UNFCCC ARTICLE 6.4 CALL FOR INPUT 2023 - STRUCTURED PUBLIC CONSULTATION: FURTHER INPUT - REQUIREMENTS FOR THE DEVELOPMENT AND ASSESSMENT OF MECHANISM METHODOLOGIES: CARBON ENGINEERING RESPONSE

August 17, 2023

EXECUTIVE SUMMARY

The inclusion of Direct Air Capture (DAC) in Article 6.4 of the guidance would be a significant step towards advancing climate action and achieving the objectives of the Paris Agreement. The mechanism methodologies document outlines several key concepts that effectively guide emissions reduction efforts but may not be the ideal fit for emissions removal, particularly deliberate climate technologies like DAC. While the concepts of additionality, baseline, and ambition over time are effective tools for guiding emissions reduction efforts, they need to be adapted to suit the unique nature of emissions removals. To meet our global climate commitments, emissions need to be drastically reduced and removals need to aggressively scale – which would benefit from different concepts to measure ambition over time.

Carbon Engineering recommends the following:

- **Additionality – Include DACCS on a positive list**
- **Baseline – The project and BAU activity baseline are zero**
- **Ambition over time needs to consider how to adequately assess the deployment of carbon dioxide removal technologies**

SECTION 3- DISTINCTION BETWEEN EMISSIONS REDUCTIONS AND REMOVALS

To effectively meet the goals of the Paris Agreement and achieve a balance between emissions and removals, it is imperative to include both carbon removals and reductions as integral components of our climate mitigation strategies. While emissions reductions play a critical role in reducing greenhouse gas emissions at their source, carbon removals, such as those achieved through DAC projects, offer a complementary solution by actively removing carbon dioxide from the atmosphere. By combining these approaches, we can enhance the likelihood of achieving net-zero emissions and preventing further climate change.

Carbon Engineering encourages the distinction of emission reductions and removals in the 6.4 mechanism for two reasons:

1) Given their complementary roles, removals and reductions should be differentiated to ensure visibility over their roles in achieving net zero outcomes.
2) The methodology development of technology-based removals requires different approaches to additionality, baseline and inclusions of all emissions through a conservative LCA to ensure credits generated are of the highest integrity and are real, transparent, conservative and credible.

SECTION 4- ENCOURAGING AMBITION OVER TIME

The idea behind setting emission reduction baselines and progressively increasing ambition over time is to align with the overarching goal of reducing emissions. As emissions decrease, the baseline shifts to reflect the lower starting point, and ambition increases to match evolving targets. This approach suits emissions reductions where the goal is to minimize emissions year after year. However, emissions removals, particularly those from DAC, aim to clean up historical emissions as well as to counterbalance residual emissions, requires a different approach to measure ambition over time. The necessary amount of carbon removal from DAC should indeed scale with targets, but it doesn't necessarily require the same baseline adjustment mechanism as emissions reductions. Instead, DAC's effectiveness relies on its ability to remove a set amount of carbon, irrespective of historical emissions trends.

SECTION 4- BASELINE

Performance-based approaches to baseline setting have been discussed since the early days of carbon crediting and trading. Using standardized baselines – i.e., performance benchmarks or default values – has reduced transaction costs and increased the transparency of CDM project activities: baselines are not set on a project-by-project level but can be determined for entire project types and sectors. Baselines setting in CDR is still being developed for many project types. However, DAC has the unique characteristic to define zero baseline. "For the purest-form CDR technology – all value-chain elements of which purely exist for the purpose of removing CO2 from the atmosphere into durable storage – Direct Air Carbon Capture and Storage (DACCS) the baseline is no activity whatsoever."[1] With the baseline of DACCS being zero, setting a below BAU baseline is not plausible.

Carbon Engineering recommends the use of zero baseline for DAC and a positive list for this activity.

