ARTICLE 6.4 MECHANISM

A6.4-MEP008-A01

Draft Methodological tool

Investment analysis

Version 01.0

DRAFT

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. The Supervisory Body of the Article 6.4 mechanism, at its tenth meeting, approved its workplan for 2024 and requested the Methodological Expert Panel (MEP) to develop recommendations on the requirements for the demonstration of additionality in mechanism methodologies.

2. At its first meeting, the MEP initiated its work on additionality, including the development of a methodological tool for conducting investment analysis.

3. The Supervisory Body, at its fifteenth meeting, adopted the "Standard: Demonstration of additionality in mechanism methodologies". In adopting the standard, the Supervisory Body requested the MEP to conduct further work, including:

   (a) Preparing a concept note on potential issues arising from the funding of Article 6.4 activities through revenues from A6.4ERs and public funding;

   (b) Further exploring issues related to the possible confidentiality of data needed for the investment analysis.

4. At its second to seventh meeting, the MEP continued to work on the methodological tool for conducting investment analysis.

2. Purpose

5. The purpose of this methodological tool is to provide guidance and specific requirements for the preparation and presentation of investment analysis in demonstrating additionality of Article 6.4 activities under the Article 6.4 mechanism.

3. Key issues and proposed solutions

6. The methodological tool draws on relevant CDM tool[1] and aligns them with the Standard “Demonstration of additionality in mechanism methodologies” (A6.4-STAN-METH-003).

7. The methodological tool contains provisions and a step-wise procedure to undertake investment analysis, including the following types of analyses:

   (a) Simple cost analysis;

   (b) Investment comparison analysis;

   (c) Benchmark analysis.

8. The methodological tool specifies under which circumstances each type of analysis is suitable. For investment comparison analysis and benchmark analysis this is

[1] See https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v14.0.pdf/history_view

complemented by a sensitivity analysis to demonstrate that the analysis is robust to reasonable variations in the critical parameters and assumptions.

9. Mechanism methodologies that use this methodological tool should specify key elements of how this tool should be applied in the context of the type of mitigation activity, including which alternative scenarios to the proposed Article 6.4 activity shall be assessed by activity participants, which type of analysis among those in paragraph 7 above should be used, what type of financial indicator may be used, and how the sensitivity analysis should be applied, as applicable.

10. In its Appendix, the methodological tool contains country default values for the expected cost of equity. A similar table has also been included in the relevant CDM tool. Consistent with the approach under the CDM, the default values have been calculated based on:

    (a) Country risk premium: This is based on Moody's rating and S&P, for countries with available rating[2], PRS Composite Risk Score for frontier markets and Fitch rating. For countries where none of the above is available, a statistical algorithm developed by the UNFCCC Secretariat is used to derive the values, based on the latest available macroeconomic data[3] published by the World Bank, IMF and the Fragile State Index (these countries are marked with an asterisk in the Appendix);

    (b) Risk-free rate of return: This is calculated based on the inflation adjusted geometric average of annualized real return on the long-term US government bonds;[4]

    (c) Equity risk premium: This is derived from the inflation-adjusted geometric average return on equity in the US market relative to the long-term US government bonds.[5]

11. Different from the CDM, a time series of values is provided from 2021 to the most recent year. This allows activity participants to use the value from the year of the start date of the Article 6.4 activity. Furthermore, the values in the Appendix to this tool do not differentiate between sectors. Based on a review of the existing sectoral differentiation under the CDM and the external expertise sought on this matter when preparing this tool, the MEP identified the need to conduct further work on any differentiation between sectors and/or types of mitigation activities. If the further work concludes that a reliable sectoral differentiation can be provided, the MEP will recommend to revise the tool to incorporate such differentiation.

12. Regarding the matter whether it is necessary to demonstrate that the incentives from the mechanism can enable the implementation of the Article 6.4 activity, the tool includes two options for consideration by the Supervisory Body: Option 1 requires such demonstrative in a qualitative or indicator manner. Option 2 does not require this. In recommending the Standard "Demonstration of additionality in mechanism methodologies" (A6.4-STAN-

[2] "Risk Premiums for Other Markets" https://pages.stern.nyu.edu/~adamodar/New_Home_Page/dataarchived.html.

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

[4] Credit Suisse Global Investment Returns Yearbook 2021 – 2023 and UBS Global Investment Returns Yearbook 2024.

[5] Credit Suisse Global Investment Returns Yearbook 2021 – 2023 and UBS Global Investment Returns Yearbook 2024.

METH-003) to the Supervisory Body, the MEP had included a general requirement in the standard on this matter that was adopted by the Supervisory Body (paragraph 9 of the standard). At the same time, the MEP had included two options in the standard on whether such an assessment should be conducted quantitatively, i.e., whether to demonstrate that the revenues from A6.4ERs make the proposed Article 6.4 activity financially viable. The Supervisory Body, however, decided not to include any such quantitative assessment. The MEP therefore seeks clarification whether or not the general requirements in paragraph 9 should be implemented through a respective provision in the proposed methodological tool, noting that this provision does not include a quantitative assessment. With regard to the arguments for and against such provisions, the MEP refers to its recommendation from MEP004 (section 3.5.1 of the document A6.4-MEP004-A02).

4. Impacts

13. The methodological tool provides clarity on the requirements and guidance on conducting the investment analysis in demonstrating additionality of Article 6.4 activities under the Article 6.4 mechanism.

5. Subsequent work and timelines

14. The default values for the cost of equity in the Appendix do not differentiate between sectors or types of mitigation activities. The tool may be amended in the future to incorporate such differentiation, to the extent that this is feasible based on available data.

15. The default values in the Appendix also need to be updated to incorporate data from more recent years.

6. Recommendations to the Supervisory Body

16. Not applicable (Document is published for a call for public inputs).

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1. Introduction

1.1. Scope

1. This methodological tool establishes requirements for activity participants for conducting an investment analysis in demonstrating the additionality of an Article 6.4 activity. It will be applied by activity participants of Article 6.4 activities within project design documents (PDDs) and be used by designated operational entities (DOEs) and the UNFCCC Secretariat in assessing the PDDs.

