SOCIALCARBON®

Validation and Verification Manual

V1.2

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About

Developed in 2005 in Tocantins, Brazil the SOCIALCARBON Standard was created by Ecologica Institute, a Civil Society Organisation of Public Interest (OSCIP). The SOCIALCARBON Standard was designed during the implementation of Brazil's first carbon sequestration project in the Bananal Island, with the differential of ensuring community involvement in the initiative. Since 2022, SOCIALCARBON has been managed by the Social Carbon Foundation, a UK Charitable Organisation with the mission to act in mitigating the effects of climate change through scientific research, environmental conservation, and community-based sustainability activities.

Since 2022, the SOCIALCARBON Standard has transitioned from a co-benefits standard to a full standard for nature-based solutions. We believe that climate action and nature-based solutions must include the participation of the local people or they will not be sustainable in the long-term. The transition of the SOCIALCARBON Standard into a full standard for nature-based solutions further supports our mission of scaling local action against biodiversity loss and climate change, but on a global scale. To enable this vision to become a reality, the Social Carbon Foundation develops high quality standards to facilitate market-driven mechanisms that accelerate the development of projects which deliver real results for our communities and the planet.

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1. Introduction

1.1 Overview

Independent third-party validation and verification plays a vital role in upholding the integrity and quality of greenhouse gas (GHG) emission reductions and removals achieved by SOCIALCARBON projects. Validation/verification bodies (VVBs) have three main roles under the SOCIALCARBON Standard: to validate projects, verify GHG emission reductions and removals, and assess third party-developed methodology elements under the methodology approval process.

VVBs are eligible to provide validation and verification services under the SOCIALCARBON Standard if they are:

1) Accredited under ISO 14064-3 and ISO 14065 by an accreditation body that is a member of the International Accreditation Forum; or
2) Approved under a SOCIALCARBON-approved GHG program[1] such as the United Nations Clean Development Mechanism (CDM) as a Designated Operational Entity (DOE).

The detailed accreditation requirements for VVBs are set out in the SOCIALCARBON Standard Guide. The VVB annual fee is set out in the Fee Schedule.

The objective of the Validation and Verification Manual is to provide guidance to increase the consistency, quality and transparency of validation and verification of projects under the SOCIALCARBON Standard and to provide guidance on assessing methodologies under the SOCIALCARBON methodology approval process.

The manual does not contain SOCIALCARBON requirements but rather provides further clarification on SOCIALCARBON rules. In addition, the manual does not address other VVB accreditation-specific topics, nor does it offer methodology-specific or sectoral scope-specific guidance (although various project types are discussed as examples).

VVBs must refer directly to the applied methodology when conducting project validation or verification. While VVBs are the primary intended users of this manual, the guidance

[1] Currently only the United Nations Clean Development Mechanism (CDM) is approved.

presented in this manual is also considered useful for project proponents and methodology developers.

This document shall be updated from time-to-time and readers should ensure they are using the most current version of the document.

1.2 Key requirements and references

The SOCIALCARBON Standard provides the standard and framework for independent validation of projects and methodologies as well as verification of GHG emission reductions and removals. The key requirements of the SOCIALCARBON Standard are described in the following documents:

- SOCIALCARBON Standard Guide
- SOCIALCARBON v6.1
- Standard Definitions

Other procedural requirements are described in the following documents:

- Registration and Issuance Process
- Methodology Approval Process
- AFOLU Non-Permanence Risk Tool

These documents are available on the SOCIALCARBON website and are updated periodically when the Social Carbon Foundation releases program updates. New requirements are effective immediately upon release, though, where appropriate, a grace period may be provided to allow stakeholders sufficient time to transition to the new requirements. VVBs must refer directly to the SOCIALCARBON website for full information on program updates.

1.3 Definitions

Definitions and acronyms that apply to the SOCIALCARBON Standard are set out in the SOCIALCARBON document *Standard Definitions*.

1.4 Seeking clarifications

VVBs that need clarification directly from the Social Carbon Foundation are encouraged to submit their questions directly to Social Carbon Foundation at info@socialcarbon.org. For responses to proprietary or commercially sensitive questions, VVBs may contact a SOCIALCARBON Standard officer directly. Where VVBs use clarifications provided by SOCIALCARBON staff or clarifications provided in this manual as a basis for interpreting SOCIALCARBON rules, they must also provide a direct reference to the SOCIALCARBON requirement set out in the SOCIALCARBON Standard documents to which the clarification applies. Clarifications provided by Social Carbon Foundation staff or in this manual are not decisions and should not be misinterpreted as approvals or consultations of specific project activities.

1.5 Overarching validation and verification principles

Overarching principles are useful for helping VVBs understand the overall goals of the SOCIALCARBON Standard. The principles serve as guidance for VVBs where project or methodology-specific requirements are not fully prescriptive.

The SOCIALCARBON Standard principles are:

- Relevance
- Completeness
- Consistency
- Accuracy
- Transparency
- Conservativeness

SOCIALCARBON principles form mandatory criteria for auditability that the VVBs must consider when validating or verifying projects, or conducting methodology assessments. For example, where a project does not use data and methods that enable meaningful comparisons of GHG related information, the VVB must note it as a non-conformance with the SOCIALCARBON principle of consistency.

In some cases, VVBs may need to use professional judgment in applying the SOCIALCARBON principles. For instance, the principles of accuracy and conservativeness are interrelated and often the principle of conservatives serves as a moderator to the principle of accuracy. The accuracy principle implies that VVBs must assess whether uncertainties with respect to GHG measurements, estimates or calculations have been reduced as much as is practical and measurement and estimation methods are used in a manner that avoids bias. The conservativeness principle implies that assumptions, values and procedures used in the project or methodology do not result in an overestimation in the quantification of net GHG emission reductions and removals. Therefore, where the data or procedures associated with the project or methodology have uncertainties, VVBs must apply the conservativeness principle.

2. Elements of Validation and Verification Plans

When a VVB is approached to conduct a validation or verification, the VVB and its client must come to agreement on the objectives, scope, criteria, level of assurance and materiality of the validation or verification assessment. These five elements form the basis for validation or verification plans and associated sampling plans. Such agreements must recognize Social Carbon Foundation as one of the primary intended users of project descriptions, monitoring reports and resulting validation and verification reports. Prior to finalizing an agreement. The various steps include determining risks to team member impartiality and determining whether the VVB can assemble a team with competencies and resources appropriate for completing the scope of work.

2.1 Objectives

Overview

The first step in conducting a validation or verification is to establish the objectives and identify the GHG assertion to be assessed as part of a validation or verification. Assessment of these assertions against the requirements of the SOCIALCARBON Standard and the applied methodology is the core objective for any project validation or verification. The objectives may vary depending on whether the engagement is a validation or verification.

The scope, criteria, level of assurance, and materiality of the validation and verification assessment should also inform the objectives.

Key Elements

2.1.1 Validation Objectives

Validation involves the assessment of a project description wherein VVBs must assess the following:

- Project conformance to SOCIALCARBON rules;
- Project conformance to the applied methodology, including the procedure for the demonstration of additionality specified in the methodology; and
- Likelihood that methods and procedures set out in the project description will generate verifiable GHG data and information when implemented.

2.1.2 Verification Objectives

Verification is conducted once project implementation has commenced. It is the ex-post assessment of the monitored GHG data and information. During verification, VVBs must evaluate the monitoring report and assess the following:

- The extent to which methods and procedures, including monitoring procedures, have been implemented in accordance with the validated project description. This includes ensuring conformance with the monitoring plan.
- The extent to which GHG emission reductions and removals reported in the monitoring report are materially accurate.

2.2 Scope and criteria

Overview

The scope of a validation or verification helps place physical and temporal boundaries on the GHG data and information that must be assessed. Criteria are the set of requirements against which the project is evaluated.

Key Elements

In determining the scope of the assessment, VVBs must take into account the physical boundaries, sites or facilities of the project and the temporal boundaries (ie, the years when GHG emission reductions and removals are quantified). For validation, the temporal boundaries are determined by SOCIALCARBON project crediting period requirements set out in the SOCIALCARBON Standard. For verification, the temporal boundaries are determined by the length of the monitoring period.

The mandatory requirements of the SOCIALCARBON Standard guide the criteria against which the validation or verification is conducted. The methodology applied to the project also informs the criteria for validation and verification; therefore, it is essential that VVBs thoroughly understand a methodology prior to undertaking an assessment. Where projects apply methodologies from other approved GHG program such as the Clean Development Mechanism (CDM), VVBs should refer to any guidance provided by such programs with regard to the application of the methodology. Some of the key validation and verification criteria are discussed further in Section 3.

VVBs are not expected to document every criterion that will apply to the validation or verification engagement. Instead, it is sufficient to indicate the relevant documents containing the criteria such as the SOCIALCARBON Standard and the applied GHG methodology.

2.3 Materiality

Overview

Materiality, as applied to GHG projects, is the concept that errors, omissions or misrepresentations, individually or in aggregate, can affect the GHG assertion and therefore affect the decisions of the intended users. The materiality threshold is non-negotiable between the project proponent and the VVB and must be informed by the SOCIALCARBON rules on materiality thresholds with respect to project scale.

Key Elements

Materiality has both qualitative and quantitative aspects. When assessing qualitative materiality, VVBs must determine whether the project conforms to SOCIALCARBON rules and methodology requirements. Certain qualitative discrepancies such as a discrepancy with respect to ownership or applicability criteria must always be noted as a material non-conformance. In other cases, qualitative discrepancies will be less definite and may ultimately manifest themselves as quantitative discrepancies. When considering less definite qualitative discrepancies, VVBs should use their professional judgment to determine the issues that immediately need to be identified as material and which require further investigation through sampling and testing.

When assessing quantitative materiality of data errors, omissions or misrepresentations, VVBs must assess materiality with respect to the aggregate estimate of GHG emission reductions and removals set out in the project description or monitoring report. Uncertainties inherent in an approved GHG methodology are not to be considered.

The materiality threshold varies depending on the amount of the project's GHG emission reductions and removals, as set out in the SOCIALCARBON Standard. The materiality threshold applies equally to validation and verification. While all material errors, omissions and misrepresentations must be addressed for a project to receive a positive validation or verification opinion, if non-material errors are found in the project documents, VVBs should ensure that such errors are addressed by the project proponent where practicable.

