

**California Carbon Capture and Storage
Review Panel**

**TECHNICAL ADVISORY COMMITTEE
REPORT**

AB 32 Regulations and CCS

AUGUST 16, 2010

CALIFORNIA CARBON CAPTURE AND STORAGE REVIEW PANEL

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Monitoring, Verification, and Reporting Overview

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Overview

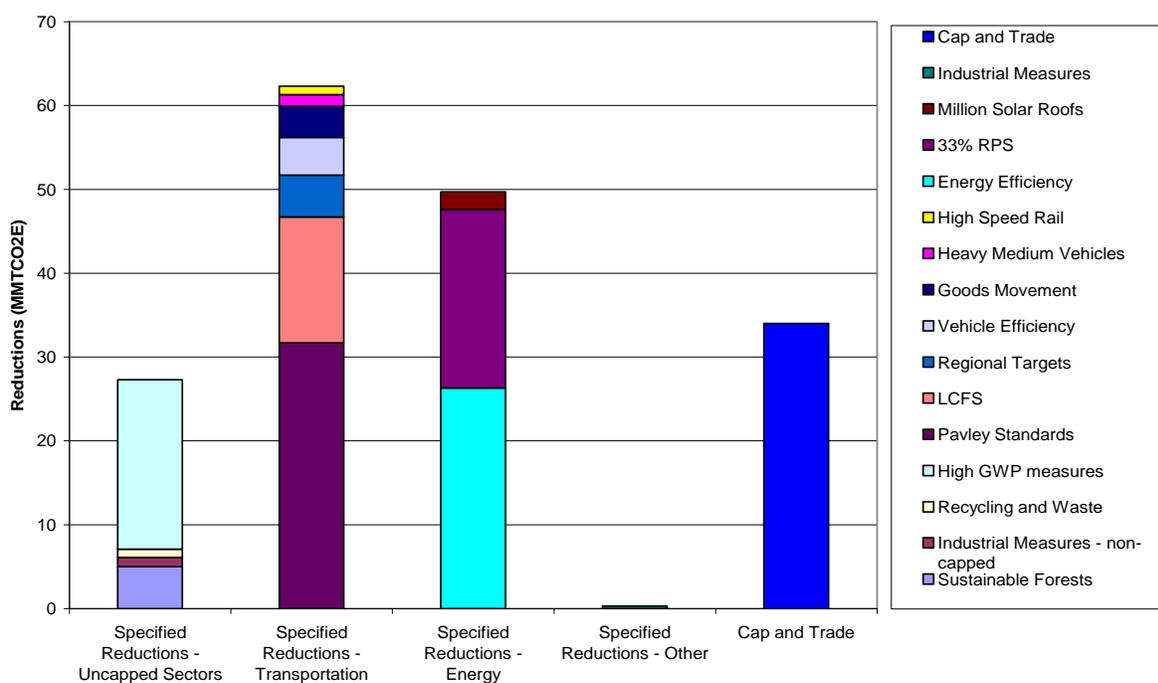
This paper examines key AB 32 regulations where CCS might play a role. It summarizes the requirements of the regulations, their current status, and regulatory needs and timeframes. Additionally, the paper describes the importance of proper greenhouse gas accounting that is necessary for several AB 32 regulations. Finally, the paper mentions the similarities and differences between AB 32 and other regulations in terms of monitoring and accounting.

The Air Resources Board (ARB) recognizes that Carbon Capture and Sequestration (CCS) might be a technology to help reach our long-term greenhouse gas (GHG) reduction goal of an 80% reduction from 1990 GHG emission levels by 2050.¹ In the near term, the Global Warming Solutions Act of 2006 (AB 32) requires ARB to reduce GHG emissions to 1990 levels by 2020. ARB will use a variety of programs including the Low Carbon Fuel Standard (LCFS)² and a Cap-and-Trade program³ to reach the target. CCS may have a role to play in those regulations.

ARB's AB 32 Regulations Relevant to CCS

As mentioned above, ARB must develop programs and regulations to reduce California's emissions to 1990 levels by 2020, a reduction of approximately 30%, based on 2008 estimates.

