Public Consultation: Methodology Framework for Carbon Capture and Storage

July 19, 2023

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Photo by Bale Mountain REDD Project

Webinar Objectives

- To present an overview of the proposed new VCS Methodology for Carbon Capture and Storage

Agenda


Photo by FUNDAECO / REDD Conservation Coast Project

1. Overview of Verra and the VCS Program
2. Methodology Development and Approval Process (MDRP)
3. Presentation of the draft CCS methodology
    a. *Introduction*
    b. *CCS+ Initiative*
    c. *CCS Methodology – What is key about this methodology, applicability, additionality and quantification of GHG reductions and removals*
4. Q&A

Verra and the VCS

- An overview of Verra and the VCS Program

VERRA

Standards for a Sustainable Future

2007

Founded in 2007 by environmental and business leaders who saw the need for greater quality assurance in voluntary carbon markets

501(c)(3)

Registered nonprofit organization under Section 501(c)(3) of the U.S. Internal Revenue Code

110+

With approximately 110 staff and growing rapidly, Verra is headquartered in Washington, D.C., USA, with staff working remotely internationally

VERRA

Verified Carbon Standard

Jurisdictional & Nested REDD+

Climate, Community & Biodiversity Standards

Sustainable Development Verified Impact Standard

Plastic Waste Reduction Standard

Verified Carbon Standard

The world's most widely used voluntary greenhouse gas program

VERRA

Impact

>1,800 projects

> One billion
carbon credits issued

Equivalent to the emissions of >260 coal-fired power plants in one year

Environmental Finance

Voluntary Carbon Market Rankings 2022

Winner

VCS: Best GHG Crediting Programme

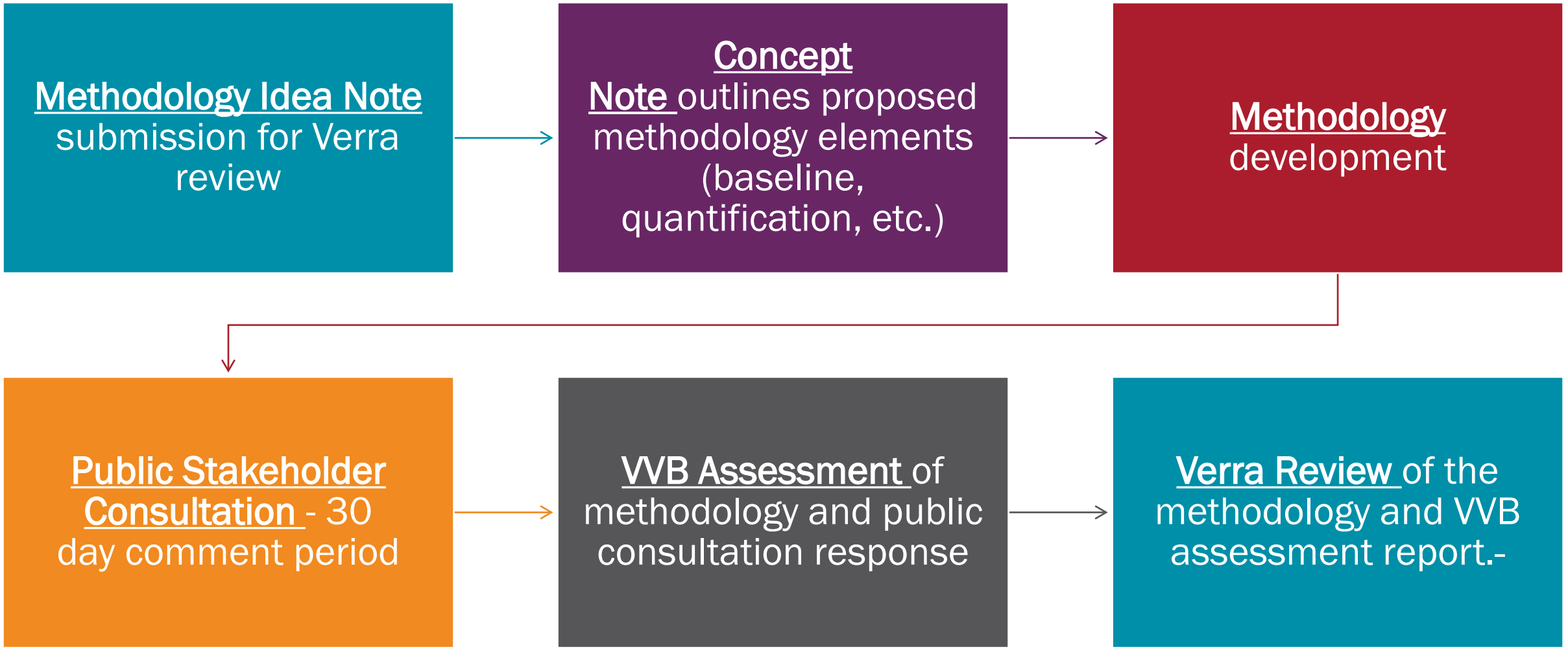
2012, 2013, 2014, 2015, 2016, 2018, 2019, 2020, 2021, 2022

