ARTICLE 6.4 MECHANISM

A6.4-MEP014-A03

Draft Mechanism methodology

Electricity generation from renewable sources connected to an electricity system

Version 02.0

Sectoral scope(s): 01

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. The Supervisory Body of the mechanism established by Article 6, paragraph 4, of the Paris Agreement (the Supervisory Body), at its fifteenth meeting (SBM 015), approved the workplan for 2025 for the Methodological Expert Panel (MEP) and requested the MEP to initiate work on the revision of CDM methodologies, methodological tools, standards, and guidelines, including the methodologies "ACM0002: Grid connected electricity generation from renewable sources" and "AMS-I.D.: Grid connected renewable electricity generation" (hereinafter referred to as "the approved CDM methodologies"). [1,2]

2. The MEP 012, considered a draft version of the mechanism methodology "Electricity generation from renewable sources connected to an electricity system" and agreed to seek inputs from stakeholders. This draft version of the mechanism methodology was prepared by incorporating revisions to the approved CDM methodologies to align with the requirements of Article 6.4 mechanism standards approved by the SBM for the development of new mechanism methodologies. The public consultation was open from 17 March to 7 April 2026, and a total of 18 submissions were received. A compilation of the public comments received is provided in the "Information note: Summary of the comments received from stakeholders on the draft mechanism methodology "Electricity generation from renewable sources connected to electricity system" from the call for public inputs to annex 3 of the MEP 012" and section 4 below explains how the comments were addressed in the revised draft mechanism methodology.[3]

2. Purpose

3. The purpose of this draft mechanism methodology is to define requirements for Article 6.4 activities that involve the installation of a greenfield power plant that generates electricity from renewable sources and feeds all electricity generated into an electricity system.

3. Key issues and proposed solutions

4. The following sub-sections outline the key elements of the mechanism methodology, including a comparison with those in the latest approved versions of the CDM methodologies "ACM0002: Grid-connected electricity generation from renewable sources" and "AMS-I.D.: Grid connected renewable electricity generation".

3.1. Applicability conditions

5. The proposed mechanism methodology is applicable to greenfield power plants that generate electricity from renewable sources connected to an electricity system, including hydro, wind, solar, and geothermal power plants.

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[1] See https://cdm.unfccc.int/methodologies/DB/XB1TX7TAZ6SLWM9B7BC67THHVD16JV.

[2] See https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK.

[3] See https://unfccc.int/sites/default/files/resource/A6.4-INFO-MISC-010.pdf.

6. For Article 6.4 activities involving hydropower plants, the mechanism methodology is limited to either run-of-river plants or plants implemented in an existing reservoir and contains specific applicability conditions to ensure that emissions from the reservoir of the project hydropower plant are negligible.

7. The table below compares the applicability conditions between the CDM methodologies and the proposed mechanism methodology.

Table 1. Comparison of applicability conditions between the CDM methodologies and the Article 6.4 mechanism methodology

CDM methodologies		Mechanism methodology
ACM0002	• Project type: retrofit, rehabilitation (or refurbishment), replacement, or capacity addition to an existing power plant or construction and operation of a new power plant/unit that uses renewable energy sources and supplies electricity to the grid; • Energy sources: renewable sources except biomass; • Specific conditions: power plants with an integrated battery energy storage system and hydropower plants can be applied under certain conditions	• Project type: a greenfield power plant that generates electricity from renewable sources and feeds all the net electricity generated into an electricity system. The power plant may include a battery energy storage system; • Energy sources: hydro (run-or-river or with existing reservoirs), wind, solar, and geothermal; • Specific conditions: hydropower plants, solar photovoltaic power plants, solar thermal power plants and binary geothermal power plants can be applied under certain conditions. Conditions to baseline equipment transfer and the use of backup generator are included
AMS-I.D.	• Project type: construction and operation of a new power plant/unit or retrofit, rehabilitation (or refurbishment), replacement, or capacity addition of an existing power plant that uses renewable energy sources and supplies electricity to the grid; • Energy sources: renewable energy such as solar, hydro, tidal/wave, wind, geothermal, and renewable biomass; • Specific conditions: hydropower plants can be applied under certain conditions	

8. Moreover, the proposed mechanism methodology includes several options with regard to the applicability conditions of the methodology, for consideration by the Supervisory Body:

(a) With regard to the applicability to countries:

(i) Option A1: Limiting the applicability of the methodology to host Parties that are Small Island Developing States (SIDS) or Least Developed Countries (LDCs); or

(ii) Option A2: Not including any applicability conditions with respect to host Parties; and

(b) With regard to the applicability of different scales of Article 6.4 activities:

(i) Option B1.1: Limiting the applicability to hydro power plants with a capacity of up to 15 MW or, where available, any lower threshold used by the host Party for defining small-scale hydropower; or

(ii) Option B1.2: Limiting the applicability to hydro power plants with a capacity of up to 15 MW for host Parties that are neither LDCs nor SIDSs and 50 MW for host Parties that are LDCs or SIDS at the time of the start date of the Article 6.4 activity or, where available, any lower threshold used by the host Party for defining small-scale hydropower; or

(iii) Option B2: Not including any applicability conditions with regard to scale.

9. The two matters referred to in paragraph 8 are discussed in the section 3.3.2 below on common practice analysis, noting that the choice of the common practice threshold and the prevalence of such restrictions in the context is discussed in that section.

10. Some types of renewable power generation projects are not eligible under this version of the mechanism methodology because it does not include provisions to determine the:

(a) Baseline emissions for activities involving retrofit, rehabilitation (or refurbishment), replacement, capacity addition or captive use for specific consumers;

(b) Carbon dioxide, methane, and nitrous oxide emissions from reservoirs;

(c) Emissions associated with biomass-fired power plants; or

(d) Emissions from fluorinated gases used as working fluid in binary geothermal power plants.

11. Moreover, wave and tidal power plants are not applicable under this mechanism methodology, given that the relevance of emissions from the construction and operation of power plants would need to be further explored. The applicability conditions of the mechanism methodology may be expanded in future revisions of the mechanism methodology.

12. The mechanism methodology also specifies applicability conditions as required by the "Standard: Setting the baseline in mechanism methodologies" (A6.4-STAN-METH-004) and the "Standard: Addressing leakage in mechanism methodologies" (A6.4-STAN-METH-005) (hereinafter referred to as the "leakage standard"), including conditions to avoid leakage emissions associated with the pre-used equipment, water resources use and land use change.[4,5]

3.2. Activity Boundary

13. The activity boundary includes the site of the project power plant and all power units connected physically to the electricity system that the Article 6.4 activity power plant is connected to.

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[4] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf.

[5] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-005.pdf.

14. The MEP has identified all potential emission sources that can be altered by an eligible Article 6.4 activity under this mechanism methodology. The justification for the exclusion of relevant emission sources is provided in appendix 1 of the mechanism methodology.

