IETA Comments to California Air Resources Board:

Public Feedback for Carbon Capture, Removal, Utilization, and Storage Program (SB 905)

28 March 2025

For over 25 years, IETA has been the leading global business voice on robust market solutions to tackle climate change while driving clean finance at scale. IETA represents a broad and diverse group of stakeholders (350+ members worldwide) that includes carbon offset project developers, insurance providers, standards, investors, banks and financial institutions, law firms, funds, and businesses who are at the forefront of climate action. IETA's expertise is regularly called upon to inform carbon market solutions that deliver measurable climate outcomes, address economic competitiveness and carbon leakage concerns, balance efficiencies with social equity, and support a just transition.

IETA welcomes the opportunity to share input with CARB on its 27 February 2025 **Public Workshop on Carbon Capture, Removal, Utilization, and Storage Program (SB 905)**. We greatly appreciate CARB's willingness to engage with stakeholders at this time. Building off the workshop's Panel Session 2, "Carbon Storage, Removal, and Utilization Technologies," IETA's response leverages its more than two decades of global experience to share resources and information with CARB to aid in its implementation of SB 905.

Most notably, we recommend **CARB leverage IETA's Geostorage and Carbon Crediting Handbook.** Released in April 2024, the handbook is a comprehensive synthesis of methods and safeguards on the crediting of reductions and removals involving geological storage of carbon dioxide.

The first part of the handbook reviews **key methodological building blocks of crediting mechanisms as they apply to geological CO2 storage technologies**. A synthesis of current methodological approaches in UN and voluntary carbon market protocols, standards and guidance is then examined. The stocktake on methods provides a powerful resource for both policymakers and practitioners considering how to develop and integrate these solutions into carbon markets.

The second part of the handbook explores **the safeguarding principles and precedents that are needed to underpin safe and secure deployment of geological CO2 storage**, such as direct air capture, bioenergy capture and removal, and the capture and storage of CO2 from industrial sources. The range of safeguards collectively support robust crediting of these climate-critical solutions.

IETA notes that the Handbook is currently undergoing revision, with an updated version expected by June 2025. IETA intends to promptly share the updated report with CARB once complete. In the meantime, we have curated a compendium of resources for CARB provided within the handbook. **Table 1** is a list of active geological sequestration protocols, methodologies, and modules; **Table 2** is a high-level guide to geological CO2 storage (GCS); **Table 3** summarizes high-level GCS criteria; **and Tables 4-6** describe those criteria in more detail.

IETA hopes these resources can guide CARB's CCUS/CDR technology assessment (**February 27 Workshop Presentation Slide 8**) and inform future workshops on CCUS/CDR technology assessments, regulatory structure, and regulatory concepts/timing assessment (**February 27 Workshop Presentation Slide 9**). IETA and its members share CARB's commitment to achieving California's net-zero climate targets and look forward to the implementation of SB 905 as a critical tool for realizing them.

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Table 1: List of Relevant Project-Based Methodological Standards (Updated March 2025)

Standards Body	Methodology/Standard/Protocol	Version/Status (Release Date)	Source
Alberta Emission Offset System	Quantification protocol for carbon dioxide capture and permanent geologic sequestration	Version 2 (January 2025)	Link
ACR	Carbon Capture and Storage Projects	Version 1.1 (September 2021)	Link
British Columbia Offset Programme	Carbon Capture and Sequestration (CCS) Protocol (DRAFT)	In Development	Link
Canada (Federal) GHG Offset Credit System	Direct Air Carbon Dioxide Capture and Geological Storage (PRELIMINARY DRAFT)	In Development	Link
Gold Standard	Methodology for biomass fermentation with carbon capture and geological storage	Version 1.0 (September 2024)	Link
Puro.earth	1. Biochar 2. Geologically Stored Carbon 3. Enhanced Rock Weathering 4. Terrestrial Storage of Biomass	1. Version 3 (February 2024) 2. Version 2 (August 2024) 3. Version 2 (October 2024) 4. Version 1 (November 2023)	**1.** Link **2.** Link **3.** Link **4.** Link
Verra – Verified Carbon Standard (VCS)	1. Methodology for VM0049 Carbon Capture and Storage (VM0049) 2. Module for CO2 Capture from Air (Direct Air Capture) 3. CO2 Transport for CCS Projects 4. CO2 Storage in Saline Aquifers and Depleted Hydrocarbon Reservoirs	1. Version 1.0 (June 2024) 2. Version 1.0 (October 2024) 3. Version 1.0 (October 2024) 4. Version 1.0 (October 2024)	**1.** Link **2.** Link **3.** Link **4.** Link
Global Carbon Council	Methodology for project activities involving the capture, transport, and geological storage of carbon dioxide	Version 1.1 (April 2024)	Link
Isometric	1. Direct Air Capture 2. Biochar Production and Storage 3. Bio-oil Geological Storage 4. Biomass Geological Storage 5. Subsurface Biomass Carbon Removal and Storage	1. Version 1.1.2 (September 2024) 2. Version 1.0.1 (October 2024) 3. Version 1.1.1 (September 2024) 4. Version 1.1.1 (September 2024) 5. Version 1.0.1 (September 2024)	**1.** Link **2.** Link **3.** Link **4.** Link **5.** Link
UNFCCC	Requirements for activities involving removals under the Article 6.4 mechanism	Version 1.0 (November 2024)	Link
IPCC	2006 IPCC Guidelines (Volume 2, Chapter 5) – Carbon Dioxide Transport, Injection, and Geological Storage	2006	Link