Example - Qualitative Material Discrepancy

Qualitative discrepancies that are material:

- An Afforestation and Reforestation (ARR) methodology requires that the evaluation of the baseline scenarios include, at minimum, historical practice baseline scenarios based on the project proponent's previous and current ARR activities, and common practice baseline scenarios based on evidence of comparable ARR for similar property types and situations in the region. While the project description provides a detailed analysis of historical practices, the VVB finds that the identification of common practice baseline scenarios is based on national data that does not differentiate between different kinds of ARR scenarios. The VVB must consider this as a material discrepancy.
- A project applies a meter calibration schedule that differs from what is set out in the validated project description. The VVB must consider this as a material discrepancy.

Qualitative discrepancy that may not be material:

- Gaps in procedures for quality management of data need not be a material discrepancy unless the VVB determines that such weaknesses in the data management procedures could result in quantitative discrepancies.

2.4 Level of Assurance

Overview

The SOCIALCARBON Standard requires a reasonable level of assurance in validation and verification that GHG assertions are free of material errors, omissions and misrepresentations. This is non-negotiable between the project proponent and the VVB.

Key Elements

In a reasonable level of assurance engagement, the VVB must test a sufficient amount of data to ensure with confidence that no material errors are present. The amount of testing to be conducted is determined based on the outcome of a risk assessment (see Section 3.3.1.1).

3. Project Validation and Verification Process

SOCIALCARBON Standard documents provide detailed rules and requirements that VVBs must refer to when conducting project validations or verifications. This section provides further guidance on some of the key areas of validation and verification.

3.1 Pre-validation assessment

VVBs are encouraged to conduct an assessment prior to undertaking project validation to ensure the project is eligible under the SOCIALCARBON Standard. The pre-assessment should, at minimum, focus on the following:

- VVBs must confirm that the validation can be completed within the relevant validation deadline, relative to the project start date (ie, the date the project starts generating emission reductions and removals). The project start date is fixed and cannot be adjusted to ensure that validation deadline is met.
- VVBs must confirm that the project applies a methodology eligible under the SOCIALCARBON Standard. Eligible methodologies include SOCIALCARBON methodologies and methodologies approved under CDM. The project must be validated against a valid version of the applied methodology. Note the relevant methodology grace periods on the GHG program website.
- In the case of AFOLU projects, VVBs must confirm that the project is in conformance with the eligibility requirements for AFOLU projects set out in SOCIALCARBON document *SOCIALCARBON Standard v6.0*. For example, project activities that convert native ecosystems are not eligible under the SOCIALCARBON Standard.
- Where the project has registered and issued credits under the CDM, VVBs must check the issuance date of the validation report used to request CDM registration to determine whether the project complies with SOCIALCARBON rules on validation deadlines.

Keep in mind

VVBs conducting a pre-validation assessment must confirm whether the project has applied a valid version of the methodology. SOCIALCARBON and CDM methodologies are updated periodically. In such cases, projects applying the previous version of the methodology must issue a validation report by the deadline posted on the methodology page of the SOCIALCARBON and CDM website.

3.2 Key validation and verification requirements

VVBs must assess the project's conformance with all SOCIALCARBON Standard requirements as well as the requirements of the applied methodology. This section provides guidance on some of the main requirements that need to be assessed, highlighting common issues and challenges faced by VVBs.

3.2.1 Project ownership

Overview

Under the SOCIALCARBON Standard, a project is only eligible where the project proponent can demonstrate project ownership. Project ownership is the legal right to control and operate the project activities.

Key Elements

VVBs are not expected to provide an opinion on the legal ownership of GHG emission reductions and removals, but VVBs must assess project ownership with a reasonable level of assurance. VVBs must assess whether the project proponent can claim project ownership based on the evidence provided by the project proponent. Such evidence may include a contractual right such as legal title to the plant or equipment that generates GHG emission reductions and removals or a legally binding agreement such as a long-term lease for the management of lands. VVBs should refer directly to the *SOCIALCARBON Standard v6.0* for a list of acceptable forms of evidence of project ownership.

While the level of due diligence required to evaluate evidence of project ownership varies depending on the project, VVBs must, at minimum, assess whether the project proponent has provided sufficient evidence to demonstrate the authenticity of the documentation presented to demonstrate project ownership. VVBs must also assess the regulatory or jurisdictional framework within which the project is being implemented to determine that there is no conflict with the project proponent's claims at a prima facie level[2]. VVBs are encouraged to solicit external expertise when evaluating a project in a geographic jurisdiction or sector where knowledge or expertise is limited.

Example – Project Ownership

A company develops a ARR project on land owned by the state government. The company has a long-term lease for the management of the land and provides the VVB with the lease as evidence of project ownership.

The VVB reviews the jurisdiction's regulatory framework and finds that state law recognizes customary land rights of indigenous peoples and local communities who reside in state-owned land. The law transfers rights to the natural resource benefits accruing from the land to local residents. The VVB notes that the state law raises a conflict with respect to the project proponent's claim to project ownership, and the VVB requires that the project proponent provide further evidence to demonstrate that project ownership is undisputed.

In response, the project proponent submits legal documentation that includes a benefits-sharing agreement established with a community residing in one section of the land. The documentation has the approval from the appropriate government authorities and the traditional authority customarily recognized by the community. However, the project proponent is unable to provide a similar agreement with a community residing in another section of the land and therefore redefines the project area to limit it only to the area where a benefits-sharing agreement has been secured. The VVB concludes that the legal documentation provides prima facie evidence that the project proponent has secured project ownership, which now encompasses a smaller area.

[2] Prima facie implies sufficient evidence to establish a fact or raise a presumption unless disproved or rebutted and is generally understood to be a flexible evidentiary standard that may at first appear sufficient.

3.2.2 Methodology Applicability

Overview

All methodologies include specific conditions that a project applying the methodology must meet in order to be eligible. VVBs must assess whether the project proponent has met these applicability conditions.

Key Elements

Project proponents are expected to detail how their project meets all applicability conditions. VVBs are required to assess the project against each of these applicability conditions to confirm that methodology requirements are satisfied. Applicability conditions may include restrictions with respect to the nature of the technology or measure used in the project, geographic conditions, baseline conditions and eligible carbon pools. Failure to conform to any applicability conditions must be viewed as a material discrepancy.

3.2.3 Baseline Scenario

Overview

The baseline scenario is a hypothetical reference case that most likely represents what would have occurred in the absence of the GHG project. Given its hypothetical nature, baseline scenarios can carry significant uncertainty and are a common source of material error.

Key Elements

VVBs must assess whether the baseline scenario selection procedure complies with the procedure set out in the methodology. Often the procedures for identifying the baseline scenario are combined with the procedures for demonstrating additionality. For example, many CDM methodologies require the use of the baseline assessment procedures set out in the CDM methodological tool *Combined tool to identify the baseline scenario and demonstrate additionality*.

Methodologies may use a project method approach in the procedures for determining the baseline scenario.

3.2.3.1 Project Method

A project method is a methodological approach that uses a project-specific approach for determining the baseline scenario. Viable alternative baseline scenarios are assessed against one or more barriers to implementation such as investment, technological and institutional barriers. The assessment of baseline scenarios should therefore focus on the identification of the most plausible baseline scenario (i.e., a scenario that faces the fewest barriers to implementation). For example, in a retrofit project that involves upgrading equipment, VVBs must consider whether the continued use of existing equipment would have been a plausible baseline scenario if the equipment was reaching the end of its useful life.

Keep in mind

VVBs should consider the following when assessing a project method for identifying the baseline scenario:

- Have all methodology requirements been met?
- Has a complete set of baseline alternatives been identified, within a justified geographic and temporal boundary relevant for the project?
- Are all alternative baseline scenarios functionally equivalent to the project? (This may not apply for AFOLU projects)
- Has objective evidence been provided to support the barriers assessment? Has the VVB sampled and tested this evidence?
- Where two or more alternative baseline scenarios seem equally likely, has the conservativeness principle been applied to select the scenario that will result in the fewest GHG emission reductions and removals?

3.2.3.3 AFOLU-Specific Guidelines

Assessing the baseline scenario in an AFOLU project can be particularly challenging due to the variety of specific requirements within each methodology.

Some questions VVBs should consider when assessing alternative land use scenarios and whether these scenarios are realistic and credible include:

- Do the land use scenarios include the continuation of pre-project land use, the proposed project activity and an alternative land use within the project boundary?
- Do the land use scenarios include the observed land use activities in surrounding geographical areas with similar socio-economic and ecological conditions?
- Do the land use scenarios include activities that occurred within the proposed project activity boundary in the past 20 years?
- Is the identification of a realistic and credible land use scenario based on analysis of land use records, field surveys and interviews?

Project proponents must justify the baseline scenario, and claims of alternative land uses, by providing sufficient evidence such as reports on geospatial planning, legal requirements and economic feasibility studies.

3.2.4 Additionality

Overview

Additionality is the concept that credited GHG emission reductions and removals must exceed (i.e., be additional to) what would have been achieved under the business-as-usual scenario, and credited reductions and removals must be attributable to the intervention of the carbon market.

Specific requirements and criteria for demonstrating additionality are specified in methodologies. VVBs must assess project additionality against these criteria in full. Methodologies may reference additionality tools from the SOCIALCARBON or approved GHG programs such as CDM. When a methodology references a tool such as the CDM Combined tool to identify the baseline scenario and demonstrate additionality, VVBs need to assess additionality in accordance with the tool. VVBs must take account of relevant guidance issued in respect of the tool except where such guidance conflicts with SOCIALCARBON rules. For example, when projects apply the CDM tools for additionality, VVBs must refer to the decisions and guidelines issued by the CDM Executive Board on assessment of barriers, investment analysis and common practice analysis, though they can disregard the CDM requirement for prior consideration of carbon finance (the latter being addressed by the SOCIALCARBON requirement to have projects validated within fixed times of the project start date).

