Verified Carbon Standard

VCS Tool

# M0310

# ADDITIONALITY ASSESSMENT

Draft Version

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Sectoral Scopes 1-16

This draft tool was developed by Verra based on Clean Development Mechanism (CDM) tools and guidelines.

# CONTENTS

# 1 SUMMARY DESCRIPTION

This tool provides procedures and requirements to assess the additionality of project activities, including the following steps:

- Step 1: Identify alternatives to the project activity
- Step 2: Barrier analysis
- Step 3: Investment analysis
- Step 4: Common practice analysis

This tool replaces the *CDM TOOL01 Tool for the Demonstration and Assessment of Additionality* for project activities under the VCS Program and consolidates the procedures and requirements for the investment analysis, barrier analysis and common practice analysis.

The VCS Program rules and requirements specify which methodologies referencing the CDM TOOL01 and other tools and guidelines listed in Section 2 must use this tool or the equivalent sections of this tool instead.

Project activities applying a methodology that uses the *CDM TOOL21 Demonstration of additionality of small-scale project activities* may also apply all applicable steps of this tool (including the common practice analysis) to comply with the CCP requirements.

Methodologies may provide a different approach to assess additionality as per the most recent version of the *VCS Methodology Requirements*.

The regulatory surplus check required in the *VCS Program rules and requirements* must be applied in addition to this tool for all project activities when assessing and demonstrating additionality.

[THE FINAL VERSION OF THIS TOOL WILL INCLUDE A FLOW CHART OF THE PROCEDURES.]

# 2 SOURCES

This tool is based on the following CDM tools and guidelines:

- *TOOL01 Tool for the Demonstration and Assessment of Additionality, v7.0*
- *TOOL24 Common Practice, v3.1*
- *TOOL27 Investment Analysis, v14.0*

- *Guidelines for Objective Demonstration and Assessment of Barriers, v1.0 (EB50 Annex 13)*

# 3 DEFINITIONS

**Input**
Resources used by the project activity, including but not limited to natural resources (such as land), energy sources, and raw materials.

**Output**
Goods or services produced by the project activity, including but not limited to finished goods, products or energy carriers (such as heat, steam, electricity).

# 4 APPLICABILITY CONDITIONS

This tool applies to all types of project activities and is used to assess and demonstrate additionality.

This tool is applicable under any of the following conditions:

1) The applicable methodology requires or permits the use of this tool; or
2) The VCS Program rules and requirements requires or permits the use of this tool.

# 5 PROCEDURES

The regulatory surplus check required *in the VCS Program rules and requirements* must be applied in addition to this tool for all project activities when assessing and demonstrating additionality.

Follow these steps to assess additionality:

- Step 1: Identify alternatives to the project activity
- Step 2: Barrier analysis
- Step 3: Investment analysis
- Step 4: Common practice analysis

Step 1 must only be applied if the methodology does not include procedures for identifying alternatives or the baseline scenario.

Project proponents must complete either Step 2 or Step 3 unless the methodology indicates otherwise.

The applicable methodology may use only selected parts of this tool and include additional procedures and requirements.

## 5.1 Applicable geographic area

The applicable geographic area must be determined for Step 1, Step 2 and Step 4. The same area must be used when applying these steps.

The default applicable geographic area is the entire host country. The project proponent may choose to limit the applicable geographic area to a specific geographic area within the host country. In this case, the project proponent must justify the essential distinctions between the applicable geographic region and the rest of the host country that lead to different investment or implementation conditions specific to the project activity. Relevant factors may include:

1) Subsidies, policies, laws or regulations
2) Climatic, topographic, or geological differences
3) Socioeconomic conditions
4) Infrastructure development and accessibility
5) Access to markets and resources
6) Cropland suitability related to soil and crop type

## 5.2 Step 1: Identify Alternatives to the Project Activity

This step identifies all realistic and credible alternative scenarios to the proposed project activity.

Step 1 does not need to be applied if the applicable methodology provides procedures and requirements for identifying the alternative scenarios or baseline scenario.

### 5.2.1 Step 1a: Define Alternative Scenarios to the Proposed Project Activity

Identify all realistic and credible alternatives to the project activity that provide a comparable output (service or product) and/or utilize a comparable input as the proposed project activity. This must include alternatives that have been implemented previously or are currently being

introduced by the project proponent and other market participants with a similar context in the applicable geographic region.[1] These alternative scenarios include:

1) The proposed project activity is undertaken without being registered as a project activity.
2) Other realistic and credible alternative scenarios to the proposed project activity scenario that deliver outputs with comparable quality, properties and application areas and/or utilize a comparable input. Further guidance and examples may be provided in the applicable methodology.
3) If realistic, the continuation of the current situation (no project activity or other alternatives undertaken).

If the proposed project activity includes different outputs and/or services, alternative scenarios for each of them should be identified separately. Realistic combinations of these should be considered as possible alternative scenarios to the proposed project activity.[2]

### 5.2.2 Step 1b: Consistency with Mandatory Applicable Laws and Regulations

Identify the alternative scenarios from Step 1a that comply with all mandatory applicable legal and regulatory requirements within the applicable geographic region. The alternative scenarios must be compatible with all applicable laws and regulations, including those that have

[1] For example:

1) For projects reducing emissions in aluminum or cement production, the output provided by the alternative scenarios should be the production of the same quantity of aluminum or cement with comparable quality and characteristics as in the project activity.
2) For improved energy efficiency of power generators in a manufacturing plant, different scenarios to supply the same amount of electricity (such as continued operation of the existing generators without retrofit or supply by the electricity grid) must be considered.
3) For a landfill gas capture project, different scenarios to manage and operate the landfill must be considered, including the methane vented to the atmosphere, captured and flared, and captured and combusted for energy generation.
4) For rice cultivation projects, both the cultivated land area (input) and rice yield (output) may be relevant factors when establishing alternative scenarios.
5) For projects recycling solid wastes (e.g., plastic), alternative scenarios with the same quantity of solid wastes (input) and recycled plastic material (output) must be considered. A realistic alternative could be disposing of the solid waste in a landfill or incinerated it, and supplying the same quantity of plastic from virgin plastic production to the market.