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Table 2: High-Level Guide to GCS Methodological Components

Methodological Component		Description
1	**Applicability Conditions**	Defines the specific circumstances, attributes and other conditions that apply to eligible geological CO2 storage activities. These can include the eligible sources of captured CO2 (e.g. which types of CO2, and from which sectors, both of which have implications for baseline selection; see below), the modes of transport, and the allowable storage media. Geographical and technical restrictions can also be applied (e.g. only countries with CCS laws; conditions on geostorage development/operations).
2	**Project Boundary & Leakage**	Defines the emissions by sources and removals by sinks that must be measured and accounted for across the capture, transport and storage (project boundary). Includes emissions occurring outside of the immediate control of the project operator (e.g. upstream emissions), but which are measurable and attributable to the project activity (i.e. 'leakage').
3	**Baseline**	Describes procedures and options to establish the baseline scenario and a methodology for calculating baseline emissions. The emissions from the project activity must be compared to the baseline to quantify the net emission reductions or carbon removals. Options include projection-based approaches (e.g. historical emissions, or estimated future emissions, without CO2 capture) or standards-based approaches (e.g. using benchmark emissions of a comparable activity without CO2 capture).
4	**Additionality**	Demonstration that the activity delivers emissions reductions/removals that would not have occurred absent of the incentive created by carbon credit revenues. Different approaches and tests exist for demonstrating additionality (e.g. first-of-a-kind (FOAK); regulatory surplus; financial additionality). The primary purpose of CO2 capture is climate mitigation, which generally means that most projects will be additional. Novelty also means that FOAK or technology penetration rates can be used to rapidly demonstrate project additionality. Financial additionality testing may also be used to discern the value of crediting where other incentives (e.g. tax breaks) or benefits also exist (e.g. commercial CO2 utilization).
5	**Non-Permanence & Liability**	Methodologies should ensure that geological storage sites are appropriately characterized, selected, developed, managed and level to mitigate against the risk of carbon reversals (quality assurance). Liability to remedy the impacts of any carbon reversals must also be allocated (liability allocation). These safeguards can be implemented either by applying geographical applicability conditions (i.e. relying on local laws and regulations) and/or through other effective safeguards (**see safeguard criteria 05, 06, 07**).
6	**Monitoring**	Robust monitoring is needed to measure flows and emissions related to aboveground features of the activity and to check for CO2 leaks in around the storage site. Results of monitoring are used to (i) quantify creditable reductions or removals and (ii) protect natural ecosystems and human health. The latter safeguard can be implemented either by applying geographical applicability conditions (i.e. relying on safety monitoring under local laws and regulations) and/or through other effective safeguards (**see safeguard criteria 08, 09**).

Table 3: Summary of High-Level Criteria for Credited Geological CO2 Storage Activities

Safeguard Area	High-Level Criteria	
Political Acceptability	1	Significant and cost-effective for national climate mitigation
	2	Aligned with national development priorities and policy aims
	3	Widespread public acceptance
Legal and Regulatory Framework for Safe Storage	4	Legal basis for injection and storage
	5	Effective site selection and development
	6	Robust oversight of site operation and closure
	7	Long-term liability
Environmental and Social Safeguards	8	Risk and safety assessment
	9	Environmental and social impacts
	10	Sustainability

Table 4: High-Level Criteria for Credited GCS Activities: Political Acceptability

Safeguard Area	High Level Criteria		Description	Examples of Evidence/Checkpoints
Political Acceptability	**1**	Significant and cost-effective for national climate mitigation	Technologies involving geostorage should be part of a host country's cost-optimized and Paris-aligned national mitigation pathway. The host country mitigation scenarios must have been developed cognizant of the UN Sustainable Development Goals (SDGs).	▪ Nationally Determined Contributions, national and subnational (i.e. inclusion of geostorage within mitigation scenarios and plans) ▪ Long-term Low Emissions Development Strategies (i.e. inclusion of geostorage) ▪ Techno-economic mitigation studies etc
	2	Aligned with national development priorities and policy aims	Technologies involving geostorage should be well aligned with the host country's national development plans, policies and sectoral programs (e.g. economic development plans, energy sector development, industrial development strategy).	▪ Nationally Determined Contributions (i.e. demonstration of alignment with broader aims) ▪ National and subnational development plans and strategies (e.g. economic development plans, energy sector development, industrial development strategy)
	3	Widespread public acceptance	Activities should only be credited where the host country government and political stakeholders accept the need for geostorage (e.g. undertaking of robust stakeholder consultation as part of national climate policy development).	▪ Normal host jurisdiction public consultation processes and procedures ▪ *OECD Best Practice Principles on Stakeholder Engagement in Regulatory Policy*

