US Carbon management policy and markets overview

February 27, 2025

Noah Deich

Carbon management is old tech for new goals

From oil and gas:

- **1930s**: carbon capture invented for oil and gas processing
- **1970s**: geologic storage of CO_2 commercialized for oil production

To CO2 pollution control for climate mitigation:

- **1990s**: first government R&D for carbon management as climate solution, including large-scale operation of dedicated CO_2 injection in offshore geologic reservoirs
- **2000s:** IPCC special report on CCS, introduction of initial 45Q tax credits and EPA class VI regulatory framework
- **2010s:** commercial operation of demonstrations + reform of 45Q tax credits
- **2020s:** expansion of 45Q tax credits + Bipartisan Infrastructure Law funding introduction of global Carbon Management Challenge

For carbon management, the US needs to:

- Demonstrate capture on new sources
- Build infrastructure for dedicated CO2 storage

CA can play leading near-term role

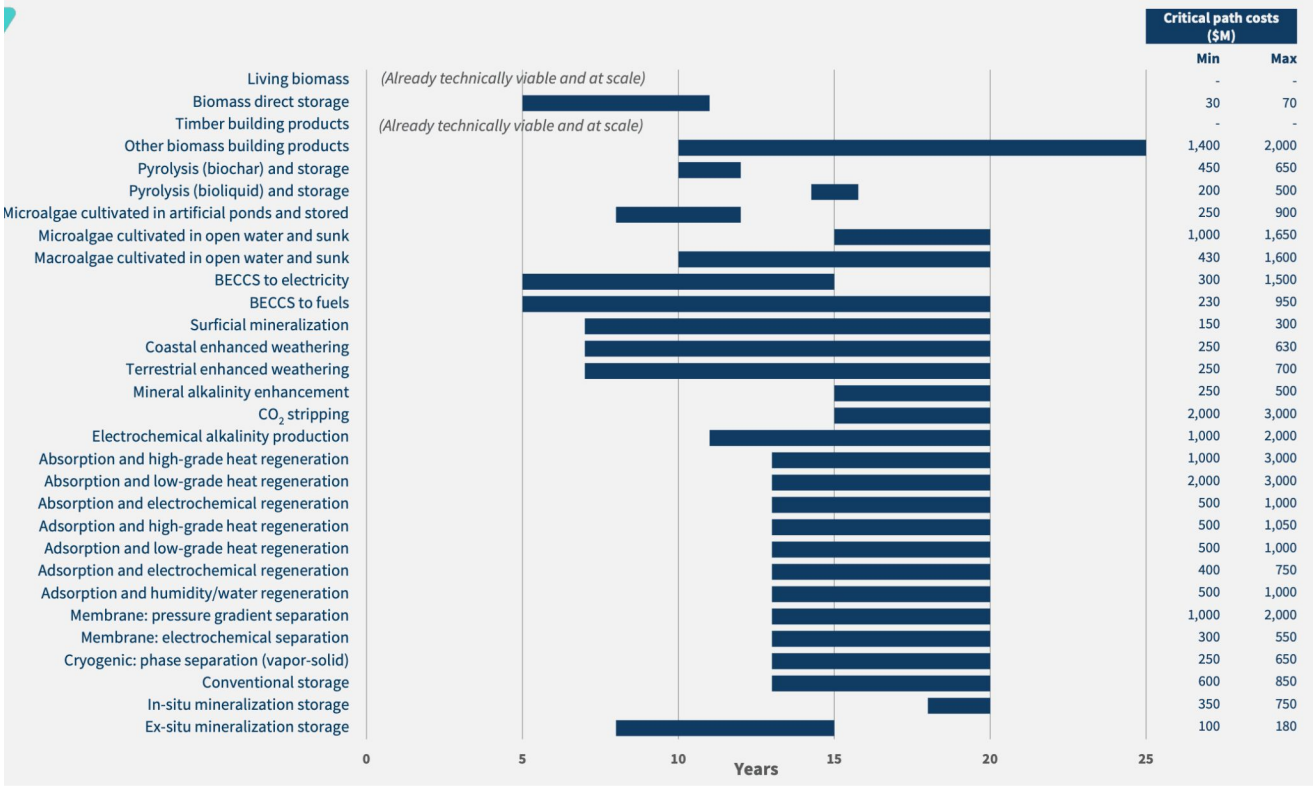
Figure 7: Example pathways to a 2050 deployment[33]

Example Pathways to a 2050 Deployment	**Today** Actuals	**2030** Target	**2050** Estimated range
CO_2 capture capacity (MT/yr)	23M	~50-70M	~300-900M
Tech carbon dioxide removal capacity (MT/yr)	<.01M	~25-30M	~200-700M
Point source capture projects (# projects)	17	~30-100	~250-900
CO_2 pipeline (miles)	5,500	~10,000-15,000	~30,000-96.000
Dedicated CO_2 storage injection* volumes (MT/yr)	19M	~190M	~500-2,000M
Permitted Class VI storage facilities (# facilities)	~8**	~120-140	~400-1,500M
New direct jobs	~5-10K	~200-300K	~1,400-2,900K

*Indicates potential injectivity; actual injectivity contingent upon CO_2 captured
**8 projects with 18 total Class VI wells

And we also must:

- Scale carbon removal beyond point-source capture



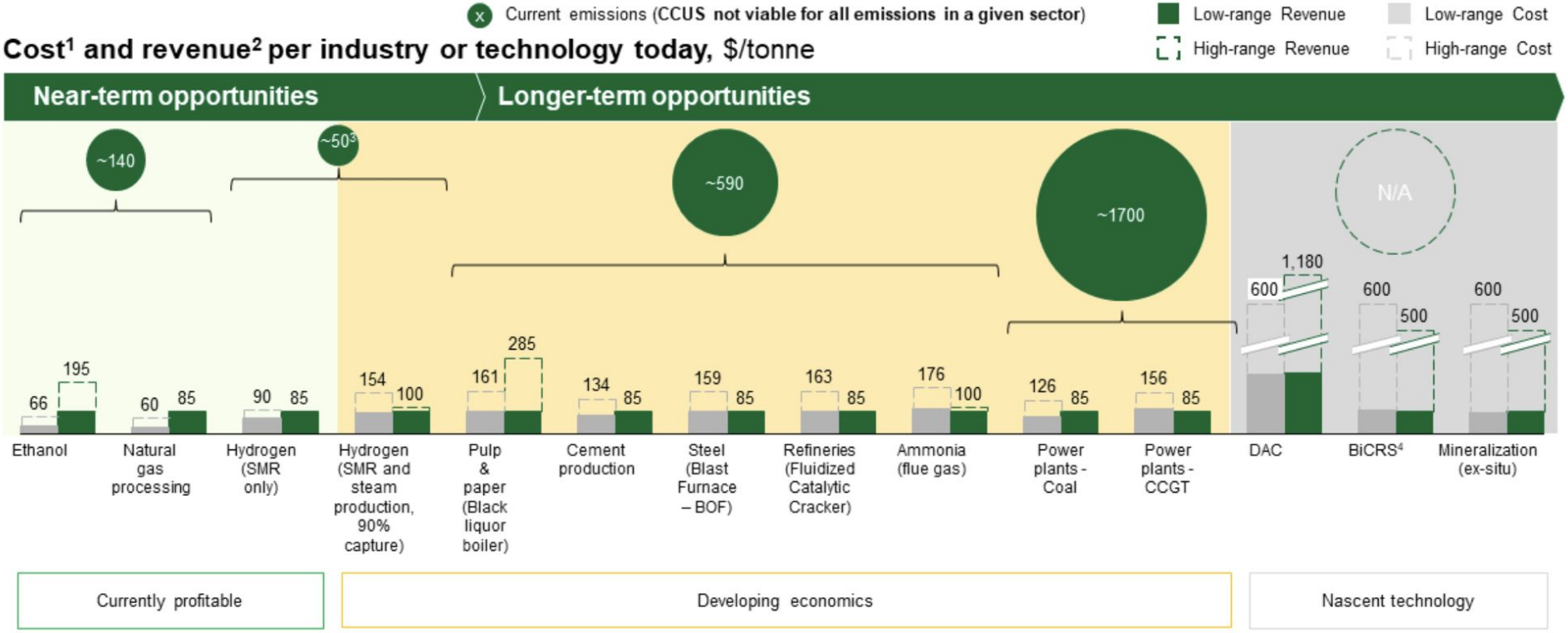
CA has near-term opportunities in:

- Biomass
- Direct air capture
- CO_2 mineralization
- Marine CDR

The US Federal Government was leading

- Research and innovation funding
- Incentives via 45Q and for carbon removal via purchasing
- Regulations for:
  - Point sources via EPA 111d rules
  - CO2 storage via EPA Class VI Underground Injection Control Rules and Department of Interior offshore geologic CO2 storage
  - CO2 pipeline safety via Department of Transportation at PHMSA
- Finance via DOE and USDA loan guarantee programs
- International diplomacy via:
  - Carbon management Challenge
  - Mission Innovation and Clean Energy Ministerials

Higher purity sources are currently profitable but do not include sufficient emissions to achieve net zero goals



Project specific economics dependent on CO2 capture capacity, utilization, distance to storage and existing equipment

Bipartisan Infrastructure Law (BIL)

The BIL provides ~$12 billion in funding for high-potential projects across the carbon management value chain, including funding for demonstration and pilot projects.[lxx] The BIL also includes $8B for Regional Clean Hydrogen Hubs, at least one of which must prioritize projects that use CCUS to generate clean hydrogen and $500M for Industrial Emissions Demonstration Projects that could include carbon management technologies.

- Carbon Capture Demonstration Projects Program ($2.5B)
- Carbon Capture Large-scale Pilot Projects ($937M)
- Carbon Capture Technology Program, Front-End Engineering and Design ($100M)
- Carbon Dioxide Transportation Infrastructure Finance and Innovation ($2.1B)[40]
- Carbon Storage Validation and Testing ($2.5B)
- Carbon Utilization Program ($310M)
- Commercial Direct Air Capture Technologies Prize Competitions ($100M)
- Precommercial Direct Air Capture Technologies Prize Competitions ($15M)
- Regional Direct Air Capture Hubs ($3.5B)

Compliance carbon markets provide pathwork of support

- Price signals in most compliance carbon markets insufficient to drive carbon management project development today
  - CA Low Carbon Fuel Standard is main exception (for limited eligible sources).
- National governments catalyzing carbon management development via:
  - Contracts for difference
  - Direct subsidies

Voluntary carbon markets focused on removals

- Prices paid for removals in the $100s/tonne -- far more than most point source capture
  - Voluntary demand weaker given fears over extension of fossil fuels
- Removals prices higher than needed to unlock necessary scale of voluntary demand
- Market adoption prevented today by:
  - Lack of convergence for carbon accounting protocols
  - Lack of clear guidance for buyers on safeguards for purchases

Top opportunities for California leadership

1. Integrate carbon management into cap-and-trade
    a. Provide opportunities to subsidize “lighthouse” projects via contracts for difference
2. Purchase carbon removal credits
    a. Establish carbon accounting standards that can be benchmark for other governments and corporations
    b. Use leadership to crowd in further government and voluntary purchases
3. Build carbon management hubs that embed community benefits and environmental protection in consistent ways for all projects

Frontier

A Buyer's Perspective on Carbon Removal

February 2025 | CARB Carbon Capture, Removal, Utilization, and Storage Workshop

Carbon removal is behind

< 50K tons of permanent removal *cumulatively*

~4B tons of permanent removal needed *annually* by 2050 (i.e., in addition to trees/soil)

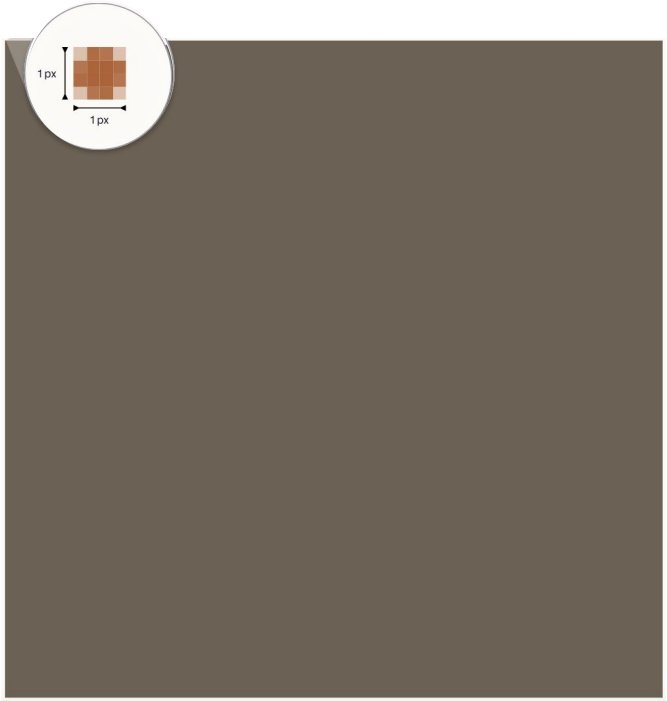


Image of large brown square representing total durable removal needed vs tiny pixel representing removals to date

Source: Climate modeling: IPCC growth path for permanent CDR is estimated as the median of C1 & C2 scenarios from AR6 WG3 that have non-zero totals for permanent CDR. Categories considered permanent are enhanced weathering, BECCS/BiCRS, DAC and Other.

Supply: Many promising companies, but few tons delivered and prices remain high

- 500+ durable CDR startups
- Majority of promising companies are early stage and expensive, though average price per ton is beginning to drop
- Companies are beginning to deliver, but building & deploying quickly remains challenging
- Fewer than 50K permanent tons and 600K durable tons have been removed to date

Pricing Change | 2023 - 2024

Weighted Average Price per Tonne

Method	2023	2024	Change
Mineralization	$370	$827	123%
Biochar	$140	$165	18%
Enhanced Weathering	$370	$308	−17%
Other BiCRS	$480	$384	−20%
BECCS	$300	$227	−24%
DACCS	$692	$316	−54%
mCDR	$1,510	$457	−70%

Image showing 2023 vs 2024 prices by carbon removal method. Source: cdr.fyi

Demand: Growing but not yet on-track for $400B+

Image showing tons sold, average order size, total orders and number of buyers in 2023 vs 2024. Source: cdr.fyi

- 13M tons ($3.5B) purchased by voluntary buyers in 2024
- Purchases are highly concentrated across a few buyers
- Policy-driven demand is coming online, but slowly

An advance market commitment to accelerate carbon removal

Frontier is an advance market commitment to buy an initial $1B+ of permanent carbon removal between 2022 and 2030. It was founded by Stripe, Alphabet, Shopify, Meta, McKinsey and tens of thousands of businesses using Stripe Climate.

stripe Alphabet shopify Meta McKinsey & Company

H&M Group JPMorgan Chase & Co. workday. salesforce AUTODESK

Watershed Partner Aledade Canva Match Group samsara

SKIMS Skyscanner WISE zendesk

Frontier's Target Criteria: scalable, permanent CDR

Criteria	Description
Durability	Stores carbon permanently (>1,000 years)
Physical footprint	Takes advantage of carbon sinks less constrained by arable land
Cost	Has a path to being affordable at scale (<$100 per ton)
Capacity	Has a path to being a meaningful part of the carbon removal solution portfolio (>0.5 gigatons per year)
Net negativity	Results in a net reduction in atmospheric carbon dioxide
Additionality	Results in net new carbon removed, rather than taking credit for removal that was already going to occur
Verifiability	Has a path to using scientifically rigorous and transparent methods for monitoring and verification
Safety and legality	Is working towards the highest standards of safety, compliance, and local environmental outcomes; actively mitigates risks and negative environmental and other externalities on an ongoing basis

We use three lenses to evaluate projects

Lens 1
Target criteria

Does the carbon removal approach meet our criteria?