Chart 1: Anticipated Scoping Plan Reductions



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¹ Executive Order S-3-05, <http://gov.ca.gov/index.php?/print-version/executive-order/1861/>

² <http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>

<http://www.arb.ca.gov/regact/2009/lcfs09/lcfscombofinal.pdf>

³ <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

is will be done with a mixture of Cap-and-Trade and other regulations. Chart 1 provides the details on how many reductions the Scoping Plan anticipated for various sectors.

The next sections will discuss the three most relevant regulations: the Mandatory Reporting Regulation (MRR), the proposed Cap-and-Trade regulation, and the Low Carbon Fuel Standard (LCFS).

Before delving into the regulatory details, it is important to understand how CCS may play a role in the Cap-and-Trade program. One way is that capture could occur at a capped source and be reported via the MRR but there is no methodology for reporting this reduction. Secondly, CCS could occur at a non-capped source and be eligible to produce an offset credit that could be obtained by a capped entity but, again, there is no methodology for CCS to receive offset credit at an uncapped source. The next two sections will go into detail on the MRR and Cap-and-Trade Regulation, their requirements, and how CCS could be incorporated into them. The paper will then look at the LCFS.

Mandatory Reporting Regulation

AB 32 requires major sources to report on their emissions of greenhouse gases. The Air Resources Board approved the Mandatory Reporting Regulation in December 2007, which became effective January 2009. The regulation will result in a reporting and verification program that ensures accurate⁴, permanent⁵, and verifiable⁶ reporting.

The MRR provides standardized methods for entities to measure, monitor, report, and verify emissions. The standardized method allows for ARB to determine the validity and accuracy of the reported emissions and provides consistency across reporting entities, and is key to having a robust reduction program to verify progress towards reduction goals. The reporting requirements must have rigor and consistency to support a trading program.

California's largest industrial GHG emitters reported their emissions for the first time in 2009. Also, electricity retail providers and marketers reported electricity transaction information. The 2008 GHG emissions reports include data from the following industrial sectors: cement plants, oil refineries, hydrogen plants, electricity generating facilities, cogeneration facilities, other large stationary combustion sources, and electricity retail providers

⁴ "Accurate" means that the result of the measurement or calculation is close to the true value of the particular quantity, taking into account both random and systematic errors.

⁵ "Permanent" means either that GHG reductions or removal enhancements are not reversible, or when GHG reductions or removal enhancements may be reversible, mechanisms are in place to replace any reversed GHG emission reductions or removal enhancements to ensure that all credited reductions endure for a period that is comparable to the median atmospheric lifetime of an anthropogenic CO₂ emission. The duration for this period is based upon the best available science, and may be periodically reviewed and revised.

⁶ "Verifiable" means that a GHG data report assertion is well documented and transparent such that it lends itself to an objective review by an accredited verification body. "Verification" is the independent audit of the emissions data report relative to a standard (regulatory requirement – MRR in this case)

and marketers. Only sources that meet certain size thresholds are subject to reporting. Oil refineries, hydrogen plants, and large stationary combustion facilities emitting $\geq 25,000$ metric tons (MT) of CO₂ per year are subject to reporting. The threshold for electricity generating and cogeneration facilities is ≥ 1 megawatt generating capacity and $\geq 2,500$ MT CO₂/yr.

Facilities subject to mandatory reporting are required to have their greenhouse gas emissions verified by a third-party ARB accredited verification body beginning in 2010, for their 2009 reported emissions. Facilities will be subject to annual verification under the proposed Cap-and-Trade program. Only ARB-accredited verification bodies⁷ and verifiers may provide verification services for the purposes of mandatory greenhouse gas emissions reporting.

As mentioned above, the MRR is the route for capped sources to report direct reductions. ARB staff will take revisions to the MRR to Board for approval in November. CCS could be included in future revisions or updates. More detail on the timeline can be found on page 6, after the Cap-and-Trade discussion.