[2] For example:

1) For cogeneration, alternative scenarios for heat and electricity generation must be established separately.
2) For improved energy efficiency in several boilers with different characteristics (e.g., size, technology, age), alternative scenarios must be established for each boiler or for types of boilers with broadly similar characteristics.

objectives other than GHG reductions and/or removals (e.g., for local air pollution control).[3] Policies that do not have legally binding status must not be considered.

Where any of the alternative scenarios of step 1a do not comply with all mandatory applicable legislation and regulations, follow these steps:

1) Assess the current practice in the applicable geographic region:
    a) For high-income countries,[4] all legal requirements are deemed to be enforced.
    b) For countries other than high-income countries, where the mandatory legal or regulatory requirements are systematically not enforced and non-compliance is widespread in the applicable geographic region, include the alternative scenarios in the list for further consideration. Demonstration of non-enforcement must be based on authoritative and up-to-date information that is relevant and applicable to the alternative scenario.
2) Where the mandatory legal or regulatory requirements are enforced, eliminate the alternative scenario from further consideration.

Provide a list of alternative scenarios to the project activity that comply with mandatory legislation and regulations considering enforcement in the applicable geographic region.

**Outcome of Step 1**

1) Where the proposed project activity is the only remaining alternative, the proposed project activity is not additional.
2) Otherwise, proceed to Step 2 (barrier analysis) or Step 3 (investment analysis).

## 5.3 Step 2: Barrier Analysis

This step identifies barriers to implementation and assesses whether they prevent the project activity or the alternative scenario(s). The project proponent must:

1) Identify realistic and credible barriers that may prevent the implementation of the project activity and the alternative(s)

2) Demonstrate that the identified barriers would prevent the implementation of the project activity

3) Demonstrate that carbon credit revenues are the decisive element in overcoming each identified barrier for the project activity

[3] For example, an alternative consisting of an open, uncapped landfill would be non-compliant in a country where this scenario implies violations of safety or environmental regulations pertaining to landfills.

[4] As defined by the World Bank. Available at: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

4) Demonstrate that the identified barriers would not prevent the implementation of at least one of the alternatives

The barrier analysis must be conducted according to the following steps and all relevant requirements in Appendix 1.

### 5.3.1 Step 2a: Identify Realistic and Credible Barriers

Establish a complete list of realistic and credible barriers that may prevent the implementation of the project activity and the alternative scenario(s). The barriers must be based on the actual context of the project activity and alternatives and the applicable geographic area,[5] reflecting practical challenges for their implementation. The list must include at least one barrier that would prevent the implementation of the project activity but must also consider other barriers relevant to the project activity and the alternative(s).

Unless the applicable methodology identifies other barriers specific to the project activity (e.g., technological barriers), such barriers are limited to:

1) Financial barriers, other than insufficient financial returns as analyzed in Step 3 (investment analysis), for example:

    a) Similar activities have only been implemented with grants or other non-commercial financing terms. Similar activities are defined as activities that rely on broadly similar technologies or practices, are of a similar scale, take place in a comparable regulatory environment, and are undertaken in the applicable geographic area.

    b) No capital is available from domestic or international capital markets due to real or perceived risks associated with investments in the applicable geographic area where the project activity is implemented. This may be demonstrated, for example, by the credit rating of the country or other investment reports from recognized sources (e.g., country investment grade or country risk reports).

2) Information barriers, for example:

    a) Lack of awareness of financial and non-financial benefits for final users[6]

    b) Low acceptance of new or alternative practices, services, or products associated with the project activity in the relevant sector due to lack of knowledge[7]

[5] Determined per Section 5.1

[6] For example, households may not be aware of the life cycle cost savings associated with the use of energy-efficient appliances.

[7] For example, construction companies may perceive that high-additive cement blends are of inferior quality to traditional Portland cement.

3) Institutional barriers, for example:

   a) The investor is not the beneficiary of financial or non-financial benefits (e.g., cost savings) associated with the implementation of the project activity[8]

   b) Decentralized corporate structures that treat energy costs as overhead instead of direct costs provide little incentive for organizational units to reduce energy use

Note – *the applicable methodology may identify other barriers (e.g., technological barriers) specific to the project activity and/or region where the project activity is implemented.*

### 5.3.2 Step 2b: Demonstrate That The Identified Barriers Would Prevent The Implementation Of The Project Activity

Demonstrate that at least one of the barriers identified in Step 2a would prevent the implementation of the project activity without revenues from carbon credits.

Provide verifiable evidence to demonstrate the existence of each identified barrier that would prevent the implementation of the project activity and, where possible, quantify the barrier(s).

### 5.3.3 Step 2c: Demonstrate that carbon credit revenues are the decisive element in overcoming each identified barrier to the project activity

Provide verifiable evidence that carbon credit revenues are the decisive element in overcoming each identified barrier to the project activity.

### 5.3.4 Step 2d: Demonstrate That The Identified Barriers Would Not Prevent The Implementation Of At Least One Of The Alternatives

Demonstrate that at least one of the alternatives identified in Step 2a does not face significant barriers, including the barriers faced by the project activity. Where possible, quantify the barriers for the alternative(s).

Explain and demonstrate with verifiable evidence how the alternative or alternatives are affected less by the identified barrier(s) than the proposed project activity.

**Outcome of** Step 2

1) Where all of the following conditions are met, proceed to Step 4 (common practice):

   a) the implementation of the project activity would be prevented by barriers

[8] For example, misaligned incentives between taxi owners and drivers may prevent the implementation of fuel reduction measures. Taxi owners that lease their vehicles to drivers who cover fuel costs, do not have a financial incentive to invest in improvements, while drivers lack ownership and will not make such investments.

b) carbon credit revenues are the decisive element in overcoming each barrier

c) at least one of the alternatives does not face significant barriers

2) Otherwise, proceed to Step 3 (investment analysis) if permitted by the applicable methodology, or conclude that the project activity is not additional.