Table 5: High-Level Criteria for Credited GCS Activities: Legal and Regulatory Framework for Safe Storage

Safeguard Area	High Level Criteria		Description	Examples of Evidence/Checkpoints
Legal and Regulatory Framework for Safe Storage	**4**	**Legal basis for injection and storage**	Activities credited under international standards should be compliant with host country laws and regulations. The responsibility for governing the geological pore space into which CO2 is injected and stored is typically vested into government (but sometimes the surface property owner). In some situations, protection of sub-surface resources may also trigger government permitting and oversight (e.g. groundwater protection). Appropriate permission must therefore be obtained to access and use geologic pore space for the purpose of storing CO2.	▪ State and National laws (e.g. constitution; mineral laws etc that indicate ownership of geological pore space and procedure(s) by which access is conferred to economic operators/private entities). ▪ CDM CCS Modalities and Procedures (requirements outlined in Appendix B)
	5	**Effective site selection and development**	In permitting the use of geological pore space for CO2 storage, the pore space owner should ensure protection of natural resources and public health and safety. The safety and security of storage in a proposed geological storage site must be appropriately demonstrated prior to the granting of access and use permission (through e.g. robust site characterization and selection reports and development, operation and closure plans).	▪ State and National laws and regulations (e.g. mineral or petroleum development laws; environmental protection laws; dedicated geological storage law) ▪ 2006 IPCC Guidelines Volume 2, Chapter 5: Carbon Dioxide Transport, Injection and Geological Storage (Requirements in Section 5.10 include reporting of site characterisation and selection, modeling, monitoring plan design, monitoring etc.) ▪ CDM CCS Modalities and Procedures (Appendix B) ▪ ISO Standard 27914:2017 - Geological Storage
	6	**Robust oversight of site operation and closure**	Geological storage activities must be operated respecting the conditions specified in storage site permits with appropriate oversight of a competent body (i.e. modes of development, operation and closure).	▪ State and National laws and regulations (clarifying the competent authority and their regulatory powers)
	7	**Long-term liability**	Responsibility for CO2 stored in geological formations must be appropriately allocated to ensure that remedial measures are implemented in the event of a leak/carbon reversal from a geological storage site.	▪ Liability arrangements (e.g. subnational national laws on environmental liability; mineral/petroleum laws; geological CO2 storage law) ▪ Liability transfer arrangements (e.g. aligned with cessation of monitoring described in 2006 IPCC Guidelines Volume 2, Ch 5) ▪ Non-permanence risk tool (NPRT) applied by registry operator

Table 6: High-Level Criteria for Credited GCS Activities: Environmental and Social Safeguards

Safeguard Area	High Level Criteria		Description	Examples of Evidence/Checkpoints
Environmental and Social Safeguards	**8**	**Risk and safety assessment**	Geological domains are inherently heterogeneous, each having unique characteristics that influence the safety, durability and non-permanence risk of storage. Risks from CO2 leaks therefore need to be suitably assessed and managed on the basis of site-specific characteristics within a proposed geological storage site, its surrounding domains and the proposed modes of development and operation. Inherent uncertainty in geological analysis means that this must be based on scenarios of specific features and potential events and processes that could occur at the specific site in order to understand the scale and magnitude of potential impacts (i.e. risks).	▪ State and National laws and regulations ▪ ISO Standard 27914:2017 – Geological Storage (Section 6: Risk Assessment) ▪ CDM CCS Modalities and Procedures (Appendix B)
	9	**Environmental and social impacts**	The nature of the impacts of leaking CO2 of an individual project needs to be understood in the context of the scenarios identified in the risk and safety assessment (e.g. communities, natural ecosystems). Measures must be taken to mitigate and mange such risks and impacts.	▪ State and National laws and regulations ▪ ISO Standard 27914:2017 - Geological Storage (Section 6: Risk Assessment) ▪ IFC Performance Standards on Environmental and Social Sustainability (Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts)
	10	**Sustainability**	Sustainability impacts and benefits of an individual project must be appropriately demonstrated (e.g. tangible co-benefits and/or contributing towards multiple United Nations SDGs). Corporate social responsibility should be part of project deployment (as appropriate to the project setting). For example, implementation could be accompanied by community support programmes and knowledge sharing, education and engagement actions relating to climate change and its mitigation through geologic CO2 storage.	▪ CDM Sustainable Development Co-Benefits Tool ▪ ISO Standard 37101:2016 - Sustainable development in communities ▪ Project-level standard requirements for sustainability (e.g. The Gold Standard requirement to deliver on at least 3 SDGs, including climate action (SDG 13))