SECTION 5- ADDITIONALITY

Facilities that use DAC to capture CO_2 from atmospheric air, and subsequently inject it for geological sequestration, have no other purpose than the removal of carbon dioxide and reduction of global net emissions. As there is no other economic motivation to finance and deploy such facilities, they financially (and climatically) additional by nature. Deploying technology at industrial scale requires high capital, multi-year planning cycles with revenue certainty to secure investment, which is a challenge. As with many innovative climate technologies, targeted government support is beneficial to move engineered carbon removal technologies such as DAC along the cost curve and get to a place of broad deployment. Around the world, governments have targeted programs to achieve this alongside compliance markets where the 'environmental benefit' (e.g., CO2 removed) is also monetized. It is well understood that these

[1] Poralla, M.; Honegger, M.; Gameros, C.; Wang, Y.; Michaelowa, A.; Sacherer, A.-K.; Ahonen, H.-M; Moreno, L. (2022): Tracking greenhouse gas removals: baseline and monitoring methodologies, additionality testing, and accounting, NET-Rapido Consortium and Perspectives Climate Research, London, UK and Freiburg i.B., Germany.

mechanisms must co-exist. Financial disclosure of government support may be used to discern the value of crediting where other incentives (e.g., tax breaks) also exist.

Carbon Engineering is pleased to see the inclusion of global positive lists as an option for assessing additionality. We are supportive of using this method to evaluate DAC projects. We encourage UNFCCC to allow DAC on to the global positive list as this would be a significant signal recognizing that DAC activities are being developed and deployed with the purpose of providing an environmental benefit to the climate and are dependent exclusively on demand from climate policy and revenue from carbon markets.

INCLUSION OF STAKEHOLDER INPUT

As a leading direct air capture company, we commend the efforts of the Supervisory Body in recognizing the importance of removals activities in addressing climate change. Carbon Engineering is committed to deploying DAC technologies responsibly, ensuring they contribute to sustainable development objectives while effectively removing carbon dioxide from the atmosphere.

Our submission builds upon information we've previously provided:

- June 28, 2023: Structured Public Consultation: Removal Activities
- May 25, 2023: Response to Information Note
- April 11, 2023: Methodology Requirements
- October 12, 2022: Activities involving removals
- October 11, 2022: Development of Mechanism

ABOUT CARBON ENGINEERING

Carbon Engineering is a global leader in the development of Direct Air Capture (DAC) technology capable of removing CO_2 from atmospheric air and, through a series of chemical reactions, delivering it in a pure compressed stream suitable for storage or use.

Carbon Engineering was founded more than a decade ago with the mission to develop and commercialize affordable and highly scalable carbon removal technology. Carbon Engineering is a developer and licensor of DAC technology. A standard commercial-scale CE DAC facility will annually capture over 1.0 $MtCO_2$ directly from the atmosphere. Carbon Engineering's DAC technology is a liquid-based DAC technology (L-DAC) that deploys an aqueous basic solution to pull CO2 directly from the atmosphere and, after a series of clever chemical looping processes, conditions the atmospheric CO2 into a dense phase that is optimized for transport and final end-use.

Carbon Engineering's DAC technology can provide highly durable CDR when combined with secure geologic storage. This rock-solid combination of DAC + secure geologic storage (DACCS) provides a highly scalable and verifiable CDR mechanism for safely storing CO_2 for 1,000+ years, all with relatively low land and water use. Today, leading commercial markets are ready and we're working with global partners to deploy large-scale commercial facilities in multiple locations around the world.

The first large-scale commercial facility to utilize our DAC technology is in active development with our partner, 1PointFive, and is expected to have an annual atmospheric capture capacity of 1.0 $MtCO_2$ when complete.[2] It's our goal to have this first plant ignite an industry by demonstrating that megaton-scale DAC technology is feasible, affordable, and available. We envision fleets of DAC facilities working alongside emissions-free electricity, energy efficiency, and clean innovations in all commercial and industrial sectors to fully tackle the climate challenge. Engineering has already commenced at a second site capable of supporting a capacity of 30 $MtCO_2$ per year. Additional information on Carbon Engineering's technology and commercial developments is provided at www.carbonengineering.com.

[2] Occidental, 1PointFive to Begin Construction of World's Largest Direct Air Capture Plant in the Texas Permian Basin