2. Methodology Development and Approval Process (MDRP)

- Steps for Methodology Development at Verra

VERRA

2. Methodology Development and Review Process (MDRP)



3a. Introduction

- Why a CCS Methodology?
- Overview of the Carbon Capture and Storage Process

VERRA

3a. Introduction – why a CCS Methodology?

CCS is a key technology that can be applied to diverse and hard-to-abate industries, has significant growth potential, and can be applied globally.

Objectives:

- To develop a high impact methodology that will support the reduction and removal of emissions globally.
- To ensure consistency across project emissions/removals estimates.
- To integrate current best practices and state-of-the-art technologies for CCS

3a. Introduction - Overview of the Carbon Capture and Storage Process

Capture:

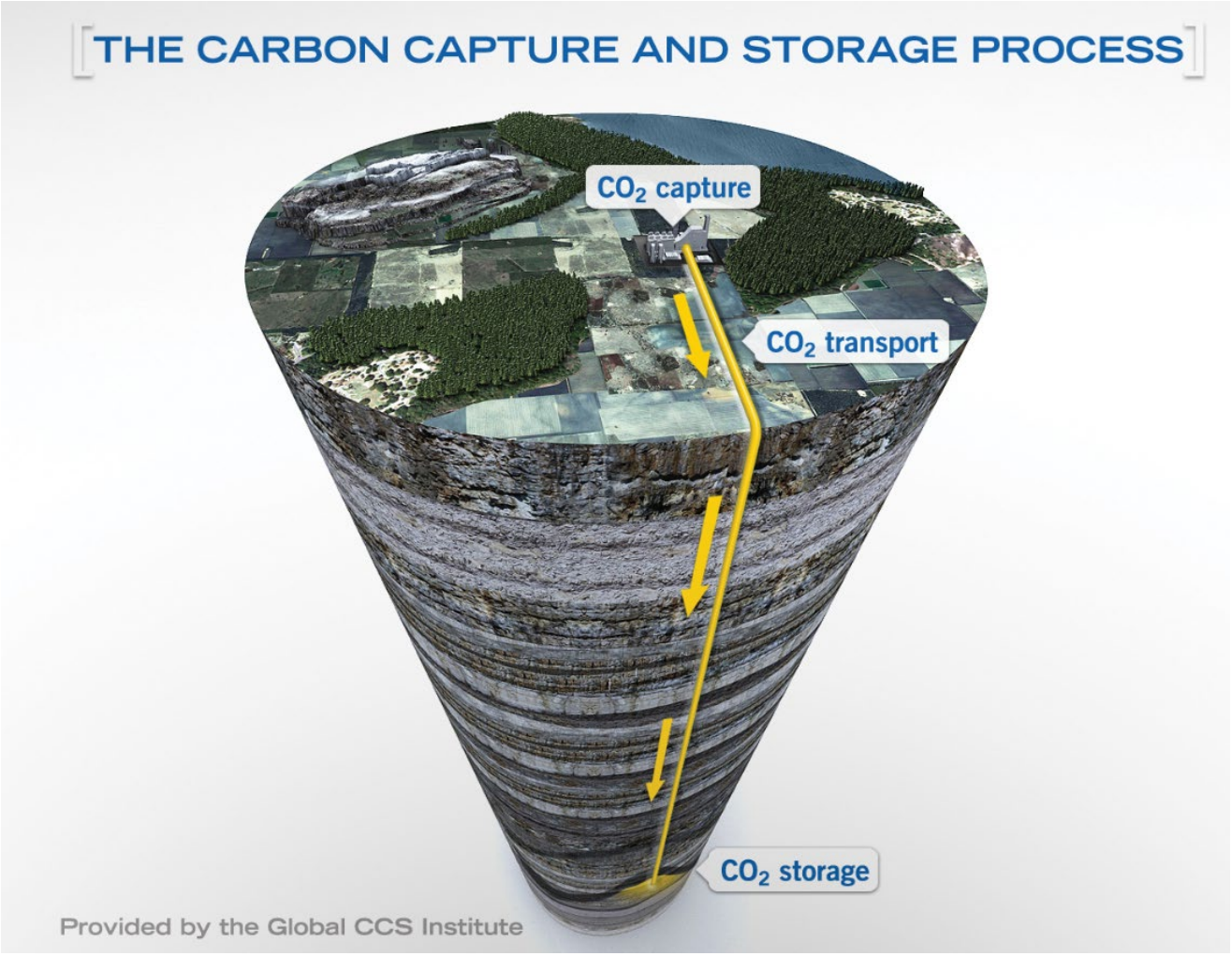
- Concentrates and compresses CO_2 from source (process gas, flue gas or the atmosphere).