1.2. Entry into force and validity

2. This document enters into force on DD//MM/YYYY and is valid for five years, i.e., until DD//MM/YYYY, unless an earlier date applies if the methodological tool is revised or withdrawn in accordance with the procedure ”Development, revision and clarification of methodologies and methodological tools” (A6.4-PROC-METH-001).

2. Definitions

3. The definitions contained in the “Standard: Demonstration of additionality in mechanism methodologies” and in the “Standard: Article 6.4 activity standard for projects” shall apply.

4. In addition, the following definitions shall apply:

Note: The MEP is further considering which of these definitions are necessary, including with regard to the development of an Article 6.4 glossary.

(a) **Asset:** An item that has a value which can be converted into cash;

(b) **Capital Expenditure (CAPEX):** Amount of money that is spent for an Article 6.4 activity, or an alternative scenario to the Article 6.4 activity, to install a fixed asset or to extend the useful lifetime of an existing fixed asset;

(c) **Cash flow:** The net balance of cash moving in and out of an Article 6.4 activity, or an alternative scenario to the Article 6.4 activity, in a specific period of time;

(d) **Depreciation:** The decrease in an asset’s value over a period of time;

(e) **Entity specific benchmark:** The financial benchmark used by the legal entity owning/managing the assets in the Article 6.4 activity;

(f) **Equity:** Amount of money that belongs to the owners of an Article 6.4 activity after all assets and liabilities have been accounted for;

(g) **Financial benchmark:** An index against which the financial performance of an Article 6.4 activity, or alternative scenarios to the Article 6.4 activity, can be measured;

(h) **Market benchmark:** the financial benchmark that is commonly applicable to the country, sector and type of activity;

(i) **Operating expenses (OPEX):** The ongoing cost for running an Article 6.4 activity or an alternative to the Article 6.4 activity;

(j) **Pure player:** An entity that concentrates solely on one specific line of business or service, offering maximum exposure to that particular sector.

3. Applicability

5. This methodological tool is applicable to Article 6.4 activities that involve emission reductions and/or net removals where it is referred to in the applied mechanism methodology.

6. This version of the tool is applicable to Article 6.4 activities implemented at the project level. The tool may be amended in the future to also cover activities implemented at other scales (e.g. programmes of activities, policies, sectoral approaches, etc).

7. Mechanism methodologies intending to use this methodological tool shall include a reference to this tool within the mechanism methodology and shall:

(a) Specify which realistic and credible alternative scenarios to the proposed Article 6.4 activity, or which minimum list of scenarios, shall be assessed by activity participants in undertaking the investment analysis or provide a procedure for activity participants to identify these alternative scenarios;[1]

(b) Specify which of the methods for investment analysis provided in this tool (simple cost analysis, benchmark analysis, investment comparison analysis) shall be applied by the activity participants or provide options for activity participants to choose between these methods;

(c) In the case that the investment comparison analysis or benchmark analysis is applied by the activity participants, specify:

(i) The financial indicator that is most suitable for the type of mitigation activity and decision context, such as the net present value (NPV) or internal rate of return (IRR), and that shall be used by the activity participants, or specify options for suitable financial indicators that may be chosen by the activity participants; and

(ii) How the sensitivity analysis shall be conducted by the activity participants in the context of the type of mitigation activities covered by the methodology, including which assumptions and parameters should be varied and the degree of these variations.

[1] In most sectors, the alternative scenarios considered shall provide the same type and level of products or service as the Article 6.4 activity. This requirement does not apply to some land-use activities such as afforestation or avoided deforestation, where there could be a change in the type of service between the scenario with the Article 6.4 activity and the baselines scenario. If the proposed Article 6.4 activity includes several different facilities, technologies, outputs 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. For example, in the case of a cogeneration project activity, alternative scenarios for heat and electricity generation should be established separately.

(iii) Whether the type of activities covered by the methodology could:

i. Only be implemented by the activity participants and not by any other entities;[2] or

ii. Be implemented by either the activity participants or other entities.[3]

8. Mechanism methodologies may provide further specifications and requirements for how this methodological tool shall be applied by activity participants in the context of the type of mitigation activities covered by the methodology.

9. Where the mechanism methodology referring to this tool contains requirements for conducting the investment analysis that are different from those described in this tool, the requirements contained in the methodology shall take precedence.

4. Normative references

10. This document refers to the following documents:

(a) Standard: Demonstration of additionality in mechanism methodologies[4];

(b) Standard: Article 6.4 Activity Standard for projects[5].

5. General principles and requirements

5.1. Principles

11. The general principles described in the most recent version of the "Standard: Demonstration of additionality in mechanism methodologies" shall apply to this tool.

5.2. General requirements

5.2.1. Validity of input data

12. The data and information used in the investment analysis shall be:

(a) Applicable to the proposed Article 6.4 activity and any alternative scenarios considered in the analysis;

(b) Consistent with the information presented to the entity's decision-making management and investors/lenders, unless otherwise specified in this tool; and

(c) Valid and applicable at the time of the start date of the Article 6.4 activity, as defined in paragraph 73 of version 02.0 of the Standard "Article 6.4 activity standard for projects".

13. Where the project design document (PDD) is submitted for validation prior to the start date of the Article 6.4 activity, the analysis shall be updated through the submission of a request for approval of post-registration changes in accordance with the procedure "Article 6.4

[2] This may apply, for example, to modifications to an existing plant.

[3] This may apply, for example, to the installation of greenfield plants.

[4] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-003.pdf.

[5] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-AC-002.pdf.

activity cycle procedure for projects" (A6.4-PROC-AC-002) or as part of the first verification of emission reductions or net removals, based on data and information that was available at the start date.

5.2.2. Article 6.4 activities with different components

14. Where an Article 6.4 activities includes different components, the investment analysis shall be applied as follows:

    (a) Where the different components of the Article 6.4 activity could also be implemented separately in the same manner without affecting each other, the investment analysis shall be conducted separately for each component of the Article 6.4 activity;[6]

    (b) Where the different components could not be implemented separately in the same manner without affecting each other, the investment analysis shall be conducted for the entire activity, including all components.[7]

5.2.3. Transparency of the analysis

15. The investment analysis shall be presented in a transparent manner, to the extent that the reader can reproduce the results.

