

## **Industry Call for a Standards Body for Long-Duration Carbon Dioxide Removal**

To reach net-zero goals and stabilize global temperatures, we will need to both dramatically cut emissions and remove large quantities of carbon dioxide (CO<sub>2</sub>) from the atmosphere.

Accordingly, we need to scale approaches for removing CO<sub>2</sub> and storing it on timescales that are commensurate with the atmospheric lifetime of fossil CO<sub>2</sub> emissions. The market for long-duration carbon dioxide removal (hereafter referred to as CDR) is relatively immature but growing rapidly, and establishing credible standards for CDR is one of several enabling factors required to scale CDR in line with climate objectives.

Seventy representatives of organizations concerned with ensuring integrity in CDR and drawing lessons from the challenges in the voluntary carbon market gathered in November 2022 to discuss the monitoring, reporting, and verification of CDR. The aim of the gathering was to build consensus among a group of diverse stakeholders around meaningful action to establish a trusted market for CDR, with the express intent of inviting the broader CDR community to provide input and participate in the next steps.

### Needs

CDR pathways are diverse in their approaches and levels of maturity. A similar diversity of scientific approaches to verification will be needed to quantify key climate outcomes in a manner that enables comparisons across pathways and effectively verifies delivered removal.

To date, CDR projects have received small-scale investment without standardized approaches to quantification. In the absence of robust and consistent quantification protocols and verification standards, early-stage buyers have invested significant time and resources into project-level diligence and bespoke verification. However, current efforts are not scalable and lack structures to ensure the sustainability and integrity of future CDR development.

Moving forward, we should establish and codify an evolving set of guidelines for assessing the performance of different CDR approaches. These guidelines must transparently set high quality standards for CDR verification, allowing flexibility for developing novel pathways while ensuring continued improvements based on the best available science. It is also important to avoid the problems that have plagued legacy carbon markets, including the reliance on subjective counterfactual baselines, conflicting incentives among actors, and the lack of consistency as to how protocols quantify climate outcomes.

### Proposed Action

To enable scientific rigor, transparency, and harmonization across CDR pathways – and avoid the problems of the past – we see the need to establish institutional mechanisms to provide a trusted, scientific stamp-of-approval for CDR protocols through an inclusive process to identify scientific consensus.

We envision an independent, not-for-profit initiative that conscientiously avoids conflicts of interest and has funding that does not depend on issuing or selling carbon credits.

This initiative should be international, transparent, and scientifically-driven. It should have the affirmative mandate to help the CDR industry scale as quickly as possible while pursuing the following objectives:

- Defining high-level, cross-pathway guidelines for quantifying the efficacy of CDR approaches.
- Reviewing and approving quantification protocols and their underlying approaches to measurement and modeling.
- Establishing guidelines for independent 3rd party verification.
- Regularly and transparently updating guidelines and protocol approvals based on the best available science.

To advance these objectives, we plan to convene an ongoing working group to involve a wider set of stakeholders, more clearly define objectives, identify viable funding sources, identify and coordinate with appropriate existing initiatives, and recruit potential founding members.

## Signatures

<b>Name</b>	<b>Organization</b>	<b>Role</b>
Greg Dipple	Arca Climate Technologies	Co-founder and Head of Science
Stephanie Arcusa	Arizona State University	Research scientist
Na'im Merchant	Carbon Curve	Founder & Managing Director
Julio Friedmann	Carbon Direct	Chief Scientist & Chief Carbon Wrangler
Avantika Singh	Carbon Direct	Senior Carbon Removal Scientist
Anu Khan	Carbon180	Deputy Director of Science & Innovation
Freya Chay	CarbonPlan	CDR Program Manager
Jeremy Freeman	CarbonPlan	Executive Director
Danny Cullenward	CarbonPlan	Policy Director
Peter Reinhardt	Charm Industrial	CEO

Nora Cohen Brown	Charm Industrial	Head of Market Development & Policy
Friedel Pretorius	Climeworks	Carbon Market Development Manager
Christoph Beuttler	Climeworks	Chief Climate Policy Officer
Mo Niknafs	Deep Science Ventures	Founding Analyst
Ben Tarbell	Ebb Carbon	Co-Founder and CEO
Roxby Hartley	EcoEngineers	Climate Risk Director
Elliot Chang	Eion Corp	Co-Founder and CTO
Shashank Samala	Heirloom	CEO
Noah McQueen	Heirloom	Co-founder and Head of Research
Jennifer Mills	Heirloom	Senior Research Scientist
Elizabeth Troein	Isometric	Head of Science
Eamon Jubbawy	Isometric	Founder & CEO
William Collins	LBNL and UC Berkeley	Associate Laboratory Director and Professor in Residence
Kristin Ellis	Lowercarbon Capital	Partner
Ryan Orbuch	Lowercarbon Capital	Partner
John Sanchez	Lowercarbon Capital	MRV Summer Associate
Rafael Broze	Microsoft	Engineered Removals Lead
Matthew Long	NCAR	Scientist
Toby Bryce	OpenAir Collective	CDR Policy Advocacy
Alexander Lavin	Pasteur Labs & Inst. for Simulation Intelligence	Founder & CEO
Mike Kelland	Planetary	CEO
Marty Odlin	Running Tide	Founder & CEO
Stacy Kauk	Shopify	Head of Sustainability
Alicia Karspeck	SilverLining	Head of Earth Information Programs

Dai Ellis	Slingshot Advisory	Strategic Advisor
David Mann	Spark Climate Solutions	Co-Founder
Zeke Hausfather	Stripe	Climate Research Lead
Joanna Klitzke	Stripe	Procurement & ecosystem strategy
Mowgli Holmes	Submarine PBC	Founder & CEO
Laura Lammers	Travertine Technologies, Inc.	Founder and CEO
Jim Mann	UNDO	Founder & CEO
David Ho	University of Hawai'i at Mānoa	Professor
Garrett Boudinot	Vycarb	Founder & CEO
Noah Planavsky	Yale University	Associate Professor
Tim Hansen	350Solutions	CEO