VVBs should note that SOCIALCARBON requirements on additionality set out in the *Methodology Requirements* section of the SOCIALCARBON Standard are high-level requirements not to be used by projects for the demonstration and assessment of additionality. Rather, the requirements provide the basis for methodologies to develop fully elaborated procedures for the demonstration and assessment of additionality.

Key Elements

The SOCIALCARBON Standard currently identifies one approaches for demonstrating additionality. This requires a regulatory surplus analysis step followed by a project-specific approach.

3.2.4.1 Regulatory Surplus

To be additional, the project activities shall not be directly mandated by any national and local laws, regulations, rules, procedures, other legally binding mandates and, where relevant, international conventions and agreements.

Example – Additionality (ARR)

An ARR project undertaken in Zambia has demonstrated additionality through the use of the *CDM Tool for the Demonstration and Assessment of Additionality* in accordance with the methodology. In conducting its assessment, the validation team reviewed the following:

Step 1: Identification of alternative land use scenarios to the proposed project activity

All identified alternative land use scenarios were deemed credible and legal.

Step 2: Investment analysis

The project proponent elected to use a simple cost analysis. However, the VVB deemed a simple cost analysis as inappropriate because the project proponent was expecting revenue from ecotourism in the project areas. The project proponent subsequently performed an investment comparison analysis using the IRR as a financial indicator. The results of the analysis indicated a five percent IRR for the project in the absence of carbon finance. Other alternatives suggested IRRs as high as 20 percent. No sensitivity analysis was conducted, which the VVB noted as a clarification request. The sensitivity analysis, which was later conducted, found the conclusions to be robust.

Step 4: Common practice analysis

Upon review, the VVB identifies that the project proponent has already been operating an ARR initiative in 10% of the proposed project area for the past 10 years. This existing area is not additional, therefore the VVB requests that this area be removed from the eligible project area.

3.2.4.2 Project Method

The project method requires that each project individually demonstrate that the project would not have been feasible in the absence of the intervention of the carbon market. The project method involves a barriers analysis step and a common practice analysis step. The barrier analysis and common practice analysis is discussed in greater detail in Section 5.2.4.

Where projects apply an investment analysis as part of the project-based demonstration of additionality, VVBs should consider the following:

- Has an appropriate method for analysis been applied? For example, a wind energy project will generate revenue beyond the sale of SCUs. The use of a simple cost-benefit analysis is not likely to be appropriate to the project context. Rather, a more detailed investment analysis would be required.
- Are the applied financial or economic indicators such as internal rate of return (IRR) or net present value (NPV) suitable for the project type and investment decision, and supported with objective evidence?
- Has uncertainty been adequately addressed in the analysis?
- How sensitive is the final result to changes in key assumptions and data?

In assessing the results of a common practice analysis step, VVBs must pay close attention to the following:

- Are the geographic and temporal boundaries appropriate? Various factors may change and influence alternative choices across geographic areas. The rate that technologies and practices evolve in the region or sector must also be considered.
- Is the justified common practice threshold appropriate? The prevalence of a project depends on the number of project alternatives, among other factors. The GHG Protocol for Project Accounting suggests applying a lower common practice threshold where several alternatives exist.
- Does the project activity qualify to be considered as a first-of-its-kind technology? A common practice analysis may not be required for emerging technologies. However, VVBs must assess whether the project activity meets the definition of first-of-its-kind. VVBs are encouraged to refer to CDM guidance to determine if the project activity qualifies as first-of-its-kind.

3.2.5 Ex-ante Quantification of Emission Reductions

Overview

VVBs must include an assessment of whether the GHG emission reductions and removals estimated in the project description will be achieved by implementing the project activity.

Key Elements

Providing assurance on future projections of GHG emission reductions and removals is inherently challenging. Various factors may influence the reductions ultimately achieved. In the assessment of GHG emission reduction and removal quantification, VVBs must, at minimum, review the following:

- Methodology equations: Where methodologies provide different options and procedures for quantifying baseline and project emissions, VVBs must confirm whether proper justification has been provided based on the choice of the baseline scenario, context of the project activity and other evidence provided. VVBs must also confirm whether correct equations have been used, reflecting the relevant methodological choices.
- Data and parameters: Where data and parameters are determined at validation (i.e., not monitored during the project crediting period), VVBs must assess all data sources, assumptions and calculations to verify that they are correct and applicable to the project. Where models are used to estimate GHG emission reductions and removals, VVBs must assess whether the model has been transparently and appropriately parameterized and calibrated for the project context. For example, where a project applies a model to estimate changes in soil carbon, and the model requires the use of a project-specific soil carbon decay rate, the VVB must determine the appropriateness of the data provided and its suitability to the given agro-ecological zone. In some cases, VVBs may need to review relevant peer-reviewed literature to ascertain the validity of the data or parameters provided by the project proponent

Keep in mind

Some projects have inherent uncertainty that cannot be resolved prior to project implementation. Examples include scientific uncertainty related to the use of models in the quantification or uncertainty surrounding weather patterns in solar and wind projects. Any such uncertainties must be transparently identified in the project's assertion of ex-ante GHG emission reductions

Example – Ex-ante quantification of GHG emission reductions

An off-grid, run-of-river hydroelectric project is being developed in Indonesia where the baseline scenario is the use of diesel generators. The methodology allows for determining the baseline based on the energy consumption of the technology in use in the absence of the project activity.

Baseline emissions are calculated, as follows:

$BE_{CO2,y} = EBL_{y} * EF_{CO2}$

Where:

$BE_{CO2,y}$ = Emissions in the baseline in year y; tCO2e

EBL_{y} = Annual energy baseline in year y; MWh

EF_{CO2} = Fuel emission factor; tCO2e/MWh

A default value of 0.8kg CO2e/KWh is used for diesel generation units. The annual energy baseline consumption is estimated to be 600KWh. In assessing the ex-ante emission reduction estimates, the VVB focused on the proposed annual energy baseline. Public data indicated that the average household electricity consumption was 350KWh per year. As a result, the project proponent prepared and justified a conservatively low forecast of annual energy consumption in the project description.

- Uncertainty: VVBs must account for any uncertainty associated with measurement. VVBs must also consider other sources of uncertainty such as uncertain future project activity or performance levels. For example, where a project uses a model to estimate forest regrowth, local climate variability can influence forest regrowth patterns
- Conservativeness: Where VVBs find uncertainty associated with a project's data and parameters, the conservativeness principle should be applied to adjust estimates of GHG emission reductions and removals and, where appropriate, manage the risk of associated uncertainty.

3.2.6 Leakage

Overview

Many GHG projects, whether related to energy, industrial processes or AFOLU, have the potential to result in leakage (i.e., the increase of GHG emissions outside the project boundary as a result of the project). VVBs must include an assessment of leakage emissions within the same country as the project if such emissions are measurable. Each methodology sets out processes to calculate leakage emissions.

Key Elements

Effects from leakage on all carbon sources, sinks and reservoirs need to be assessed, and significant effects must be considered when calculating net GHG emission reductions or removals. Accounting for positive leakage (emission reductions that occur outside the project area as a beneficial spill-over effect from implementing the project activity) is not allowed. VVBs must approach leakage quantification in the same manner as baseline and project quantification, assessing all data sources, assumptions and calculations to verify accuracy and applicability.

Keep in mind

When a project includes timber harvesting, as in ARR projects, market leakage can be calculated using a discount factor. When validating a market leakage discount factor, VVBs need to be aware that project proponents are incentivized to select the lowest discount factor possible to maximize net emission reductions or removals claimed by the project.

For non-AFOLU projects that reference CDM tools for calculating leakage, such as from fossil fuel combustion, electricity consumption or transportation, VVBs must ensure that the procedures and criteria specified in the tools have been applied appropriately.

For AFOLU projects, VVBs must assess if the project has accounted for any leakage considered to be significant (i.e., greater than the *de minimis* threshold of five percent of total GHG emission reductions and removals) for three types of leakage: market leakage, activity-shifting leakage and ecological leakage. Further guidance on the three types of leakage in AFOLU projects is provided in Section 5.2.6.

3.2.7 Monitoring Plan

Overview

A monitoring plan includes details about monitoring parameters, schedules and process. The plan must describe the entire system employed by a project proponent for obtaining, recording, compiling and analysing GHG data and information, as well as descriptions of the roles and responsibilities of those involved. Monitoring plans must be assessed by VVBs to ensure that the GHG emission reductions and removals generated by a project will be measurable and verifiable.

Key Elements

VVBs must confirm that a project's monitoring plan conforms to requirements set out in the applied methodology. In addition, VVBs must assess the relevant data quality management procedures for generating verifiable GHG data and avoiding material errors in reported GHG emission reductions and removals.

VVBs should consider the following:

- Data monitoring, calibration or other similar procedures need to be consistently performed, according to validated methods.
- Recognized areas of data uncertainty and risks for material error need to be adequately managed through data controls and quality assurance checks.
- Record-keeping practices need to result in the generation of sufficient levels of documentary evidence to support assessment against all relevant criteria.
- Controls and procedures need to be in place to avoid intentional or unintentional alteration or destruction of data.
- Controls need to be in place to ensure participating staff are sufficiently qualified.
- The project proponent needs to demonstrate sufficient management oversight and accountability for the conduct of monitoring procedures. Discrepancies between a project's monitoring plan and the monitoring requirements in the applied methodology must be cited as a material discrepancy.

Keep in mind

For AFOLU projects that require field measurements to monitor changes in carbon stocks, VVBs must assess whether the project's sampling approach is appropriately documented and in accordance with the guidelines established by the methodology. VVBs must consider whether the monitoring plan includes target precision levels, sample site locations, stratification, number of plots per strata, types of plots used, frequency of measurement and appropriate quality control checks such as a field protocol or standard operating procedures for data collection.

3.2.8 Methodology deviations

Overview

Methodology requirements may be impracticable in some specific project circumstances. The SOCIALCARBON Standard permits deviations from the applied methodology where they pertain to the criteria and procedures relating to monitoring and measurement. Deviations relating to any other part of the methodology are not permitted and require a methodology revision.