16. The assumptions, data and conclusions in the investment analysis shall be transparently documented, appropriately justified and substantiated by evidence.

17. Activity participants shall provide a spreadsheet version of the investment analysis. All formulas used in this analysis shall be readable and all relevant cells shall be viewable and unprotected. If specific elements of the analysis are confidential due to trade secrets, commercially sensitive data, personal data or security-sensitive details, the activity participants may, in addition to the spreadsheet version, provide a redacted pdf version of the analysis that may black-out the relevant elements. The submission of a redacted version shall be clearly and appropriately justified. The redacted version will be made publicly available by the UNFCCC secretariat.

18. For transparency purposes, activity participants may specify in the PDD:

    (a) The abatement costs of the Article 6.4 activity (e.g., as USD per tCO_2e); and

    (b) Any monetary and non-monetary benefits made available to Indigenous Peoples and Local Communities (IPLCs) or other stakeholders.

5.2.4. Accuracy and conservativeness

19. Known input data to the analysis shall be accurate. Where assumptions have to be made or where the data is uncertain a conservative choice shall be made within the plausible range of outcomes.[8]

[6] This applies, for example, to a rooftop photovoltaic power plant that is installed at a nitric acid plant reducing N_2O emisisons through a secondary catalyst.

[7] This applies, for example, to landfill gas capture project that involves both methane utilisation and methane flaring.

[8] This applies, for example, to future electricity prices. In this case, a lower value within the plausible range of electricity prices shall be used if that leads to fewer revenues for the proposed Article 6.4 activity.

5.2.5. Relevance and completeness

20. Only data and information that is relevant for the analysis shall be presented.

21. The information presented shall be complete. No data and information that is relevant to the analysis shall be omitted.

5.2.6. Validation by designated operational entities (DOEs)

22. In validating the application of this tool, DOEs shall assess and validate the relevance, completeness, consistency, accuracy, transparency and conservativeness of the data and information and the credibility of assumptions, rationales and justifications provided in the PDD. The elements checked during this assessment and the conclusions shall be documented transparently in the validation report.

6. Methodological approaches

6.1. Methods for investment analysis

23. The investment analysis shall be carried out using one of the following methods:

    (a) Simple cost analysis: Demonstration that the implementation of an Article 6.4 activity is associated with costs and does not generate any cost savings or revenues other than from A6.4ERs;

    (b) Benchmark analysis: Comparison of the financial attractiveness of an Article 6.4 activity with a financial benchmark;

    (c) Investment comparison analysis: Comparison of the financial attractiveness of an Article 6.4 activity with alternative options.

6.2. Simple cost analysis

24. The simple cost analysis may be undertaken if:

    (a) The implementation of the Article 6.4 activity does not generate any cost savings or revenues other than from A6.4ERs; and

    (b) Possible alternative scenarios to the Article 6.4 activity also do not generate cost savings or revenues.[9]

25. The simple cost analysis shall be conducted in the following steps:

    (a) Describe the Article 6.4 activity scenario and the alternative scenarios to be considered in conducting the analysis;

    (b) Determine the assessment period;

[9] For example, landfill gas flaring may not generate any cost savings or revenues other than from A6.4ERs. Possible alternative scenario could be venting of landfill gas or capturing and using the landfill gas for energy generation. The latter provides revenues and could, in some instances, be financially attractive and hence the most likely course of action. Therefore, it is not appropriate to use the simple cost analysis in this context.

(c) Demonstrate that the Article 6.4 activity scenario does not generate any cost savings or revenues other than from A6.4ERs during the assessment period, and justify the analysis with appropriate evidence;

(d) Demonstrate that the alternative scenarios do not generate any cost savings or revenues during the assessment period, and justify the analysis with appropriate evidence;

(e) Document any public funding provided to the Article 6.4 activity. If the public funding, expressed in grant equivalents, is larger than the expected revenues from A6.4ERs (e.g., based on common market prices for A6.4ERs for the type of Article 6.4 activity), demonstrate that public funding would not have filled the funding gap of the Article 6.4 activity (considering CAPEX and OPEX and any revenues other than A6.4ERs of the activity) in the absence of revenues from A6.4ERs. This may, for example, apply to public funding schemes that are designed to pay for the funding gap of mitigation activities.[10]

26. The simple cost analysis is concluded positively, i.e., it is demonstrated that the Article 6.4 activity is not financially viable without the incentives from the mechanism [and that the incentives from the mechanism enable the implementation of the activity *(Option 1)*], if the steps in paragraph 25 (c) to (e) are satisfied.

6.3. Benchmark analysis

27. The benchmark analysis may be undertaken where the only alternative scenario to the Article 6.4 activity is the continuation of the current situation without any alternative investment by the activity participants.

28. The benchmark analysis shall be conducted in the following steps:

(a) Describe the Article 6.4 activity scenario to be considered in conducting the analysis;

(b) Determine the assessment period;

(c) Select the financial indicator for assessing the financial viability of the Article 6.4 activity, consistent with the specification by the mechanism methodology;

(d) Determine the financial benchmark for the selected financial indicator, such as the cost of equity or the weighted average cost of capital (WACC), and justify the determination with appropriate evidence;

(e) Calculate the financial viability of the Article 6.4 activity without revenues from A6.4ERs, using the selected financial indicator, and justify the calculation with appropriate evidence;

[10] This could, for example, apply to public funding provided through „contracts for difference“ under which governments pay companies for the additional costs of adopting low greenhouse emission technologies. For example, a low emissions technology could cost USD 100 per unit of output whereas an emissions-intensive technology costs only USD 60. Without any revenues from A6.4ERs or other carbon credits, the government would close the funding gap and pay the company USD 40 per unit of output. Any additional funding through A6.4ERs (e.g. USD 10 per unit of output) could simply reduce funding through the government (e.g. to 30 USD per unit of output). In this case, the activity would be implemented irrespective of the incentives from the Article 6.4 mechanism.