Since CCS cuts across numerous sectors and potentially entities (e.g., electricity provider, pipeline operator, and sequestration site operator), determining reporting rules is key. It could be treated as three separate reporting sectors or as one CCS sector. Until this detail is determined, many issues will be unresolved. For example, what entity reports emissions and reductions and is responsible for leaks? Determining which is best for ensuring full reporting and compliance with emission obligations as well as avoiding double counting would be a necessary step.

Summary & Key Points of MRR:

- Basis for Cap-and-Trade compliance
- The MRR includes out-of-state electricity providers to California
- ARB is responsible for a reporting and verification program that ensures accurate, permanent, and verifiable reporting.
- There is currently no mechanism for CCS to be reported under the MRR
- Any future inclusion would be at least a year-long process
- A robust reporting quantification methodology is necessary first and it must meet the criteria listed in the third bullet.
- Many details (e.g., who reports, what are the monitoring requirements) for CCS to be included in the MRR are unclear at this point

⁷ Frequently asked questions about verification: <http://www.arb.ca.gov/cc/reporting/ghg-ver/faq.pdf>

List of ARB accredited verification bodies: http://www.arb.ca.gov/cc/reporting/ghg-ver/arb_vb.htm

List of ARB accredited verifiers: http://www.arb.ca.gov/cc/reporting/ghg-ver/verifiers_web.xls

Verification Fact Sheet: <http://www.arb.ca.gov/cc/reporting/ghg-ver/verification.pdf>

Verification Overview Presentation: http://www.arb.ca.gov/cc/reporting/ghg-ver/verification_webinar_1-27-10.pdf

Cap-and-Trade Preliminary Draft Regulation

The Cap-and-Trade preliminary draft regulation⁸ proposes a statewide cap on greenhouse gas emissions from included entities. One metric ton of carbon dioxide equivalent emissions equals one allowance. The total number of allowances created is equal to the cap set for cumulative emissions from all covered sectors for that year or group of years.

To set the trading system in motion, ARB would distribute allowances, or emissions permits, to capped entities. In addition to allowances, a limited amount of emission reductions from sources that are outside the cap coverage could be authorized; these reductions are called offsets. Both allowances and offsets, which are both types of compliance instruments, can be traded among entities. The most recent economic analysis estimates an allowance price around \$21 per allowance in 2020.⁹

Entities will be required to surrender compliance instruments equal to their annual emissions at the end of each compliance period, each of which is proposed to be three years in length (2012–2014, 2015–2017, and 2018–2020). ARB staff is considering whether to shorten the compliance period to a year.

The Cap-and-Trade program will cover large industrial sources ($\geq 25,000$ MTCO₂e/year) and electricity generation starting in 2012; and transportation fuels, industrial combustion at facilities emitting less than 25,000 MTCO₂e per year, and all commercial and residential fuel combustion of natural gas and propane starting in 2015.

The Air Resources Board will use the Mandatory Reporting Regulation data to determine which entities have a compliance obligation and how many compliance instruments each entity must surrender. An entity will have to offer allowances or offset credits for each metric ton it reports¹⁰ emitting.

As mentioned above, CCS cannot currently be reported through the mandatory reporting program.

Offsets

Offsets would be the mechanism for CCS at non-capped sources to produce credits under the Cap-and-Trade system that could be obtained by a capped entity for compliance purposes; however, there is no ARB-approved offset project protocol for CCS. This section will talk about criteria that an offset project protocol would need to meet to be considered under the Cap-and-Trade system.

AB 32 requires offsets to meet rigorous criteria that demonstrate that the emission reductions are real, permanent, verifiable, enforceable, and quantifiable¹¹. Further, the action or project

⁸ California Air Resources Board, November 24, 2009, Preliminary Draft Regulation for a California Cap-and-Trade Program, <http://www.arb.ca.gov/cc/capandtrade/meetings/121409/pdr.pdf>

⁹ ARB's Updated Economic Analysis of California's Climate Change Scoping Plan.

