

Date: 19 June 2023

Structured Public Consultation - Removal Activities

44.01 response

About 44.01

44.01 eliminates CO₂ by turning it into rock. Our pioneering technology accelerates the natural process of CO₂ mineralisation, meaning we can convert captured CO₂ into inert carbonate material permanently and rapidly. We work with an ultramafic rock called peridotite that is abundant in Oman and the UAE but also found across the world including in the USA, Europe, Africa, Japan and Australia. We have conducted successful pilots and we are now currently building large-scale demonstration projects in Oman and the UAE. Our process is safe, scalable and lasts forever.

The role of Article 6.4

44.01 believes the Article 6.4 guidance should set shared international standards to enable frictionless trade of emissions abatement/carbon credits.

For the international carbon market to function effectively, we need clarity and alignment on standards and regulations, including certified methodologies for monitoring and verification. We see the 6.4SB helping to set those international standards, and the registry administrator collating projects that align with those standards.

Furthermore, we also see the Article 6.4 guidance providing clear differentiation between different types of carbon sequestration, and especially between truly permanent carbon removal and reversible carbon storage pathways. The 6.4SB can play an important role in helping clarify levels of permanence and setting appropriate monitoring and insurance requirements for technologies that provide reversible carbon storage.

However, there are already competing measures being developed at national and multinational level, including the USA's Inflation Reduction Act and the EU's Carbon Removal Certification Framework. It is important that, as much as possible, all these frameworks are aligned, otherwise we could see CDR providers migrating to lower-standard jurisdictions.

Measurement, Monitoring, Reporting and Verification (MMRV)

The integrity and credibility of the carbon market is dependent on stringent, transparent monitoring requirements that ensure:

- Buyers can be confident of the type and duration of carbon removal they have purchased
- Risk of reversal is minimised
- Any reversals are identified quickly so that they can be addressed safely and rapidly
- Where reversal occurs, those who have purchased 'reversed' carbon credits, or who have suffered because of the reversal, are compensated adequately

For these reasons, we believe the monitoring period should begin with the initial capture of CO₂, continue through its storage and sequestration, and only finish if/when the CDR provider can demonstrate that it is no longer possible for the CO₂ to be re-released back into the atmosphere, for example after CO₂ has been mineralised.

Exact monitoring requirements will vary across different carbon capture and sequestration technologies and the frequency of monitoring reports might decrease over time if the risk of reversal decreases, but some form of monitoring and reporting should always be required unless and until a sequestration provider can demonstrate permanent carbon disposal/removal.

For carbon mineralisation, we would propose the injection site should be monitored continuously from the point of injection until all the CO₂ has been mineralised. Data from this monitoring should be reported once a year for verification purposes. Once full mineralisation of CO₂ has been verified it will be impossible for the CO₂ to escape back into the atmosphere. There will therefore be no requirement for continued monitoring after this point.

44.01 is developing a proprietary measuring, monitoring, reporting and verification (MMRV) methodology to measure the rate of mineralisation, ensure the safety of our projects, and ultimately prove that we have removed all the injected CO₂. Our methodology includes a combination of geochemical and geophysical methods that allows quantitative monitoring of mineralised CO₂ in a geologic reservoir.

We anticipate MMRV methodologies like this will become significant value differentiators for CDR providers, and while we agree with the 6.4SB's commitment to transparency in MMRV, we feel it is important that transparency requirements do not undermine intellectual property. It is possible to back-engineer MMRV methodologies from the data they produce, so this data should be protected from potential competitors. Options for how this might work include:

- CDR providers publish a summary or interpretation of their MMRV data publicly but are not required to publish the raw data. This raw data must be held for an appropriate period depending on the nature of the CDR technology, and can be requested by overseeing authorities, who must keep it confidential.
- A neutral third-party body is established with responsibility for verifying carbon removal and reversals. This body has access to all MMRV data, but this data is not made publicly available.
- Existing standards bodies are empowered to fulfil this function but are regularly audited by 6.4SB.

Crediting period

We understand the crediting period to reflect the duration of a carbon removal activity (i.e. how long the CO₂ will remain sequestered).

For CDR activities that offer truly permanent removal, for example by mineralising CO₂ or converting it into another inert state, this period should last forever, once permanent carbon removal has been demonstrated and verified.

For CDR activities that offer temporary or reversible sequestration, the crediting period would need to be renewed periodically in line with monitoring data confirming the CO₂ was still sequestered.

Reversals

It is important that CDR buyers are protected from the risks of reversals, but also that local communities are protected and compensated from potential safety issues, particularly in cases where CO₂ or other greenhouse gases are stored under high pressure.

For this reason, we believe insurance related to reversals should cover not only the cost of re-sequestering any escaped CO₂ but also any potential environmental and safety impacts. This may require a mix of insurance products, for example a buffer pool of carbon credits to address potential reversals combined with a standard insurance product to compensate local communities and/or governments for ecological damage.

We would suggest the method and timeline for addressing reversals is a matter for negotiation between CDR purchasers, CDR providers and insurers. We anticipate this would vary according to the CDR methodology and the specific activity.

44.01's technology eliminates CO₂ by converting it into inert carbonate material. Once this mineralisation has taken place, the process is not reversible. We therefore do not believe our process requires insurance after mineralisation of all injected CO₂ has been verified. Any buffer credits held until that time should be released to the carbon market.

Accounting for removals and leakage

Accounting for the net amount of CO₂ removed through in-situ mineralisation should encompass all project emissions resulting from operation of the mineralisation facility. These include emissions from on-site fuel combustion, purchased electricity and heat, as well as those associated with water procurement, transport and consumption. Additionally, any intentional and unintentional discharges resulting from the storage and injection of the CO₂ should be included as project emissions.

44.01's MMRV methodology will enable us to account for these emissions, and to monitor for any leaks from the subsurface prior to mineralisation taking place.

Contribution to sustainable development

44.01, like many CDR technology companies, takes a 'planet-first' approach to technology development, ensuring the environment and local communities are not adversely impacted before taking any measures to scale up our solution. The MMRV measures outlined in this document are designed to identify and help mitigate any potential environmental or social damage quickly and effectively.

It is also important to reflect the sustainable development benefits of CDR technologies like 44.01's.

Engineered CDR technologies are being deployed across the 'Global South' and are already making a significant contribution to sustainable development goals, beyond the obvious contribution to SDG 13: Climate Action. Many countries in the 'Global South' are attractive destinations for CDR technologies given their capacity to provide renewable energy (e.g. solar) and the abundance of geological formations suitable for carbon sequestration (e.g. peridotite). Deploying CDR technologies can help decarbonise developing countries, bring employment and skills development opportunities (particularly pertinent in regions like the Middle East that are transitioning away from hydrocarbon-intensive industries), and provide developing countries with a way to monetise previously overlooked natural resources, such as geological sequestration sinks.

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Thank you for the opportunity to respond to this consultation. We would be very happy to provide more information or to discuss this vital issue further.