15. Compared to the CDM methodologies, the mechanism methodology additionally accounts for:

(a) Methane and nitrous oxide emissions from fossil fuel consumption by backup generators operated in the project; and

(b) Wake effects for wind power plants; and

(c) Upstream emissions from the production, transport and installation of BESS.

3.3. Demonstration of additionality

16. To demonstrate additionality, the following analyses are required at the activity level: regulatory analysis, analysis of lock-in risk, investment analysis, and common practice analysis. The latter three analyses shall be conducted following the relevant methodological tools.

3.3.1. Analysis of lock-in risk

17. The MEP assessed the lock-in risk and concluded that the type of wind, solar and hydro power plants that are eligible under this methodology do not pose a material lock-in risk. The applicability conditions of the methodology ensure that the emissions from these technologies are very low and that they do not involve significant land use.

18. With regard to geothermal power generation, the MEP identified that some plants could involve high emissions. For example, flash steam and dry steam geothermal power plants may exhibit substantial emissions due to the nature of their technology, as geothermal fluids contain elevated concentrations of naturally occurring CO_2 and CH_4. Based on a literature review, some geothermal systems have reported greenhouse gas (GHG) emission intensities around 100 – 400 g CO_2 eq / kWh, while exceptional carbonate-hosted systems may exceed 1 000 g CO_2 eq / kWh. Therefore, the MEP considers that geothermal power plants may pose a lock-in risk. Meanwhile, the MEP noted that the emission levels of geothermal power plants vary depending on various factors, such as geological conditions and technology types. It may not be feasible to determine one or more factors to categorize geothermal power plants with low emission intensity for exclusion from the lock-in risk analysis. The methodology therefore requires conducting a lock-in risk analysis using the "Methodological Tool: Analysis of lock-in risk" (A6.4-AMT-008).

3.3.2. Common practice analysis and related eligibility limitations

19. The mechanism methodology uses the "Methodological Tool: Common practice analysis" (A6.4-AMT-001) to conduct the common practice analysis. Consistent with the methodological tool, the mechanism methodology specifies how the methodological tool shall be applied in the context of the specific methodology, including the:

(a) Metric used to assess common practice (recent power plant capacity additions);

(b) Geographical area to be considered (geographical area of the electricity system); and

(c) Common practice threshold (a percentage of recent power plant capacity additions).

20. The MEP notes that the choice of the common practice threshold is a key policy matter. The mechanism methodology includes the following options for the common practice threshold for consideration by the Supervisory Body:

(a) For host Parties that are neither Least Developed Countries (LDCs) nor Small Island Developing states (SIDS), the methodology includes alternative thresholds of 2.5 per cent, 5 per cent or 10 per cent; and

(b) For host Parties that are LDCs or SIDS, the methodology includes alternative thresholds of 5 per cent, 10 per cent or 15 per cent.

21. The MEP notes that the common practice tool provides an upper limit for the thresholds that may be used by mechanism methodologies. For the metric of recent capacity additions, as used in this mechanism methodology, the upper limit is 20 per cent for Parties that are neither LDCs nor SIDS and 25 per cent for LDCs or SIDS. The MEP notes, however, that the stringency and implications of a common practice threshold also depend on how “similar” activities are defined. A given threshold is less stringent if “similar” activities are defined more narrowly (e.g., wind power instead of renewable electricity generation). For example:

(a) The approved methodology “A6.4-AMM-002: N_2O abatement from nitric acid production” uses the upper limit of the common practice threshold (which makes the outcome relatively less stringent than using the lower value) but considers all abatement technologies that are eligible under the methodology as a “similar” activity and no abatement as a “different” activity for the purpose of assessing common practice (which makes the outcome relatively more stringent compared to considering a more narrowed definition of “similar” activity);

(b) By contrast, this draft mechanism methodology does not consider all renewable electricity generation as a “similar” activity but differentiates between several technologies, including onshore wind power generation, offshore wind power generation, solar PV power generation, solar thermal power generation, geothermal power generation and hydropower generation (which makes the outcome relatively less stringent compared to considering all renewable electricity generation as “similar” activity). To ensure comparability in stringency with approved methodologies, the MEP therefore recommends using a lower threshold than the upper limit specified in the common practice analysis tool (which makes the outcome relatively more stringent compared than using the upper threshold).

22. The thresholds in paragraph 20 above have implications for the eligibility of Article 6.4 activities. To facilitate the consideration by the Supervisory Body, the MEP assessed the implications of the three alternative threshold levels specified in paragraph 20. Table 2 and Table 3 below illustrate in how many countries the relevant technologies would not be deemed common practice with the three alternative threshold levels, using data provided

by Ember on power plant capacity additions.[6] A lower threshold provides a higher safeguard for ensuring additionality but also reduces the number of countries in which the technologies would be eligible. The tables differentiate between two different start dates of Article 6.4 activities: Table 2 illustrates the implications for a start date in 2021 for which data from 2018 to 2020 would be used to assess common practice, and Table 3 illustrates the implications for a start date in 2025 for which data from 2022 to 2024 would be used.

23. The MEP further notes that the values in the tables present upper limits for solar and wind power. The underlying data provided by Ember does not differentiate between onshore and offshore wind power plants, and between solar PV and thermal solar power plants. Therefore, the number of countries in which these technologies would not be common practice could in reality be somewhat higher. Furthermore, information on geothermal power plants is not separately specified in the data by Ember but aggregated into "other renewables". This does not allow for analysis of the implications of the common practice thresholds. The MEP notes, however, that the installed capacities of geothermal power plants are low and that the technology would not be common practice in most, if not all, countries. Lastly, it should be noted that the Ember data is only provided for countries and not at the level of electricity systems (which is the unit of analysis applied in this mechanism methodology), noting that in some instances an electricity system may encompass several countries or one larger country may have several electricity systems, in which case the outcome could be more stringent or less stringent, depending on the structure of the capacity additions in the electricity system.

