Five Requirements for High-Quality CDR Audit

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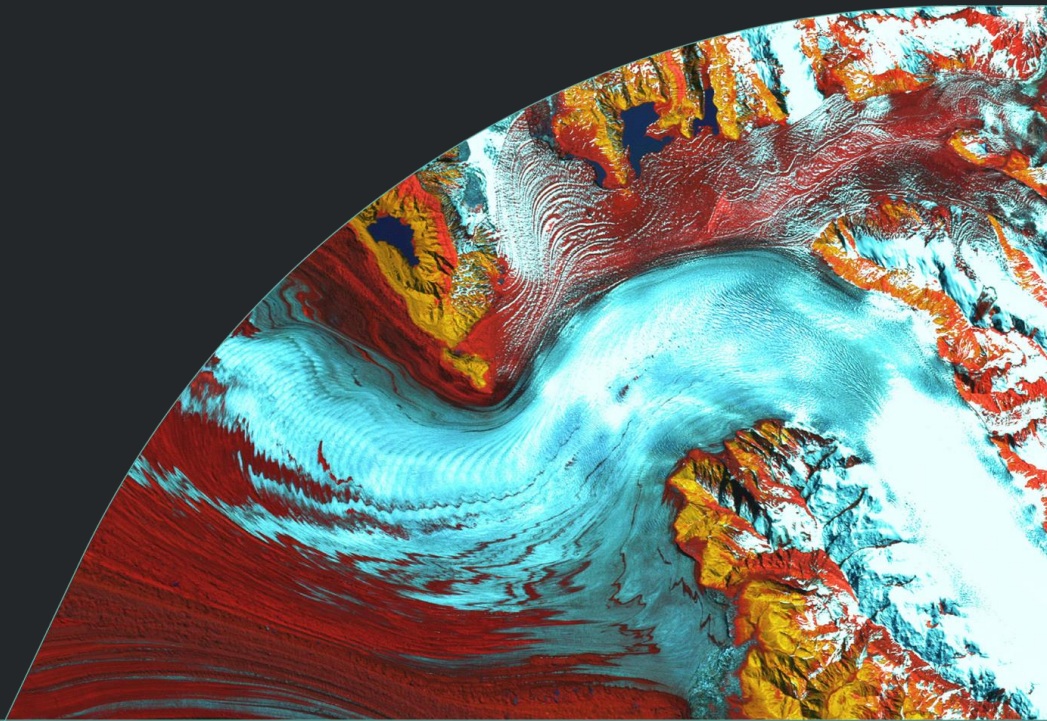
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Executive Summary

The carbon dioxide removal (CDR) industry stands at a critical juncture where credibility depends on robust audit practices. As more projects enter the market and new technologies emerge, the need for reliable verification is vital for the integrity of the market. This article outlines five essential requirements for high-quality CDR audits, drawing from practical experience in methodology development and project verification.

These requirements address the complete audit cycle, from understanding the hierarchical nature of CDR validation to selecting appropriate assurance levels, managing the dynamic nature of audits, ensuring auditor competency, and maintaining transparency. The guidance provided balances the need for rigorous verification with the practical constraints faced by innovative CDR projects.

As the CDR industry grows, one question keeps surfacing: How do we know if these projects deliver what they promise? The answer lies in high-quality auditing. However, not all audits are created equally. Success in carbon removal verification requires understanding and implementing five key requirements that separate effective CDR audits from the rest.

1. Understanding the Audit Hierarchy

Based on our experience in developing methodologies and conducting audits, we recommend implementing a clear hierarchy to ensure the robust verification of carbon removal claims.

First should come the methodology audit. Here, a CDR approach would be evaluated against recognized standards like ISO14064 or registry requirements such as Gold Standard. This master blueprint must pass scrutiny before project implementation begins. Getting the methodology right is the first rung on the ladder to having verifiable credits.

Next comes project validation. Once a methodology passes muster, auditors verify that a specific project correctly implements this approved methodology. This validation confirms that the project design aligns with the methodology's requirements for measuring, reporting, and verifying (MRV) carbon removal.

The final step is non-negotiable: All carbon removal claims must be verified against the validated project design, including any methodologies and/or protocols used. This verification is essential – it's the only way to ensure that promised carbon removal outcomes are being delivered. What makes this process particularly robust is its flexibility for improvement. Each audit iteration presents opportunities for refinement. Different auditors might highlight different aspects of the project that could be enhanced, bringing fresh perspectives and diverse expertise. While this might mean adjusting processes or updating documentation methods, these changes ultimately strengthen the project and improve the accuracy of carbon removal accounting.

2. Align Assurance with Claims

The level of assurance for CDR audits is governed by ISO 14064-3:2019, which sets the international standard for greenhouse gas (GHG) validation and verification. However, choosing the right level isn't just about picking the highest possible assurance – it's about selecting what's achievable and appropriate for the project.

Reasonable Assurance

ISO 14064-3 defines reasonable assurance as providing a high but not absolute level of confidence. This involves detailed sampling of data across critical measurement points, verification of calculation methodologies, cross-checking of primary data sources, review of monitoring systems and controls, and site visits during key operational periods.

Limited Assurance

Under ISO 14064-3, limited assurance involves a less granular review of data collection processes, spot-checking of critical calculations, a focus on system design rather than comprehensive data verification, and fewer site visits with more remote verification.