Transport:

- Moves CO_2 from capture site to injection site.

Storage:

- Injects CO_2 into underground geologic storage reservoirs or into materials or products like cement.



Reference: CCS Image Library - Global CCS Institute, accessed on: July 12, 2023

3b. CCS+ Initiative

- Structure, objectives, workstream

Mission statement

CCS+ initiative

The CCS+ Initiative aims to scale cutting edge climate technologies by developing a robust carbon accounting infrastructure that promotes environmental integrity

The CCS+ Initiative in a nutshell

A unique approach

A high-quality integrated carbon accounting methodology infrastructure for the full suite of CCS, CCU and tech CDR solutions.

Through collaboration

Developed by pooling expertise in carbon markets, climate science and engineering, covering all use cases.

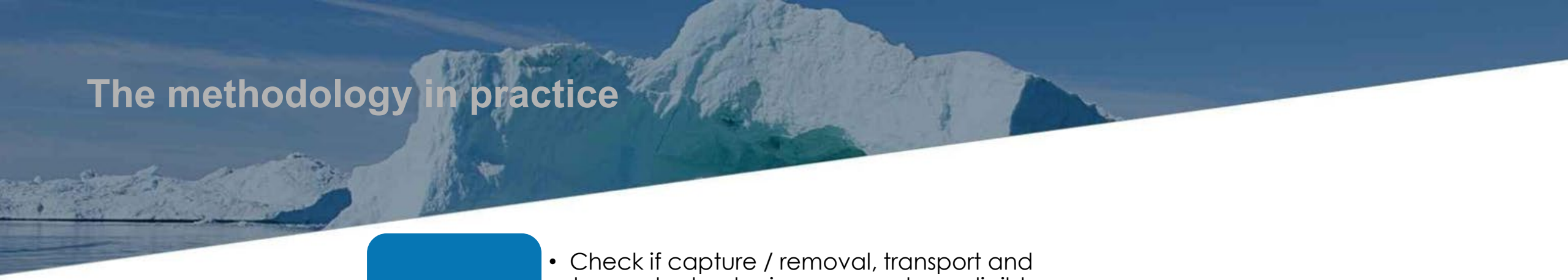
Creating a public good

Subject to public scrutiny, with the aim of creating a public good that adheres to the highest levels of environmental integrity.

Members

Advisory Group	IETA International Emissions Trading Association; ICROA International Carbon Reduction & Offset Alliance; wbcsd; zep; IFC International Finance Corporation World Bank Group; Global CCS Institute; Negative Emissions Platform; TNO innovation for life; OGCI Oil and Gas Climate Initiative; Responsible Steel
Carbon Consultants	perspectives climate group; south pole
Core Partners	Low Carbon Ventures; Carbon Finance Labs; Northern Lights; TotalEnergies; equinor; bp; Baker Hughes; ifp Energies nouvelles; Mitsubishi Corporation; Shell
Partners	Hafslund Oslo Celsio; drax; ClimatePartner; INPEX; JOGMEC; NEXT Carbon Solutions; ENOWA. NEOM; JX; Ørsted; JAPEX Japan Petroleum Exploration Co., Ltd.; MERCURIA; FS Fueling Sustainability; General Electric; Sika; The Japan Gas Association; HARSCO Environmental
Technology Partners	Carbon Engineering; climeworks; Carbfix; CarbonQuest; futurebiogas; Kajima Corporation; carbyon; 44.01; NeoCarbon; Carbon Upcycling; Progressive Energy; neustark; RESMAN
Standard Setting Body	VERRA