Table 2. Number of countries in which relevant renewable power generation technologies with a start date in 2021 would not be deemed common practice, using different common practice thresholds

		Article 6.4 activities starting in 2021 (average 2018-2020)		
		Wind	**Solar**	**Hydro**
Lower thresholds:	LDCs/SIDS	75	56	47
- < 2.5 per cent non-LDCs/SIDS;	Non-LDCs/SIDS	75	71	37
- < 5 per cent LDCs/SIDS	**TOTAL**	**150**	**127**	**84**
Middle thresholds:	LDCs/SIDS	82	69	50
- < 5 per cent non-LDCs/SIDS;	Non-LDCs/SIDS	86	82	42
- < 10 per cent LDCs/SIDS	**TOTAL**	**168**	**151**	**92**
Upper thresholds:	LDCs/SIDS	83	78	52
- < 10 per cent non-LDCs/SIDS;	Non-LDCs/SIDS	102	105	53
- < 15 per cent LDCs/SIDS	**TOTAL**	**185**	**183**	**105**
All countries	LDCs/SIDS	84	84	84
	Non-LDCs/SIDS	130	130	130
	TOTAL	**204**	**204**	**204**

[6] Ember's country-level electricity dataset (annual capacity additions by technology) was used for the analysis, downloaded directly from the Ember data visualizer (2024 release). See https://ember-energy.org/data/

Table 3. Number of countries in which relevant renewable power generation technologies with a start date in 2025 would not be deemed common practice, using different common practice thresholds

		Article 6.4 activities starting in 2025 (most recent three years of data)		
		Wind	**Solar**	**Hydro**
Lower thresholds:	LDCs/SIDS	74	43	47
- < 2.5 per cent non-LDCs/SIDS;	Non-LDCs/SIDS	67	44	40
- < 5 per cent LDCs/SIDS	**TOTAL**	**141**	**87**	**87**
Middle thresholds:	LDCs/SIDS	80	55	51
- < 5 per cent non-LDCs/SIDS;	Non-LDCs/SIDS	79	61	44
- < 10 per cent LDCs/SIDS	**TOTAL**	**159**	**116**	**95**
Upper thresholds:	LDCs/SIDS	82	66	51
- < 10 per cent non-LDCs/SIDS;	Non-LDCs/SIDS	94	80	54
- < 15 per cent LDCs/SIDS	**TOTAL**	**176**	**146**	**105**
All countries	LDCs/SIDS	84	84	84
	Non-LDCs/SIDS	130	130	130
	TOTAL	**204**	**204**	**204**

24. As highlighted in section 3.1 above, the methodology also includes options for consideration by the Supervisory Body related to the eligibility of the mechanism methodology to groups of countries and project scales. Such restrictions have been introduced in other contexts:

(a) The Verified Carbon Standard (VCS) limited eligibility to specific countries in version 4.0 of the VCS Standard which was released in 2020. Recently, the VCS approved a new methodology (VMR0017) that broadens earlier restrictions and uses different country eligibility criteria for different technologies. Wind power, geothermal power and terrestrial solar PV power is eligible in low-, lower middle-, and upper middle-income countries, as classified by the World Bank. Hydro power is only eligible in LDCs and only up to a capacity of 15 MW;[7]

(b) The Gold Standard limits eligibility to LDCs, SIDS, and land-locked developing countries (LLDCs) and allows for projects in low income and low middle-income countries if the penetration of the technology is less than 5 per cent. For hydro power plants, projects with more than 20 MW are only eligible in exceptional cases. Some further exceptions apply, for example, to projects implemented in conflict zones;[8]

[7] See https://verra.org/wp-content/uploads/2026/04/VMR0017-Grid-Connected-Electricity-Generation-from-Renewable-Sources-ACM0002-Revision-v1.0.pdf.

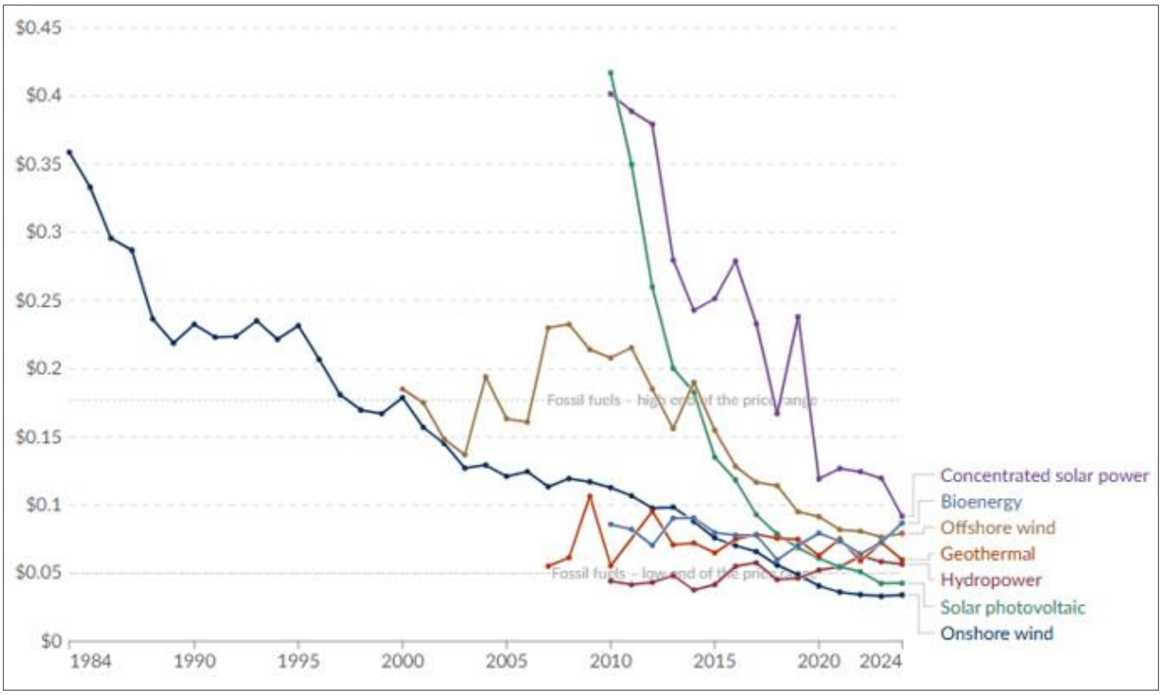
[8] See https://globalgoals.goldstandard.org/standards/202_V1.4_AR-Renewable-Energy-Activity-Requirements.pdf.

(c) The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) limits the applicability for Phase I from 2024 to 2026 to projects with a capacity of up to 15 MW but did not include any limitations on eligible countries;[9] and

(d) The Integrity Council for the Voluntary Carbon Market (ICVCM) did initially not consider any renewable electricity generation technologies to meet the relevant criteria and requirements for approval, but recently approved the VCS methodology VMR0017 referred to in sub-paragraph (a) above.[10,11]

25. The MEP also notes that costs of renewable electricity generation have declined over time. Figure 1 below illustrates how the levelized cost of energy generation of different renewable electricity generation technologies have changed over time.