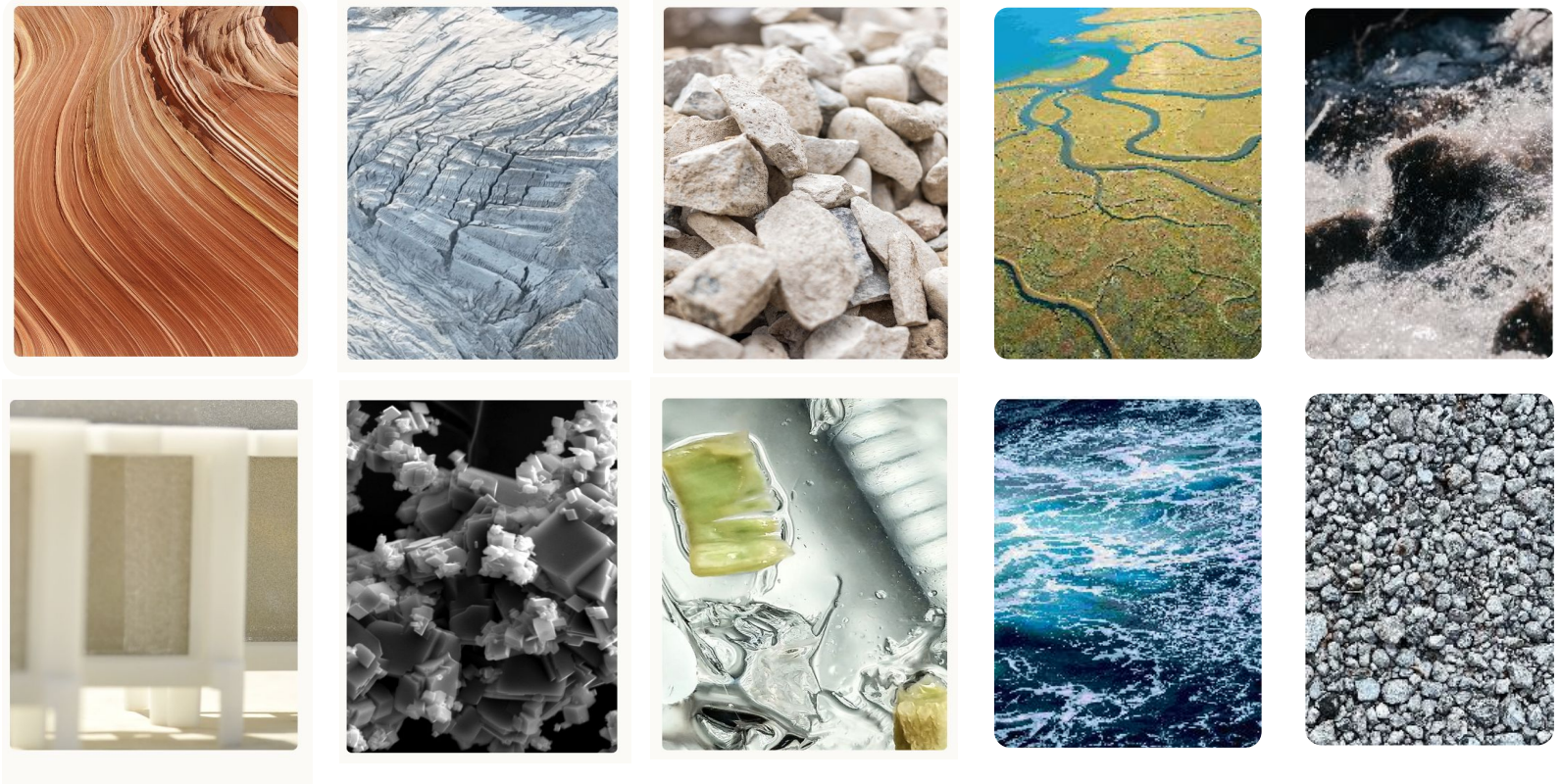
Lens 2
Execution

Can this team deliver on the proposal, given where the technology is today?

Lens 3
Portfolio

Does this purchase help us build a diverse, risk-adjusted portfolio of carbon removal approaches?

We purchase a diverse portfolio of approaches



Images of carbon removal materials (direct air capture systems, limestone, etc.) and deployment sites (oceans, agricultural fields, rivers)

Early buyers can accelerate responsible innovation

Early buyers "steer" in multiple ways

- Creating alignment across buyers on principles for high-quality removals
- Diligencing across multiple dimensions
- Setting a high bar for standards for carbon removal measurement, community engagement, and ecosystem safety
- Making applications & contracts publicly available to enable transparency & learning
- Delivery criteria and/or milestones within contracts to spur scientific research

As customers in a small market, early buyers can influence the broader CDR ecosystem, including suppliers, other buyers, and standard-setters

Challenge #1: Lack of incentives to purchase today

- **Voluntary demand is growing, but slowly.** As of 2023, only 40 buyers had purchased more than 1,000 tons of CDR.

- **There are limited incentives for voluntary climate action this decade.** Voluntary standards require durable CDR to meet net zero targets, but do not dictate an amount to be purchased on the path to net zero. There is limited regulatory pressure to buy durable CDR vs other solutions.

- **Purchasing is expensive, technical, and time consuming.** Durable tons are more expensive than alternatives. The average company is focused on decarbonization and lacks the dedicated legal or scientific capacity to evaluate and make purchases quickly.

- **In short, current markets don’t reward buying durable CDR early.**

Challenge #2: Lack of established measurement standards

- **The process to measure CDR from varies widely by approach.** Quantifying removals from direct air capture requires different methods than for enhanced weathering.
- **Each approach has tricky technical questions.** Durable removal avoids some of the additionality and durability questions of traditional offsets, but there are still uncertainties associated with quantifying deliveries.
- **Protocols differ, and suppliers can pick between them.** There are multiple, competing organizations that issue credits, with different protocols, which means suppliers could choose the “easiest” or cheapest.

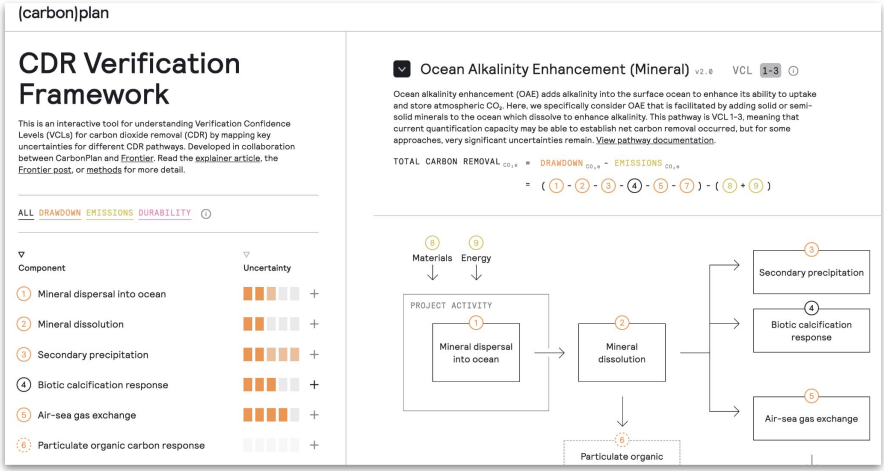


Image of a CarbonPlan’s Verification Framework, a tool outlining the components to be calculated to measure net removals for each CDR approach

How does Frontier estimate that a ton has been permanently been removed?