(f) Demonstrate that the Article 6.4 activity without revenues from A6.4ERs is not financially viable, by comparing the financial indicator calculated for the Article 6.4 activity in sub-paragraph (d) with the financial benchmark determined in sub-paragraph (e);

(g) Conduct a sensitivity analysis to demonstrate that the analysis is robust to reasonable variations in the critical parameters and assumptions, including CAPEX, OPEX, revenues and cost savings, as applicable, and justify the calculation with appropriate evidence;

Option 1: Include provisions on incentives from the mechanism

(h) Describe how the incentives from the mechanism can enable the implementation of the Article 6.4 activity;[11]

Option 2: No text

(i) Document any public funding provided to the Article 6.4 activity. If the public funding, expressed in grant equivalents, is larger than the expected revenues from A6.4ERs (e.g., based on common market prices for A6.4ERs for the type of Article 6.4 activity), demonstrate that public funding would not have filled the funding gap of the Article 6.4 activity (considering CAPEX and OPEX and any revenues other than A6.4ERs of the activity) in the absence of revenues from A6.4ERs. This may, for example, apply to public funding schemes that are designed to pay for the funding gap of mitigation activities.[12]

29. The benchmark analysis is concluded positively, i.e., it is demonstrated that the Article 6.4 activity is not financially viable without the incentives from the mechanism [and that the incentives from the mechanism enable the implementation of the activity *(Option 1)*], if the steps in paragraph 28 (f) to (i) are satisfied.

6.4. Investment comparison analysis

30. The investment comparison analysis may be undertaken where at least one alternative scenario to the Article 6.4 activity includes an investment by the activity participants.

31. The investment comparison analysis shall be conducted in the following steps:

(a) Describe the Article 6.4 activity scenario and the alternative scenarios to be considered in conducting the analysis;

(b) Determine the assessment period;

[11] This could be demonstrated in a qualitiative manner or by providing exemplary information that revenues from carbon credits have, in principle, the ability to increase the financial indicator above the finanial benchmark.

[12] This could, for example, apply to public funding provided through „contracts for difference“ under which governments pay companies for the additional costs of adopting low greenhouse emission technologies. For example, a low emissions technology could cost USD 100 per unit of output whereas an emissions-intensive technology costs only USD 60. Without any revenues from A6.4ERs or other carbon credits, the government would close the funding gap and pay the company USD 40 per unit of output. Any additional funding through A6.4ERs (e.g. USD 10 per unit of output) could simply reduce funding through the government (e.g. to 30 USD per unit of output). In this case, the activity would be implemented irrespective of the incentives from the Article 6.4 mechanism.

(c) Select the financial indicator for assessing the financial viability of the Article 6.4 activity and the alternative scenarios,FCAP consistent with the specification by the mechanism methodology;

(d) Where applicable, determine the financial benchmark for the selected financial indicator, such as the cost of equity or the weighted average cost of capital (WACC), and justify the determination with appropriate evidence;

(e) Calculate the financial viability of the Article 6.4 activity and the alternative scenarios without revenues from A6.4ERs, using the selected financial indicator, and justify the calculation with appropriate evidence;

(f) Demonstrate that the Article 6.4 activity without revenues from A6.4ERs is not the most financially viable scenario, by comparing the financial indicator calculated for the Article 6.4 activity and the alternative scenarios in sub-paragraph (d);

(g) Conduct a sensitivity analysis to demonstrate that the analysis is robust to reasonable variations in the critical parameters and assumptions, including CAPEX, OPEX, revenues and cost savings, as applicable, and justify the calculation with appropriate evidence;

Option 1: Include provisions on incentives from the mechanism

(h) Describe how the incentives from the mechanism can enable the implementation of the Article 6.4 activity;[13]

Option 2: No text

(i) Document any public funding provided to the Article 6.4 activity. If the public funding, expressed in grant equivalents, is larger than the expected revenues from A6.4ERs (e.g., based on common market prices for A6.4ERs for the type of Article 6.4 activity), demonstrate that public funding would not have filled the funding gap of the Article 6.4 activity (considering CAPEX and OPEX and any revenues other than A6.4ERs of the activity) in the absence of revenues from A6.4ERs. This may, for example, apply to public funding schemes that are designed to pay for the funding gap of mitigation activities.[14]

32. The investment comparison analysis is concluded positively, i.e., it is demonstrated that the Article 6.4 activity is not financially viable without the incentives from the mechanism [and that the incentives from the mechanism enable the implementation of the activity *(Option 1)*, if the steps in paragraph 31 (a) to (i) are satisfied.

[13] This could be demonstrated in a qualitiative manner or by providing exemplary information that revenues from carbon credits have, in principle, the ability to make the Article 6.4 activity the financially most viable scenario.

[14] This could, for example, apply to public funding provided through „contracts for difference“ under which governments pay companies for the additional costs of adopting low greenhouse emission technologies. For example, a low emissions technology could cost USD 100 per unit of output whereas an emissions-intensive technology costs only USD 60. Without any revenues from A6.4ERs or other carbon credits, the government would close the funding gap and pay the company USD 40 per unit of output. Any additional funding through A6.4ERs (e.g. USD 10 per unit of output) could simply reduce funding through the government (e.g. to 30 USD per unit of output). In this case, the activity would be implemented irrespective of the incentives from the Article 6.4 mechanism.

7. Requirements for determining relevant parameters and implementing the analysis

33. This section sets out further requirements for determining relevant parameters and implementing the analysis. The headline of each sub-section indicates to which methods of investment analysis it applies.

7.1. Assessment period (simple cost analysis, benchmark analysis, investment comparison analysis)

34. The assessment period shall reflect the period of expected operation of the underlying technology or practice.

35. Where an activity does not have an end date of expected operation, a minimum assessment period of [30] years shall be used.[15]

The MEP is further assessing the implications of these provisions for activities that may not have an end date but continue to operate in perpetuity.