The methodology in practice



Approach for application of "methodology" to project activity

Step 1 – Framework Methodology

- Check if capture / removal, transport and storage technologies proposed are eligible under Methodology Frameworks

Step 2 – Capture Modules

- Select modules for the applicable capture / removal technologies

Step 3 – Transport Modules

- Select modules for the applicable transport technologies

Step 4 – Storage Modules

- Select modules for the applicable storage technologies

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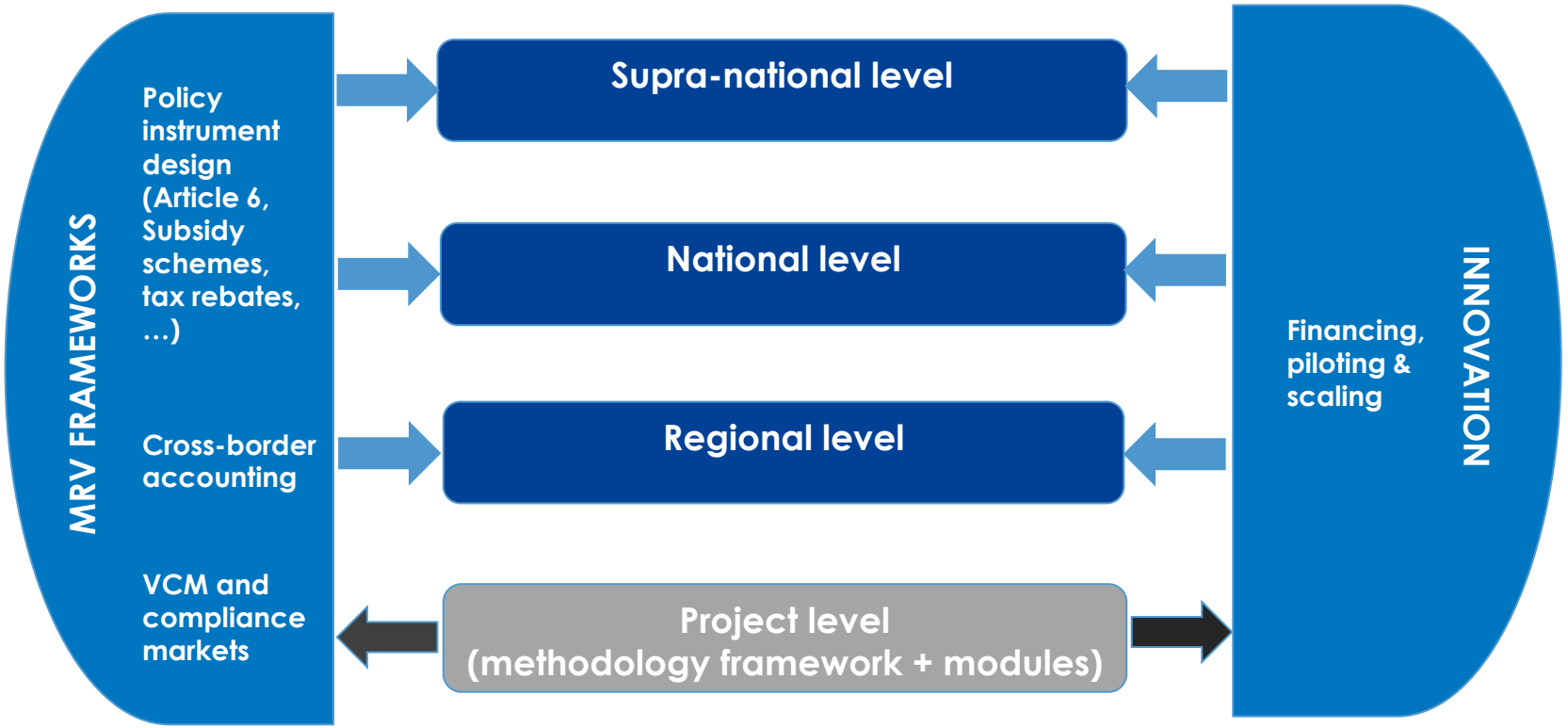
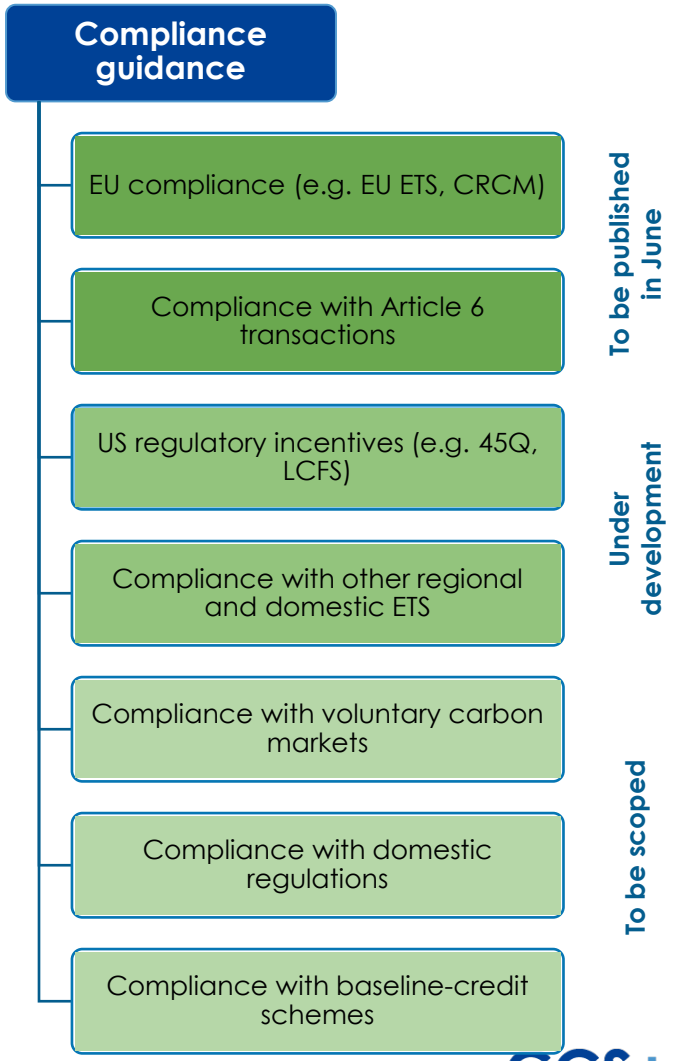
Bridging between voluntary and compliance markets