It's a three-step process:

- **Protocol:** Prior to purchasing, Frontier's scientific team reviews the supplier's measurement approach and approves a protocol for measuring and reporting tons removed. This protocol discounts the net removal volume based on any uncertainties or reversal risks.

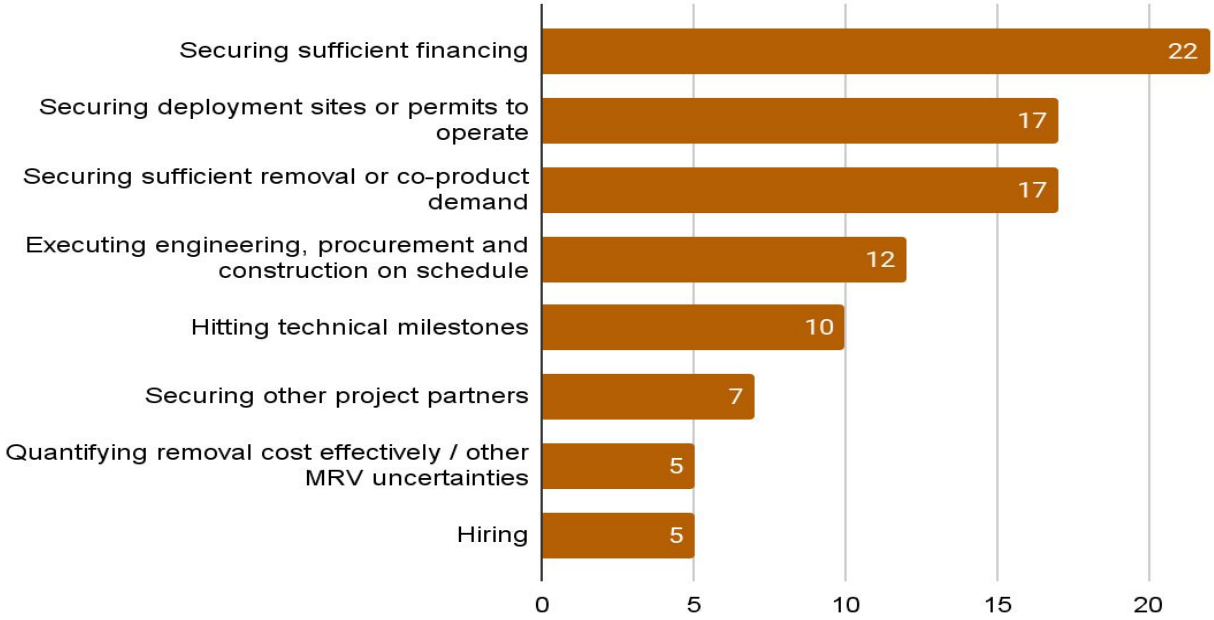
- **Registry & verification:** Frontier approves an independent, third party credit issuer (or registry), who works with a verifier to review the supplier's delivery data against the approved protocol and issues credits.

- **Delivery:** Frontier buyers accept the confirmed credits from the supplier.

Source: Frontier perspective "Quantifying delivered carbon removal as an early buyer" Fall 2022

Challenge #3: Barriers to getting projects built quickly

What are the the biggest risks to achieving your cost and volume trajectory?



Accessing financing, finding customers, and securing permits are cited by companies **as top barriers to scaling quickly**

Source: 2024 Frontier portfolio survey with 31 responses

Opportunities for California to accelerate the carbon removal field

To address field uncertainties and accelerate the early removals market, CARB could consider:

- Supporting a diverse portfolio of emerging carbon removal technologies, in line with California's 2022 Scoping Plan that identified a target of 7 MMT of CDR by 2030
- Signaling to the market what high quality removal looks like to de-risk purchasing
- Providing clear regulatory pathways and support throughout project permitting
- Defining clear, unified measurement standards for carbon removal approaches. This includes adopting protocols for CDR approaches that could be used consistently across programs (e.g. LCFS)

Thank you

frontierclimate.com

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

CARB PERMANENCE WORKSHOP

Feb 2025

WHAT WILL HELP THE VOLUNTARY CARBON MARKET TO REACH ITS POTENTIAL?

THE CHALLENGE

The Voluntary Carbon Market lacks the consistent high-integrity it needs to achieve its full potential

Voluntary carbon markets to date have lacked a widely-accepted threshold for high-quality carbon credits. **Concerns over quality have dampened confidence**.

The market is not yet fully transparent, deep, liquid, standardized or scalable so it is **less efficient at channeling climate finance capital for maximum impact**.

Lack of shared vision and alignment across the market on the **next generation of standards, rules and systems** for delivering and scaling high integrity credits has hampered the race to the top.

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

OUR WORK

01

ASSESSMENT

We are assessing carbon-crediting programs and methodology types against the Core Carbon Principles (CCPs). CCP labelled carbon credits will bring integrity to the market.

02

STAKEHOLDER ENGAGEMENT

We are engaging with all stakeholders in the market including, VCM practitioners, governments and regulators, Indigenous Peoples & local communities.

03

CONTINUOUS IMPROVEMENT

We are working to ensure carbon programs and projects increase ambition over time. Our stakeholder workshops will identify best practice in key areas to feed into the next iteration of the CCPs.

OUR GOVERNING BOARD

The Board consists of 22 Board Members with representation across all key stakeholder groups, including experts in carbon market methodologies, sustainable finance, environmental NGOs, philanthropy, UNFCCC process expertise, regulatory affairs, the corporate sector, science and academia, local communities and indigenous peoples.

Chair

Annette Nazareth

Giulia Carbone

Sonja Gibbs

Doris Honold

Michael Hugman

Ma Jun

Angela Churie Kallhauge

Farrukh Khan

Mark Kenber

Kelley Kizzier

Dee Lawrence

Kavita Prakash-Mani

Yasmine Moezinia

Will Turner

Rod Taylor

Carl Wesselink

Perumal Arumugam
(Observer)

Alexia Kelly
Board Alternate

Tracey Wong
Board Alternate

Agustin Silvani
Board Alternate

Mary Grady

Chris Leeds

Jeff Swartz

Elected market representatives

Chosen via vote by the Member Consultation Group, acting in their personal capacity

Francisco Souza

Kanyinke Sena

Jennifer Corpuz

Indigenous Peoples and Local Communities

3 dedicated board seats for IPs & LCs (e.g. peoples from indigenous groups, rainforest nations, etc.)

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

OUR 2024 INDEPENDENT EXPERT PANEL

EXPERT PANEL CO-CHAIRS

Pedro Martins Barata
Associate Vice President, Carbon Markets and Private Sector Decarbonization and Partner at Get2c

Gabriel Labbate
Head of Climate Mitigation Unit, UNEP

Daniel Ortega-Pacheco
Director, BIOCARBON

CORE EXPERTS

Derik Broekhoff
Stockholm Environment Institute

Gilles Dufrasne,
Carbon Market Watch

Jürg Fussler
INFRAS

Donna Lee
Calyx Global

Jessica Wade-Murphy
Atmosphere Alternative

Felipe de Leon
Independent Advisor

Ousmane Fall Sarr
West African Alliance on Carbon Markets

Lambert Schneider
Research Coordinator for International Climate Policy at Oeko-Institut

Sudhir Sharma
GEF UNEP

AND SUBJECT MATTER EXPERTS

16 experts supporting the Expert Panel's evaluation of specific carbon crediting programs and classes of carbon credits with their specialist expertise.