Figure 1. Levelized cost of energy for renewables[12]



26. With regard to limitations to specific scales, the MEP does not recommend scale differentiations for wind, solar, or geothermal power plants but includes option in the methodology for hydro power plants. In the assessment of the MEP:

(a) The size of solar and wind power projects is not a decisive factor for additionality. Other factors, in particular wind speed and solar radiation availability, play a greater role;

9 See https://www.icao.int/CORSIA/corsia-eligible-emissions-units.

10 See https://icvcm.org/wp-content/uploads/2024/08/GS_ACM0002_v1-21_2024.pdf.

11 See https://icvcm.org/wp-content/uploads/2026/05/M49_VCS_VMR0017_v1.0_2026.pdf.

12 Source: Our World in Data, *Levelized Cost of Energy for Renewables* (interactive data visualization), available at: https://ourworldindata.org/grapher/levelized-cost-of-energy (accessed 23 June 2026).

(b) For geothermal power plants, size may play a role, but such plants are not yet common practice and concerns about additionality are less relevant at this time; and

(c) For hydropower plants, project size can play an important role. The decision to construct larger hydro power plants are sometimes not only based on economic grounds but policy decisions by authorities. The “Methodological tool: Investment analysis” (A6.4-AMT-002), however, does not address such situations, which may make it difficult to exclude such cases within the current additionality demonstration framework. Moreover, the costs of electricity generation are often higher for smaller plants. For this reason, the MEP included options for limiting the size of hydropower plants in (see section 3.1 above and paragraph 17 in the draft mechanism methodology):

(i) One option (B.1.1) limits the size to 15 MW for all countries or, where available, any lower threshold used by the host Party for defining small-scale hydropower plant;

(ii) Another option (B.1.2) limits the size to 15 MW for host Parties that are neither LDCs nor SIDSs and 50 MW for host Parties that are LDCs or SIDS at the time of the start date of the Article 6.4 activity or, where available, any lower threshold used by the host Party for defining small-scale hydropower plant;

(iii) Another option (B.2) does not include any applicability conditions with regard to scale.

27. With regard to the eligibility of countries, the MEP notes that this matter could be addressed in two different ways: (a) by limiting the methodology to specific types of countries (Options A.1 and A.2 in section 3.1 above) or (b) by selecting a strict common practice threshold that would effectively exclude countries where renewable power generation technologies are already more widespread (see options in paragraph 8(a) above). Given that the Supervisory Body clarified, at its fifteenth meeting, that the MEP should refrain from using any categorization of Parties/countries, such as high- income and low-income countries, that is not agreed under the Paris Agreement, the MEP included only the option of limiting eligibility to LDCs and SIDS in the proposed methodology. This option was proposed by one stakeholder and by MEP members.

28. The MEP notes that these options are mainly policy considerations and involve trade-offs. The common practice test, and any restrictions in eligibility of countries and scales, would serve as a safeguard against risk of “false positives”, i.e., projects that pass the regulatory and investment analysis although they are not additional. Renewable power generation technologies may pose a higher risk of "false positive" compared with other mitigation technologies under the Article 6.4 mechanism, considering the rapid decrease of the cost and the increase of their penetration. At the same time, this could also lead to “false negatives”, i.e., projects that cannot register under the Article 6.4 mechanism although they are additional. Despite the decline in the cost of renewable energy, the MEP also observed that some of these activities still face barriers in financing due to the currency risks, policy uncertainty, and other factors such as the cost of grid upgrade in case it is being borne by the developers of the renewable energy power plants. Some activities may therefore not be viable without an incentive from the Article 6.4 mechanism.

29. In considering these trade-offs, it is further noted that false positives could undermine integrity and potentially lead to higher aggregated emissions whereas false negatives do not directly affect emissions but could lead to fewer registered projects and higher aggregated mitigation costs. The MEP considers that the uptake of a technology might be a better indicator for the risk of false positives than whether a host Party belongs to a certain group of countries.

3.4. Baseline scenario

3.4.1. Identification of the baseline scenario

30. An approach based on existing actual or historical emissions, adjusted downwards, is selected to determine the baseline scenario. The selection was made considering that the electricity generation by existing or new grid-connected power plants may differ between Article 6.4 activities and regions, depending on the intermittent nature of the activity, the power generation technologies, and the natural resources (e.g., wind or precipitation) available in the respective electricity system.

31. The baseline scenario is determined at the mechanism methodology level as electricity generation by existing or new power plants connected to the electricity system.

3.4.2. Calculation of unadjusted baseline emissions

32. The unadjusted baseline emissions are calculated using the "Methodological tool: Emissions from electricity generation and consumption" (A6.4-AMT-007).[13]

3.4.3. Determination of the downward adjusted baseline emissions

33. Consistent with the "Standard: Setting the baseline in mechanism methodologies" (A6.4-STAN-METH-004), the initial downward adjustment is determined as the higher value between the initial downward adjustment determined based on uncertainty and a minimum initial downward adjustment.

34. The annual increase in the downward adjustment for subsequent years is set at 1 per cent, which corresponds to the minimum value in the "Standard: Setting the baseline in mechanism methodologies" (A6.4-STAN-METH-004). The minimum value is proposed for this specific methodology noting that the emissions intensity of electricity generation is already declining in many countries. Moreover, several other considerations for selecting the annual increase in the downward adjustment from paragraph 70 of the "Standard: Setting the baseline in mechanism methodologies" (A6.4-STAN-METH-004) are not relevant here, such as setting incentives for the adoption of less GHG intensive technologies or practices.

35. Compared to the approved methodology "A6.4-AMM-001: Flaring and or use of landfill gas"[14], the methodology adopts a simpler approach to mathematically implementing the downward adjustment. Rather than determining the initial downward adjustment as an absolute value in tonnes of carbon dioxide equivalent for the first calendar year, it determines the initial downward adjustment as a relative reduction. Combining this with

[13] See https://unfccc.int/sites/default/files/resource/A6.4-AMT-007-v01.0.pdf.

[14] See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amm-001.

the increase in the downward adjustment in subsequent years, it derives a relative downward adjustment applicable to each calendar year of the crediting period. This approach reduces the complexity of the equations.

36. The approach implemented in this mechanism methodology is consistent with the intent of the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004) but also addresses issues with its application that were not identified when preparing the standard:

(a) In developing the equations of the standard, it was implicitly assumed that an Article 6.4 activity generates in each year a similar level of emission reductions or removals. However, for some Article 6.4 activities the amount of emission reductions or net removals could increase or decrease over time. For example, in the case of improved cookstoves, the number of cookstoves installed over time may increase over time, and so would the amount of emission reductions. By contrast, in the case of a landfill gas capture project implemented at a closed landfill site, the amount of methane generated and captured may decline over time. Similarly, an Article 6.4 activity may not necessarily start at the beginning of a calendar year but could start at any time. In these instances, the absolute initial downward adjustment in the first year of the crediting period may not be representative for other years of the crediting period. With the adoption of a relative downward adjustment in this mechanism methodology, this issue is addressed, as the unadjusted baseline emissions observed in each year of the crediting period are adjusted with the same relative downward adjustment;

(b) In developing the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004), it was not considered that the application of the initial downward adjustment in the last calendar year of the last crediting period would be punitive if that year only includes a short period (e.g., one month). This matter was also raised in public comments received on this methodology. The revised approach with a relative downward adjustment addresses this matter.