Key Elements

The limited scope of permissible methodology deviations implies that VVBs should be cautious when assessing the validity of proposed deviations. VVBs must ensure that methodology deviations do not negatively affect the conservativeness of the quantification of GHG emissions reductions or removals, except where the deviations result in greater accuracy. VVBs must also note that past methodology deviations are not precedent setting (i.e., approval of a particular deviation does not grant approval of the similar deviations in the future).

In most cases, VVBs should be able to recognize whether a methodology deviation relates only to the procedures relating to monitoring and measurement. However, given the interconnected nature of many methodologies, VVBs should be aware that such deviations may have implications on other provisions of the methodology (e.g., equations for quantification) and must assess this possibility when evaluating a proposed deviation.

Example – Methodology deviation

A methodology requires the use of a default factor to calculate project emissions and no options are provided for developing an alternative factor. At validation, the project proponent proposes the use of an alternative, peer-reviewed, region-specific factor as a methodology deviation. The project proponent also proposes a new quantification approach that alters the equation for calculating baseline emissions. The VVB rejects the proposed deviation to the quantification approach, citing the fact that the proposed deviation is not specific to the "procedures relating to monitoring and measurement". However, given that the default factor is a parameter available at validation, the VVB determines that the proposed deviation is allowed. The VVB finds that while use of a regional default factor may result in less conservative quantification of GHG emission reductions or removals, it increases accuracy.

The same methodology requires the use of particular measurement equipment to monitor methane emissions in the project scenario. At validation, the project proponent proposes an alternative model of monitoring equipment due to the particular model specified in the methodology no longer being sold in the market. The project proponent demonstrates that the alternative monitoring equipment does not negatively impact the conservativeness of the quantification of GHG emission reductions or removals.

The project proponent documents the use of a regional default factor and more modern measurement equipment in the project description as methodology deviations. The VVB also documents in the validation report that the deviations are appropriately described and justified, and that the project remains in compliance with SOCIALCARBON rules. The VVB issues a positive validation. At the subsequent verification, the VVB will take note of the methodology deviations when reporting on the implementation of the project activity.

3.2.9 Project Description Deviations

Overview

Projects may be implemented differently from the validated project description, or the project may change over time. Further, project proponents may want to switch to use the latest version of a methodology or a different methodology altogether, recognising the development and evolution of methodologies. In such cases, the SOCIALCARBON Standard allows project description deviations at the time of verification.

Key Elements

Where a project description deviation is proposed, VVBs must first ascertain whether the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario. Guidance on these three types of impacts is set out in the CDM Guidelines on assessment of different types of changes from the project activity as described in the registered PDD. Determination of whether the deviation impacts any of these three elements must be consistent with the CDM guidance and apply the following conditions:

- Where the deviation impacts applicability of the methodology, additionality or appropriateness of the baseline scenario, the project proponent must describe and justify the deviation in a revised version of the project description. The requirement for a revised project description is in recognition of the deviation being a substantial change to the project.
- Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the project proponent must describe and justify the deviation in the monitoring report. The deviation is documented in the monitoring report in recognition of the deviation being a more limited change to the project.

VVBs are required to assess whether the deviation is appropriately described and justified. VVBs are further required to determine whether the project remains in compliance with SOCIALCARBON rules. The findings and conclusions must be reported in the verification report and the deviation must also be reported on in all subsequent verification reports. Where the assessment results in a negative conclusion, the verification report, and either the monitoring report or revised project description, must be provided to the Social Carbon Foundation, as set out in the SOCIALCARBON Standard. VVBs must have experience of project validation, recognizing that assessment of project description deviations is a validation activity.

Note also that past project description deviations are not precedent setting (i.e., each deviation must be assessed upon its merits and approval of similar deviations does not provide a sufficient basis for approval).

Example – Project description deviation

A registered ARR project is undergoing inventory field work in preparation for the initial verification. While processing the inventory data, the project proponent realizes their GIS technician committed a processing error that resulted in incorrect mapping of the project area, leading to an omission of five percent of the project area. At verification, the project proponent proposes, through a project description deviation, expanding the project area to include the forests mistakenly excluded from the project area. The project proponent documents that the expansion would not have an impact on the applicability of the methodology, appropriateness of the baseline scenario nor additionality of the project. The VVB, determines that, consistent with the CDM Guidelines on assessment of different types of changes from the project activity as described in the registered PDD, the addition of project activity sites may impact the validity of the investment analysis or barrier analysis as validated in the project description. The VVB requests that the project proponent describe and justify the deviation in a revised version of the project description.

A registered ARR project undergoes a change in management that results in modifications to various silviculture techniques. The project proponent now conducts re-planting, fertilization and other management approaches in a manner unlike how it was reported in the project description. The project proponent describes the new techniques in the monitoring report and justifies that the deviation does not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

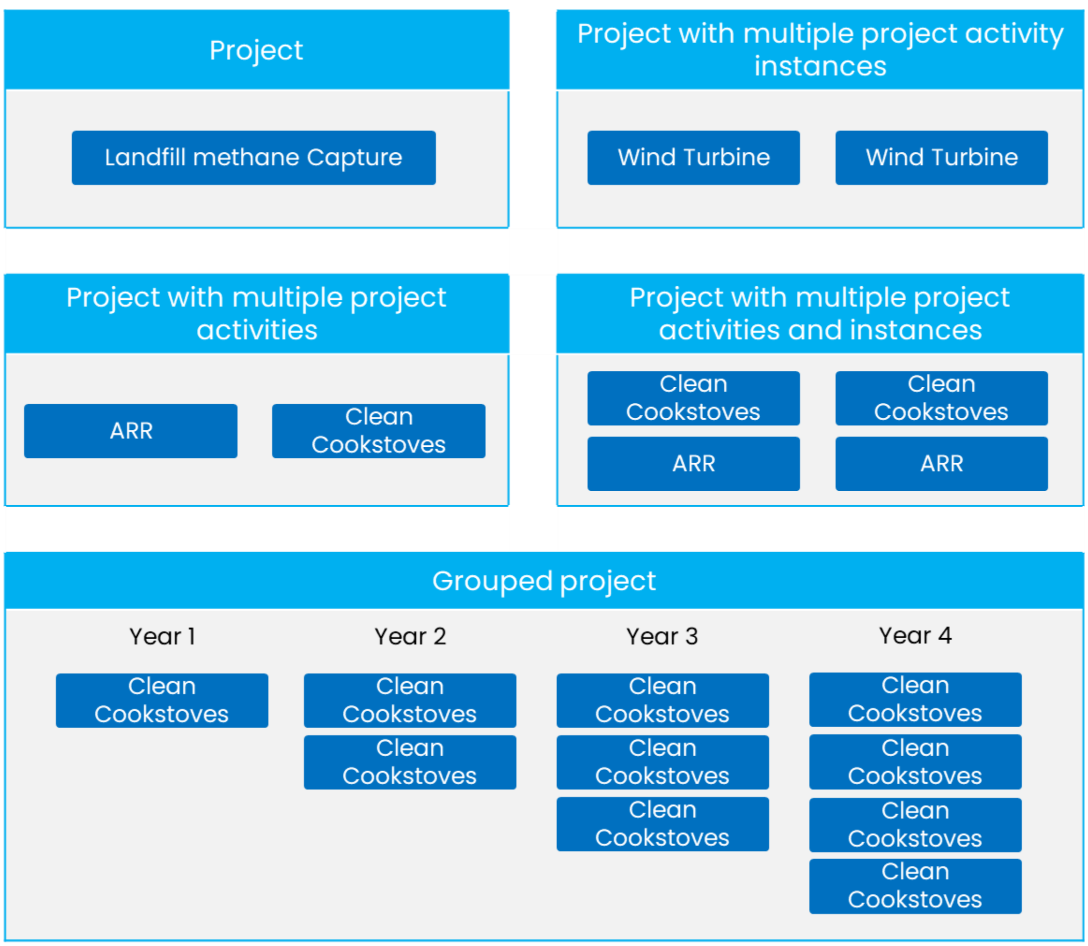
When assessing these deviations, the VVBs conclude in each verification report that the deviations are appropriately described and justified, and that the projects remain in compliance with SOCIALCARBON rules. At the subsequent verification, the VVBs will take note of the deviation when reporting on the implementation of the project activity.

3.2.10 Projects with Multiple Project Activities or Multiple Project Activity Instances

Overview

Under the SOCIALCARBON rules, project proponents can combine multiple project activities or multiple project activity instances within one project. Project activity refers to the set of technologies or measures that generate GHG emission reductions and removals set out in a given methodology. Project activity instance refers to an individual unit of a project activity. For example, if the project activity is the implementation of efficient cookstoves, each individual cookstove represents a project activity instance. Diagram 1 below provides a schematic overview of the five project configurations that are allowable under the SOCIALCARBON Standard.

Diagram 1: Project Configurations allowable under SOCIALCARBON rules.



Key Elements

Projects with multiple instances of project activities or multiple project activities need only one project description and a single validation is undertaken. For projects with multiple instances, the demonstration and assessment of baseline and additionality is combined, because multiple project activity instances are undertaken as part of the same investment decision. A project with multiple project activities refers to the implementation of different types of project activities and can entail the application of a combination of methodologies. VVBs must perform the assessment of baseline and additionality separately for each project activity, except where these can be integrated by using the same tool and/or procedures for each activity (e.g., generation of electricity from methane captured in an anaerobic digester). In addition, VVBs must consider whether the project proponent has provided sufficient evidence to establish the impracticality of a separate demonstration of additionality. For example, multiple additionality assessments are unnecessary where a project proponent implements different project activities at a single facility such as the installation of an anaerobic manure digester and electricity generation system on a farm. However, where a project includes implementation of energy efficiency retrofits on one site and implementation of fuel switch on another site, the VVB should assess whether both project activities emanate from a single investment decision.

Keep in mind

VVBs should consider whether multiple project activity instances are simply separate projects. For example, where instances are geographically distant, baseline and additionality characteristics for these instances may be quite different, given that common practice, local laws and other characteristics may vary. VVBs should assess whether aggregated baseline and additionality assessments would yield the same outcome as an individual assessment of each instance.