Understanding Real-World Constraints

When planning a CDR project audit, pressure may be felt to achieve the highest possible assurance level. However, the reality is more nuanced. Many innovative CDR projects face inherent limitations that make complete or even reasonable assurance impractical. Consider a direct air capture (DAC) facility testing new absorbent technology – some parameters simply can't be measured with traditional methods yet. Or consider an enhanced weathering project in a remote location where frequent site visits would be prohibitively expensive or logistically impossible.

3. Don't Prescribe What Auditors Want to See - Embrace the Dynamic Nature of Audits

What many project developers don't realize is that audits rarely follow a straight line from start to finish. Think of an audit as an investigation that follows the evidence where it leads. Although there might be a temptation to pre-package everything an auditor is expected to see, this approach often misses the mark.

A straightforward plan to verify carbon removal calculations might initially be in place, but inconsistencies in the data could require deeper investigation. An initial site visit might reveal that the monitoring system needs additional controls, triggering a broader review of the measurement processes.

This fluid nature of audits isn't a flaw – it's a feature. As auditors dig deeper into the project, they often uncover areas that need more attention. A simple spot check might reveal patterns that suggest the need for more comprehensive sampling. What started as a routine review of system controls might expand into a detailed examination of specific processes when unexpected variables emerge.

4. Choose Competent Auditors - The Right Expertise at the Right Time

Choosing an auditor is an important step. Some registries require auditors to have American National Standards Institute (ANSI) National Accreditation Board (ANAB) certification. This prescribed requirement can be written into a methodology even if they aren't requirements at the registry level. ANAB requires internal checks for auditors, including conflicts of interest (COIs). This is critical because COIs are an insidious and systemic problem that reduces the quality of audits and, thereby, the integrity of the credits being sold.

Selecting appropriate auditors requires understanding what expertise is needed at each stage of the process. Different phases of validation and verification demand different levels of technical competency.

Methodology Validation: Deep Expertise Required

At this critical first stage, while methodologies are often developed by world-leading scientists pushing the boundaries of CDR innovation, they need to be validated by auditors who combine strong scientific understanding with practical audit experience. These auditors must have the following:

- **Scientific Competency:** Advanced scientific understanding of carbon cycle dynamics, biogeochemical processes, measurement technologies, uncertainty quantification, and the ability to evaluate scientific models.

- **Critical Audit Knowledge:** Understanding of additionality, permanence, leakage, and life-cycle analysis (LCA) across attributional, consequential, and displacement impacts.

- **Project Validation:** A technical understanding is critical. Similar to methodology validation, project validation requires auditors with a solid scientific understanding of the CDR technology and practical knowledge of industry standards.

- **Carbon Removal Verification:** Well-documented projects enable a broader auditor pool. Once the methodology is validated and the Project Design Document (PDD) is properly established, verification of carbon removal reports becomes more straightforward. A well-written PDD creates a framework that allows consistent verification by different auditors.

This combination of scientific expertise, technical, and audit experience is essential. Their strong scientific backgrounds enable them to evaluate methodologies effectively, while their audit expertise establishes proper verification frameworks.

5. Make Results Public - Transparency Drives Innovation

The carbon removal industry advances faster when we learn from each other. While protecting proprietary technology is essential, sharing audit results and methodological approaches creates a rising tide that lifts all boats, or in this context, CDR projects.

Methodology development benefits enormously from public scrutiny. When draft methodologies are opened for public comment, the entire industry gains valuable insights. Industry experts can identify potential gaps, while scientists challenge assumptions. Practitioners bring real-world implementation experience to the table, flagging potential challenges before they become problems.

Publishing project boundaries and scope decisions establish precedents for similar projects and create consistent approaches across the industry. As more projects share their LCA approaches, we're developing better practices for boundary setting, uncertainty management, and displacement effect calculations.

When it comes to sharing audit results, CDR projects must balance transparency with confidentiality. The key is focusing on information that advances industry knowledge and helps establish standards while carefully protecting truly confidential business information and competitive advantages.

Conclusion

The path to credible carbon removal claims requires careful attention to each of these five requirements. While no audit system is perfect, following these guidelines helps ensure that CDR projects can defend their carbon removal claims while contributing to industry-wide improvement.

Key takeaways:

- The audit hierarchy provides a framework for systematic validation and verification.

- Choosing the right assurance level depends on project maturity and capabilities.

- Expect and embrace the dynamic nature of audits.

- Match auditor expertise to the project phase - scientific expertise is crucial early, while good documentation enables broader verifier pools later.

- Transparency builds market confidence and advances industry standards.

As the CDR industry matures, these requirements will likely evolve. However, the fundamental principles they represent – systematic validation, appropriate assurance, dynamic investigation, competent verification, and transparent reporting – will remain essential. Projects that embrace these principles strengthen their credibility and contribute to building a more robust and trusted carbon removal industry.

The challenge of climate change demands that we get this right. While individual projects may focus on specific removal technologies, our collective success depends on building and maintaining trust in CDR verification. Through careful attention to these audit requirements, we can ensure that the carbon removal industry continues to grow with scientific integrity and effective verification practices, ultimately contributing to a sustainable future for all.

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