## 5.4 Step 3: Investment Analysis

The objective of this step is to conduct an investment analysis to assess the economic or financial attractiveness of the alternative scenarios identified in Step 1 or the applicable methodology.

The investment analysis must be conducted in accordance with the following procedures and the requirements in Appendix 2.

Select one of the following options and explain and support the choice of the type of investment analysis:[9]

a) **Option 1: Investment comparison analysis**
Use this option to compare the financial indicator of the project activity with the alternative scenarios and demonstrate that the project activity is less financially attractive in the absence of carbon credits. Where relevant, the alternative scenarios considered must provide the same type output or utilize the same input as the project activity.[10]

b) **Option 2: Benchmark analysis**
Use this option to compare the financial indicator of the project activity with a benchmark. Typically, a benchmark analysis is suitable if the proposed project activity is developed as part of a portfolio of technologies or practices, or if entities other than the project proponent could provide the same output of the project activity.[11]

### 5.4.1 Investment comparison analysis

1) Identify the financial indicator, such as IRR, NPV, cost-benefit ratio, or levelized cost[12], suitable for the project type and decision-making context.

[9] The option "simple cost analysis" that was provided in the CDM TOOL01 has been removed. If the project activity and the alternatives do not generate any financial or economic benefits, they may apply the "investment comparison analysis" without cash inflows.

[10] For example, the investment conparison analysis is suitable for a project activity in a manufacturing plant that has different alternative scenarios to supply the same level of electric and thermal energy for the manufacturing process

[11] For example, the benchmark analysis is suitable for a grid-connected solar power plant

[12] e.g., levelized cost of electricity production in $/kWh or delivered heat in $/GJ

2) Calculate the suitable financial indicator for all alternative scenarios.

3) Present a clear comparison of the financial indicator for all alternative scenarios and rank the alternative scenarios according to the financial indicator.

4) Demonstrate that the mitigation activity would not be the economically most attractive scenario in absence of carbon credits.

5) Conduct a sensitivity analysis to assess whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions.

### 5.4.2 Benchmark analysis

1) Identify the financial indicator, such as IRR, suitable for the project type and decision-making context.

2) Calculate the financial indicator for the project activity.

3) Demonstrate that:

   a) the project activity would not meet the required financial benchmark without carbon credit revenues;

   b) the economic performance of the mitigation activity increases decisively through carbon credit revenues; and

   c) carbon credit revenues raise the financial indicator at or above the required financial benchmark.[13]

   [Where a project activity can demonstrate that it meets 3a (but not 3b and 3c) and all other applicable requirements in this tool, it is considered additional, but it will not be eligible for a CCP label.]

4) Conduct a sensitivity analysis to assess whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions.

**Outcome of** Step 3

1) Proceed to Step 4 (common practice analysis) if after the sensitivity analysis it is concluded that:

   a) the proposed project activity is unlikely to be the most financially/economically attractive scenario (investment comparison analysis); or

   b) is unlikely to be financially/economically attractive (benchmark analysis)

[13] The forecasted carbon revenues must be based on verifiable evidence such as contracts, actual sale of similar credits, published price forecasts applicable to the project

2) Otherwise, proceed to Step 2 (barrier analysis) if permitted by the applicable methodology, or conclude that the project activity is not additional.

## 5.5 Step 4: Common practice analysis

### 5.5.1 Step 4a: Determination of the procedures for the common practice analysis

The previous steps must be complemented with an analysis of the extent to which the proposed project type (e.g., technology or practice) has already diffused in the relevant sector and applicable geographic area.[14]

For the following measures,[15] apply Step 4b:

1) Fuel or feedstock switch (e.g., switch from naphtha to natural gas for energy generation, switch from limestone to gypsum in cement clinker production);
2) Switch of technology with or without change in energy source (e.g., energy efficiency improvements, power generation based on renewable energy);
3) Methane destruction (e.g., landfill gas flaring);
4) Methane formation avoidance (e.g., use of biomass for energy generation that would otherwise have been left to decay and emit methane); and
5) Carbon capture and storage (e.g., technology-based carbon capture and storage where $CO_2$ is sourced from industrial facilities or the atmosphere).

For all other measures apply Step 4c.

### 5.5.2 Step 4b: Common practice analysis for measure(s) that are listed in Step 4a

1) Calculate the applicable capacity or output range as +/-50% of the proposed project activity's total design capacity or output.
2) Identify similar projects (both VCS and non-VCS) that meet all of the following conditions:
    a) The projects are located in the applicable geographic area
    b) The projects apply the same measure (per Step 4a) as the proposed project activity

[14] Determined per Section 5.1

[15] For the context of this tool, a measure is a broad class of greenhouse gas emission reduction and carbon dioxide removal activities with common features.

c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity

d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and application areas (e.g., clinker) as the proposed project plant

e) The capacity or output of the projects is within the applicable capacity or output range calculated in the previous step

f) The projects started commercial operation before the project is published for public stakeholder consultation or before the start date of the proposed project activity, whichever is earlier[16]

*3)* Within the similar projects identified in the previous step, identify those that are not registered, submitted for registration or undergoing validation under the VCS program. Note their number $N_{all}$. Projects under other GHG programs may optionally be excluded from $N_{all}$.

4) Within similar projects identified in the previous step, identify those with technologies that differ by at least one of the following (as appropriate in the context of the measure applied in the project activity and applicable geographic area):

a) Energy source/fuel (e.g., energy generation by different energy sources such as wind and hydro and different types of fuels such as biomass and natural gas);

b) Feedstock (e.g., production of fuel ethanol from different feedstocks such as sugar cane and starch, production of cement with varying percentages of alternative fuels or less carbon-intensive fuels);

c) Investment climate on the date of the investment decision, such as access to technology, subsidies or other financial flows, promotional policies or legal regulations; or

d) Other features and conditions, such as the nature of the investment (for unit cost of capacity or output[17] technologies/activities are considered different where their costs is at least 20% lower).

Note the number of projects with different technologies $N_{diff}$.