Example – Projects with multiple instances of project activities

Deciding whether baseline identification and additionality demonstration can be performed jointly or separately depends on the circumstances of the project activity instances. The following two examples require different approaches:

1. A wind energy project with total capacity of 12.5 MW comprises ten wind turbine generators of varying capacities. All the wind turbines are located in the state of Karnataka, India and were commissioned between 2020 and 2022. The electricity generated is sold to the state electricity supply company on the basis of power purchase agreements. Based on the baseline scenario and additionality assessment, the VVB concludes that the project activity conforms to the SOCIALCARBON definition of a project with multiple instances. The baseline identification and additionality demonstration for the ten wind turbines can be performed jointly.
2. A landfill gas project captures methane for electricity production at three different landfill sites, located in the states of Arizona, Mississippi, and Texas in the United States. Different local regulations apply at each site, and waste management practices also differ. The VVB concludes that the identification of the baseline and demonstration of additionality cannot be done jointly for the three landfills, and each site would need to be considered as a separate project.

3.2.11 Grouped Projects

Overview

SOCIALCARBON rules for grouped projects allow for the expansion of project activities over time and over a geographically dispersed area. New project activity instances can be added to the project over time (i.e., following initial project validation) within predefined geographic areas, provided they meet the set of eligibility criteria set out in the project description. The new instances are validated at the time of verification.

In keeping with the intent of the CDM rules on Program of Activities (PoA), the SOCIALCARBON rules on grouped projects are intended for programmatic initiatives that are typically managed by a central coordinating entity. The rules are designed to facilitate the scaling up of project activities where the GHG emission reductions generated by each project activity instance are small. Examples of activities well suited to the grouped project approach include solar home systems, installation of efficient lighting and installation of clean cookstoves.

Key Elements

VVBs should focus on the following key elements when validating grouped projects:

- Geographic areas: VVBs must ensure that the project description clearly identifies the geographic areas within which new instances may be added. Geographic areas must be defined using geodetic polygons and provided in a KML file. Such geographic areas need not be contiguous and may be large or small, noting the grouped project requirements for additionality and baseline assessments of the geographic area.
- Identification of baseline scenario and demonstration of additionality: The assessment of baseline scenario and additionality is based upon the initial instances included within each geographic area. VVBs must ensure that, for each project activity, a single baseline scenario exists for each geographic area. VVBs must also ensure for each project activity that additionality is demonstrated across the entirety of each geographic area. Failing this, VVBs must require that the geographic areas are redefined such that the requirements are met. As with projects with multiple instances, project activity instances within a grouped project should be part of the same investment decision if they are to be included in a single project.
- Eligibility criteria: VVBs must ensure that an appropriate set of eligibility criteria are established for each combination of project activity and geographic area. The criteria are used to validate new project activity instances, essentially serving as a checklist to determine whether the instances share the same attributes as the initial set of validated project activities instances. For example, eligibility criteria for grouped projects implementing CFLs may state that new instances must be installed in grid-connected households and the CFLs must be at least 30 percent more expensive compared to conventional incandescent bulbs. In general, VVBs must ensure that the eligibility criteria are developed sufficiently that such determinations could be made when validating new instances. Eligibility criteria must also conform to any restrictions set out in the methodologies applied.

- Monitoring and GHG information system: VVBs must ensure that the project has an appropriate monitoring plan that includes a sampling plan to collect data from all project activity instances and information systems, allowing for centralized data collection. VVBs must ensure the sampling plan is able to generate statistically significant results.
- Methodology: Grouped projects can apply methodologies other than those designed specifically for grouped projects. When reviewing the methodology and the project's application of it, VVBs must be mindful of any capacity limits applicable to the methodology. VVBs need only ensure that project activity instances and clusters adhere to such capacity limits; the grouped project as a whole may exceed the capacity limit.

3.2.12 Assessing Non-Permanence Risk

Overview

AFOLU project proponents must complete a self-assessment of the potential transient and permanent losses to their project's carbon stocks over a 100-year period. *The SOCIALCARBON AFOLU Non-Permanence Risk Tool* generates risk ratings that are applied to the net change in the project's carbon stocks, thereby determining the number of buffer credits that the project proponent deducts at a verification event. At verification, VVBs must assess the project's non-permanence risk based upon the project's *Non-Permanence Risk Report*.

Key Elements

The non-permanence risk rating only needs to be assessed for projects with GHG emission sources or sinks that can be reversed. GHG project activities are not subject to buffer withholding if they do not store carbon in biomass or carbon pools, such as projects that reduce N2O, CH4 or fossil-derived CO2.

Risk factors are classified into three categories: internal risks, external risks and natural risks. The risk tool assesses internal risk further by evaluating sub-categories: project management, financial viability, community engagement and project longevity.

When assessing the non-permanence risk report for AFOLU projects, VVBs must refer to the most recent version of the risk tool and assess whether the project meets the risk threshold identified for each risk category and the project as a whole. In assessing risk factors, VVBs should pay particular attention to the following:

- When assessing internal risk, VVBs must evaluate the risk that project activities will not be continued in the future. VVBs should note that the project proponent does not have to provide evidence of project ownership for the entire project longevity. Rather, the project proponent must demonstrate it can obtain and maintain project ownership for the entire project crediting period. For example, evidence of project ownership for a 10-year period is acceptable if project ownership is renewable at the end of 10 years.
- For all AFOLU project types, the entire project longevity must be covered by management and financial plans that demonstrate the intention to continue the management practices. The project longevity risk rating is determined by whether the project proponent has a legal agreement or requirement to continue the management practice. A legal agreement or requirement must be in place to continue the management practice. A legal agreement to protect land, such as national designation as a protected area, is insufficient to demonstrate that a management practice will continue for the length of the project.
- Projects with longevities of less than 10 years are not permitted under the SOCIALCARBON Standard, and VVBs in such cases must fail the risk assessment.
- While risk is assessed over a 100-year period from the start of the current monitoring period, the analysis should be based on data and assumptions that accurately reflect current conditions, not past or future circumstances, when determining all risks, including the opportunity costs and financial viability.
- When assessing the cumulative cash flow breakeven point, VVBs must evaluate whether recurring capital expenditures have been accounted for in the breakeven analysis.

Keep in mind

If a project proponent is aware that part of the project area has comparatively greater risks, the project area can be stratified for the purpose of the risk analysis. The VVB would assess the non-permanence risk for each stratified project area. The risk rating would then apply to the net change in the project's carbon stocks of the respective stratified area.

Example – Assessing Non-Permanence Risk

An ARR project in Kenya began implementing activities to reforest previously degraded land 2015. The project was verified in 2018. In preparing a non-permanence risk assessment, the project proponent evaluated the project's financial viability and opportunity cost based on, among various factors, previously secured funding and alternative land uses developed prior to the project start date.

However, a major donor discontinued funding for the project in 2017. Meanwhile, growing oil palm demand led to a significant increase in the land value of the project's surrounding areas, compared to the 2015 land value. The project's opportunity cost increased with respect to its main alternative land use, which the project proponent identified as draining peatland for oil palm production.

Upon verifying the non-permanence risk assessment, the VVB noted a non-conformance that the project proponent did not correctly apply the risk tool. The project proponent improperly estimated the cumulative cash flow breakeven point and the net present value (NPV) based on data and information from the project start date and not information from the date of the current assessment. The project proponent revised the risk assessment for both financial viability and opportunity cost and estimated risk based on the most recent data available from the date of the assessment.

3.3 Key Elements of the validation and verification process

3.3.1 Sampling, Validation and Verification plans

Overview

Sampling plans and associated validation or verification plans describe the planned validation or verification activities and schedules. These plans also address what data and information will be sampled and how it will be tested. A robust sampling plan is critical in ensuring the robustness of the validation or verification.

Key Elements

In developing sampling, plans, VVBs must consider the objectives, scope, criteria, materiality and level of assurance for the proposed validation or verification assessment.

Keep in mind

Sampling applies to both quantitative and qualitative data and information. Qualitative information (e.g., procedures or applicability) is particularly relevant for validation. Quantitative data (e.g., monitored results) is a principal focus at verification.

3.3.1.1 Sampling Plans

A sampling plan should describe: risks of material error, types of data and information to be assessed, methods to be used to assess the data and information, and the amount of each type of data or information to be assessed.

To determine each of these, a VVB must first conduct a risk assessment to identify areas that may potentially result in material discrepancy. Risk assessments must follow the guidelines set out in Annex A.2.4.6 of ISO 14064-3 and include, at minimum, reviews of the following:

- Background information: Contextual information is provided to help readers understand the nature, scale and complexity of the project.
- Potential sources of material error: Potential sources of material error will differ for validation and verification, reflecting the different objectives as set out in Section 2.1.
- GHG information system controls: Controls are needed to avoid or correct errors (ie, control risk) for each source of potential material error. Consideration should be given to the full data chain of custody for all relevant data types, considering potential risks of error at each step in the chain.
- Residual risks: Any areas of risk not adequately addressed by the control systems should be identified for inclusion in the sampling plan. ISO 14064-3 identifies a range of testing methods that can be employed alone or in combination to assess a particular residual risk.

Keep in mind

Data and information vary in reliability. ISO 14064-3 delineates three general types of evidence in order of decreasing reliability:

- Physical: directly observable such as witnessing a meter calibration.
- Documentary: written or electronic records, logs, data or procedures.
- Testimonial: verbal information gathered through interviews.

For less reliable sources of evidence, cross-checking should be used. Given that physically observed data is considered most reliable, and that VVBs are required to provide a reasonable level of assurance, site visits must be included in validation and verification plans.

3.3.1.2 Data Testing Methods and Determining Representative Samples

VVBs may employ several testing methods, including, inter alia: simple random sampling, stratified random sampling, systematic sampling, cluster sampling and multi-stage sampling.

Choice of testing method (or combination of methods) will depend on the data in question and the nature and extent of risks identified. VVBs should apply their professional judgment in determining the most appropriate method. VVBs are encouraged to use the following resources as guidance:

- Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (PoAs);
- IPCC 2006 Guidelines for National Greenhouse Gas Inventories;
- IPCC 2003 Good Practice Guidelines for Land Use, Land-Use Change and Forestry

Multiple cross-checking methods are advisable where data is less reliable. VVBs must also determine the amount of data required for the assessment (e.g., how many data points or records) by selected methods. Data samples must be representative of the whole data set and reflect the risk assessment.

