



Monitoring, Verification, and Reporting

An Oxford Offsetting Principles (OOP)-aligned portfolio requires robust monitoring, verification, and reporting (MRV) protocols, to ensure the environmental integrity of emission reduction or removal units.¹ Effective MRV protocols are particularly important for the development and upscaling of a diverse pool of projects, as demonstrated through carbon dioxide removal (CDR) pathways. CDR deployment is unavoidable under all scenarios projected in the [Sixth IPCC Assessment Report](#). Moreover, a truly OOP-aligned portfolio requires the full transition to durable removals to counterbalance residual hard to abate emissions. Effective MRV protocols are a critical component in fostering confidence and ensuring the net zero alignment of the carbon market. The science undergirding MRV is rapidly evolving, leading to potential uncertainty in the evolution of protocols in the future. Indeed, an assessment of 117 MRV protocols across different CDR methods for the [2024 State of CDR](#) report found that protocols for novel CDR require additional research and technological inputs whilst those for conventional CDR require increased harmonisation. Across all protocols, there is a need to introduce more scientific clarity and cross-industry consensus on accounting concepts and parameters, particularly on durability requirements. Net-zero aligned MRV protocols should strike a balance between maintaining necessary flexibility for long-term integrity and providing sufficient confidence to secure robust levels of private investment.

(1) The Evolving MRV Guidance Ecosystem

The MRV landscape is dynamic, consistently evolving in line with best available science. Public and private standards are routinely revising increasingly interconnected high-level guidance on MRV protocols. A future consensus among standards bodies on the processes for reviewing and approving MRV protocols could provide greater assurance to market participants and enhance the credibility of nascent methods. Attempts to bring such a consensus based approach to the MRV ecosystem are ongoing, for instance, via the work of the [Carbon Removal Standards Initiative](#). To gain further consensus and standard interoperability, the MRV ecosystem is aided by quasi-regulatory third-party consultation processes such as those held by the Integrity Council for the Voluntary Carbon Market (ICVCM) or recognised by the Article 6.4 Supervisory Body under the Paris Agreement Crediting Mechanism.

Standards' guidance on MRV protocols should be translated into project level guidance, reflecting the unique methodological requirements to assess different types of projects and the distinct phases in their lifecycle. Crucially, project-specific MRV requirements can help maintain incentives for improving project performance over time. Methodologies typically oversimplify accounting measures for reversal risks and providing one singular buffer pool number for a given pathway, reducing the incentive for projects can innovate and improve over time. Tailoring MRV protocols to the specific pathway and project can

¹ For importance of robust MRV to ensure quality of mitigation efforts, see Probst, B. S., Toetzke, M., Kontoleon, A., Díaz Anadón, L., Minx, J. C., Haya, B. K., Schneider, L., Trotter, P. A., West, T. A. P., Gill-Wiehl, A., & Hoffmann, V. H. (2024). *Systematic assessment of the achieved emission reductions of carbon crediting projects*.

also help ensure the costs of MRV compliance are appropriate for the risk profile of a given project.

(2) MRV Protocols for Early-stage Technologies

Credible MRV protocols are particularly imperative for nascent technologies, such as several durable CDR pathways. Considering that the CDR industry is developing in the wake of the confidence crisis in the offsetting industry, robust MRV protocols can help deliver long-term integrity, which in turn can bolster investor confidence. However, these forward-looking integrity goals must be balanced with the short-term need to unlock critical capital for novel infrastructure. To reduce the cost barriers of these protocols, including high operating expenses, government support is critical. Research from the [LSE Grantham Research Institute](#) recommends that governments play an active role in reducing MRV costs—for example, by providing targeted capital expenditure support for advanced sensors, remote sensing applications, and AI-driven data verification. MRV for early-stage technologies should be both scientifically rigorous and adjust to market needs. To ensure against the risk of non-delivery of the climate outcome, MRV for novel pathways can include various measures such as a rigorous due diligence and risk assessment, or tiered buffer pools, allowing nascent technologies a longer timeframe to deliver carbon credits or larger buffer pools. Investment should also not be limited to carbon credits alone but should support non-credit-based units which can be used for contribution rather than compensation purposes. Such adjustments to pathway-specific MRVs can provide more confidence to market participants, contributing to increased demand for urgently needed innovation.

(3) The Importance of MRV as a Path to Scale

Robust MRV provides an evident pathway to scaling demand. Integration of such units into domestic compliance markets, such as the UK and EU emissions trading schemes (ETS) as well as international markets such as the Carbon Offsetting and Reduction Scheme in International Aviation (CORSIA) scheme present open opportunities in this regard. The work currently being undertaken by the Article 6.4 Supervisory Body pertaining to the validation of certain methodologies also presents an opportunity in this regard. A balance must be struck, however, in recognising the fast-evolving nature of the science and technology underpinning CDR methods, which renders the MRV protocols governing them likely to also undergo significant change ex-post. Whereas their ability to adapt and evolve is critical to ensuring scientific rigour, this uncertainty risks undermining investor confidence in the short term. To combat this uncertainty, more conservative measures could be applied to methodologies from their early development stages, such as aggressive discounting to address potential future leakage. More conservative accounting measures upfront can also reduce complexity for monitoring processes. In this way, safeguards can be put in place to guard against the potential invalidation of previously invested assets, as methodologies adapt and evolve. To increase certainty in this regard, MRV protocols should be made interoperable with national greenhouse gas accounting, *ensuring that removals have greater political utility in achieving nationally determined contributions*. The requirements and the cost of MRV protocols should also be tailored to the specific capacities and responsibilities of different types of jurisdictions.