¹⁰ through the mandatory reporting program

¹¹ Definitions:

must also be additional to what is required by law or regulation or would otherwise have occurred. Additionality is proposed to be determined via a performance standard and not a strict financial additionality criterion. Future offsets are currently only allowed from ARB approved protocols but ARB may link with other programs in the future.

Because offsets must occur at non-capped sources, any GHG reductions occurring through CCS at a capped facility would not be considered offsets. Carbon capture and sequestration occurring at non-capped sources might be considered for offsets if a CCS offset project protocol is approved by the Board.

The current proposal is that offset protocols must be approved by the Board after an environmental impact assessment is conducted in compliance with the California Environmental Quality Act (CEQA). Additionally, ARB would pursue an open review process, including public workshops and comment periods, for any offset protocol. A CCS project protocol is not among the considerations for this year but could be added for future years. The process for developing future protocols is not set but may follow the current approach of adapting a rigorous methodology developed by another entity. Any methodology developed outside of the AB 32 program must be revised to make it compliance grade for AB 32 and consistent with ARB regulations.

The current proposed draft regulation would allow offsets for up to 4 percent of a source's compliance obligation, ensuring that at least half of the emissions reductions come from the capped sources themselves.

“Real” means, in the context of offset projects, that GHG reductions or removal enhancements result from a demonstrable action or set of actions, and are quantified using appropriate, accurate and conservative methodologies that account for all GHG sources, sinks and reservoirs within the offset project boundary and account for offset uncertainty and the potential for activity-shifting leakage and market-shifting leakage.

“Permanent” means, in the context of offset protocols, either that GHG reductions or removal enhancements are not reversible, or when GHG reductions or removal enhancements may be reversible, mechanisms are in place to replace any reversed GHG emission reductions or removal enhancements to ensure that all credited reductions endure for a period that is comparable to the median atmospheric lifetime of an anthropogenic CO₂ emission. The duration for this period is based upon the best available science, and may be periodically reviewed and revised.

“Verifiable” means that a GHG offset project data report assertion is well documented and transparent such that it lends itself to an objective review by an accredited verification body.

“Verification” is the independent audit of the emissions data report relative to a standard (regulatory requirement – MRR in this case)

“Enforceable” means the authority for ARB to hold a particular party liable and to take appropriate action if any of the provisions of this article are violated.

“Quantifiable” means, in the context of offset projects, the ability to accurately measure and calculate GHG reductions or removals relative to an activity baseline in a reliable and replicable manner for all GHG emission sources, sinks or reservoirs within the offset project boundary, while accounting for offset uncertainty and activity-shifting leakage and market-shifting leakage.

Timeline

The timeline for both the Cap-and-Trade and Mandatory Reporting revisions is as follows:

- Summer/Fall 2010: Revisions to Cap-and-Trade preliminary draft regulation and Mandatory Reporting Regulation (MRR) released
- Sept/Oct 2010: Public release of final Cap-and-Trade regulation and MRR along with Initial Statement of Reasons.
- November 2010: Board considers adoption of Cap-and-Trade regulation and MRR changes
- Spring 2011: Adopted regulations go to Office of Administrative Law (OAL) for review and approval
- Fall/Winter 2011: OAL decision on regulation
- Fall 2011: Initial distribution of allowances
- January 1, 2012: Cap-and-Trade program launch

There is no reporting process or offset project protocol for CCS; therefore, it will not be included or creditable in the proposed regulation scheduled to go to the Board in November 2010. However, CCS could be included in either process in future revisions or updates and could be included in the Cap-and-Trade program between 2012 and 2020.

Summary and Key Points of Cap-and-Trade Preliminary Draft Regulation:

- ARB is responsible for a GHG emissions reporting and verification program that ensures accurate, permanent, and verifiable reductions.
- CCS could be counted under Cap-and-Trade either through a direct entity reduction at a capped sector as reported under the Mandatory Reporting Regulation or as an offset obtained by a capped source for CCS occurring at a non-capped source.
- Emissions and reductions must be reported to ARB and verified by a third-party
- Currently, there is no mechanism for CCS to be a reduction option either through reporting or as an offset
- Any future inclusion could only occur if an accounting methodology is available that fulfills the AB 32 criteria and has undergone an environmental impact assessment and a public development process.
- CCS could only be an offset at a non-capped source
- AB 32 requires ARB to monitor compliance with and enforce any regulation adopted under the Act.
- The Cap-and-Trade preliminary draft regulation includes out-of-state electricity providers to California

Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS) is one part of ARB's goal to meet the 2020 goals outlined in AB 32. Executive Order S-1-07¹² requested ARB create an LCFS. The order calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The LCFS is separate from Mandatory Reporting and the Cap-and-Trade Program; it has its own reporting tools and offset requirements.

