Carbon to Sea Initiative

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Input to DOE's Carbon Dioxide Removal Purchasing (CO_2RP) Challenge

The **Carbon to Sea Initiative** (CTS) is a nonprofit effort whose mission is to systematically assess whether and which alkalinity enhancement (OAE) pathways can deliver safe, cost-effective, and permanent CO_2 removal at scale. We are guided by a set of core principles that emphasize transparent outcomes, strong and clear governance standards, and a commitment to meaningful stakeholder engagement.

We are delivering on our mission by funding research to close knowledge gaps; advancing relevant technology and policy development; and engaging in community-building to support the emergence of a responsible and sustainable ocean-based CDR sector, should that be appropriate. Last year, we awarded more than **$23 million to scientists and engineering teams** to ask and answer questions associated with: efficacy and permanence, environmental safety, economics, utility of byproducts, alkalinity delivery, alkalinity generation, and measurement, reporting and verification (MRV).

We greatly appreciate the Administration's efforts to advance marine carbon dioxide removal (mCDR) research, development and demonstration. Funding, such as that provided by DOE's Office of Fossil Energy and Carbon Management (FECM) and ARPA-E, and by the National Oceanographic Partnership Program (NOPP), supplies critical support to answer key questions about efficacy and environmental safety.

At present, the CO_2 Removal (CDR) industry operates primarily within a voluntary market which suffers from a lack of rigorous and consistent standards. This dynamic is exacerbated by some willingness to accept low-quality, lower-cost carbon credits. Given current dynamics, programs and policies are needed to increase market demand for high-quality carbon credits, such as those that can be supplied by permanent CDR approaches for the voluntary market. Effective policy should enable a "race to the top" in terms of efficacy such that CDR, including mCDR, is seen by markets, governments, and the general public, as a legitimate and effective component of strategies to eliminate growth in, and eventually reduce, atmospheric concentrations of greenhouse gasses.

Notably, all CDR efforts must complement — and not replace — ongoing work to dramatically reduce greenhouse gas emissions. It's clear that voluntary efforts will help but be insufficient. To meet Paris Agreement targets, compliance markets will need to expand rapidly to ensure enforceable policies to reduce emissions and support production and market demand for verifiably additional and durable CDR.

FECM's CDR purchase pilot prize is an important initial step in this direction. It will help to advance the technological readiness of certain CDR approaches by evaluating their life cycle negative emissions potential and MRV practices. This information, in turn, will inform the

federal government's research strategy to fill key gaps in knowledge and technology to drive a broad suite of approaches toward market readiness.

The recently announced CDR purchasing challenge (CO_2RP) is a logical and important follow-on to the purchase pilot. While additional federal funding will certainly be required to develop a broad portfolio of market-ready CDR approaches that is technologically neutral and verifiably emissions-negative, the CO_2RP challenge supports the emerging mCDR sector in several important ways. For suppliers who may not have been ready to meet the production and verification criteria of the purchase prize, it offers a way to "stress test" their processes using the knowledge and approach developed for evaluating purchase prize competitors. Suppliers will as a result gain valuable feedback on the current strengths and weaknesses of their approaches in areas such as MRV; supply chain sustainability; and technical, logistical, and financial requirements to transition from demonstration to large-scale deployment.

Aligning with CDR Credit Suppliers

The benefits of this approach will be enhanced if the agency treats this as the collaborative effort it appears intended to be, not as a competition. Unlike the purchase prize, where DOE is limited in the feedback it can provide to competitors and proposals have to be locked down after a certain point to ensure fair competition, a collaborative effort could share information back and forth between second-wave suppliers and DOE, as well as among suppliers, consistent with protecting proprietary business information. In this way, suppliers could improve their submissions based on information provided by DOE about methods and technologies that appear to offer the greatest promise for, for example, verifying additionality and permanence. Similarly, collaboration among second-wave suppliers, encouraged by Information supplied by and convenings on select topics hosted by DOE, could also improve the quality of submissions under the purchase challenge, lead to performance improvements of these emerging technologies, and contribute to the development of a code of practice for the industry.