- Amr Osama Aziz
- Ana Aubad
- Nate van Beilen
- Miguel Cortes
- Randall Spalding-Fetcher
- Michael Gillenwater
- Kelley Hamrick
- Stephanie La Hoz Theuer
- Denis Machnik
- Quirin Oberpriller
- Karen Olsen
- Sue Philips
- Ma Xin
- Alberto Ramirez
- Elijah Toirai
- Leighton Gall

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

OUR DISTINGUISHED ADVISORY GROUP

Tim Adams
IIF

Alberto Carrillo
SBTi

Blas L. Pérez Henriquez
Stanford university

Joaquim Levy
Former Managing Director and World BankGroup Chief Financial Officer

Emilio Sempris
Former Panama Minister of Environment

Matthew Arnold
TNC

Fu Chengyu
Sinopec

Hindou Ibrahim
Association for Indigenous Women & Peoples of Chad

Catherine McGuinness
City of London

Vera Songwe
UN Economic Commission for Africa

Sandy Boss
BlackRock

Jon Creyts
Rocky Mountain Institute

Michael Jenkins
Ecosystem Marketplace

Renée González Montagut
Fondo Mexicano para la Conservación de la Naturaleza

Nicholas Stern
Grantham Research Institute, LSE

Peter Boyd
Yale School of the Enviro

Paula DiPerna
CDP

Tuntiak Katan
Alliance of Territorial Comm

Alberto Musalem
Evince Asset Management

Adair Turner
Energy Transitions Commission

Kate Brandt
Google

Ciara Furse
London Stock Exchange and HSBC

John Kilani
Al-Attiyah Foundation

Dilhan Pillay Sangrasegara
Temasek

Bill Winters
Standard Chartered

Mark Carney
UN Special Envoy on Climate Action and Finance

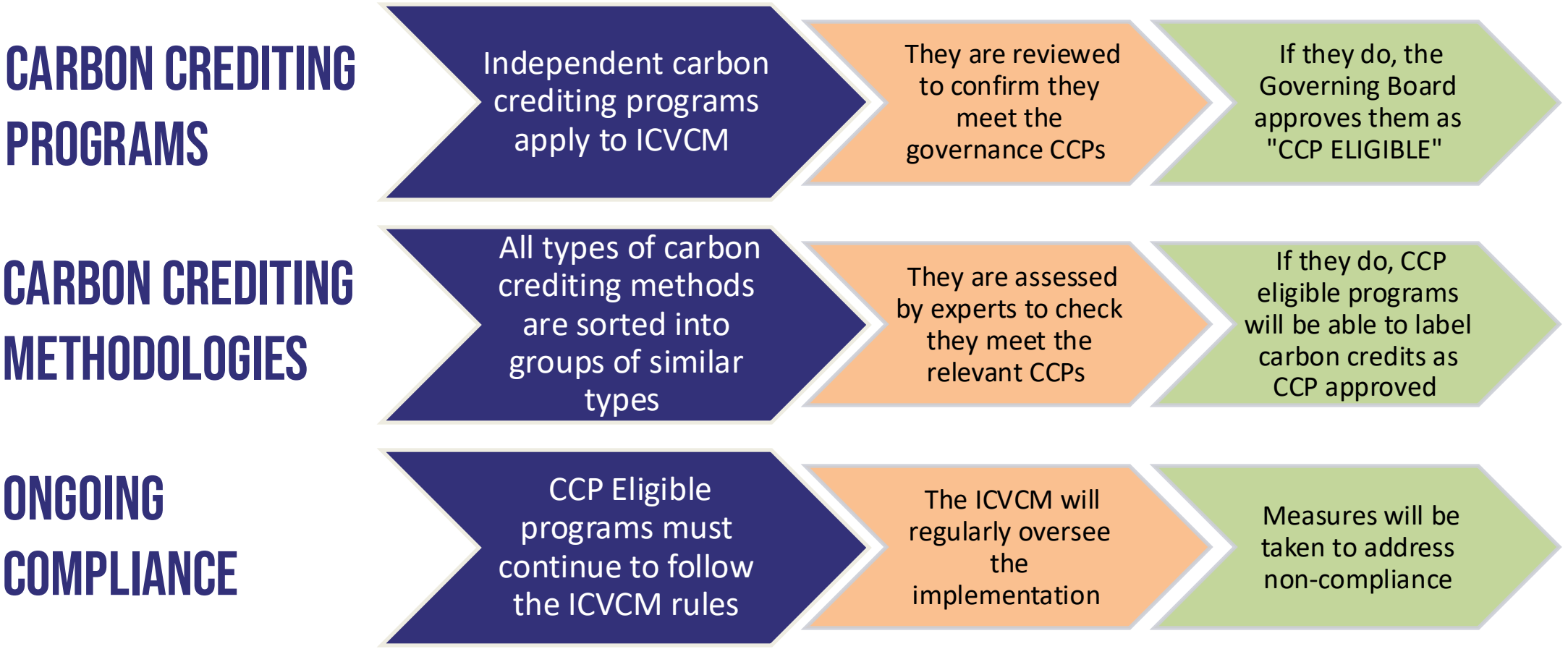
Jonah Goldman
Breakthrough Energy

Lian Pin Koh
University of Singapore

Laurent Segalen
Megawatt-X

Ailun Yang
Bloomberg Philanthropies

THE ICVCM ASSESSMENT AND OVERSIGHT PROCESS



THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

ICVCM'S DOUBLE TICK PROCESS

INDEPENDENT CARBON CREDITING PROGRAMS APPLY TO ICVCM → THEY ARE REVIEWED TO CONFIRM THEY MEET THE GOVERNANCE CCPS → IF THEY DO, THE GOVERNING BOARD APPROVES THEM AS 'CCP - ELIGIBLE'

ALL TYPES OF CARBON CREDITING METHODS ARE SORTED INTO GROUPS OF SIMILAR TYPES → THEY ARE ASSESSED BY EXPERTS TO CHECK THEY MEET THE RELEVANT CCPS → IF THEY DO, THE GOVERNING BOARD CLASSIFIES THEM AS 'CCP - APPROVED'

+ = PROGRAMS CAN ISSUE CCP-LABELLED CREDITS

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

THE CORE CARBON PRINCIPLES

The CCPs set a global benchmark to ensure integrity in the voluntary carbon market.

GOVERNANCE

1. Effective governance
2. Tracking
3. Transparency
4. Robust independent third-party validation and verification

EMISSIONS IMPACT

5. Additionality
6. Permanence
7. Robust quantification of emission reductions and removals
8. No double counting

SUSTAINABLE DEVELOPMENT

9. Sustainable development benefits and safeguards
10. Contribution to net zero transition

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

CCP ATTRIBUTES

Carbon crediting programs can use attributes to highlight additional features related to the project for which the carbon credit has been issued.

This allows buyers to purchase carbon credits that match their preferences.