3.4.4. Comparison of the downward adjusted baseline and the conservative business-as-usual (BAU) baseline

37. The conservative BAU scenario is deemed to be the same as the baseline scenario. Therefore, the conservative BAU emissions will always be higher than the downward-adjusted baseline emissions, except for the calendar year of the start date of the first crediting period. For that year, a discount factor is applied to the adjusted baseline emissions to ensure they remain below the BAU baseline. Therefore, there is no need to calculate or compare the conservative BAU emissions in subsequent years.

3.5. Activity scenario

38. The mechanism methodology includes the following sources of activity emissions:

(a) Carbon dioxide, methane, and nitrous oxide emissions from fossil fuel consumption in solar thermal power plants, geothermal power plants or backup generators;

(b) Carbon dioxide emissions from electricity consumption (e.g., during times when a renewable power plant is not operating); and

(c) Carbon dioxide, methane, and hydrocarbon/refrigerant emissions from the operation of geothermal power plants.

3.6. Leakage

39. Leakage emissions from the use of pre-used equipment are avoided through an applicability condition that requires equipment installed under the Article 6.4 activity to be newly produced and not previously used.

40. Leakage emissions related to competition for wind resource use, i.e., wake effects of a wind power plant, are calculated by subtracting the reduction in electricity generation by other wind power plants through wake effects. Leakage emissions related to competition for water resource use are avoided through an applicability condition that requires that the implementation of the Article 6.4 activity does not reduce the availability of water for irrigation, and that the hydropower plant operates in full compliance with the reservoir's authorized operating rules and water rights.

41. With regard to the quantification of the reduction in electricity generation by other wind power plants through wake effects, the MEP has conducted literature reviews and interviews with industry experts and noted that the decrease in electricity generation of other wind power plants due to the Article 6.4 activity could be up to 40 per cent, while the influencing factors can be complex, such as wind direction, climate conditions, and terrain conditions. Therefore, the MEP concludes that consideration of wake effects is necessary and proposes a two-step determination approach.

42. To quantify the emissions from wake effects, the mechanism methodology provides conditions under which Article 6.4 activities are exempted from such consideration: 1) if the other wind power plants neighbouring the Article 6.4 activity are also activities registered under the Article 6.4 mechanism, given that in such instances the decrease in electricity generation is already accounted for when quantifying the emission reductions from these other activities; and 2) if the distance between the Article 6.4 activity and other wind power plants is below a conservative threshold, considering that distance is a verifiable factor that strongly affects the size of any wake effects.

43. Based on the outcomes of the literature reviews and interviews with experts on wake effect models, the MEP noted that wake effects persist over longer distances for offshore wind power plants than for onshore ones, due to flatter surfaces and more stable climate conditions. Therefore, different thresholds have been provided for onshore and offshore wind power plants. With regard to the specific values of the thresholds, the MEP noted that various values were provided in different studies for the extent of wake effects, and prescribes a conservative interpretation of model-based projection of wake effects. The MEP has also selected conservative values, i.e., the upper limits from the studies, as the default values for distance beyond which wake effects are not accounted for in onshore and offshore wind power plants.

44. Leakage emissions due to upstream emissions from the manufacturing, transportation and installation of a BESS are also accounted for in this mechanism methodology, because the upstream emissions from Article 6.4 activities with an integrated BESS may lead to an increase in upstream emissions compared to the upstream emissions associated with the baseline scenario. These leakage emissions are determined by multiplying the electricity delivered by the BESS by a conservative upstream emission factor for the manufacturing, transportation and installation of different types of BESS. The value was derived based on

literature review of technical papers and articles published on life-cycle analysis of batteries and BESS.

45. All other potential leakage emissions sources are not considered in this version of the mechanism methodology. An analysis of unaccounted emission sources is included in appendix 1.

3.7. Data and parameters

46. The data and parameters that are not monitored, and those that are monitored, are provided in sections 13 and 14 of the mechanism methodology.

3.8. Avoidance of double counting

47. Consistent with the provisions in appendix of version 1.0 of the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004), the mechanism methodology contains provisions to avoid various forms of double counting.

3.9. Alignment with NDCs, LT-LEDS, and long-term goals of the Paris Agreement

48. Activity participants shall ensure that the activity complies with paragraph 10 of the appendix to the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004).

4. Consideration of public comments

49. This section summarizes how substantive comments were addressed. Editorial comments or very minor issues are not summarized here.

50. Some proposals were not incorporated into the proposed mechanism methodology because they are not aligned with the RMPs or relevant standards under the Article 6.4 mechanism, such as the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004), the “Standard: Demonstration of additionality in mechanism methodologies” (A6.4-STAN-METH-003), the “Methodological tool: Investment analysis” (A6.4-AMT-002) and the “Methodological tool: Common practice analysis” (A6.4-AMT-001). Such comments include, for example:

(a) Proposing alternative approaches to calculate the initial downward adjustment and the annual increase in the downward adjustment;

(b) Investigating the cumulative impacts of the downward adjustments in baseline emissions and other conservative approaches required in the methodology, considering that the methodology is combined with various mandatory tools, such as the tool to calculate emission factor of the electricity system;

(c) Eliminating the minimum downward adjusted baseline or to replace it with dynamic, context-specific, and capped approaches;

(d) Including approaches to demonstrate additionality other than those already included in the “Standard: Demonstration of additionality in mechanism methodologies”;

(e) Including simplified requirements for small-scale projects;

(f) Adding a provision indicating that the identification of “different technologies” for common practice analysis should consider structural barriers; and

(g) Using a time-bound approach that is different from the definition contained in the “Methodological tool: Common practice analysis” (A6.4-AMT-001).

51. Some other proposals were also not incorporated into the mechanism methodology since this version of the methodology is intended to provide a simplified and practical approach which is primarily focused on enabling the transition of a large share of relevant CDM projects to the Article 6.4 mechanism. The proposed changes would involve a substantive revision of some requirements that would require significantly more time to finalise a first version of this methodology. The MEP highlights that these proposed changes are not intended to be ruled out and welcomes the submissions of proposals to revise and expand the scope of this mechanism methodology as per the “Procedure: Development, revision and clarification of methodologies and methodological tools” (A6.4-PROC-METH-001)[15]. The proposals that were not incorporated involve, among others:

(a) Expanding the scope of the proposed mechanism methodology to:

(i) Cover the capacity increase, modernization, rehabilitation, or replacement of existing power plants generating electricity from renewable sources;

(ii) Cover different types of energy storage projects, such as pumped-storage projects;

(iii) Cover scenarios where a power plant exists in the project site but was shut-down long before the start date of the project; and

(iv) Cover projects involving captive consumption of the renewable electricity or sale of the renewable electricity to specific end consumers.