The LCFS framework is based on the premise that each fuel has a "life-cycle" GHG emission value that is then compared to a standard.¹³ This life-cycle analysis represents the GHG emissions associated with the production, transportation, and use of low carbon fuels in motor vehicles. The life-cycle analysis includes the direct emissions associated with producing, transporting, and using the fuels. In addition, the life-cycle analysis considers other effects, both direct and indirect, that are caused by the change in land use or other effects. For some crop-based biofuels, the LCFS has identified land use changes as a significant source of additional GHG emissions.

The standards are expressed as the carbon intensity of gasoline and diesel fuel and their alternatives in terms of grams of carbon dioxide equivalent per megajoule (gCO₂E/MJ). Providers of transportation fuels must demonstrate that the mix of fuels they supply meet the LCFS intensity standards for each annual compliance period. They must report all fuels and track the fuels' carbon intensity through a system of credits and deficits. Credits are generated from fuels with lower carbon intensity than the standard. Deficits result from the use of fuels with higher carbon intensity than the standard. A regulated party meets its compliance obligation by ensuring that the amount of credits it earns (or acquires) is equal to, or greater than, the deficits it has incurred. Credits may be banked and traded within the LCFS market to meet obligations.

ARB is developing a secure on-line LCFS Reporting Tool (LRT) to support the reporting requirements of fuels and other data to the State. ARB will review the reports for completeness and accuracy, evaluate the data to determine compliance, and conduct field investigations and audits to verify and validate the information.

CCS is specified as an option for producers of High Carbon Intensity Crude Oil (HCICO) to reduce emissions for production and transport of crude oil to less than 15 gCO₂e/MJ and thereby no longer be considered HCICO. CCS could be considered when used for the production of alternative fuels such as hydrogen, compressed natural gas (CNG), or electricity. For CCS to be incorporated into the LCFS, a quantification methodology would be necessary.

Summary and Key Points of LCFS

- CCS is specified as an option to lower the carbon intensity of high carbon intensity crude oil to the California default.

¹² <http://gov.ca.gov/executive-order/5172/>

¹³ For petroleum-based fuels, the life-cycle analysis is also referred to as "well-to-wheels"; for fuels produced from crops, the life-cycle analysis is sometimes referred to as "seed-to-wheels",

- CCS could be considered when used for the production of alternative fuels such as biofuels, hydrogen, CNG, or electricity.
- There is no project protocol in place. This protocol may be different from the protocol for the MRR and Cap-and-Trade.

Accounting and AB 32 Regulations

Accurately accounting for carbon dioxide captured, transported, and sequestered is necessary for ARB to ensure that the sequestered CO₂ can be quantified and verified as permanent. Both the reductions and emissions from the mitigation technology would need to be considered. Reporting and offset methodologies must be consistent and rigorous enough to support a trading system.

Unlike the Division of Oil, Gas, and Geothermal Resources' (DOGGR) monitoring requirements, ARB's accounting methodologies must be able to accurately quantify emissions and reductions. Any accounting scheme must identify and quantify leakage to the atmosphere. A monitoring program designed purely for health and safety or to protect drinking water would not be sufficient for quantification purposes, where every ton of CO₂ leaked to the surface or lost as fugitives at a compressor or wellhead has to be quantified.

Measurement, monitoring, verification, and reporting must occur through ARB's system in order to ensure consistent application and compliance with overall AB 32 programs. AB 32 requires ARB to monitor, verify, and enforce the greenhouse gas Mandatory Reporting Regulation as well as ensure that any greenhouse gas reductions are accurate, permanent, and verifiable. ARB's approach has been to develop sector-based rather than project-based accounting requirements.