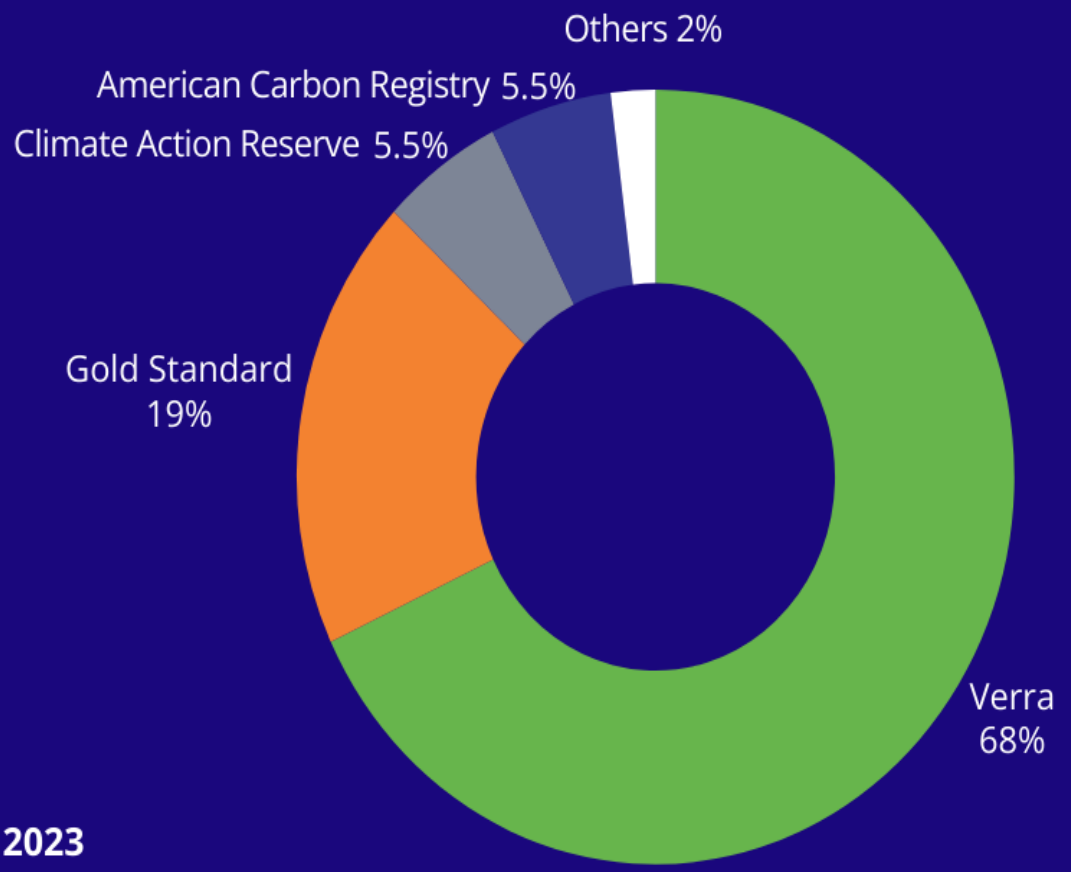
- **CCP Attribute 1:** Host country authorization pursuant to Article 6 of the Paris Agreement
- **CCP Attribute 2:** Share of proceeds for Adaptation (if decided)
- **CCP Attribute 3:** Quantified positive SDG impacts (under development)

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

MARKET BUY-IN

- Latest progress on assessments: Categories, Programs
- Recognition as key standard setter alongside: GHG Protocol, SBTi, VCMI
- Programs already responding to new requirements and updating program rules
- VCMI Claims Code of Practice points to ICVCM approved credits

WE ARE NOW ASSESSING CARBON CREDITING PROGRAMS REPRESENTING 98% OF THE MARKET.

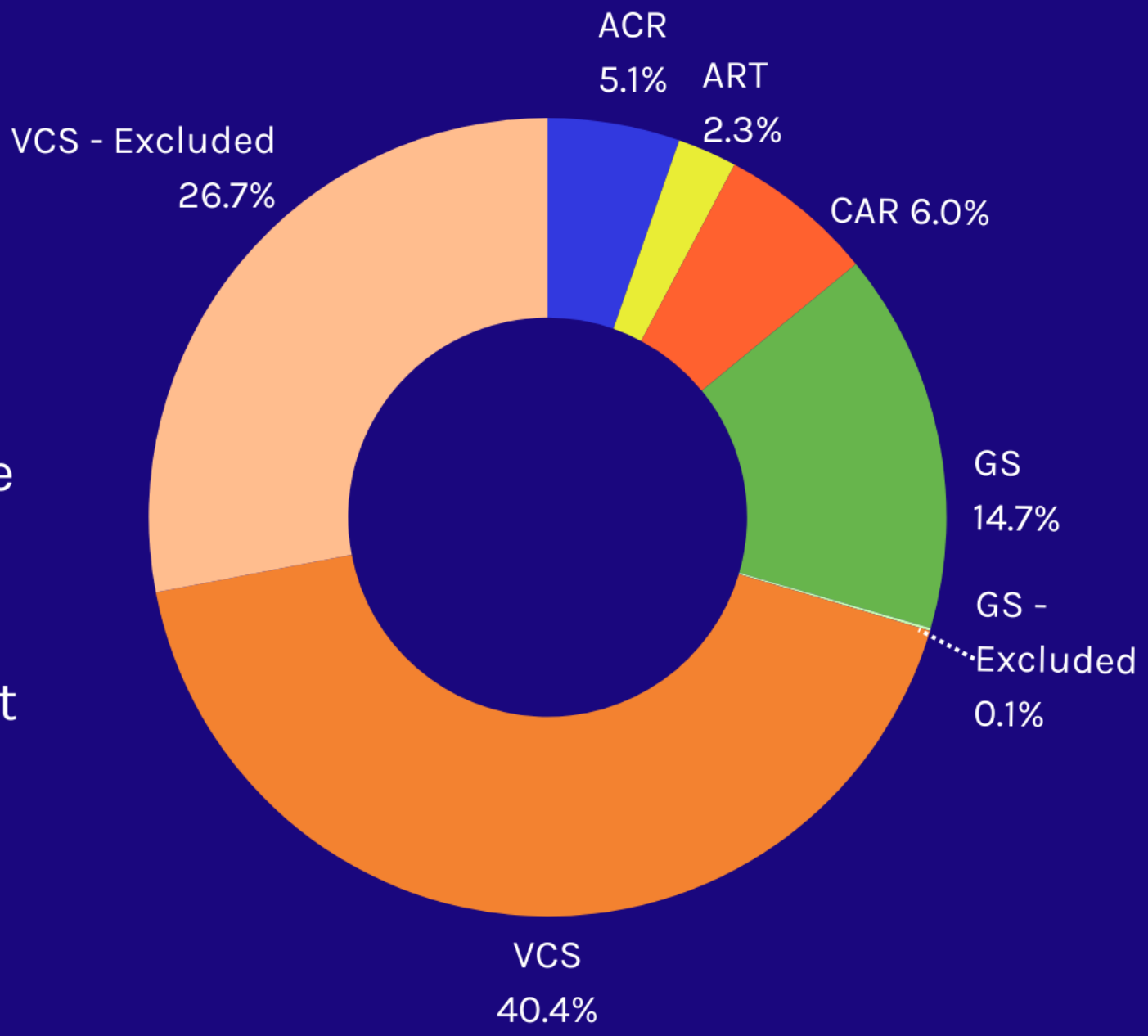


Credits retired in 2023

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

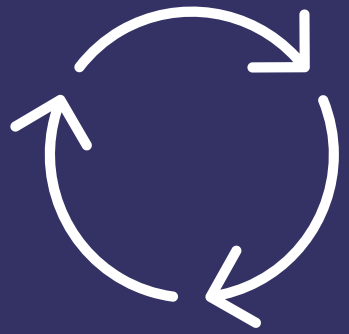
CCP-ELIGIBLE PROGRAMS' MARKET SHARE

- Market share by total issuance
- Submitted methodologies by CCP-Eligible Programs account for 68.5% of the total market share