7.2. Type of expenditure, revenues and cost savings to be considered (simple cost analysis, benchmark analysis, investment comparison analysis)

36. The analysis shall include all relevant costs, including capital expenditure (CAPEX) and operational expenditure (OPEX), including any barriers that can be monetized and quantified as an additional cost, and all revenues and cost savings, including any public funding such as subsidies, where applicable.

37. The residual value of the activity assets at the end of the assessment period shall be included as a cash inflow in the final year. The fair value of the assets shall be calculated in accordance with local accounting regulations, where available, or otherwise international best practice.

38. Any expenditures incurred prior to the start date of the Article 6.4 activity, as defined in paragraph 73 of version 02.0 of the Standard “Article 6.4 activity standard for projects” (A6.4-STAN-AC002), shall not be considered in the analysis, as such expenditures are sunk costs which remain unaffected by the decision whether or not to proceed with the Article 6.4 activity. This shall not apply to expenditures that the Article 6.4 activity committed to make prior to the start date but for which the payment is only made after the start date.

39. For activities whose implementation has been ceased after their initial commencement and where the Article 6.4 activity consists of the recommencement of the implementation due to consideration of the benefits from the Article 6.4 mechanism, the investment analysis should reflect the economic decision-making context at the point of the decision to recommence the activity. Therefore, CAPEX incurred prior to the decision to recommence the activity can be reflected as the recoverable value of the assets, which are limited to the potential reuse/resale of tangible assets.[16]

[15] This may, for example, apply to some activities in the land-use sector.

[16] Capital expenditures should be included not at the original investment costs but at the market fair value at the point of the decision to proceed with the recommencement, demonstrating the value through assessments done by chartered specialists.

40. The analysis shall not include any transaction costs associated with generating A6.4ERs (e.g., costs for preparing the PDD, validation and verification fees to be paid to the UNFCCC).

7.3. Internal consistency of input values (simple cost analysis, benchmark analysis, investment comparison analysis)

41. All parameters and assumptions used in the analysis shall be internally consistent. For example, cash flows shall be expressed in either real or nominal terms consistently and be determined consistent with the financial indicator used.

7.4. Cash flow basis (benchmark analysis, investment comparison analysis)

42. The benchmark analysis or investment comparison analysis shall be conducted based on either the total cash flow or the equity cash flow, consistent with the approach used by the activity participants for making investment decisions.

7.5. Financial indicators (benchmark analysis, investment comparison analysis)

43. The financial indicators to be used for the benchmark analysis or investment comparison analysis may include the following:

    (a) Net present value (NPV): The NPV represents the total value of an investment, based on the present value of cash inflows and outflows during the assessment period;

    (b) Project IRR: The project IRR is used to determine the viability of an activity to generate returns and service debt, based on all projected capital expenditures and the series of cash flows throughout the assessment period;

    (c) Equity IRR: The equity IRR is used to determine the final return on the initial equity investment for the proposed activity.

44. The selected financial indicator shall be consistent with the cash flow basis used for the analysis. For example, an equity IRR shall be used where equity cash flows are used and a project IRR shall be used where total cash flows are used.

45. In calculating the NPV, an appropriate discount rate shall be applied. The discount rate shall be determined consistent with the requirements on determining the financial benchmark in section 7.6 below and either represent the cost of equity (for an equity cash flow basis) or the weighted average cost of capital (for a total cash flow basis).

7.6. Determination of the financial benchmark (benchmark analysis) or discount rate (investment comparison analysis)

7.6.1. Basis for determining the financial benchmark or discount rate

46. The financial benchmark or discount rate (for an NPV analysis) shall be consistent with the financial indicator selected for the analysis and shall be valid and applicable at the time of the start date of the Article 6.4 activity.

47. Where the Article 6.4 activity can only be implemented by the activity participants and not by any other entities, as determined by the applied mechanism methodology, the entity-specific benchmark shall be used as the financial benchmark or discount rate (for an NPV analysis).

48. Where the Article 6.4 activity could also be implemented by other entities, as determined by the applied mechanism methodology, the financial benchmark, or discount rate (for an NPV analysis), shall be based on the more conservative value between:

    (a) The entity-specific benchmark; and

    (b) The market benchmark.

7.6.2. General aspects for determining the financial benchmark

49. To justify the entity-specific benchmark, appropriate evidence and documentation shall be provided to demonstrate that the financial benchmark has also been presented to the entity's decision-making management and investors/lenders. Where similar investments have been made by the entity in the past, it shall be demonstrated that a consistent benchmark has been used for the same country/region, or any deviations shall be duly justified. The validating DOE shall undertake a thorough assessment of the financial statements of the project developer to assess the past financial behaviour of the entity during at least the last 3 years in relation to similar projects.

50. Where a market benchmark is determined, the respective values shall be based on parameters that are standard in the market, as further specified in section 7.6.3.1 below.

51. If the analysis is carried out in nominal terms and the financial benchmark is only available in real terms, the financial benchmark in real terms shall be converted to a financial benchmark in nominal terms by applying the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the activity shall be used.

7.6.3. Cost of equity

52. The cost of equity refers to the rate of return expected on an investment funded through equity.

53. Where a market benchmark is determined, activity participants may:

    The MEP would like to seek public inputs on whether both approaches should be applied and whether this may lead to a risk of "cherry picking" given that the values provided under sub-paragraph (a) are not conservative but represent a best estimate of the likely cost of equity.

    (a) Use the default values in the Appendix to this tool for the cost of equity; or

    (b) Determine the cost of equity using the Capital Asset Pricing Model (CAPM) based on parameters that are standard in the market, which shall be modelled taking into account the history (time series) of the market key variables proper of the specific technology and/or sector, as follows:

$$r_e = r_f + \beta \times (r_m - r_f) \qquad \text{Equation (1)}$$

Where:

r_e = Cost of equity

r_f = Risk-free rate, calculated based on local sovereign debt with a maturity date close to the project lifetime (at least 10 years) and sufficient liquidity. The latest (rather than the average over a time horizon) sovereign debt data available at the time of the investment decision should be used.