3.3.1.3 Validation and Verification Plans

VVBs must prepare validation and verification plans that describe the schedule of validation or verification activities, documents to be reviewed, locations to be visited, validation or verification team duties, and associated logistical details and arrangements. Design of the validation or verification plan must be informed by the sampling plan.

Example – Sampling and verification plan

A gas-to-biomass fuel switching project using a methodology for fuel switch from fossil fuels to biomass residues for thermal power is undergoing its first verification. During the risk assessment portion of sampling plan development, the VVB identified baseline emissions from fossil fuel combustion for heat generation ($BE_{HG,y}$) as a key emission source with potential for material error. The equation used to calculate $BE_{HG,y}$ is as follows:

$$BE_{HG,y} = \frac{HG_{PJ,biomass,y} \times EF_{FF,CO2,y}}{n_{heat,FF}}$$

Where:

$BE_{HG,y}$	=	Baseline emissions from fossil fuel combustion for heat generation in the heat generation equipment (tCO2e/yr)
$HG_{PJ,biomass,y}$	=	Heat generated with incremental biomass residues used as a result of the project activity during the year y (GH/yr)
$EF_{FF,CO2,y}$	=	CO2 emission factor of the fossil fuel type displaced by biomass residues (tCO2e/GJ)
$n_{heat,FF}$	=	Average net efficiency of the heat generation equipment if fired with fossil fuels in the baseline (ratio)

Below is a simplified summary of related details on the sampling plan. In developing the verification plan, the VVB ensured that the site visit was scheduled to correspond with a scheduled calibration event, sufficient time was allocated to perform the planned data sampling and testing, and appropriate verification team members were assigned to specific tasks.

Potential Discrepancy	**Reporting Risk**	**Control Risk**	**Planned Sampling and Testing**
$HG_{PJ,biomass,y}$	Meter Calibration	Medium (use of non-accredited firm)	• Physically observe calibration firm conducting calibration • Review all calibration logs • Interview calibration technicians
	Data entry and storage in spreadsheet	Very low (automated data acquisition and uploading; validated previously)	• Trace back limited sample data to raw data • High level review of dataset to ensure continuity of data over reporting period
$EF_{FF,CO2,y}$	Data entry and storage in spreadsheet	Medium (manual entry to spreadsheet)	Review spreadsheet to confirm that η validated values are used
$n_{heat,FF}$			
$BE_{HG,y}$	Spreadsheet used for calculations	Low-Medium (good access controls, validated previously)	Recalculate a limited sample of daily results

3.3.1.4 Updating Sampling, Validation and Verification Plans

As data are sampled and tested, VVBs will likely need to change the initial risk assessments. VVBs must update sampling, validation and verification plans in an iterative manner according to increases or decreases in the perceived level of risk. Some situations may necessitate extending the validation or verification schedule or number of sites visited. Adjustments, while potentially inconvenient and involving some cost, are necessary to ensure that a reasonable level of assurance can be provided.

3.3.2 Resolution of Material Discrepancies and Clarification Requests

Overview

Resolution of identified actual or potential material discrepancies is an important part of finalizing a validation or a verification. All identified discrepancies and areas for clarification must be clearly communicated to the project proponent, addressed and transparently documented.

Key Elements

Validation and verification almost always result in the identification of areas requiring further clarification and discrepancies that must be addressed. VVBs must clearly document the following:

- Clarification requests (CLs): Project reporting lacks transparency and further information is needed to determine if a material discrepancy is present.
- Corrective action requests (CARs): The VVB has identified a material discrepancy or nonconformance that the project proponent must address.

When issuing CLs and CARs to project proponents, the following guidelines apply:

- VVBs must be careful not to offer consulting advice when issuing CARs such as how to address noted deficiencies. Otherwise, the independence of the VVB is called into question.

- The SOCIALCARBON validation and verification reporting templates require that VVBs document the process used to resolve material discrepancies (not just the discrepancies themselves).
- VVBs must document all identified CLs and CARs and summarize the CLs and CARs in the validation or verification report.
- All CLs and CARs need to be fully resolved prior to issuance of a positive validation or verification statement. In the case of validation, it is unacceptable for VVBs to leave material discrepancies unresolved (e.g., deficiencies in a project's data management system), which a verifier may need to ensure is addressed at a later date.

3.4 Common technically challenging areas

During validation and verification, common areas of technical challenge arise across a wide variety of projects and methodologies. This section identifies some common issues and provides related guidance.

3.4.1 Complete Identification of GHG Sources, Sinks and Reservoirs

Overview

A key component of assessing project and baseline emissions is the complete identification of relevant GHG sources, sinks and reservoirs. While the methodology identifies the relevant types of GHG sources, sinks and reservoirs, the project proponent must determine the specific sources, sinks and reservoirs present and ultimately quantified for a given project.

Key Elements

Identification of a complete set of relevant GHG sources, sinks and reservoirs can be challenging, especially for large or complex project sites, or where the project involves multiple sites. For many projects, this can be a potential source of material error.

During validation, VVBs must first assess the project proponent's process for identifying relevant emission sources (e.g., how systematic was the process and who was involved in carrying it out?) to identify the associated control risk. The sampling plan could then be developed accordingly. In addition to review of engineering drawings and interviews with key staff, careful attention during site tours (if the facility has already been constructed) can be effective in confirming identified GHG sources, sinks and reservoirs.

During verification, the verification team must not only visit all relevant sites but also sample an adequate number of sites based on a risk assessment.

In both validation and verification, the assessment team will need sufficient technical experience related to the methodology and project technology. Deficiencies in this area have in the past led VVBs to overlook material discrepancies.

3.4.2 Calibration

Overview

Calibration of monitoring equipment is critical in ensuring accurate reporting of results. This is a common problem area for projects. Calibration is frequently conducted incorrectly or at inappropriate times. The result is often a material impact on the reported emission quantifications.

Key Elements

Calibration problems can often be traced to poor calibration procedures, including communication of calibration schedules and associated record keeping. Problems are also common when unqualified or inexperienced technicians are employed.

Calibration is an issue for both validation and verification. During validation, VVBs must focus on ensuring that calibration plans meet the requirements specified in the applied methodology and/or by the equipment manufacturer. Calibration schedules need to be clearly presented and communicated to relevant staff. It should also be clear how verifiable records of calibration will be generated.

During verification, attention must be placed on reviewing objective evidence, demonstrating that calibration was performed according to plan. Depending on assessed risk and project type, the use of cross-referenced data and information is recommended. Best practice examples include timing a site visit to align with a calibration event, reviewing calibration logs and/or interviewing the individual(s) conducting the calibration (which often involves outside service providers).

Determining minimum required experience or qualifications for a calibration technician or organization can be challenging. Ideally, the project uses calibration organizations accredited to relevant standards. Other non-accredited organizations may also perform calibrations if permitted by an equipment manufacturer's specifications and the relevant methodology. Ultimately, VVBs must assess whether calibration practices follow current good practice as required by Clause 5.10 of ISO 14064-2 and meet any requirements specified in the methodology. To avoid significant challenges during verification, it is important that these procedures are carefully scrutinized during validation.

Example – Calibration

A landfill gas destruction project in the United States has developed a SOCIALCARBON project using a consolidated methodology for landfill gas project activities. In order to minimize the risk of calibration drift in gas flow meters, the project proponent established a quarterly field check schedule. During verification, the VVB discovered that planned quarterly checks were missed, and only single checks at the beginning and end of the annual reporting period were conducted. The final check showed that the calibration had drifted significantly, over-reporting gas flows by 10 percent. The monitoring report was based on unadjusted meter readings. The VVB cited two material discrepancies:

1. <u>Material error of up to 10%</u>: To resolve this issue, the project proponent conservatively assumed that the meter over-reported flows by 10% for the entire monitoring period. As a result, the proponent discounted measured flows (and thus reductions) for the entire year by 9.1 percent [10 ÷ (100 + 10)].
2. <u>Non-conformance with the validated monitoring plan</u>: To resolve this issue, the project proponent submitted a project description deviation applicable to the reporting period, justifying the conservativeness of the alternative approach. The project proponent also identified why the scheduled checks were missed and enhanced associated monitoring and quality assurance procedures accordingly.

3.4.3 Emission Factors, Measurement Abbreviations and Conversion Factors

Overview

Emission factors, conversion factors and measurement abbreviations, while often taken for granted, are all common areas where material errors may be introduced into the quantification of GHG reductions and removals.

Key Elements

Accuracy is contingent on proper use of the factors and assumptions embedded in GHG calculations. Accuracy likewise relies on proper understanding of any abbreviations or industry-specific language. The following are examples of factors and abbreviations:

- Emission factors (e.g., tCO2e per MWh electricity, tonne CO2e per m^3 natural gas);
- Conversion factors (e.g., BTU/m^3 , g/L, kg/tonne, GWPs);
- Measurement abbreviations (e.g., MMBTU, SCF, kt, Nm^3).

VVBs must ensure that factors and abbreviations are appropriate and meet the requirements of the applied methodology. VVBs must ensure the sampling and testing are appropriate for the assessed risk. Spreadsheets can pose significant risks, especially where associated data quality controls are minimal.

Experience from a range of GHG programs indicates that VVBs tend to devote insufficient time to sampling and testing emission factors, conversion factors and measurement abbreviations. Errors often emerge when spot checks are conducted by program administrators.

3.4.4 Models

Overview

Models are powerful tools used to provide GHG data where direct monitoring or simple estimation is not possible or practical. Models can, however, be complex. Results are sensitive to various inputs and key assumptions, making them a common source of material error.

Key Elements

Models can range from simple (e.g., expressed as a single equation) to complex (e.g., comprised of many equations incorporated into modelling software). Models can estimate emissions directly (e.g., a landfill gas generation model) or indirectly (e.g., a forest growth and yield model that estimates changes in amount of woody biomass).

There are two broad uses for models:

- Estimating ex-ante GHG data in a project description (e.g., use of the CDM Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site to estimate ex-ante baseline emissions for a landfill gas project).
- Estimating ex-post GHG data in a monitoring report.