(b) Providing more refined approaches for activities integrated with an integrated battery energy storage system (BESS), including:

(i) Classifying power plants operated with an integrated BESS as “non-intermittent” sources;

(ii) Revising the common practice indicator to differentiate solar PV projects by the presence and storage capacity of an integrated BESS; and

(iii) Providing a separate project emissions treatment for renewable energy projects with an integrated BESS, by distinguishing and addressing grid charging, renewable charging, auxiliary consumption, later discharge, and battery losses.

4.1. Definitions

52. A comment was submitted proposing to complement the definition of “Installed power generation capacity” by referring to the nameplate of the turbines. The MEP did not implement the proposed change because not all eligible power plant technologies use turbines and a general definition, applicable to all technologies, may work better for the purpose of this methodology (e.g., to address considerations related to solar PV).

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[15] See https://unfccc.int/sites/default/files/resource/A6.4-PROC-METH-001.pdf.

4.2. Applicability conditions

53. A comment was submitted recommending a requirement that the volume and surface area of the existing reservoir is not changed after the implementation of hydropower projects implemented in the existing reservoir. The MEP addressed the comment, though using slightly modified provisions. The applicability conditions include provisions that the implementation of the Article 6.4 activity does not lead to a change in the volume of water in the existing reservoir, does not reduce the availability of water for irrigation and that the hydropower plant operates in full compliance with the reservoir's authorized operating rules and water rights.

54. One comment proposed to allow projects to deliver all electricity generated after meeting their auxiliary consumption needs. The MEP accepted the proposed revision by adding "net" in paragraph 12 of the mechanism methodology.

55. A comment recommended limiting the applicability of the methodology to Article 6.4 activities implemented in LDCs or SIDS. This is included as an option in the mechanism methodology for consideration by the Supervisory Body (see the discussion in sections 3.1 and 3.3.2 above).

56. One comment argued that limiting the applicability of the mechanism methodology to run-of-river hydropower plants and, based on the specific criteria related to hydraulic retention time and storage duration, may not adequately reflect the role of reservoirs in some countries, and recommended removing this restriction. The MEP noted that this version of the methodology does not estimate emissions from reservoirs and therefore kept the current restrictions.

57. A comment proposed to include a definition for peatlands. The MEP implemented the proposed change by including a new definition in section "2. Definitions".

58. One comment proposed new text to demonstrate that a reservoir was built independently of the Article 6.4 activity. The MEP implemented part of the proposal from the stakeholder and included provisions that the reservoirs shall have been established at least 10 years prior to the start date of the project, or 3 years with demonstration that the reservoir(s) have been planned, approved and financed without a power plant (see paragraph 16(b)(i) in the mechanism methodology).

59. Two comments recommended removing the threshold for the amount of electricity that may be generated with a backup diesel generator, justified with the grid downtime and instability across many developing countries. The MEP removed this provision and clarified in the definitions and in the applicability conditions of this methodology that the backup diesel generator shall be used solely for maintaining system continuity and safety during emergency or contingency events, and not for supplying electricity to end-users. In addition, any emissions arising from this source will be accounted as activity emissions.

60. Some comments proposed revising the language related to avoidance of double counting to allow other measures that ensures no double issuance of credits occurs, rather than by restricting activity participants from entering into a power purchase agreement (PPA) since the approach is overly restrictive. The MEP implemented the proposed change requiring in such case the claims shall be cancelled, ring-fenced, or otherwise reconciled to prevent double claiming, and moving the revised paragraph to section "11. Avoidance of double-counting".

61. Some comments recommended removing a requirement in the methodology which restricts activity participants from entering into agreements to supply electricity through the electricity system to specific consumers, and instead including safeguards in the methodology requesting the activity participants to disclose how the environmental attribute is separated from the electricity generated and that it will not be possible for the off-taker to claim renewable energy use in such cases. The MEP considered this matter and identified several issues that would arise if the electricity was provided to specific consumers, including that the electricity provided by the Article 6.4 activity may displace electricity generation at the site of the consumers or that the consumers may account for the same emission reductions. Addressing these issues would require significant amendments to the methodology. The MEP therefore retained the exclusion of such activities in this version of the methodology but noted that activity participants could request for a revision of the methodology or submit a new methodology to address these matters.

62. Two comments were submitted in relation to the applicability condition that equipment installed under the Article 6.4 activity has not previously been used in any other plant and is newly produced, recommending to revise the definition of newly installed equipment and to further clarify that replacement of spare parts or failed components are not treated as use of pre-used equipment. The MEP implemented both proposals by adding the definition of "equipment" from the "Methodological tool: Determination of the technical lifetime of equipment" (A6.4-AMT-006) in footnote 19 and by further elaborating how to demonstrate that the equipment was unused (see paragraph 21(b)(ii) in the mechanism methodology).

4.3. Activity boundary

63. One comment was submitted recommending the inclusion of upstream emissions from the construction of the Article 6.4 activity power plant, arguing that the justifications contained in appendix 1 are not sufficient to justify the exclusion of such sources. The MEP confirmed that the upstream emissions from the construction of the project power plant are lower than those from the baseline power plant through various approaches, including evaluating LCA studies in the literature and databases. The MEP also noted that the upstream emissions from the production, transportation, and installation of any BESS may lead to an increase in emissions compared to the baseline scenario. Thus, the emissions associated with BESS have been included as leakage emission sources (see section "9. Leakage" of the mechanism methodology).

64. Two comments were submitted recommending that upstream emissions from the construction of all power plants connected to the electricity system should be included as baseline emissions if the upstream emissions due to the construction of the Article 6.4 activity power plant is considered. The MEP did not implement this proposed revision because of the high uncertainty and complexity of quantifying upstream emissions from the construction of power plants in both baseline and activity scenario, noting that the exclusion is deemed to be conservative and simplifies the methodology. The exclusion of such emission sources is justified in appendix 1 of the mechanism methodology.

65. One comment recommended revising the activity boundary with regard to CO_2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants. The comment noted that some of these plants use fossil fuels to ensure that the project's heat transfer fluid is kept at a certain temperature, rather than for electricity generation. The MEP implemented the proposed change by revising the description of the emission source "CO_2 emissions from combustion of fossil fuels for

electricity generation in solar thermal power plants and geothermal power plants” to “CO_2 emissions from combustion of fossil fuels in back-up generators, solar thermal power plants or geothermal power plants”.

66. One comment was submitted proposing to remove the leakage emissions due to wake effects or to introduce a screening rule to assess the material impact of this leakage source and, accordingly, the consideration of these leakage emissions by activity participants. The MEP partially implemented the proposal. The conditions for considering wake effects under this mechanism methodology include a distance threshold and whether the impacted wind farm is a registered Article 6.4 activity. The MEP also included provisions for how to quantify wake effects.