Aligning with CDR Credit Buyers

For buyers, participation in this challenge offers the opportunity to get in on the ground floor of an emerging sector supplying the highly verifiable and durable net-negative emissions that are needed to meaningfully address the climate crisis, and which have been in short supply in the voluntary market. Such purchases currently come with a significant price premium, and the limited number of purchasers to date are making a commendable, but also strategic, investment in what they feel will likely be the future of carbon offsets. Pairing buyers interested in high-quality offsets with suppliers of that commodity will help to create a race to the top for quality within the voluntary market, which is sorely needed. Clearly, it will be necessary to greatly expand the number of buyers willing to pay the current price premium of high-quality CDR both to change the dynamics of the voluntary market and to gain access to the growing number of compliance markets.

To expand market demand, DOE should work closely and collaboratively with the current cadre of businesses committed to purchasing high-quality CDR. Just as DOE seeks a second-wave of CDR suppliers, it should work with supportive businesses and suppliers to identify and encourage a second wave of buyers. It should explore ways in which the federal government could encourage finance mechanisms, such as advance market commitments, and tax policy, among other approaches, to expand the circle of buyers. Similar to the recommended approach with suppliers, we suggest that DOE pursue maximum practicable

transparency and sharing of information gained through the purchase prize and the CO_2RP challenge with current and prospective buyers. Highlighting the results and rigor of life cycle assessments and MRV associated with evaluated technologies will raise prospective buyers' confidence in CDR offsets as a high-value product, establish a contrast with lower-cost but lower-quality products on the market, and thereby raise demand for quality products in the marketplace.

Carbon to Sea is working to fill gaps in knowledge and advance technologies needed to establish the safety, efficacy, and durability of a variety of OAE pathways.

That includes funding for a diverse portfolio of laboratory, mesocosm, and field experiments; biogeochemical model development and deployment; and technology and life cycle assessment methodology development to assess the carbon removal effectiveness and environmental effects of chemical and electrochemical OA pathways. Through that work, CTS seeks to advance the readiness of the most effective, safe and scalable approaches, while flagging those pathways with unacceptable environmental risks or significant techno-economic challenges.

In the United States, CTS is also engaging Congress to provide the **public funding needed** to ready mCDR to play a significant role in meeting climate goals. As mentioned above, information derived from the CDR purchase prize and the CO_2RP challenge will inform strategic public and private investment in RD&D for a variety of CDR pathways, including investments by CTS and under the mCDR research plan being developed by the federal **Fast Track Action Committee**.

In addition, CTS is supporting efforts at the federal, state, and international levels to increase access to and demand for mCDR offsets in voluntary and compliance markets. Development and increasing standardization of methods for life cycle assessment and MRV are important precursors for acceptance of mCDR into compliance markets through mechanisms such as:

- the European Union's Carbon Removal Certification Framework,
- California's Emission Trading Scheme,
- Canada's Greenhouse Gas Offset Credit System, and
- the mechanisms for international credit trading under Article 6 of the Paris Agreement.

The role of government in establishing codes of practice and standards for CDR offsets

Toward these ends, DOE should consider what constructive role the Federal Government could play in setting codes of practice and/or standards for CDR offsets that are interoperable among the growing number of venues in which they may be traded. This would serve both to increase the utility and availability of CDR to offset hard-to-abate emissions and maintain US public- and private-sector leadership in developing these climate-friendly technologies. A **2023 report by the Bipartisan Policy Center** explores a wide range of options for government engagement to drive development of standards for this emerging industry. Options beyond the status quo of no direct federal involvement range from provision of federal guidance, through facilitating the formation of self-regulatory organizations subject to government-backed guardrails for enforcement of quality (similar to the New York Stock Exchange), to direct federal government regulation of CDR offsets.

For More Information regarding input on *FR Doc. 2024-05269*, contact: Diane Hoskins, Global Policy Director, Carbon to Sea initiative, **diane@carbontosea.org**.