Compliance guidance notes

for regulatory and voluntary schemes





CCS+ initiative

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3c. CCS Methodology

- What is key about this Methodology?
- Applicability
- Additionality
- Quantification of GHG emissions and removals

3c. What is key about this Methodology?

- Modular framework
- Adaptable for future modules/tools
- VCS Sectoral scope 16 - Carbon Capture and Storage
- Differentiates removals from emission reductions
- Enables and encourages CCS hubs
- Permanence - long term monitoring of possible leakage sources and stringent closure requirements.

3c. Applicability

- Globally applicable
- Project activities that capture atmospheric CO_2 (removals). Future modules will include:
  - BECCS (removals),
  - Post-combustion capture at point sources (from a source facility),
  - Industrial sources (e.g., hydrogen production), and
  - Natural gas acid gas separation
- Direct air capture may include co-capture of on-site emission sources (preventing their release)
- Facilities may be new, expansions of existing facilities, or refurbishments that would have been decommissioned
- Transport may include pipelines, ships, rail and road
- Project activities that store in saline aquifers
  - Future modules will include depleted oil and gas reservoirs and mineralization
  - Does not include utilization (this will be under a separate methodology)

Public Consultation - requested feedback

Applicability:

1. Can emissions reductions and CDR be addressed under a single framework methodology, or should there be a stand-alone framework methodology for removals? Why or why not?