Given that models are often complex and have inherent uncertainty, VVBs must ensure that applied models apply conservative factors to discount for model uncertainty and use conservative assumptions and parameters that are likely to underestimate, rather than overestimate, the GHG emission reductions or removals. VVBs must also ensure that sufficient empirical testing has been conducted to calibrate the model accurately for the project. For example, where a forest growth and yield model is used to estimate change in carbon stocks, the model may need to be calibrated and/or validated through field measurements and compared against inventory data to ensure the appropriateness of the model for the project. Model results should be subjected to sensitivity analysis, taking into account variation in input parameters. It is also important that the validation or verification team include an expert experienced in the application of the particular model to ensure its correct use.

Keep in mind

Key questions to consider when reviewing factors and abbreviations include:

- Is the factor appropriate for the project or baseline technology, fuel type, geographic location and time period?
- Are the correct units being used?
- Has there been confusion between CO2 and CO2e?
- Has there been confusion between GHGs such as CO2 and CH4?
- Have the VVB and project proponent clearly understood the abbreviations?
- Have the abbreviations been used correctly in the calculations?
- Have metric and imperial units been confused?

4. Project Validation and Verification Reporting

Project validation and verification reporting is central to the transparency of validation and verification processes. Reporting provides a means for Social Carbon Foundation and other stakeholders to better understand VVB findings and supporting rationale. This ultimately increases market confidence in the SOCIALCARBON Standard and its projects and SCUs. Reports are also an important tool during subsequent verifications, as they can provide useful inputs to a VVB's risk assessment.

4.1 Report templates

Overview

The SOCIALCARBON Standard ensures consistent VVB reporting by requiring the use of validation and verification report templates. Guidance is contained within each template to assist VVBs in properly documenting processes, findings and conclusions.

Key Elements

When preparing a validation or verification report, VVBs must address, at minimum, the specific items detailed within the SOCIALCARBON templates (SOCIALCARBON Validation Report Template and SOCIALCARBON Verification Report Template, respectively) and adhere to the structure of the template. However, VVBs can provide additional information. VVBs are encouraged to include additional documentation as annexes to the reports where needed.

The report templates have been developed to ensure both a minimum level of transparency in reporting and consistency in work undertaken by different VVBs. Both templates are structured in a similar manner covering the following key areas:

- Introduction: Covers objectives, scope, criteria, level of assurance and project description.
- Process: Addresses methods, objectives and criteria, including the sampling plan used to undertake the validation or verification.
- Findings: Identifies, discusses and justifies findings in specific areas identified in the templates.
- Conclusions: Provides a clear statement of conclusions, addressing specific items identified in the templates.

The verification template also includes a section for reporting on the validation process, findings and conclusions, which VVBs need to complete where a methodology deviation or project description deviation is applied to the project or where new project activity instances are added to a grouped project. In some cases, verification may also include gap validation of a project that is registered sequentially under the SOCIALCARBON and another approved GHG program.

4.2 Reporting level of detail

Overview

A sufficient level of information and detail must be provided in validation and verification reports to allow readers to understand the validation or verification process and draw informed conclusions about the project.

Key Elements

Understanding the appropriate level of detail for reporting is a common challenge for VVBs. Reporting is simplified through various report templates where VVBs are instructed whether to provide more descriptions or more detailed discussion and justification.

All sections of the templates, other than validation or verification findings, require only a description. VVBs must indicate the activities conducted, methods used, criteria applied and other information as appropriate. Descriptions should be succinct, while providing enough detail for the reader to understand what approaches were taken. VVBs are not required to include details on why they pursued a chosen course of action.

In contrast, the validation and verification findings sections of the templates require the identification, discussion and justification of all conclusions. VVBs must not only indicate findings but must also provide details on the following:

- Project proponent assertions;
- Types and amounts of evidence sampled and tested;
- Material and non-material discrepancies identified and how they were addressed; and
- Results of data testing that support the validation or verification conclusions.

VVBs must also ensure that reports contain an itemized breakdown of GHG emission reductions and removals where appropriate. For example, where the net emission reductions and removals is the sum of emission reductions and removals from changes in soil carbon, changes in both belowground biomass and aboveground biomass, as well as emission reductions and removals from each of the carbon pools must be stated and verified separately.

Where the monitoring report includes vintage breakdowns, the verification report must verify the emission reduction and removal volume for each vintage period specifying the exact start dates and end dates of the vintage period. This is required if SCUs are to be issued according to any vintage period breakdown in the monitoring report.

It is not necessary to provide detailed information such as the results of individual recalculations, notes from interviews and meetings, or detailed observations from site visits. This detailed information should still be retained outside of the validation or verification report in the form of validation and verification records. Such records assist VVBs in demonstrating conformance to ISO 14064-3 and ISO 14065 (eg, as part of accreditation assessment and surveillance). SOCIALCARBONA may also request such records as part of program oversight.

5. Methodology Assessment

The SOCIALCARBON Standard provides a unique hybrid approach to methodology development. Social Carbon Foundation may develop methodologies itself, meanwhile the Standard supports the bottom-up approach to methodology development that incentivizes project proponents or other market participants to create new methodological approaches for accounting for GHG emissions reductions or removals in eligible sectoral scopes. Ensuring that SOCIALCARBON methodologies are robust is integral to quality assurance of the SOCIALCARBON Standard. This section sets out guidance that VVBs are expected to follow when conducting methodology assessments of methodologies developed by organisations other than by the Social Carbon Foundation.

5.1 Guidance on key elements of methodology approval process

Assessment of new methodologies, methodology revisions, modules and tools are guided by the requirements and procedures set out in SOCIALCARBON document Methodology Approval Process. Methodologies submitted to SOCIALCARBON undergo a 30-day public consultation period followed by an independent assessment by a qualified VVB. Where the VVB approves a methodology, Social Carbon Foundation conducts a final review prior to approving the methodology. A full breakdown of the process can be found in the SOCIALCARBON Standard document *Methodology Approval Process.*

5.1.1 Role of the VVB

Under the methodology approval process, the selected VVB is required to independently assess the methodology. The methodology assessment process is a desk review process that involves a thorough review of all the elements of a methodology as set out under the

Methodology Approval Process. Methodology assessments typically entail an iterative review where the VVB issues CLs and CARs that must be addressed by the developer until the issues are resolved satisfactorily.

Methodology assessments require background research, document reviews, and interviews with experts and key stakeholders to determine whether criteria and procedures described in the methodology conform with the requirements and principles set out in the SOCIALCARBON Standard as well with scientific best practice. VVBs must also carefully evaluate the underlying assumptions and conceptual approaches that are used in methodology and explain whether and how the methodology takes into account relevant scientific and sector specific considerations.

VVBs conducting methodology assessments need to meet the eligibility criteria set out in the Methodology Approval Process. VVBs are responsible for assembling competent and qualified teams to undertake methodology assessments. VVBs must consider sector-specific competencies and capabilities of personnel when building assessment teams. VVBs must also ensure teams include an appropriately qualified, independent technical reviewer.

Some VVBs contract external experts as consultants where a methodology requires detailed technical or scientific expertise in a sector for which it does not have in-house expertise.

5.1.2 Role of Social Carbon Foundation

In the context of third-party developed methodologies, the Social Carbon Foundation is responsible for managing the methodology approval process and for providing support and oversight to ensure that approved methodologies are consistent with SOCIALCARBON rules. Each methodology submitted to the methodology approval process is assigned a program officer who is responsible for facilitating communications across the relevant stakeholders and for conducting a review of the methodology at various stages of the process. SOCIALCARBONA reviews methodologies upon initial submission of the methodology (before the methodology is posted for public consultation), after VVB assessment. During the assessment, it is important that VVBs inform SOCIALCARBONA of progress related to all relevant milestones.

5.1.4 Effective Communications

Close communications between the methodology developer, the VVBs and Social Carbon Foundation is critical in ensuring that the methodology assessment is completed in a timely, efficient and robust manner. The Social Carbon Foundation program officer managing the methodology can help facilitate communication where appropriate. The program officer can also provide clarifications on Social Carbon Foundation procedures and requirements as needed.

5.1.5 Seeking Clarifications from Social Carbon Foundation

If there is a lack of consensus on the methodology element between the methodology developer and VVB, either party may request that Social Carbon Foundation provide clarification or facilitate additional discussions between all parties to resolve the issue. While the VVB are ultimately responsible for assessing the methodology element, the clarifications provided by Social Carbon Foundation may, in certain cases, take precedence over assessment findings of the VVB.

5.2 Key assessment criteria

Methodologies set out the detailed criteria and procedures that project activities must follow. Detailed requirements for methodologies are set out in the SOCIALCARBON Documents *SOCIALCARBON Standard v6.0* and *Methodology Requirements*.

When conducting a methodology assessment, VVBs need to assess whether the methodology conforms to SOCIALCARBON rules and whether the methodology has appropriate criteria and procedures to ensure conservativeness and scientific integrity.

VVBs must also ensure that methodologies are written in a manner that provides a prescriptive set of criteria and procedures that projects can apply and VVBs can audit against, thereby minimizing the scope for subjective interpretation, or gaming, by project proponents and VVBs using the methodology. This includes the use of precise language and the avoidance of vague terminology. For example, VVBs must ensure the proper use of key words *must*, *should* and *may*. Consistent with best practice, *must* is to be used to indicate a firm requirement, *should* is to be used to indicate a (non-mandatory) recommendation and *may* is to be used to indicate a permissible or allowable option. The term *shall* is reserved for SOCIALCARBON Standard documents and is generally not appropriate for methodologies.

Methodology assessments must focus on whether and how the methodology addresses the components set out in the sections below.

Keep in mind

Methodologies must not restate SOCIALCARBON requirements. For example, SOCIALCARBON requirements on project crediting period should not be included in the methodology. Where necessary, methodologies may make reference to the SOCIALCARBON rules directly to prevent methodologies from becoming outdated, should it be necessary to update a specific SOCIALCARBON requirement. References to specific tools or SOCIALCARBON Standard documents must not state specific versions but rather refer to the most recent version of the tool or document.