Carbon capture and sequestration brings unique considerations to GHG accounting as it includes reductions and emissions that cross sectoral boundaries. Reductions occur at an industrial facility but emissions occur both at the facility during capture and elsewhere as the carbon dioxide is transported, compressed, and injected into the subsurface. Additionally, the sequestration site would need to be able to verify that the reductions are permanent.

Enhanced oil recovery with sequestration would present more considerations because emissions can occur in the production, recycling, and reinjection phase. The subsurface could also need to be monitored for migration to other producing sites or abandoned wells.

The U.S. Environmental Protection Agency, European Union, Intergovernmental Panel on Climate Change, non-profits, industry organizations, and others are developing or have developed national and international accounting guidelines or systems for CCS; however, any and all of them would need to be revised to be compliance-grade for ARB's programs. The revisions process would be public and include technical and policy changes to ensure that the quantification methodology is appropriate for California conditions including consistency with the MRR and Cap-and-Trade Regulation as well as considering any changes that may need to be made to account for different risks due to California geology and seismicity concerns.

Some fundamental questions arise when considering how CCS might be accounted for under AB 32 regulations:

- What level of measurement/monitoring certainty would be enough?

- Currently the Mandatory Reporting Regulation has established a +/- five percent standard for the measurements that generate fuels emissions estimates.
- Would a monitoring plan need to be able to detect a leak of x amount with x likelihood? (e.g., if a leak were detected, would it need to be quantified within +/- five percent?)
- Can current monitoring techniques quantify leaks with enough accuracy and precision?
- If measurement accuracy and precision is not high enough, would it be sufficient to incorporate the uncertainty into the emissions and reductions accounting?
- How would permanence be addressed?
 - Cap-and-Trade program current thinking:
 - If reductions or removals may be reversible (e.g., there could be an emissions leak):
 - Mechanisms must be in place to replace any reversed carbon.
 - The operator must ensure that credited reductions endure for a period comparable to the atmospheric lifetime of anthropogenic CO₂ emissions.
 - Permanence is also being addressed in each protocol.
- Who verifies the emissions and reductions?
 - Under Cap-and-Trade, ARB requires verification statements from third party verifiers for both reporting and offsets.
 - LCFS: ARB
- Who would be responsible if there is a reversal (e.g. if there is a leak to the atmosphere)?
 - Under Cap-and-Trade, ARB is considering how to address this issue.
 - Under LCFS, this issue remains to be addressed.
 - Reversal discussions must consider all sectors covered by AB 32 and would not be limited to CCS.

Regulatory process and timelines

ARB engages in an extensive public process with any regulation or regulatory change. A full regulatory development process can take years, whereas a revision to a regulation may not take as long. After an extensive public participation process of generally 6 months or longer, staff submits an initial statement of reasons detailing the rationale for a regulation and recommends a regulation or regulatory change. The documents are made public through a 45-day notice for comment. Staff then presents the information to the Board, which determines its approval or denial. If the regulation is approved, staff provides the proposed final regulation to the state's Office of Administrative Law (OAL), along with a final statement of reasons incorporating

responses to comments. OAL has a year after the initiation of the 45-day comment period to act on the regulation.

Consistency with other agencies

In addition to AB 32 programs, other agencies have a role in regulating and monitoring CCS either through greenhouse gas or underground injection related regulations. Two important programs to consider are the Emission Performance Standard (EPS) under SB 1368 and the Underground Injection Control program.