β = Beta, calculated as the weighted arithmetic average of the beta of all the pure players that have been in business for at least 3 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. The individual betas shall be calculated independently without deleveraging by the debt-equity ratios of the pure players.

r_m = Expected market return, calculated using the average of the following three annualized rates of return of stock market for (1) the longest time series available, (2) a 20-year horizon (if existing), and (3) a 10-year horizon (if existing). Daily values shall be used. Should there be multiple stock exchange indices, stock issues for a given company, or sovereign debt issues, the most liquid or most frequently traded one shall be used. For stock market indices, liquidity is assessed with the volume of trading for the component stock issues.

54. The cost of equity may be determined by the activity participants using the CAPM if the following conditions are satisfied:

(a) The relevant stock exchange has operated for more than 10 years;

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

(c) The average share turnover ratio over the last calendar year is in excess of 20 per cent (a ratio of 20 per cent of the stock market is traded more than once per year);

(d) There are at least three domestic pure players that belong to the same sector as the Article 6.4 activity to calculate beta with at least 3 years of daily stock market data, and daily values are available;

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

7.6.3.1. Cost of debt

55. Where an entity-specifc benchmark is determined, it shall be based on the weighted average cost of debt financing of the legal entity owning/managing the assets of the Article 6.4 activity, as follows:

(a) For Article 6.4 activities financed by loans, use the weighted average cost of outstanding long-term debt of the entity or the terms of the specific loans provided by lenders to the Article 6.4 activity;

(b) For Article 6.4 activities financed by bonds, use the weighted average yield of the bonds during the last three months prior to the start date of the Article 6.4 activity. The use of bonds to determine the cost of debt is only appropriate for corporate bonds issued in the host country;

(c) In cases where the debt finance structure of the Article 6.4 is not yet available (e.g., a letter of intent for debt funding is not available), the cost of debt shall reflect the costs of debts from similar activities undertaken by the same entity in the same host country, consistent with the information presented to the entity's decision-making management and investors/lenders.

56. Where a market benchmark is determined, the cost of debt shall be calculated as the cost of financing in capital markets (i.e., commercial lending rates comparable activities in the host country), based on documented evidence from financial institutions.

7.6.4. Determination of the weighted average cost of capital (WACC)

57. The weighted average cost of capital (WACC) is the average rate with which an entity finances its assets and can be an appropriate financial benchmark for a project IRR.

58. The weighted average cost of capital (WACC) shall be calculated as follows:

$$WACC = W_e \times r_e + W_d \times r_d \times (1 - T_c) \quad \text{Equation (2)}$$

Where:

W_e	=	Percentage of financing that is equity (%)
R_e	=	Cost of equity
W_d	=	Percentage of financing that is debt (%)
r_d	=	Cost of debt
T_c	=	Corporate tax rate

59. Where an entity-specific benchmark is determined, the weighting of debt financing and equity financing shall reflect the long-term debt/equity finance structure of the legal entity owning/managing the assets of the Article 6.4 activity. The percentage shall be determined based on the latest balance sheet provided under local fiscal/accounting standards and rules if: (a) the legal entity owning/managing the assets of the Article 6.4 activity has balance sheets audited by a third party within two years prior to the start date of the Article 6.4 activity; and (b) the accounting books of the legal entity reflect at least the total value of all the assets needed for implementing the Article 6.4 activity. If the debt/equity finance structure is not yet available, the weighting shall be consistent with information presented to the entity's decision-making management and investors/lenders.

60. Where a market benchmark is determined, the typical debt/equity finance structure observed in the sector of the country should be used.

7.7. Calculation of the financial viability of the proposed Article 6.4 activity (benchmark analysis, investment comparison analysis) and alternative scenarios (investment comparison analysis)

61. In calculating a project IRR, the costs associated with the financing of the activity shall not be taken into account because including the cost of finance would lead to double counting of this expenditure.

62. In calculating an equity IRR, only the portion of the investment financed through equity shall be considered (i.e., the cost of equity). The costs associated with the servicing of debt (interest expenses and principle repayment) are accounted as costs.

63. The investment analysis shall be conducted with post-tax cash flows. Depreciation and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, shall be added back to net profits for the purpose of calculating the financial indicator (e.g., IRR, NPV). The cash flow effects of taxation shall be included in the calculation.

7.8. Sensitivity Analysis (benchmark analysis, investment comparison analysis)

64. To ensure conservativeness, the benchmark analysis and investment comparison analysis shall include a sensitivity analysis in order to demonstrate that the outcome of the analysis is robust to reasonable variations in the critical parameters and assumptions, including CAPEX, OPEX, revenues and cost savings, as applicable.

65. A sensitivity analysis shall be carried out to assess potential scenarios in which the financial indicator for the activity would reach the level of the financial benchmark and/or the proposed activity becomes the most financially attractive alternative.

66. The variation of assumptions and parameters in the sensitivity analysis shall be consistent with the specification in the mechanism methodology. It is recommended that mechanism methodologies require a variation of at least +/- 10% to the input values which constitute more than 20% of the total costs or total revenues, unless this is not deemed appropriate in the context of the specific circumstances of the type of mitigation activity.

67. The DOE shall assess the appropriateness of the applied variation, in the context of the specific circumstances of the Article 6.4. In cases where the applied variation results in the financial indicator reaching the level of the financial benchmark and/or the proposed Article 6.4 activity becoming the most financially attractive alternative, the proposed Article 6.4 activity shall not be deemed additional.