[16] While identifying similar projects, project proponents may also use publicly available information, for example from government departments, industry associations, international associations on the market penetration of different technologies, etc.

[17] In general, capacity values should be considered in the common practice assessment. The use of output values should be justified and consistently applied in the assessment.

5) Step 5: calculate factor F=1-$N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) in the applicable geographic area.

The proposed project activity is a "common practice" if the factor F is greater than 20% and $N_{all}$-$N_{diff}$ is greater than 3.[18]

### 5.5.3 Step 4c: Common practice analysis for measure(s) that are not listed in Step 4a

Provide an analysis of the extent to which similar activities to the proposed project activity have been implemented previously or are currently underway in the applicable geographic area. Similar activities are those with comparable technologies or practices, scales and regulatory environment. Exclude activities that are under validation or registered in a GHG program. Provide documented and verifiable evidence to support the analysis and, where relevant, quantitative information.

If similar activities to the proposed project activity are identified, compare the project activity to these other activities. Identify and explain any essential distinctions between the proposed project and similar activities. Such essential distinctions may include significant changes in circumstances, such as new barriers or the end of promotional policies, that affect the implementation of the proposed project compared to other similar activities. The distinction must be fundamental and verifiable.

If similar activities are observed and no essential distinctions can be identified, the proposed project is considered "common practice."

**Outcome of Step 4**

1) If the outcome of Step 4 is that the proposed project activity is not "common practice," and all other relevant steps in this tool or the applicable methodology are met, then the proposed project activity is additional.
2) If the outcome of Step 4 is that the proposed project activity is "common practice," then it is not additional.

# 6 REFERENCES

Not applicable.

[18] If F is greater than 20% but $N_{all}$-$N_{diff}$ is 3 or less, the project is not a common practice.

# APPENDIX 1: BARRIER ANALYSIS REQUIREMENTS

The following requirements must be applied to demonstrate the existence of barriers.

1) Verifiable evidence to demonstrate the existence of barriers, and that the carbon credit revenues are the decisive element in overcoming each barrier may include:

    - Relevant legislation, regulatory information or industry norms
    - Publically available studies or surveys
    - Relevant third-party studies or surveys (e.g., market surveys, technology studies) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc.
    - Data from national or international statistics
    - Documentation of relevant market data (e.g., market prices, tariffs, policies)
    - Written documentation from independent experts from research institutions, industry associations or similar
    - Written documentation from the project developer in the context of the proposed project activity or similar projects implemented in the past (e.g., minutes from Board meetings, correspondence, internal feasibility studies) may be used to support the analysis, but must not be the only evidence provided

    **Rationale:** Verifiable evidence is required to objectively demonstrate the existence of barriers and determine whether the carbon credit revenues are a decisive element in overcoming each barrier.

2) The evidence used must be interpreted and applied conservatively to assure that it is very unlikely that the effect of the barrier is overestimated.

    **Rationale:** Barriers may have a level of uncertainty and conservative interpretation of the evidence should be made to reduce the risk of false positives in the additionality assessment.

3) While demonstrating barriers, the project proponents must provide relevant information of the company, and other entities and users involved, such as the nature of the entities involved in the financing, company organization and ownership, or relevant financial information.[19]

[19] Example: A subsidiary of a multinational group may have different access to capital or information than a local SME company.

**Rationale:** This complementary information is relevant in assessing the existence and significance of barriers faced in the actual context of the project activity and alternatives.

4) The assessment of the significance of barriers should consider the level of access to capital, availability of information, and institutional conditions in the specific context of the project activity and sector.[20]

   **Rationale:** The assessment should account for the specific context of the project activity and sector to ensure that only relevant barriers are identified.

5) In order to make an objective claim for a specific barrier, the project proponent may demonstrate that in similar circumstances (in similar industries/sectors, in companies of similar size and ownership structure, in similar projects) the barriers prevented the implementation of other projects.

   **Rationale:** The evidence of the existence of the barrier for other projects under similar circumstances makes the barriers more objective and provides a strong argument that a project is additional.

6) Barriers that can be mitigated by additional financial means may be quantified and represented as costs. They should not be identified as a barrier but considered in the investment analysis.[21]

   **Rationale:** A barrier that can be monetized and quantified as an additional cost in an investment analysis can demonstrate in a much more objective way than how the barrier prevents investment from being pursued.

7) Project proponents claiming a financial barrier must demonstrate that the project implementation was reliant on the benefit of the carbon credits, where applicable. Therefore, it must be demonstrated that the lender explicitly considers the project registration when approving the loan or that carbon credits are otherwise decisive for accessing capital.[22]

   **Rationale:** Demonstrating that the lender considers the project registration or that carbon credits are otherwise essential for accessing capital or securing funding provides clear

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[20] For example, projects in industries with small- and medium-sized enterprises may not have the same means to access capital or overcome other barriers as projects in sectors where typically large or international companies operate.

[21] For example, trained labor and the required knowledge to operate and maintain new technologies may initially not be available for a company. Hoewver, this does not necessarily prevent the implementation of the project. Most equipment suppliers are able to provide sufficient training and/or even provide themselves with staff to operate the plant. However, this adds additional costs (salaries, training costs, service fees) that can be considered in the investment analysis.

[22] For example:

(1) The investment is made by a company that also purchases the VCUs, and the loan agreement requires the registration of the project activity and generation of VCUs.

(2) A significant part of the project investment is provided upfront by a company as a pre-payment for expected VCUs to enable the project implementation.

evidence of their role in decision-making and that they are desicive in overcoming financial barriers.

# APPENDIX 2: INVESTMENT ANALYSIS REQUIREMENTS

## A2.1 General Requirements

1) Project proponents must provide an Excel spreadsheet with the detailed investment analysis.

    a) All formulas must be readable, and all relevant cells must be viewable and unprotected

    b) Justify and cite assumptions in a verifiable manner

    c) The spreadsheet will be made available to Verra reviewers

    d) The spreadsheet will be published alongside the project description on the Verra website

    e) Commercially sensitive information may be protected as per the VCS Standard, where it can be demonstrated, to Verra's satisfaction, that such information is commercially sensitive.