4.4. Demonstration of additionality – regulatory analysis

67. One comment noted that the requirement for activity participants to demonstrate that the Article 6.4 activity would not occur due to legal obligations mandating the installation of renewable power plants may constitute a positive obligation that does not exclude the use of non-renewable components (e.g. within hybrid systems), which could indicate that the activity is non-additional. The comment proposed to only consider the requirement that explicitly required the installation of renewable power plants and prohibited the installation of non-renewable energy in the regulatory analysis. The MEP did not implement the proposed change because the regulatory analysis must consider the regulatory framework encompassing all requirements related to the installation of renewable energy systems.

68. Several comments were received on the requirements of methodology that the Article 6.4 activity does not participate in a support scheme or is subject to a penalty scheme that is designed to achieve quantitative target or outcome, such as competitive bidding processes for the installation of a certain capacity of renewable power plants. The MEP noted that this requirement is based on provisions in the “Standard: Demonstration of additionality in mechanism methodologies”. The MEP did not consider comments which suggested changes to the provisions in that standard. The MEP noted that the requirement would not prevent activities from registering that fall benefit from a feed-in tariff, but the tariff is insufficient to make the Article 6.4 activity viable. With regard to a proposal to assess whether the Article 6.4 activity contributes to renewable targets at or above a country's NDC trajectory, the MEP noted that this may not be easy to implement in practice but noted that countries can use the Article 6.4 mechanism as a means of implementation, in which case such legal requirements would not be considered in the analysis.

69. Two comments recommended removing the possibility of claiming emission reductions in excess of those emission reductions that would be achieved as a result of the legal requirements since this could result in scenarios where A6.4ERs could be partially issued for activities that are entirely viable without the revenue from the surplus emissions reduction. The MEP implemented the proposed change by removing the text specific to allowing the claim of emission reductions in excess of the requirement (see paragraph 31 of the draft mechanism methodology).

70. A comment proposed to assess the legal requirements at the renewal of the crediting period only since the assessment in each monitoring period is too stringent. The MEP did not implement the proposed change and considered it important in the context of this mechanism methodology to assess legal requirements more frequently.

4.5. Demonstration of additionality – assessment of lock-in risk

71. Several comments recommended adopting Option 1 in the version of the mechanism methodology published for public comments, i.e. not requiring a lock-in analysis or any of the activities applicable under this mechanism methodology due to the low GHG emission intensity of renewable power generation technologies. After further consideration of the matter, including external input from a consultant, the MEP included in the mechanism methodology a requirement to conduct the lock-in risk analysis for geothermal power plants, considering the wide variation in emission intensity level of geothermal power generation.

72. One comment recommended a simplified approach for lock-in assessment under *Option 3* in the version of the mechanism methodology published for public comments, i.e. *requiring a lock-in analysis only for solar and hydropower plants, limited to the resource assessment with regard to land use,* based on land-use where the land can be demonstrated to be barren, degraded, non-arable, or otherwise of low competing land-use value. Although this option was not selected for the analysis of lock-in, the MEP included an applicability condition that required activities involving solar power plants shall not be implemented on agricultural or forestland in the methodology (see paragraph 19 of the draft mechanism methodology).

4.6. Demonstration of additionality – investment analysis

73. Some comments were received proposing additional guidance or illustrative best practice examples on what constitutes “credible evidence”. The MEP did not implement the proposed change since some examples for credible evidence are provided in footnote 11 of version 1.0 of the “Methodological tool: Investment analysis” (A6.4-AMT-002).

74. One comment recommended revising the specification of “implementation entity”, which requires activity participants to assume that the Article 6.4 activity could be implemented by either the activity participants or other entities, unless it can be demonstrated that only the activity participants can implement it. The comment noted the current requirement imported a competitive market assumption that does not exist in SIDS electricity markets by allowing the use of the cost of capital parameters consistent with actual market participants for Article 6.4 activities implemented in LDCs/SIDS. The MEP did not implement the proposed change because the requirement is relevant to determine the benchmark, which requires the consideration of the overall market situation. However, the MEP made some modifications to treat both options equally: either assume the activity could be implemented by others, or provide evidence that only the participant can implement it (see paragraph 35(d) of the draft mechanism methodology).

75. One comment recommended conducting the sensitivity analysis for all inputs exceeding 10 per cent of total costs, rather than 20 per cent. The MEP did not implement the proposed change considering that the proportion of 20 per cent is deemed appropriate because it covers the essential input values of the investment analysis.

4.7. Demonstration of additionality – common practice analysis

76. One comment received on the requirement to use a time-bound approach under the common practice analysis with a reference period of the most recent [3][5] years prior to the earlier of the start of operation of the Article 6.4 activity or the submission of the PDD for validation, recommended using a reference period of 3 years, whereas another

comment proposed a number of years consistent with the number of years used to calculate the grid emission factor as per the electricity emissions tool. The MEP agreed to use 3 years.

77. Comments were received proposing to limit the scope of the applicable geographical area to the host country and not to allow widening the geographical area. The MEP did not implement the proposed revision because the proposal did not align with the "Methodological tool: Common practice analysis" (A6.4-AMT-001). One comment proposed to set "continent" as the widened area for countries other than LDCs and SIDS. MEP agreed to set the electricity system as the default applicable geographical area and also to allow the area to be widened to the host country, continent or global for countries other than LDCs and SIDS, in accordance with the "Methodological tool: Common practice analysis" (A6.4-AMT-001).

78. Comments were received proposing thresholds (microscale: less than 1 MW; small-scale: 1-15 MW; and large scale: more than 15 MW) to the scale of output or capacity of the technology, measure, or practice. The MEP did not implement the proposed change since the capacity size is not the most critical element when compared with resource availability (e.g., wind, and sunlight).

79. Several comments were received on the different proposed common practice thresholds The MEP noted that the determination of the common practice threshold is a key policy matter and proposed options in the mechanism methodology. The explanation of the proposal on the common practice threshold is provided in section 3.2.2 above.

80. Comments to the determination of similar, comparable and different activities involved removing the activities registered under other carbon crediting schemes, differentiating wind power plants between onshore and offshore (Option 2), differentiating between solar PV plants co-located with BESS and without co-located BESS and differentiating geothermal power plants between binary, flash and dry steam. The MEP removed the inclusion of activities registered under other carbon crediting schemes and agreed to differentiate wind power plants between onshore and offshore; however, the MEP did not implement the differentiation between solar power plants with and without co-located BESS and did not differentiate different types of geothermal power plants (see paragraph 37(g) of the draft mechanism methodology).