Appendix. Default values for the cost of equity

1. The default values for the cost of equity (or expected return on equity) presentend in this Appendix are calculated for each host country as the sum of the following parameters:

   (a) Country risk premium: This is based on Moody's rating and S&P, for countries with available rating[1], PRS Composite Risk Score for frontier markets and Fitch rating. For countries where none of the above is available, a statistical algorithm developed by the UNFCCC Secretariat is used to derive the values, based on the latest available macroeconomic data[2] published by the World Bank, IMF and the Fragile State Index (these countries are marked with an asterisk on Table 1 below);

   (b) Risk-free rate of return: This is calculated based on the inflation adjusted geometric average of annualized real return on the long-term US government bonds;[3]

   (c) Equity risk premium: This is derived from the inflation-adjusted geometric average return on equity in the US market relative to the long-term US government bonds.[4]

2. The cost of equity provided in Table 1 irepresents a post-tax benchmark.

3. The cost of equity is provided for the years 2021 to 2024. Where these default values are used, activity participants shall apply the value corresponding to the calendar year of the start date of the Article 6.4 activity, as defined in paragraph 73 of version 2.0 of the Standard "Article 6.4 activity standard for projects " (A6.4-STAN-AC002).

Table 1. Default values for the cost of equity

Country	2021	2022	2023	2024
Afghanistan*	17.91	18.17	20.31	19.94
Albania	13.06	12.95	15.47	14.58
Algeria	17.42	14.93	12.89	14.58
Andorra (Principality of)	15.96	10.38	10.99	10.78
Angola	15.96	14.93	18.92	17.51
Argentina	20.32	20.37	28.41	25.55
Armenia	12.19	12.06	13.91	13.26
Australia	8.70	8.50	7.70	8.00
Austria	9.08	8.89	8.39	8.58
Azerbaijan	11.61	11.47	12.02	11.66

[1] "Risk Premiums for Other Markets" https://pages.stern.nyu.edu/~adamodar/New_Home_Page/dataarchived.html.

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

[3] Credit Suisse Global Investment Returns Yearbook 2021 – 2023 and UBS Global Investment Returns Yearbook 2024.

[4] Credit Suisse Global Investment Returns Yearbook 2021 – 2023 and UBS Global Investment Returns Yearbook 2024.

Country	2021	2022	2023	2024
Bahamas	11.61	12.06	15.47	14.58
Bahrain	14.03	13.94	17.19	16.04
Bangladesh	12.19	12.06	13.91	14.58
Barbados	15.96	15.91	20.64	17.51
Belarus	15.00	14.93	28.41	31.49
Belgium	9.29	9.10	8.73	8.88
Belize	18.38	18.39	23.24	21.17
Benin	14.03	12.95	15.47	14.58
Bermuda	9.52	9.34	9.16	9.24
Bhutan*	14.03	14.82	17.20	15.15
Bolivia (Plurinational State of)	14.03	13.94	17.19	18.97
Bosnia and Herzegovina	15.00	14.93	18.92	17.51
Botswana	9.52	9.69	9.77	9.75
Brazil	11.61	11.47	12.89	12.40
Brunei Darussalam*	9.52	9.34	9.16	8.88
Bulgaria	10.25	10.08	10.46	10.34
Burkina Faso	14.03	13.94	20.64	18.97
Burundi*	17.98	17.78	20.80	21.63
Cambodia	14.03	13.94	17.19	16.04
Cameroon	14.03	13.94	17.19	18.97
Canada	8.70	8.50	7.70	8.00
Cape Verde	14.03	14.93	18.92	17.51
Cayman Islands	9.29	9.10	8.73	8.88
Central African Republic*	15.65	17.39	19.96	20.47
Chad*	18.03	17.02	20.71	21.17
Chile	9.38	9.20	9.16	9.24
China (People's Republic of)	9.38	9.20	8.92	9.03
Colombia	10.54	10.38	10.99	10.78
Comoros*	17.57	14.62	18.03	16.33
Congo (Democratic Republic of)	15.96	15.91	18.92	17.51
Congo (Republic of)	17.42	17.40	23.24	21.17
Cook Islands	13.06	12.95	15.47	14.58
Costa Rica	14.03	13.94	17.19	14.58
Côte d'Ivoire	12.19	12.06	13.91	13.26
Croatia	11.12	10.97	10.99	10.78
Cuba	17.42	20.37	28.41	25.55
Curacao	9.86	10.38	10.99	11.21
Cyprus	11.61	10.97	12.02	10.78
Czechia	9.29	9.10	8.73	8.88
Denmark	8.70	8.50	7.70	8.00
Djibouti*	15.97	16.02	21.42	18.96

Country	2021	2022	2023	2024
Dominican Republic	12.19	12.06	13.91	13.26
Ecuador	18.38	18.39	24.96	22.63
Equatorial Guinea*	14.55	14.62	15.50	12.75
Egypt	14.03	13.94	17.19	18.97
El Salvador	15.00	15.91	24.96	22.63
Eritrea*	17.53	17.51	17.85	16.05
Estonia	9.38	9.20	8.92	9.03
Ethiopia	14.03	17.40	23.24	21.17
Fiji	12.19	12.95	15.47	14.58
Finland	9.08	8.89	8.39	8.58
France	9.18	8.99	8.55	8.72
Gabon	15.96	15.91	20.64	18.97
Gambia	15.00	13.94	17.19	14.58
Georgia	11.61	11.47	12.89	12.40
Germany	8.70	8.50	7.70	8.00
Ghana	15.00	14.93	28.41	22.63
Greece	12.19	12.06	13.91	11.66
Grenada*	13.76	13.64	17.56	14.37
Guatemala	11.12	10.97	12.02	11.66
Guinea	20.32	17.40	23.24	21.17
Guinea-Bissau	15.96	14.93	18.92	16.04
Guyana	14.03	12.95	10.46	10.34
Haiti	20.32	18.39	28.41	22.63
Honduras	13.06	12.95	15.47	14.58
Hungary	10.83	10.38	10.99	10.78
Iceland	9.52	9.34	9.16	9.24
India	10.83	10.68	11.49	11.21
Indonesia	10.54	10.38	10.99	10.78
Iran (Islamic Republic of)	17.42	14.93	15.47	17.51
Iraq	15.96	15.91	20.64	18.97
Ireland	9.52	9.34	8.92	8.88
Isle of Man	9.29	9.10	8.73	8.88
Israel	9.38	9.20	8.92	9.03
Italy	10.83	10.68	11.49	11.21
Jamaica	14.03	13.94	17.19	14.58
Japan	9.38	9.20	8.92	9.03
Jordan	13.06	12.95	15.47	14.58
Kazakhstan	10.83	10.38	10.99	10.78
Kenya	14.03	13.94	17.19	17.51
Kiribati*	9.31	16.12	18.49	12.43
Korea	9.18	8.99	8.55	8.72