3.5.2 All information in project documents shall be presumed to be public.

**Rationale:** Investment analysis must be presented in a transparent manner, to the extent that the reader can reproduce the results.

2) The assessment period for the selected financial indicator (such as IRR or NPV) should reflect the expected project lifetime.[23] Alternatively, a shorter assessment of at least ten years may be used.

**Rationale:** The purpose of undertaking an investment analysis is to determine whether or not the project activity would be financially viable without the incentive of carbon credits. This analysis must consider the full operational lifespan, since the actual project activity may extend beyond the crediting period.

3) The investment analysis must reflect all cash flows associated with the project activity during the assessment period, including:

    a) All investment, operational and maintenance costs. Such costs must be included for the alternative scenarios but may be conservatively excluded for the project activity.

    b) All revenues, such as incomes from sales of products or services, subsidies, fiscal incentives, and official development aid. Cost savings associated with the implementation of the project activity (e.g., tax benefits) must also be included as

[23] This refers to real project lifetime (e.g., technical lifetime, or period of the operational permit), not the crediting period.

revenues. Revenues must be included for the project activity, but may be conservatively excluded for the alternative scenarios.

c) The project's risks can be accounted for as costs. Such risks and their associate costs must be supported by verifiable third-party evidence, such as insurance premiums from reputable insurance providers or reports from industry associations.

**Rationale:** All cash flows associated with the project activity and alternative scenarios are relevant for establishing the financial indicator. Excluding costs for the project activity and excluding revenues for alternative scenarios is conservative in determining the baseline scenario and/or additionality.

4) All parameters and assumptions used in the analysis must be consistent:

   a) with the financial indicator applied

   b) across alternative scenarios unless differences can be well substantiated

   **Rationale:** Consistency is important to guarantee an accurate investment analysis and comparison of alternatives and provide reliable conclusions about the additionality of the project activity.

5) The input values used in the investment analysis and the benchmark must be valid and applicable at the time of the investment decision for the project activity. Any expenditures occurred prior to the investment decision of the project activity must be excluded from the investment analysis.

   **Rationale:** The use of the investment analysis to demonstrate additionality is intended to assess if an investor would implement the project activity without the revenues of carbon credits. This decision is based on information available at the time of the investment decision. Expenditures prior to investment decision, such as costs for feasibility studies or testing, are sunk costs and do not influence the final investment decision.

6) Where the implementation of a project activity ceases after the commencement and the implementation is recommenced at a later point:

   a) The investment analysis must reflect the economic decision-making context at the time of the decision to recommence the project activity.

   b) Capital expenditures incurred in tangible assets between the initial decision and the decision to recommence the project activity may be included as the recoverable value from the potential reuse or resale of the assets. Such capital expenditures are included at the market fair value at the point of the decision to recommence and must be based on assessments from independent third-party experts.

   c) Expenditures other than capital expenditures in tangible assets incurred prior to the decision to recommence must be excluded.

**Rationale:** At the time of the decision to recommence the implementation of the project activity, the decision is based on the information available at that time. Prior expenditures, such as feasibility studies or testing costs, do not affect the final decision unless they involve tangible assets that can be reused or resold.

7) All assumptions, data and conclusions in the investment analysis must be:

   a) transparently documented in the project description

   b) appropriately justified and substantiated by evidence

   c) consistent with information presented to the company's decision-making management and to investors/lenders

8) The fair value of the assets at the end of the assessment period must be included as a cash inflow in the final year. The fair value should be calculated in accordance with local accounting regulations, or international best practice. The fair value must include both the book value of the asset and the expected profit or loss on the realization of the assets (if applicable).

   **Rationale:** In determining a financial indicator, capital expenditures that have not been fully depreciated should be reflected as a cash inflow. Excluding their fair value would incorrectly assume that the assets have no value remaining, although they may still be used by the project proponent in other projects or sold to other market participants.

9) If the financial indicator selected requires a discount rate (e.g., for the NPV in the investment comparison analysis), the discount rate must be determined following the requirements for the calculation of IRR benchmarks in section A2.3.

   **Rationale:** The discount rates must align with the benchmark for consistency and to ensure that the NPV reflects a true measure of profitability relative to the project's risks and the cost of capital.

10) The investment analysis must be conducted with post-tax cash flows.

    **Rationale:** The weighted average costs of capital (WACC)[24] and cost of equity[25] are post-tax IRR benchmarks. By using post-tax cash flows the investment analysis provides the net cash flows consistent with the WACC or cost of equity.

11) Depreciation and other non-cash items deducted from gross profits for tax calculations must be added back when determining the financial indicator.

[24] The WACC is determined in paragraph 15)

[25] The cost of equity is determined in paragraph 18)

**Rationale:** Depreciation is a non-cash expense and not an actual cash outflow. To avoid double counting the cost of the assets, the depreciation is added back when calculating the financial indicator.

## A2.2 Application of Project IRR and Equity IRR

12) The investment analysis must be consistent with the indicator used (such as project IRR or equity IRR) and the type of benchmark selected in accordance with section A2.3.

13) When calculating the project IRR, the cost of financing expenditures (i.e., loan repayments and interest) must be excluded.

**Rationale:** The purpose of the project IRR calculation is to determine the viability of the project to service debt. Including the cost of financing as an expense would result in double counting of this cost.

14) When calculating the equity IRR, only the portion of the investment costs financed by equity is included as a cash outflow. The portion of the investment costs which is financed by debt must be excluded from the cash flows.

**Rationale:** The purpose of the equity IRR calculation is to determine the final return on the initial equity investment. In such calculations cost of servicing debt (interest and principle payments) are a real cash outflow. Considering the investment costs financed by debt as cash outflow would result in double counting of the cost of debt.

