February 10, 2023

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_2) from the atmosphere. Accordingly, we need to scale approaches for removing CO_2 and storing it on timescales that are commensurate with the atmospheric lifetime of fossil CO_2 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

Name	**Organization**	**Role**
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
Morgan Raven	Carboniferous	Chief Science Officer
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
Matt Eisaman	Ebb Carbon	Co-Founder and CTO
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

Additional Signatures (Added March 1, 2023)

Mostyn Brown	AFRY Management Consulting	Manager - Carbon Markets
John Dennehy	Agreeable	Founder
Peter Nocchiero	Alternate Future	Founder
Gonzalo Fuenzalida	Andes	CEO
Kaitlyn Baab	Andes	VP of Operations
Andrew Denu	Andes	Commercial Lead
Tania Timmermann	Andes	Co-founder & CTO
Bjorn Traag	Andes	Chief Scientific Officer
Adam Taylor	Brilliant Planet	CEO
Travis Caddy	C-Capsule	Product Manager
Fergal Mee	Carbon Action London	GHG Standards director
Brian Reynolds	Carbon Char Store Ltd	Director
Geoff Holmes	Carbon Engineering	Director of Government Relations
Marian Krüger	Carbon Removal Accelerator	Co-Founder and Co-Lead
Grant Faber	Carbon-Based Consulting	Founder and President
Rahul Misra	CarbonCure Technologies	Head of Carbon Product and Operations
Kevin Kelly	CarbonCure Technologies	Vice President, Carbon Finance
Hannes Junginger	Carbonfuture	Founder & CEO
Anna Lehner	Carbonfuture	Standards & Methodologies
Matt Wilson Plasek	Carbonfuture	Head of US Business
Kyle Kornack	Carbonfuture	US Partnerships

Dan Maxbauer	Carleton College	Assistant Professor
Sebastian Smith	Charm Industrial	Talent Lead
Ewan Jones	Climacrux	Founder
Fabio Salgado	Corporación Ambiental Empresarial	Director GAU
Mick Greenwood	CUR8 Earth Limited	Operations Director
Jonathan Kaida	Export Development Canada	Director of Global Trade - Cleantech
Sri Nikitha Thummanapalli	Facets	Product Manager
Anya Doherty	Foodsteps	CEO
Tyler Cyronak	Georgia Southern University	Assistant Professor
Benabdallah Jamil	H64 - The Zero Fund	CEO
Liselotte Tinel	IMT Nord Europe	assistant professor
Marc Ferguson	InfinaVero	CEO and Systems Engineer
Professor Wil Burns	Institute for Carbon Removal Law & Policy, American University	Co-Director
Hiroshi Mizutani	Institute of Sociogeochemistry	Senior Research Scientist
Andre Fernandez	Invert	Co-CEO
João Pedro Tauscheck Zielinski	IPR/PUCRS	Research Geologist
Thomas Merriman	Kita	Chief Product Officer
Tyler Hamilton	MaRS Discovery District	Senior Director, Cleantech
Laura di Bonaventura	MUUS Climate Partners	Principal

Tani Brown	MUUS Climate Partners	Principal
Venna v. Lepel	Novocarbo	CCO
Josh Santos	Noya	CEO
Dr. Anthony Walker	Oak Ridge National Laboratory	Senior Scientist
Luke Pecor	Oceanid MRV	Director of Administration
Mugwe Manga	Olsuswa Energy	Founder/CEO
Hasan Muslemani	Oxford Institute for Energy Studies	Head of Carbon Management Research
Ben Field	Patch	Climate Strategist
Nicolas Sdez	PRONOE	Co-Founder & CEO
Melissa Ward	San Diego State University & University of Oxford	Research Scientist
Spencer Kerber	Spkerber	Product
Isabella Arzeno-Soltero	Stanford University	Postdoctoral Scholar
Christina Beckmqnn	Tomorrow's Air	Founder
Sterling Vanderzee	UBC	PhD Candidate
Damian Brady	University of Maine	Associate Professor
Ning Zeng	University of Maryland and Carbon Lockdown Project	Professor and Founder
Manish Devana	University of Miami	PhD Candidate
Jaime Palter	University Of Rhode Island	Associate Professor
Jakob Rønning	University of Southern Denmark	Phd fellow

Charlie Hendry Smith	Veolia ES UK	Corporate Development Executive
Tom Green	Vesta, PBC	CEO & Co-Founder
Chris Tolles	Yard Stick PBC	CEO + Co-Founder
Karan Khimji	44.01	CCO
Bruce	Individual	Retired
Michael Liquori		
Rupert Newton		