Key insights into CDR standards requirements supporting MRV methods

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As a result of anthropogenic climate change there is a call to implement a rapid transition to Net-Zero greenhouse gas (GHG) emissions. However, reducing emissions is not going to be sufficient for climate stabilisation, and there is a need to remove CO_2 from the atmosphere through carbon dioxide removal (CDR). CDR will require more rigorous Monitoring, Reporting and Verification (MRV) because of the complexity of some of the processes and the requirement for CO_2 to be stored long-term. With a range of different novel approaches to CDR being developed there are difficulties in ensuring that the quality of each approach is regulated, as well as scalable to make meaningful impacts on climate change. The majority of standards and technology-specific methodologies available for CDR currently lack the scope required to become a governing standard. It is evident, from the formation of alliances and certified methodologies, such as the Enhanced Weathering Alliance and European Biochar Certification, that progress in developing CDR approaches requires collaboration from industry. Yet, as more companies develop new standards there is a risk of making meaningful comparisons of CDR approaches more complex, because of inconsistent MRV methodologies.

Current approaches for CDR can be engineered or nature-based. In both cases monitoring of large temporal and spatial zones is required, and permanence is an important consideration, thus models must be deployed to quantify the evolution of captured CO_2. To verify such models, accurate sampling and testing methodologies are critical. At a practical level, engineering specifications are needed to assure quality. If these specifications are not built on proper standards (e.g. CEN and ISO) problems will arise in defining the requirements of the process between customers, producers, and regulators. C-SINK, an EU/UKRI-funded project, aims to deliver a package to support the large-scale deployment of CDR, including pre-standards for a range of different land application technologies, such as enhanced weathering, biochar, artificial soils, and biological CO_2 fixation. These technologies introduce key challenges, such as the sources of variance, that must be considered to determine CDR efficiency, ensuring also a robust method for high precision carbon credit calculation. Therefore, field trials will be carried out across Europe to evaluate pre-standards through *in situ* MRV testing as part of the C-SINK project.