## A2.3 Selection of Appropriate Benchmarks

15) The applied benchmark must be appropriate for the type of IRR calculated and based on parameters that are standard in the market and that is commonly applicable to the country, sector and type of mitigation activity:

a) WACC for the project IRR

$$WACC = r_e \times W_e + r_d \times (1 - T_c) \times W_d \quad (1)$$

Where:

$r_e$ = Cost of equity (-)
$W_e$ = Portion of equity for financing (%)
$r_d$ = Cost of debt (-)
$W_d$ = Portion of debt for financing (%)
$T_c$ = Corporate tax rate (-)

b) Required/expected returns on equity for the equity IRR

**Rationale:** For the same project activity, the project IRR and equity IRR are different. The benchmark should be appropriate to the type of IRR calculation applied and be representative for the country, sector and type of mitigation activity.

16) All cash flows and the financial benchmark (if applicable) must be consistently used in either real or nominal terms. Where an investment analysis is carried out in nominal terms and the available IRR benchmark is in real terms, the benchmark must be converted to nominal values by adding the inflation rate.

17) The inflation rate must be obtained from the following sources (use the highest available option):

    a) inflation forecast of the central bank of the host country for the duration of the crediting period

    b) the target inflation rate of the central bank

    c) the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund) or the World Bank for the next five years after the time of decision making must be used.

### A2.3.1 Cost of equity (expected return on equity) in the market

18) The cost of equity must be determined by any of the following applicable to the country, sector and type of mitigation activity:

    a) The appropriate default value determined as per section A2.5;

    b) Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data;

    c) Estimates of the required return on capital, based on bankers views and private equity investors/funds' required return on comparable projects;

    d) Government/official approved benchmark where such benchmarks are used for investment decisions; or

    e) Calculating the cost of equity using capital asset pricing model (CAPM) as per requirement 19) if all of the following conditions are satisfied, according to the most recent datasets from the World Federation of Exchanges and the Gross Domestic Product (GDP) from the World Bank or UNSTAT:

        i) More than 10 years of existence for the stock exchange;

        ii) The stock market is representative of the domestic economy, i.e. ratio of stock market capitalization to GDP is in excess of 20 per cent;

iii) The average share turnover ratio over the last calendar year is in excess of 20 per cent;

iv) There are at least three domestic pure players that belong to the same sector as the project[26] to calculate beta with at least 3 years of daily stock market data, and daily values are available; and

v) There are domestic government securities labelled in the domestic currency with maturities over 10 years.

**Rationale:** The values in section A2.5 reflect approximate returns on equity expected by the market for different sectors and countries. The expectation of return depends on conditions of the market that can be modeled, taking into account the history (time series) of the market's key variables.

19) The cost of equity using CAPM is calculated as follows, using official data sources from financial institutions (e.g., central banks, stock exchanges). Other reputable third-party sources may be used if official data from financial institutions is unavailable.

$$r_e = r_f + \beta \times (r_m - r_f) \quad (2)$$

Where:

$r_e$ = Cost of equity (-)
$r_f$ = Risk-free rate (-)
$\beta$ = Beta (-)
$r_m$ = Expected market return

The parameters must be established as follows:

a) The risk-free rate must be based on local sovereign debt and have a maturity date close to the project lifetime (at least 10 years) and sufficient liquidity. The latest sovereign debt data available at the time of the investment decision must be used.

b) Beta[27] must be calculated as the weighted arithmetic average of the beta of all the pure players that have been in business for at least three years and over the longest common lifetime for the companies in the sample of pure players, weighted by the total capitals (i.e. equity and long-term debt) of the pure players. Every pure player that meets the abovementioned criteria and that belongs to the same sector as defined in the previous paragraph must be accounted for and used in the beta calculation. The

[26] If this data requirement cannot be met, the sector may be defined more broadly, e.g. by extending from the solar PV sector to the renewable energy sector and even to the utilities sector, so that at least three players can be identified.

[27] Measure of the risk (volatility of returns)

individual betas must be calculated independently without deleveraging by the debt-equity ratios of the pure players.

c) The expected market return must be calculated using the average of the following three annualized rates of return of stock market for (i) the longest time series available, (ii) a 20-year horizon (if existing), and (iii) a 10-year horizon (if existing). Daily values must be used. If there are multiple stock exchange indices, stock issues for a given company, or sovereign debt issues, the most liquid or most frequently traded one must be used. For stock market indices, liquidity is assessed with the volume of trading for the component stock issues.

### A2.3.2 Cost of debt

20) The cost of debt must be calculated as the cost of financing in the capital markets (e.g., commercial lending rates and guarantees required for the country and the type of project activity concerned), based on documented evidence from financial institutions regarding the cost of debt financing of comparable projects.

### A2.3.3 Weighting of debt and equity

21) The typical debt/equity finance structure observed in the sector and host country must be used based on verifiable third party information. If such information is not available, 50 percent debt and 50 percent equity financing must be used.

## A2.4 Sensitivity analysis

22) Variables (including revenues and costs) constituting more than 20% of either total project costs or revenues must be subjected to reasonable variation. Any other variables with a material impact must also be varied. The sensitivity analysis must be included in the Excel spreadsheet, and the results and conclusions must be presented in the Project Description.

**Rationale:** The initial objective of the sensitivity analysis is to determine in which scenarios the project activity would pass the benchmark or become more favorable than the alternative(s). Reasonable variations must be applied to assess likely scenarios that may change the conclusions.

23) To determine the reasonable range of variations in the project context, market data and third-party studies[28] relevant for the project circumstances may be used. Past trends may also be used if they are based on verifiable evidence. Where such information is not available, variations must at least cover a range of +/- 10 percent.

24) In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative, the VVB must provide an assessment of the

[28] For example, reasonable variations in energy generation can be based on studies conducted by a third-party consultant.

probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.

**Rationale:** The ultimate objective of the sensitivity analysis is to determine the likelihood of a scenario other than the one presented, providing a cross-check on the suitability of the assumptions used in developing the investment analysis.