THE INTEGRITY COUNCIL FOR THE VOLUNTARY CARBON MARKET

CONTINUOUS IMPROVEMENT WORK PROGRAMS: BUILDING THE FUTURE OF THE VCM



ICVCM'S PIONEERING CONTINUOUS IMPROVEMENT WORK PROGRAMS (CIWPS) OVERVIEW

The CIWPs market evolution strategy will inform a modernized, standardized, and scalable high integrity VCM 2.0

Goals of CIWPs

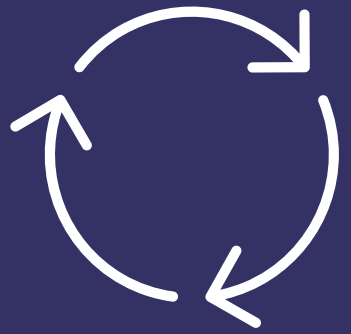
- Address areas where **innovative approaches** and technological advance will enable the ICVCM to **build stronger, more transparent, and more robust solutions** for the VCM as a whole
- **Bring together leading market experts** and key stakeholders in a collaborative effort to **harness existing and emerging best practices** to address the complex challenges and opportunities facing the market today
- **Advance a "virtuous cycle" of feedback** between voluntary and emerging compliance markets around the globe

Leveraging outputs to advance CCPs

- The board will **consider outputs for integration into next version of CCPs**
- In some instances, it will **issue recommendations** and findings for work that is needed to scale and modernize the market, but that the **ICVCM might not implement itself**

THE INTEGRITY COUNCIL FOR THE VOLUNTARY CARBON MARKET

CONTINUOUS IMPROVEMENT WORK PROGRAMS: BUILDING THE FUTURE OF THE VCM



THE BOARD HAS APPROVED 13 CIWPS ON MARKET EVOLUTION AND INNOVATION

Completed Expected to launch Jan 2025

BATCH 1

1. **Paris Agreement harmonization**
   - Consideration of a **Share of Proceeds for Adaptation**
   - **Alignment of baselines with Nationally Determined Contributions**
   - **Corresponding Adjustments**
2. **Social Safeguards and Benefit Sharing**
3. **Permanence**

BATCH 2 & 3 (SEQUENCING TBD)

4. **Measurement, Reporting and Verification (MRV) Systems (including DMRV)**
5. **Market transparency, Standardization, and Scalability**
6. **Oversight of Validation and Verification Bodies (VVBs)**
7. Simplified approaches for **small projects**
8. **Jurisdictional crediting approaches**
9. **Renewable Energy Crediting Approaches** (focused on Additionality)
10. **Transition Crediting** (related to energy transition)
11. **Permanence** (continued)

ICVCM ASSESSMENT FRAMEWORK: PERMANENCE

Criterion 9.1	**Categories to which permanence requirements apply**
Criterion 9.2	**Compensation for reversals**
Criterion 9.3	**Monitoring and compensation period**
Criterion 9.4	**Compensation mechanism**
Criterion 9.5	**Jurisdictional REDD+ permanence**

CORE CARBON PRINCIPLE

CRITERION 9.1: CATEGORIZATION OF ACTIVITIES

The GHG emission reductions or removals from the mitigation activity shall be permanent, or, where there is a risk of reversal, there shall be measures in place to address those risks and compensate for reversals.

Material risk of reversal

- Conservation and avoided conversion
- Agriculture soil carbon sequestration
- Forestry sequestration
- Wetland and marine ecosystem restoration and management

Lower risk of reversal

- Displacement of non-renewable biomass
- Biochar
- CCS with geological storage
- Enhanced weathering
- CCS with mineralization
- CO2 in concrete utilization

CRITERION 9.2: COMPENSATION FOR REVERSALS

IC-VCM guidance allowed for two compensation options:

Option #1

The **carbon crediting program** shall cancel a carbon credit for each tonne of CO2 equivalent reversed

Option #2

The **carbon crediting program shall require the project developer** to cancel a carbon credit for each tonne of CO2 equivalent reversed

CRITERION 9.3: MONITORING AND COMPENSATION PERIOD

For activities with a material risk of reversal, the carbon-crediting program shall:

- Require a **monitoring and compensation period of at least forty years** from the start of the first crediting period
- Require **project developers to monitor and report any reversals** for the full monitoring and compensation period and **compensate for unavoidable reversals**
- **Refrain from issuing** further carbon credits until **avoidable reversals have been compensated**
- **Draw upon the pooled buffer reserve** if avoidable reversals are not compensated
- Treat **cessation of monitoring** and verification as an **avoidable reversal**

CRITERION 9.4: COMPENSATION MECHANISM

For activities with a material risk of reversal, the carbon-crediting program shall:

- **Require estimation of reversal risk** using a publicly available methodology
- **Incentivize project developers** to mitigate reversal risk
- **Define criteria** for determining whether a reversal is **avoidable or unavoidable**
- Implement a **pooled buffer reserve**:
  - **Minimum of 20%** of all credits issued *or* **proportional to the reversal risk** with consideration that avoidable reversals are not required to be compensated for
  - Make **publicly available the contents** of the pooled buffer reserve

CRITERION 9.5: JURISDICTIONAL REDD+ PERMANENCE

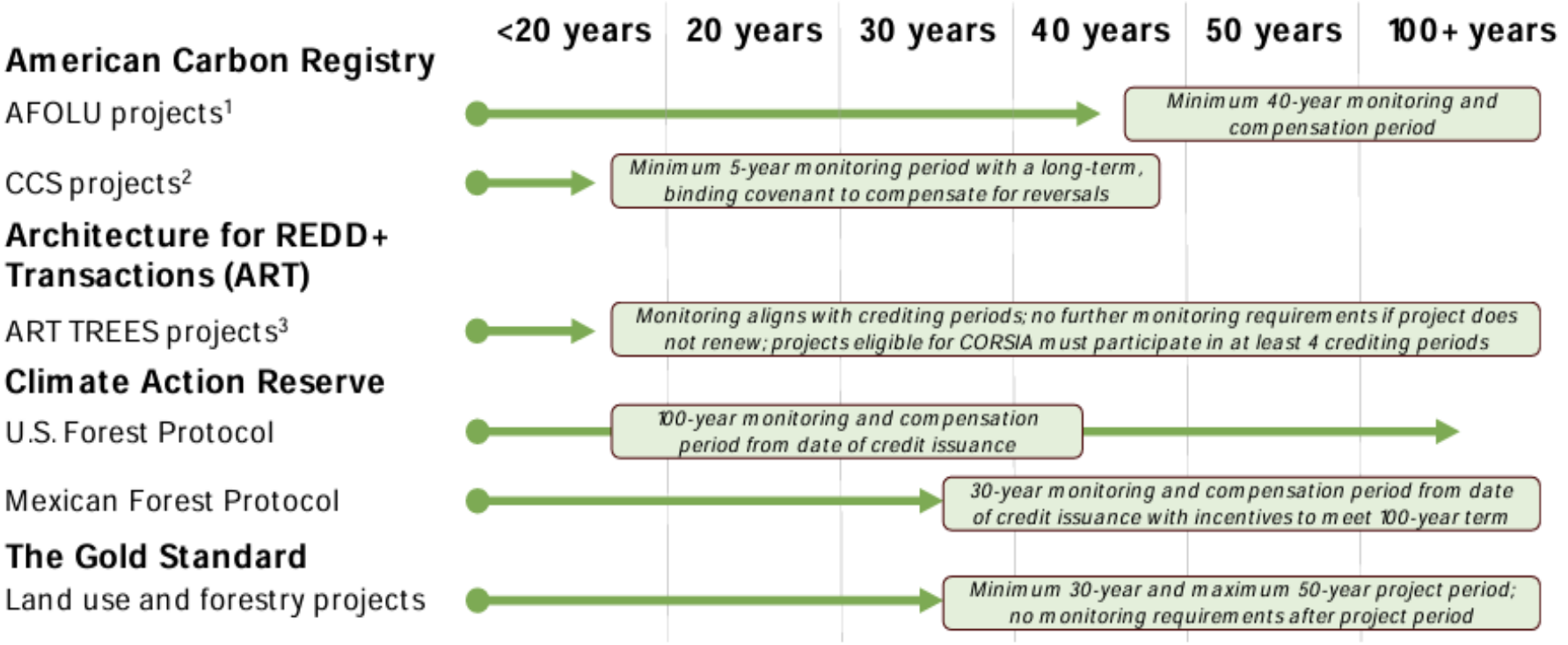
For jurisdictional REDD+ (JREDD+), the carbon-crediting program shall:

- **Implement a pooled buffer reserve** that is contributed to by JREDD+ actors
- Require that the percentage of **credits contributed to the buffer be equivalent to the reversal risk** and adequate to **compensate for potential reversals for at least 40 years**
- Where a **reversal occurs** and it exceeds a JREDD+ actor's contribution to the buffer, **require the JREDD+ actor to replenish** the buffer to a level **equal to the reversal risk**
- Require that all credits in the buffer from a JREDD+ actor be **canceled if the JREDD+ actor leaves the program**

CURRENT APPROACHES TO PERMANENCE ACROSS CREDITING STANDARDS (1/2)

Monitoring and compensation periods for selected carbon crediting programs (1/2)

NON-EXHAUSITIVE

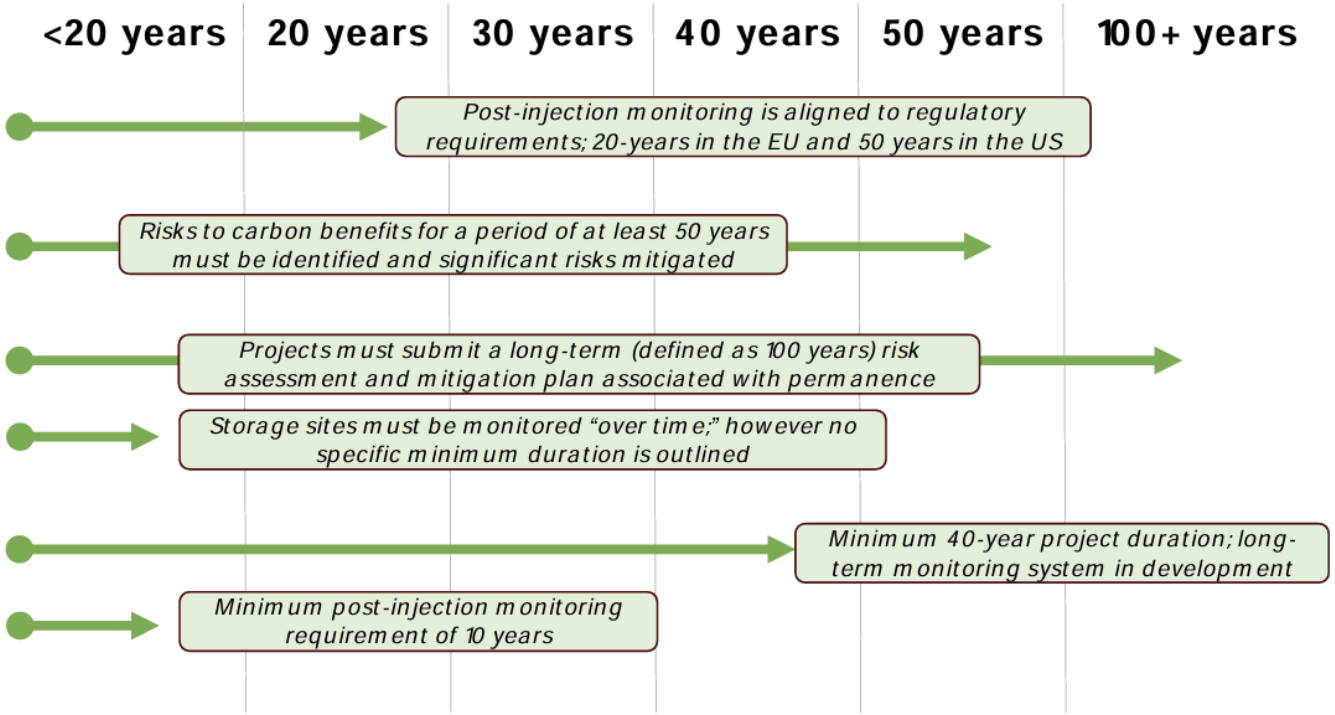


[1]Agriculture, forestry and other land use; [2]Carbon capture and storage; [3]The REDD+ Environmental Excellence Standard

CURRENT APPROACHES TO PERMANENCE ACROSS CREDITING STANDARDS (2/2)

Monitoring and compensation periods for selected carbon crediting programs (2/2)

NON-EXHAUSTIVE



PERMANENCE CIWP OVERVIEW

Launched to bring together different perspectives and stakeholders in the market to drive consensus and develop a shared understanding among the expert community on:

- Consider the various approaches to addressing the issue of permanence for carbon crediting purposes
- Identify key open questions or gaps in understanding or knowledge
- Develop recommendations for addressing permanence (including risk assessment, allocation, and mitigation) that will result in “investment-grade” carbon credits that maintain scientific rigor in delivering climate impact **while balancing complex policy, legal, financial, equity, and implementation** trade-offs.

PERMANENCE CIWP OVERVIEW

Topics explored

- **Monitoring and compensation periods and/or reserve requirements**, including consideration of:
  - **Methods to provide for longer monitoring** and compensation periods (e.g., one hundred years)
  - **Whether** monitoring and compensation **periods should count from the start of the first crediting period** or from **the vintage of the mitigation** outcome
  - **Options for transferring the monitoring and compensation oversight** to the carbon crediting program or the jurisdiction
- **Pooled buffer reserves, their design, sufficiency** (including periodic stress testing considering a range of scenarios), **feasibility, and possible new designs**
- **Reversal risk assessment tools and procedures** (including risks presented by climate change)
- **Insurance products and mechanisms**

Next steps

Building on previous work, a follow-on Permanence CIWP will launch in 2025 and will focus on 3 key areas:

1. Buffer pool stress testing piloting
2. Feasibility and design of a "Global Permanence Trust"
   - Financial modeling and legal consultation to inform design and structure
   - Feasibility and design of standardized approaches to project level risk assessment
3. Role of insurance

THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

THANK YOU

- Alexia Kelly akelly@hightidefoundation.org
- Follow us on X (Twitter) (@ic_vcm) or subscribe to LinkedIn (www.linkedin.com/company/icvcm)
- Sign up for newsletter via our website or info@icvcm.org
- Visit our website: www.icvcm.org
- Media enquiries: icvcm@greenhouse.agency
- Join our Market Consultation Group: https://icvcm.org/market-consultation-group-join/
- Check out the workshop report from the CIWP Permanence Workshop
  - https://www.cambridge.org/engage/coe/article-details/66c38d1ff3f4b052905d4317

FIND OUT MORE BY EMAILING:
info@icvcm.org