinent to Class VI wells, or any type of geologic storage?

The framework for CROPs will focus on geologic reservoirs receiving CO₂ from Class VI injection wells for carbon sequestration.

Q) How is a Common Resource Operating Plan (CROP) different from existing unitization rules and laws?

The framework for CROPs is still being developed and will likely differ in many ways from existing rules for unitization of mineral interests. For more information on development of the framework, please visit:

<https://resources.ca.gov/Initiatives/Transitioning-to-Clean-Energy>.

Q) We appreciate DOC's initiative to accelerate guidelines for landowner agreements. Does the law require agency approval of agreements made between willing landowners? What happens to agreements that are made before the guidelines are final? We believe waiting even until late 2024 for agreements will delay achieving 2030 goal of 20 MMT removed.

These are among the issues to be discussed during the public engagement process, identifying options for the Framework governing CROPs. For more information on development of the framework, please visit:

<https://resources.ca.gov/Initiatives/Transitioning-to-Clean-Energy>.

Q) What state agencies have a role regulating the installation and operation of CO2 pipelines carrying captured emissions? Is there a lead agency?

The Office of the State Fire Marshal – Pipeline Safety Division (OSFM) is part of the Department of Forestry and Fire Protection (CAL FIRE), within the California Natural Resources Agency (CNRA). OSFM maintains regulatory jurisdiction over hazardous liquid intrastate pipelines which transport petroleum, petroleum products, CO2, highly volatile liquids, anhydrous ammonia, and ethanol or other non-petroleum fuel including biofuel, which is flammable, toxic, or would be harmful to the environment if released in significant quantities.

The California Public Utilities Commission (CPUC) regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. As part of their jurisdiction, the CPUC ensures that intrastate natural gas and liquid petroleum gas pipeline systems are designed, constructed, operated, and maintained according to safety standards set by the CPUC and PHMSA. CPUC's existing authority does not extend to intrastate CO2 gas pipelines.

The OSFM is currently limited to applying only federal safety standards to CO2 pipelines: transport of supercritical CO2 that is composed of at least 90% CO2. Establishing separate standards in California that are in addition to federal regulation is only possible if changes are made in State law.

Q) Do we envision that there will be a statewide pipeline system supporting Carbon Capture & Sequestration (CCS) and Direct Air Capture (DAC)?

No plans for a statewide pipeline system are in consideration at this time.

Q) Commenter notes that a recent report on the Sleipner project in Norway that had to be discontinued because the geology started changing in unanticipated ways as more CO2 was injected to the underground space. What lessons do we learn from this project for California?

What the Sleipner project demonstrates is that each CCS project has unique geology that needs to be properly characterized prior to injection activities, and that geologic storage performance during injection requires continuous high-quality monitoring and management of injection operations.

Q) How significant is the risk that storage of CO2 in California will induce more earthquakes, and do we have a sense of how much we'd need to limit injection to avoid this outcome?

What we've learned from other geologic carbon sequestration projects in the U.S. is that earthquakes induced by injection and storage of CO2 do occur at lower magnitudes. The potential for such events should be evaluate as part of risk assessment and these events can be limited (or the risk of such events reduced) by following an approved risk management plan (RMP). The RMP should summarize the activities evaluated for risk, what those risks are, how they are ranked, and the steps that CCS Project Operators will take to manage, monitor, avoid, or minimize those risks. During injection activities, continuous high-quality monitoring is needed to detect and determine if there is an increased earthquake risk. Mitigation of that risk would follow the RMP and might include changes in injection activities. CARB anticipates that protocols it will adopt for CCUS technologies under SB 905 will include risk assessment and risk management plan requirements.

Q) California already injects waste water into deep formations that are typically associated with oil and gas reservoirs with little to no seismic issues caused by the injection process. How is injecting carbon into a reservoir any different?

Wastewater injection into reservoirs depleted of oil and gas is done into depleted pore space that may accommodate fluids without significant changes in pressure and the potential for induced seismicity. Injection of carbon is typically done as supercritical CO₂, which is a very dense fluid at high pressure. Due to the much greater injection pressure and injection depth for CO₂ relative to wastewater in depleted reservoirs, CCS project operators and regulators must more carefully evaluate the geologic properties of the reservoir and surrounding formations to ensure safe and permanent storage.

Q) Isn't there a concern that induced seismicity will result in a loss of integrity of the geologic reservoir? The discussion focused on damage to the wellbore, but aren't there other potential concerns too?

Significant induced seismicity has the potential to impact the integrity of storage complex and the wellbore. However, the risk and potential impacts of induced seismicity will be mitigated by requirements for comprehensive study and careful selection of the sequestration site and storage complex, and detailed reservoir modeling. In addition, a robust seismic monitoring program and adherence to an approved risk management plan will support mitigation actions.

Q) Will earthquakes release carbon?

Significant induced seismicity has the potential to impact the integrity of storage complex and the wellbore. However, the risk and potential impacts of induced seismicity will be mitigated by requirements for comprehensive study and careful selection of the sequestration site and storage complex, and detailed reservoir modeling. In addition, a robust seismic monitoring program and adherence to an approved risk management plan will support induced seismicity mitigation.

Q) Question about the earthquake safety system that has been talked about. We all know that predicting an earthquake is hard to do, maybe immediately before it happens we hear about it. I'm just concerned about the safety system that is being set up and how effective that will be?

Earthquakes cannot be predicted. What we've learned from other geologic carbon sequestration projects in the U.S. is that earthquakes induced by injection and storage of CO₂ do occur at lower magnitudes. The potential for such events should be evaluated as part of a risk assessment, and these events can be limited (or the risk of such events reduced) by following an approved risk management plan (RMP). The RMP should summarize the activities evaluated for risk, what those risks are, how they are ranked, and the steps that CCS Project Operators will take to manage, monitor, avoid, or minimize those risks. During injection activities, continuous high-quality monitoring is needed to detect and determine if there is an increased earthquake risk. Mitigation of the risk would follow the RMP and might include changes in injection activities. CARB anticipates that protocols it will adapt for CCUS technologies under SB 905 will include risk assessment and risk management plan requirements.

Q) Don't see any information about risk assessment. How will the public be involved in risk assessment of these proposed projects?

CARB anticipates that protocols it will adopt for CCUS technologies under SB 905 will include risk assessment and risk management plan requirements. The public will have the opportunity to provide comment on rulemakings and protocols.

Q) Who can provide more information to us (about the McFarland project) and how this will affect us?

Prior to construction and operation of the San Joaquin Renewables CCS project in McFarland, California, the project will be required to undergo review under the California Environmental Quality Act (CEQA). CEQA review will identify and evaluate potential environmental impacts associated with the project as part of a public process. The City of McFarland is the lead agency for CEQA for the project and is currently preparing the Environmental Impact Report required.