The EPS establishes a standard for CO₂ emissions at baseload plants and includes a provision to allow CCS to be used to meet that standard. The CO₂ emission performance standard (EPS) for baseload generation owned by, or under long-term contract to the state's utilities is 1,100 lbs CO₂/MWh. The California Energy Commission and the California Public Utilities Commissions implement this standard and it is a separate process from the AB 32 regulations. The current regulations implementing SB 1368 at CEC and the CPUC allow for the use of CCS to meet the EPS but the details for determining compliance are unclear. The CEC regulation states that for covered procurements that employ geologic CO₂ sequestration, the successfully sequestered carbon dioxide emissions shall not be included in the annual average CO₂ emissions. 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 CO₂ 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 CO₂ once the sequestration project is operational

These requirements differ from AB 32 requirements in a few key ways: 1) The EPS is based on emissions over the lifetime of the plant whereas the MRR considers annual emissions and the LCFS considers life-cycle emissions (including indirect emissions); 2) the EPS requires an economically and technically feasible plan for permanent sequestration and the MRR and Cap-and-Trade would need a quantification methodology that can quantify any emissions or verify permanent sequestration. The definition of permanent sequestration is not included and may have different criteria than those defined under the AB 32 regulations. For these reasons, AB 32 regulations will have different requirements for compliance than SB 1368.

The following table details the different requirements of the various agencies' regulations:

Regulation	Agency	Permanence	Monitoring Goal or requirement	Metric for estimating GHG Emissions to Atmosphere
Emission Performance Standard	CEC and CPUC	Included but not defined	Unclear	Lifetime annual average GHG emissions
Mandatory GHG Reporting Regulations and Cap-and-Trade Preliminary Draft Regulation	ARB	All credited reductions endure for a period that is comparable to the median atmospheric lifetime of an anthropogenic CO ₂ emission	Detect and quantify emissions (if any) and verify permanence	Annual Emissions
Underground Injection Control Program	DOGGR or US EPA	Not necessary as long as protection of underground sources of drinking water.	Protect Underground Sources of Drinking Water	None
Low Carbon Fuel Standard	ARB	Not addressed for CCS at this time	Verify carbon intensity of fuel	Life-cycle carbon intensity of fuel

CCS projects would get a permit from the Underground Injection Control (UIC) Program, which requires monitoring similar but not identical to ARB needs. The UIC program is under the federal Safe Drinking Water Act and its mandate is to protect underground sources of drinking water (USDW). Although the permits require monitoring to ensure USDW protection, the monitoring is not designed to quantify emissions or ensure permanence, which are key components of AB 32 related monitoring needs.

Although ARB cannot use other agencies' requirements directly, ARB realizes the utility of remaining consistent across agencies and streamlining the process as much as possible. However, since the needs for the EPS and the UIC programs are significantly different than the need for quantification for a carbon trading scheme, monitoring and other requirements would be inherently different.

Summary and Key Points

The following is a summary of key points related to AB 32 regulations and the potential inclusion of CCS:

- AB 32 requires ARB to implement a GHG reporting program and the agency is accountable for ensuring the reductions are real, permanent, quantifiable, verifiable, and enforceable.
 - ARB must implement the monitoring and verification processes
 - Uses third party verification
- Cap-and-Trade and the LCFS are just two tools to meet the anticipated 2020 emissions goal.

- A robust quantification methodology would be required in order for CCS projects to play a role in AB 32 regulations.
 - The timeline could be several years to develop and finalize a quantification methodology and incorporate it into regulations
- There are differences among ARB regulations and between ARB regulations and those of other agencies. Consistency in methods such as monitoring plans or quantification methodologies is ideal but there are different needs necessary to meet the different statutory authority and program goals. For example, each regulation has a different compliance time-frame and/or mechanism for quantifying greenhouse gas emissions:
 - ARB: Reporting through the current Mandatory Reporting Regulation requires quantification of annual emission estimates on an entity or facility level. The Cap-and-Trade regulation is considering compliance based on multi-year averages for emission estimates. Both regulations require rigorous quantification methodologies.
 - CEC/CPUC: The Emission Performance Standard requires compliance with a lifetime annual average carbon dioxide emission level.
 - DOGGR: The Underground Injection Control Program does not consider quantification but ensures protection of underground sources of drinking water with no quantification of greenhouse gas emissions.

The regulatory and statutory differences mean that AB 32 regulations would have different monitoring, quantification, reporting, and verification needs and requirements for compliance from each other and other agency's regulations.