Country	2021	2022	2023	2024
Korea (Democratic People's Republic of)	20.32	20.37	28.41	31.49
Kuwait	9.38	9.20	8.92	9.03
Kyrgyzstan	14.03	13.94	18.92	17.51
Lao People's Democratic Republic	17.42	17.40	24.96	22.63
Latvia	9.86	9.69	9.77	9.75
Lebanon	27.88	28.84	32.39	31.49
Lesotho*	18.75	17.65	19.39	19.75
Liberia	20.32	17.40	23.24	25.55
Libya	17.42	12.95	20.46	10.78
Liechtenstein	8.70	8.50	7.70	8.00
Lithuania	9.86	9.34	9.16	9.24
Luxembourg	8.70	8.50	7.70	8.00
Madagascar	15.00	14.93	18.92	18.49
Malawi	17.42	17.40	28.41	25.55
Malaysia	9.86	9.69	9.77	9.75
Maldives	15.00	15.91	20.64	18.97
Mali	15.96	15.91	23.24	21.17
Malta	9.52	9.34	9.16	9.24
Mauritania*	15.73	16.75	17.77	14.63
Mauritius	10.25	10.38	11.49	11.21
Mexico	10.25	10.08	10.99	10.78
Micronesia (Federated States of)*	15.64	16.88	19.87	20.49
Moldova (Republic of)	15.00	14.93	18.92	17.51
Mongolia	15.00	14.93	18.92	17.51
Montenegro	13.06	12.95	15.47	14.58
Morocco	11.12	10.97	12.02	11.66
Mozambique	17.42	17.40	23.24	21.17
Myanmar	15.00	20.37	24.96	22.63
Namibia	12.19	12.06	15.47	14.58
Netherlands	8.70	8.50	7.70	8.00
New Zealand	8.70	8.50	7.70	8.00
Nicaragua	15.00	14.93	18.92	17.51
Niger	15.00	14.93	18.92	21.17
Nigeria	14.03	13.94	18.92	18.97
North Macedonia	12.19	12.06	13.91	13.26
Norway	8.70	8.50	7.70	8.00
Oman	12.19	12.06	13.91	11.66
Pakistan	15.00	14.93	20.64	22.63
Panama	10.25	10.38	10.99	10.78
Papua New Guinea	14.03	13.94	17.19	16.04
Paraguay	11.12	10.97	12.02	11.66

Country	2021	2022	2023	2024
Peru	9.86	10.08	10.46	10.34
Philippines	10.54	10.38	10.99	10.78
Poland	9.52	9.34	9.16	9.24
Portugal	10.83	10.38	10.99	9.75
Qatar	9.29	9.10	8.73	8.88
Romania	10.83	10.68	11.49	11.21
Russian Federation	10.83	10.68	20.64	14.58
Rwanda	14.03	13.94	17.19	16.04
Saint Lucia*	13.82	14.57	18.55	14.94
Samoa*	15.64	14.94	20.26	18.26
San Marino*	12.83	12.57	8.87	9.26
Sao Tome and Principe*	22.25	18.57	20.48	20.53
Saudi Arabia	9.38	9.20	8.92	9.03
Senegal	12.19	12.06	13.91	13.26
Serbia	12.19	11.47	12.89	12.40
Sierra Leone	21.96	18.39	22.23	22.63
Singapore	8.70	8.50	7.70	8.00
Slovakia	9.52	9.34	9.16	9.24
Slovenia	9.86	9.69	9.77	9.75
Solomon Islands	15.00	15.91	20.64	18.97
Somalia	20.32	20.37	20.62	20.56
South Africa	11.61	11.47	12.89	12.40
South Sudan*	20.08	20.37	20.31	20.57
Spain	10.25	10.08	10.46	10.34
Sri Lanka	15.96	17.40	28.41	25.55
St. Maarten	10.83	11.47	12.89	12.40
St. Vincent & the Grenadines	15.00	14.93	18.92	17.51
Sudan	27.88	28.84	32.39	31.49
Suriname	18.38	18.39	24.96	22.63
Swaziland	15.00	14.93	18.92	17.51
Sweden	8.70	8.50	7.70	8.00
Switzerland	8.70	8.50	7.70	8.00
Syrian Arab Republic	27.88	28.84	32.39	31.49
Taiwan	9.29	9.10	8.73	8.88
Tajikistan	15.00	14.93	18.92	17.51
Tanzania (United Republic of)	14.03	13.94	17.19	16.04
Thailand	10.25	10.08	10.46	10.34
Timor-Leste*	15.38	16.86	21.46	20.57
Togo	15.00	14.93	18.92	17.51
Tonga*	13.80	13.82	20.72	14.83
Trinidad and Tobago	11.12	11.47	12.89	12.40

Country	2021	2022	2023	2024
Tunisia	14.03	15.91	20.64	21.17
Turkey	14.03	13.94	18.92	17.51
Turkmenistan*	9.35	16.14	10.40	9.64
Uganda	14.03	13.94	17.19	16.04
Ukraine	15.00	14.93	24.96	25.55
United Arab Emirates	9.18	8.99	8.55	8.72
United Kingdom of Great Britain and Northern Ireland	9.29	9.10	8.73	8.88
United States	8.70	8.50	7.70	8.00
Uruguay	10.54	10.38	10.99	10.78
Uzbekistan	13.06	12.95	15.47	13.26
Vanuatu*	12.84	13.49	22.59	14.90
Venezuela	27.88	28.84	32.39	31.49
Vietnam	12.19	12.06	12.89	12.40
Yemen, Republic	27.88	20.37	32.39	22.63
Zambia	20.32	20.37	28.41	22.63
Zimbabwe	20.32	15.91	20.64	21.17

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Document information

Version	*Date*	*Description*
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