## A2.5 Default values for the cost of equity (expected return on equity)

25) The default values for the cost of equity or expected return on equity in the host country are calculated as the sum of the following parameters, adjusted to reflect the different risk levels across sectoral scopes:

    a) Risk-free rate of return: calculated based on the inflation-adjusted geometric average of annualized real return on the long-term US government bonds for 1973 - 2022.[29] A value of 3.1 percent is used.[30]

    b) Equity risk premium: derived from the inflation-adjusted geometric average return on equity in the US market relative to the long-term US government bonds for 1973 - 2022. A value of 2.7 percent is used.[31]

    c) Country risk premium: based on Moody's rating and S&P, for countries with available rating,[32] PRS Composite Risk Score for frontier markets and Fitch rating. For countries where none of the above is available, a statistical algorithm developed by UNFCCC is used to derive the values, based on the latest available macroeconomic data[33] published by the World Bank, IMF and the Fragile State Index (these countries are marked with an asterisk in Table 1).

26) The sectoral scopes are organized into three different groups to determine the adjustment factor to reflect the risk of a project:

    a) Group 1 (no adjustment):

[29] USA dollar values are used as it has the longest recorded historical data for both goverment bonds and stock markets.

[30] Credit Suisse Global Investment Returns Yearbook 2023– summary edition (page 42), sourced from https://www.credit-suisse.com/about-us/en/reports-research/studies-publications.html.

[31] Equity risk premium: derived from the inflation-adjusted geometric average return on equity in the US market relative to the long-term US government bonds for 1973 - 2022. A value of 2.7 per cent is used.3

[32] "Risk Premiums for Other Markets" – July 2023, https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datacurrent.html

[33] The estimates may not reflect the most recent events or extreme circumstances experienced in some countries at the time of publication.

1. Energy (renewable/non-renewable)
2. Energy distribution
3. Energy demand
13. Waste handling and disposal

b) Group 2 (the cost of equity is increased by 1.0 percentage point):

4. Manufacturing industries
5. Chemical industry
6. Construction
7. Transport
8. Mining/Mineral production
9. Metal production
10. Fugitive emissions – from fuels (solid, oil, and gas)
11. Fugitive emissions – from Industrial gases (halocarbons and sulphur hexafluoride)
12. Solvent use
16. Carbon capture and storage

c) Group 3 (the cost of equity is reduced by 0.5 percentage points):

14. Agriculture, forestry and other land use (AFOLU)
15. Livestock and manure management

27) Select the relevant benchmark value for the project activity based on the country and sector. The values are expressed in percentages in real terms.

**Table 1: Default values for the cost of equity (expected return on equity) in real terms**

| Country | Group 1 | Group 2 | Group 3 |
|---|---|---|---|
| Afghanistan* | 24.03 | 25.03 | 23.53 |
| Albania | 12.63 | 13.63 | 12.13 |
| Algeria | 11.26 | 12.26 | 10.76 |
| Angola | 15.66 | 16.66 | 15.16 |
| Argentina | 24.01 | 25.01 | 23.51 |
| Armenia | 11.26 | 12.26 | 10.76 |
| Azerbaijan | 9.60 | 10.60 | 9.10 |
| Bahamas | 12.63 | 13.63 | 12.13 |
| Bahrain | 14.15 | 15.15 | 13.65 |
| Bangladesh | 12.63 | 13.63 | 12.13 |
| Belize | 19.46 | 20.46 | 18.96 |
| Benin | 12.63 | 13.63 | 12.13 |

| | | | |
|---|---|---|---|
| Bhutan* | 13.19 | 14.19 | 12.69 |
| Bolivia | 17.18 | 18.18 | 16.68 |
| Bosnia and Herzegovina | 15.66 | 16.66 | 15.16 |
| Botswana | 7.62 | 8.62 | 7.12 |
| Brazil | 10.37 | 11.37 | 9.87 |
| Brunei Darussalam | 6.71 | 7.71 | 6.21 |
| Burkina Faso | 17.18 | 18.18 | 16.68 |
| Burundi* | 21.62 | 22.62 | 21.12 |
| Côte d'Ivoire | 11.26 | 12.26 | 10.76 |
| Cambodia | 14.15 | 15.15 | 13.65 |
| Cameroon | 14.15 | 15.15 | 13.65 |
| Cape Verde | 15.66 | 16.66 | 15.16 |
| Central African Republic* | 17.33 | 18.33 | 16.83 |
| Chad* | 22.04 | 23.04 | 21.54 |
| Chile | 7.08 | 8.08 | 6.58 |
| China | 6.87 | 7.87 | 6.37 |
| Colombia | 8.69 | 9.69 | 8.19 |
| Comoros* | 17.43 | 18.43 | 16.93 |
| Congo | 19.46 | 20.46 | 18.96 |
| Cook Islands | 14.15 | 15.15 | 13.65 |
| Costa Rica | 14.15 | 15.15 | 13.65 |
| Cuba | 24.01 | 25.01 | 23.51 |
| Democratic People's Republic of Korea | 24.01 | 25.01 | 23.51 |
| Democratic Republic of the Congo | 15.66 | 16.66 | 15.16 |
| Djibouti* | 16.68 | 17.68 | 16.18 |
| Dominican Republic | 11.26 | 12.26 | 10.76 |
| Ecuador | 20.98 | 21.98 | 20.48 |
| Egypt | 15.66 | 16.66 | 15.16 |
| El Salvador | 20.98 | 21.98 | 20.48 |
| Equatorial Guinea* | 12.87 | 13.87 | 12.37 |
| Eritrea* | 15.98 | 16.98 | 15.48 |
| Ethiopia | 19.46 | 20.46 | 18.96 |
| Fiji | 12.63 | 13.63 | 12.13 |
| Gabon | 17.18 | 18.18 | 16.68 |
| Gambia | 14.15 | 15.15 | 13.65 |