3c. Additionality

Two approaches could be used to assess additionality:

1. **Project Method**
   - A project specific analysis to determine whether projects are viable without carbon credits. Projects must demonstrate regulatory surplus, barriers to implementation, and that they are not common practice.
   - An investment barrier has been proposed for a barrier to implementation. A project is additional if an investment analysis concludes that it would not be attractive without carbon revenues.
   - A project is additional if it has an IRR lower than 21%, aimed to limit the maximum return on investment a proponent can plan to make when investing in a CCS project.
   - Guidance on how to account costs and revenues is proposed

3c. Additionality

2. **Standardized Approach**
   - An evaluation of the project activity sector against pre-determined eligibility criteria during methodology development to determine conditions and safeguards that projects meet to be additional.
   - Activity penetration is a standardized approach that is considered meaningful for evaluating CCS:
     - Maximum adoption potential must be determined for the technology within a jurisdiction
     - Methodology developers must demonstrate adoption using the most recent data available at the time of methodology development
     - Market adoption must be lower than 5%

Public Consultation - requested feedback

Additionality:

1. Given the high capital cost and long investment horizon of CCS projects, do you think a project approach or standardized approach is more appropriate for assessing additionality? Why?
2. Should a standardized approach using activity penetration be used for assessing additionality for particular project types or capture technologies (such as DAC or other CDR technologies) instead of the project approach using investment analysis? Why or why not?
3. When establishing a positive list (activity penetration) for assessing additionality, how would the maximum adoption potential of DAC or other capture technologies be measured? What data sources might inform this?
4. When assessing additionality using activity penetration, how would the maximum adoption potential of DAC facility be measured? What data sources might inform this?
5. Is a maximum IRR of 21% appropriate for the risk-return profile for CCS technologies in the coming 5-10 years? What alternative maximum IRR would you suggest and why?

3c. Quantification of reductions and removals

$$ER_y = BE_y - PE_y - LE_y$$

- **ER_y** Emissions reductions or removals
- **BE_y** Baseline emissions measured as CO_2 injected at the storage site(s) less the non-VCS CO_2 injected at the storage site(s)
- **PE_y** Project emissions determined according to capture module(s), transport module(s) and storage module(s). Considerations for:
  - Third-party co-generation energy supplies (offsite generation)
  - Waste heat utilization
  - Biogenic fuels
  - Simplified and conservative transport emission estimation for short segments
- **LE_y** Leakage emissions determined according to capture module(s), transport module(s) and storage module(s). Considerations for:
  - Upstream fuel and electricity emissions
  - Fabrication of capture materials (embodied carbon)

3c. Quantification of reductions and removals

Reservoir Monitoring and Permanence:

- Monitoring is divided into intentional and unintentional discharges:
  - Intentional – venting and blow-downs for maintenance and safety, measured or conservative estimates
  - Unintentional – further sub-divided into surface and sub-surface:
    - Surface – fugitive emissions, equipment failure and line breaks
    - Subsurface – Reservoir losses must be monitored according to a monitoring plan (described in VCS Program Document GCS Requirements). Monitoring plan must define the detection threshold and monitoring frequency of each monitoring technique

Public Consultation - requested feedback

Quantification:

1. What types of construction, fabrication or production emissions in DAC projects or other projects may be material to the overall emissions quantification and why?
2. What risks would purpose-built green PPAs pose to credit integrity? How could these be managed? Are there existing standards, regulations, or other sources that provide guidance related to accounting emission benefits of purpose-built green PPAs?
3. Is a simplified approach to quantifying small transport emission segments appropriate and why? Are the thresholds and emission intensities proposed appropriate? If not, please explain why and include alternatives with data sources.

Permanence

1. What differences in monitoring and long-term risk of reversals exist between storage in saline aquifers and depleted oil and gas reservoirs? Do you think requirements would be different enough to justify having separate modules? Why or why not

Next Steps

July	Consultation period
Aug-Sept 2023	Modules revised per input from consultation
Q3 2023	Module validation
Q4 2023	Methodology revision concludes
2024	Revised methodology publication

Public Comment Period

- Available at Public Consultation: Methodology Framework for Carbon Capture and Storage - Verra
- Open for public comment from **30 June - 29 July**
- Submit comments to *methodologies@verra.org*

Ongoing or Future Work Related to CCS

Related to this draft methodology:

- Please see existing requirements document:
  - *Geologic Carbon Storage (GCS) Requirements* document
  - *GCS Non-Permanence Risk Tool* document
- *Draft consultation for program changes* related to:
  - Embodied carbon and construction emissions (particularly relevant to DACCS project activities)
  - Modifications to the rules for using activity penetration to assess additionality
- Potential future updates related to CCS work:
  - Digitize the GCS NPRT Tool
  - Develop an electricity tool for making consistent measuring electrical energy consumption and providing guidelines for 'purpose-built green PPAs'

4. Questions

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Thank You


Photo by FUNDAECO / REDD Conservation Coast Project

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