Where methodologies include definitions, VVBs must ensure that the definitions are consistent with SOCIALCARBON definitions. If methodologies contain definitions not included in the *Standard Definitions*, or the methodology contains more narrowly defined terms than in the *Standard Definitions*, such methodology definitions need to be noted within the methodology element. In addition, VVBs must ensure that terms are used consistently across the methodology.

5.2.1 Applicability

Overview

The applicability conditions set out the criteria for determining which projects are eligible under the methodology. These may include conditions with respect to GHG reduction technologies and measures, or geographic areas under which a methodology is applicable.

Key Elements

VVBs must assess whether the methodology provides a clear and defined specification and/or list of project activities eligible under the methodology. This means that applicability conditions cannot be open ended. For example, a methodology cannot state that a methodology can be applied to "a range of energy efficiency measures" but instead needs to specify the energy efficiency activities or measures that are applicable, such as replacement of incandescent light bulbs with CFLs and LEDs. Modules and tools also need to set clear conditions and parameters under which the module or tool is applicable.

VVBs must bear in mind that applicability conditions must not include criteria and procedures that are addressed in other sections of the methodology. For example, the applicability conditions section cannot state that the project will have no leakage, but the methodology must instead provide a procedure for determining leakage within the leakage section. In addition, conditions specified in tools or modules used by the methodology must not contradict any conditions specified in the applicability conditions section.

VVBs must also bear in mind that a methodology should not create limiting conditions that restrict its use to a single project or proprietary technology or approach.

5.2.2 Project Boundary

Overview

The project boundary in a methodology sets out criteria and procedures for identifying and describing the GHG sources, sinks and reservoirs relevant to the project and baseline scenarios.

Key Elements

VVBs must assess whether the methodology has provided adequate justification for the included and excluded GHG sources, sinks and reservoirs. AFOLU methodologies must adhere to the requirements on relevant carbon pools set out in the AFOLU Requirements. VVBs must also assess whether the GHG sources, sinks and reservoirs identified for the project and those identified in the baseline scenario are equivalent and consistent. VVBs must assess whether the project boundary includes, at minimum, all GHG sources, sinks and reservoirs controlled by the project proponent and related to the project.

5.2.3 Baseline scenario

Overview

All methodologies need to establish criteria and procedures for identifying alternative baseline scenarios and determining the most plausible scenario.

Key Elements

The baseline scenario is a reference case for the project activity. VVBs must consider whether the procedures for determining the baseline scenario take into account existing and alternative project types, activities and technologies that provide the same type of quality and quantity of product or service as the project activity. Note that functional equivalence between the baseline scenario and the project scenario may not apply or be appropriate for certain AFOLU project types.

VVBs must assess whether the procedure for identifying the baseline scenario allows for identifying the most plausible baseline scenario and determine whether the procedure takes into account relevant information concerning present or future conditions such as political, technical, economic and sociocultural conditions.

The procedure for the identification of baseline scenario may be combined with the procedure for demonstrating additionality where appropriate.

5.2.4 Additionality

Overview

The procedures for demonstrating additionality provide a step-wise approach to demonstrate whether a project activity would have occurred in the absence of the intervention of the carbon market.

Key Elements

VVBs must assess whether the procedure set out in the methodology complies the SOCIALCARBON rules on project methods for additionality. Note that referencing or restating SOCIALCARBON rules is not sufficient. Rather, methodologies need to apply an appropriate additionality tool that is approved under the SOCIALCARBON or an approved GHG program, or methodologies can develop new, detailed procedures for demonstrating additionality within the methodology or as a separate tool. However, methodologies may reference SOCIALCARBON requirements on regulatory surplus without providing further procedures. The project method approach must align with the CDM project method for the assessment of additionality.

5.2.5 Procedure for Quantification of Net GHG Emission Reductions and Removals

Overview

Methodologies need to establish procedures for quantifying GHG emissions and reductions and removals. As set out in the SOCIALCARBON Standard, the procedure must determine baseline emissions, project emissions and emissions associated with leakage.

Key Elements

When assessing quantification procedures, VVBs must determine whether appropriate formulae and calculation methods have been used. The methods must provide a logical and consistent approach to determine the net GHG emission reductions and removals. The assessment must also focus on whether appropriate parameters have been applied in the calculation methods or formulae.

Quantification procedures are subject to uncertainty. VVBs must assess whether the methodology relies on assumptions, parameters and/or procedures with significant uncertainty and whether the methodology has appropriate procedures to address such uncertainty. The SOCIALCARBON Standard sets out required confidence intervals and, where the uncertainty exceeds the permitted thresholds, methodologies are required to apply a conservative deduction to address the uncertainty. VVBs are encouraged to review the most recent version of the *IPCC report Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* when reviewing the uncertainty associated with methodologies.

VVBs must pay particular attention to uncertainty where indirect methods such as models, default factors and proxies are used to estimate GHG emissions reductions and removals, and where direct measurements are not feasible either due to the nature of the project activity or due to the complexity and cost involved in field-based measurements. While methodologies may pursue a model-based approach to estimate GHG emission reductions and removals, VVBs must assess whether the model is based on publicly available, reputable and recognized sources.

VVBs may also be required to determine whether a model has been calibrated for use in a given ecological zone. For example, a methodology for reduced deforestation in a semi-arid zone should not use a model that is derived from data from a moist tropical climatic zone. VVBs must assess whether the methodologies that use models include basic requirements for model selection, parameterization, calibration, and validation to the local project area. VVBs must also assess whether methodologies include a pathway for calibrating, or refining, the model uncertainty through the use of available data and/or measurements.

5.2.6 Leakage

Overview

Methodologies must specify procedures for estimating leakage in project activities. Specific leakage requirements for various AFOLU project categories are detailed in the AFOLU Requirements.

Key Elements

Assessing leakage can be challenging. Complex inter-linkages typically exist between a project activity and the activities outside the project boundary. VVBs must consider whether changes in GHG emissions outside the project boundary are directly attributable to the project.

Where a project results in a change in GHG emissions outside the project boundary, those emissions are considered as leakage. A key question VVBs must consider when assessing leakage is whether the methodology has accounted for potential upstream and downstream emission sources associated with the project activity. For example, in a project activity that uses biomass to generate electricity and the project boundary only includes emission sources within the generation site, upstream emissions that result from the production of biomass should be evaluated. Given that a project activity can have multiple upstream and downstream effects, VVBs should consider the significance of the effect and the extent to which the effects are directly attributable to the project activity. The principle of relevance should be applied in determining what constitutes leakage.

In some methodologies it may be necessary to evaluate and account for lifecycle emissions. Lifecycle emissions are emissions associated with the product life from cradle-to-grave (i.e., from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, including disposal or recycling). For example, in fuel switch projects where conventional fossil fuels are replaced with biofuels, the seed to tailpipe emissions associate with biofuels, depending on how the biofuel is produced, can be very significant.

In AFOLU methodologies, VVBs must ensure that the methodology has appropriate criteria and procedures for addressing the following types of leakage, as applicable:

- Market leakage: Projects may significantly reduce the production of a commodity, causing a change in the supply and demand equilibrium, resulting in a shift of production elsewhere.
- Activity-shifting leakage: The agent of deforestation and/or degradation may move to an area outside the project boundary and continues activities elsewhere.
- Ecological leakage: Wetlands restoration and conservation (WRC) projects may cause changes in GHG emissions or fluxes of GHG emissions from ecosystems hydrologically connected to the project area.

Criteria and procedures for determining leakage may either be within the methodology or a separate tool. Where appropriate, the methodology may also reference approved tools for the estimation of leakage.

5.2.7 Monitoring

Overview

The methodology must provide the data and parameters to be reported, including sources of data and units of measurement.

Key Elements

In assessing monitoring data and parameters, VVBs must assess whether the default factors and standards used are from a publicly available, reputable and recognized source (e.g., IPCC or published government data), peer reviewed, and appropriate for the given source, sink or reservoir. The standards and factors must also reflect current data.

Where methodologies do not provide data values, VVBs must assess whether the methodology establishes appropriate procedures for the project proponent to determine data values.

VVBs must also consider whether the measurement methods prescribed by the methodology are appropriate. For instance, in some case direct measurements of GHG emissions may be feasible (e.g., measuring the methane captured in landfills through flow meters); in other cases, indirect measurements of GHG emissions combined with calculations may be more appropriate (e.g., calculating carbon stock changes from models). These choices may involve trade-offs between accuracy and uncertainty. If a methodology uses a less accurate method for monitoring a particular GHG source or sink, the VVB must assess whether appropriate procedures are in place to ensure that the estimates are conservative. As set out in the *IPCC Good Practice Guidance and Uncertainty Management*, higher tier methods that involve direct measurement result in more reliable estimates with reduced uncertainty. This implies that methodologies that rely on low-tier approaches, such as the Tier One method of using default emission factors, must ensure that the default factors are conservative to account for uncertainty.

Where methodologies require the use of remotely sensed data, VVBs must, at minimum, require that internationally-recognized published guidelines are followed for evaluating remotely-sensed data. Guidelines for estimating carbon stock based on forest inventories and remotely sensed data are found in the *IPCC Good Practice Guidelines for LULUCF* and the Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD).

5.3 Reporting requirements

Methodology assessment reports must clearly describe the process of the assessment as well as the findings from the assessment.

SOCIALCARBON provides a template for methodology assessments. The template requires that VVBs provide a description of the assessment, the method and criteria used, and any findings of uncertainties related to the methodology element. For each aspect of the methodology element, VVBs must assess whether and how the criteria and procedures are appropriate, adequate and in compliance with SOCIALCARBON rules. All CLs and CARs as well as the methodology developer's responses need to be documented.

VVBs must ensure that the methodology assessment reports provide a sufficient level of detail to allow Social Carbon Foundation and other intended readers to understand how the methodology conforms to SOCIALCARBON rules and scientific best practice. For example, where a VVB relies on published peer reviewed studies to evaluate the credibility of a procedure used in a methodology, the methodology assessment report should provide references to the studies.

Appendix 1: Document history

Version	Date	Comment
V1.0	03 Jan 2022	Initial version released under SOCIALCARBON Version 6.0.
V1.1	05 Dec 2022	Formatting updates
V1.2	03 July 2023	Regulatory surplus definition updated to align with Standard and article 6.2