| | | | |
|---|---|---|---|
| Georgia | 10.37 | 11.37 | 9.87 |
| Ghana | 24.01 | 25.01 | 23.51 |
| Grenada* | 14.15 | 15.15 | 13.65 |
| Guatemala | 9.60 | 10.60 | 9.10 |
| Guinea | 19.46 | 20.46 | 18.96 |
| Guinea-Bissau | 14.15 | 15.15 | 13.65 |
| Guyana | 8.23 | 9.23 | 7.73 |
| Haiti | 24.01 | 25.01 | 23.51 |
| Honduras | 12.63 | 13.63 | 12.13 |
| India | 9.13 | 10.13 | 8.63 |
| Indonesia | 8.69 | 9.69 | 8.19 |
| Iran (Islamic Republic of) | 15.66 | 16.66 | 15.16 |
| Iraq | 17.18 | 18.18 | 16.68 |
| Israel | 6.87 | 7.87 | 6.37 |
| Jamaica | 14.15 | 15.15 | 13.65 |
| Jordan | 12.63 | 13.63 | 12.13 |
| Kazakhstan | 8.69 | 9.69 | 8.19 |
| Kenya | 15.66 | 16.66 | 15.16 |
| Kiribati* | 11.19 | 12.19 | 10.69 |
| Kuwait | 6.87 | 7.87 | 6.37 |
| Kyrgyzstan | 15.66 | 16.66 | 15.16 |
| Lao People's Democratic Republic | 20.98 | 21.98 | 20.48 |
| Lebanon | 30.62 | 31.62 | 30.12 |
| Lesotho | 11.25 | 12.25 | 10.75 |
| Liberia | 20.98 | 21.98 | 20.48 |
| Libya | 8.69 | 9.69 | 8.19 |
| Madagascar | 15.66 | 16.66 | 15.16 |
| Malawi | 24.01 | 25.01 | 23.51 |
| Malaysia | 7.62 | 8.62 | 7.12 |
| Maldives | 17.18 | 18.18 | 16.68 |
| Mali | 19.46 | 20.46 | 18.96 |
| Mauritania* | 15.80 | 16.80 | 15.30 |
| Mauritius | 9.13 | 10.13 | 8.63 |
| Mexico | 8.69 | 9.69 | 8.19 |
| Micronesia (Federated States of)* | 17.00 | 18.00 | 16.50 |

| | | | |
|---|---|---|---|
| Mongolia | 15.66 | 16.66 | 15.16 |
| Montenegro | 12.63 | 13.63 | 12.13 |
| Morocco | 9.60 | 10.60 | 9.10 |
| Mozambique | 19.46 | 20.46 | 18.96 |
| Myanmar | 20.98 | 21.98 | 20.48 |
| Namibia | 12.63 | 13.63 | 12.13 |
| Nepal* | 18.74 | 19.74 | 18.24 |
| Nicaragua | 15.66 | 16.66 | 15.16 |
| Niger | 15.66 | 16.66 | 15.16 |
| Nigeria | 15.66 | 16.66 | 15.16 |
| North Macedonia | 11.26 | 12.26 | 10.76 |
| Oman | 10.37 | 11.37 | 9.87 |
| Pakistan | 20.98 | 21.98 | 20.48 |
| Panama | 8.69 | 9.69 | 8.19 |
| Papua New Guinea | 14.15 | 15.15 | 13.65 |
| Paraguay | 9.60 | 10.60 | 9.10 |
| Peru | 8.23 | 9.23 | 7.73 |
| Philippines | 8.69 | 9.69 | 8.19 |
| Qatar | 6.71 | 7.71 | 6.21 |
| Republic of Korea | 6.55 | 7.55 | 6.05 |
| Republic of Moldova | 13.58 | 14.58 | 13.08 |
| Republic of South Sudan* | 22.00 | 23.00 | 21.50 |
| Rwanda | 14.15 | 15.15 | 13.65 |
| Saint Lucia* | 12.72 | 13.72 | 12.22 |
| Saint Vincent and the Grenadines | 15.66 | 16.66 | 15.16 |
| Samoa* | 18.28 | 19.28 | 17.78 |
| San Marino | 12.94 | 13.94 | 12.44 |
| Sao Tome and Principe* | 21.82 | 22.82 | 21.32 |
| Saudi Arabia | 6.87 | 7.87 | 6.37 |
| Senegal | 11.26 | 12.26 | 10.76 |
| Serbia | 10.37 | 11.37 | 9.87 |
| Sierra Leone | 24.01 | 25.01 | 23.51 |
| Singapore | 5.80 | 6.80 | 5.30 |
| Solomon Islands | 17.18 | 18.18 | 16.68 |
| Somalia | 24.01 | 25.01 | 23.51 |

| | | | |
|---|---|---|---|
| South Africa | 10.37 | 11.37 | 9.87 |
| Sri Lanka | 24.01 | 25.01 | 23.51 |
| Sudan | 30.62 | 31.62 | 30.12 |
| Suriname | 20.98 | 21.98 | 20.48 |
| Swaziland | 15.66 | 16.66 | 15.16 |
| Syrian Arab Republic | 30.62 | 31.62 | 30.12 |
| Tajikistan | 15.66 | 16.66 | 15.16 |
| Thailand | 8.23 | 9.23 | 7.73 |
| Timor-Leste* | 17.99 | 18.99 | 17.49 |
| Togo | 15.66 | 16.66 | 15.16 |
| Tonga* | 9.08 | 10.08 | 8.58 |
| Trinidad and Tobago | 10.37 | 11.37 | 9.87 |
| Tunisia | 19.46 | 20.46 | 18.96 |
| Turkmenistan | 8.69 | 9.69 | 8.19 |
| Uganda | 14.15 | 15.15 | 13.65 |
| United Arab Emirates | 6.55 | 7.55 | 6.05 |
| United Republic of Tanzania | 14.15 | 15.15 | 13.65 |
| Uruguay | 8.69 | 9.69 | 8.19 |
| Uzbekistan | 11.26 | 12.26 | 10.76 |
| Vanuatu* | 11.91 | 12.91 | 11.41 |
| Venezuela | 30.62 | 31.62 | 30.12 |
| Viet Nam | 10.37 | 11.37 | 9.87 |
| Yemen | 20.98 | 21.98 | 20.48 |
| Zambia | 24.01 | 25.01 | 23.51 |
| Zimbabwe | 17.18 | 18.18 | 16.68 |

# DOCUMENT HISTORY

| Version | Date | Comment |
|---|---|---|
| v1.0 | 21 Aug 2024 | Draft version for public stakeholder consultation |