4.8. Baseline emissions – Unadjusted baseline emission

81. One comment recommended to provide a method for justifying the determination that there are no feasible alternatives other than continuing to operate the reservoir without reducing its size for an Article 6.4 activity that installs a greenfield hydropower plant at an existing reservoir. The MEP implemented the proposed change by including specifications for conducting the investment analysis for Article 6.4 activities involving hydropower plants implemented at one or more existing reservoir(s) (see paragraph 35(a)(ii) of the draft mechanism methodology).

82. A comment proposed to modify equations 1 and 2 by removing the parameter $EG_{legal,y}$ and to correct the definition and notation of the parameter $EG_{PJ,y}$. The MEP implemented the proposed change to remove the parameter $EG_{legal,y}$, and the proposed change to the definition of the parameter $EG_{PJ,y}$, however it did not implement the change to the notation of the parameter because it already refers to the electricity generation eligible for crediting.

83. One comment recommended removing the consideration of uncertainty from the calculation of the emission factor of the electricity system since it is already covered by the electricity emissions tool. The MEP has implemented the proposed change by revising paragraph 50 of the draft mechanism methodology, explaining that uncertainty of the emission factor of the electricity system is covered by following the provisions from the tool.

84. Several comments proposed to address the wake effect. The MEP revised the methodology by:

(a) Replacing the parameters $EG_{shadowing,y}$ and $EG_{shadowing,h}$ by $EG_{wake,y}$ in equations (1) and (2);

(b) Listing conditions under which the wake effect must be considered (see paragraph 43 of the draft mechanism methodology);

(c) Proposing an approach to determine $EG_{wake,y}$ (monitoring using wake models) (see paragraph 45 of the draft mechanism methodology), including the conditions for using wake models.

4.9. Activity emissions

85. One comment recommended revising the requirements for the calculation of activity emissions by defining a threshold below which emissions are considered immaterial. The MEP did not implement the proposed change since the consumption of fuel to operate the power plant can be quantified and, therefore, must be accounted for as activity emissions.

86. Some comments recommended including the tables with the monitoring requirements for the parameters $NCV_{i,y}$ and $EF_{CO2e,i,y}$. The MEP implemented the proposed change in section "14. Data and parameters monitored".

4.10. Avoidance of double-counting

87. Some comments recommended allowing for participation in environmental attribute systems if the claims are cancelled, ring-fenced, or otherwise reconciled to prevent double claiming, including by providing conditions to distinguish prohibited overlap from overlap that is adequately managed through transparent accounting treatment. The MEP implemented the proposed change in paragraph 77(a) of the draft mechanism methodology.

88. The following comments were received to the demonstration that reported greenhouse gas emission reductions do not overlap with mandatory domestic mitigation schemes such as emission trading systems:

(a) A comment recommended accepting clear evidence pathways, such as standard templates and standard declarations, for overlap checks with domestic mitigation schemes and other relevant systems. The MEP did not implement the proposed change since evidence of no overlap is already addressed in the "Standard: Article 6.4 validation and verification standard for projects" (A6.4-STAN-AC-003) as part of the requirements for verification;

(b) A comment requested to clarify how the requirements for demonstrating that there is no overlap with mandatory domestic mitigation schemes may impact a project which has already received a National Authorization since a project that received the authorization does not need to further demonstrate it. Such observation was not considered since host Party Authorization does not require confirmation regarding the double counting of credits; and

(c) A comment proposed revising the "may" requirement, regarding the provision of evidence showing that the mitigation outcomes of the Article 6.4 activity are not counted in the mandatory mitigation scheme to reduce the obligations by the entities covered by the scheme, to "shall" since it should be mandatory for the activity participant to provide such evidence The MEP implemented the proposed change in section "11. Avoidance of double-counting".

89. A comment proposed to provide more detailed guidance on how to prevent double counting when participating in instances where the mechanism is formally recognised as a means to achieve a target set by frameworks, environmental markets, or mandatory domestic mitigation schemes. The MEP considered this comment and determined to remove the whole paragraph containing this requirement to avoid any misinterpretation or misunderstanding.

4.11. Demonstration of alignment with the policies, options and implementation plans with regard to the NDC and LT-LEDS of the host Party and the long-term temperature goal of the Paris Agreement and long-term goals of the Paris Agreement

90. A comment proposed to provide a standardized templates for host country approval and NDC alignment in each mechanism methodology. The MEP did not implement the proposed change since paragraph 10 of the appendix of version 1.0 to the "Standard: Setting the baseline in mechanism methodologies" (A6.4-STAN-METH-004) already covers how the DNA of the host Party should demonstrate the alignment.

4.12. Data and parameters monitored

91. A comment recommended to referring to default values and uncertainties from the latest IPCC Assessment Report. The MEP did not implement the proposed change since the global warming potentials (GWPs) of the IPCC AR5 are required to be used as per the "Standard: Article 6.4 activity standard for projects" (A6.4-STAN-AC-002).

92. A comment recommended revising the "Data / Parameter table 3" to (i) provide a clear hierarchy of acceptable evidence sources is provided for assessing wind shadowing effects, (ii) set as 2 km the distance between wind power plants to consider the wake effect, (iii) allow for the use of a conservative default factor or the use of project-specific reports, and (iv) require that the models used for wake effect are certified by an independent assessor. Refer to the answer provided in paragraph 84 of this cover note. With this change, the "Data / Parameter table 3" from section "13. Data and parameters not monitored" was removed, and a new table was included under section "14. Data and parameters monitored" of the draft mechanism methodology containing the monitoring provisions for the parameter $EG_{wake,y}$.

4.13. Data and parameters monitored

93. A comment was submitted allowing the use of the ASTM standard or an equivalent standard in the row "Measurement and procedures" of the "Data / Parameter table 5"

(average mass fraction of carbon dioxide in the produced steam in year *y*). The MEP implemented the proposed change in the “Data / Parameter table 10” of the draft mechanism methodology.

4.14. Appendix – Background information on the inclusion and exclusion of emission sources

94. A comment elaborated on the justification for not considering leakage emissions due to the diversion of existing production processes or outputs and proposed adding an applicability condition in the PDD requiring project developers to document the prior land use of the project site and assess whether displacement of agricultural production is likely to result in land-use change emissions elsewhere. The MEP implemented the proposed change by adding the applicability condition in paragraph 19 of the mechanism methodology requiring that solar photovoltaic power plants and solar thermal power plants shall not be installed on agricultural land or forestland.

95. A comment proposed the paragraph regarding the rebound effect should indicate that, when identifying the increase in the level of service as a result of the implementation of the Article 6.4 activity (rebound effect) as a leakage source, the level of service increase is compared to the baseline scenario (rebound effect). This is distinct from the level of service used to satisfy additional demand, which equals to the level of service under the baseline scenario which is done by a greenfield project, and is not related to the rebound effect. The MEP implemented the proposed change.

96. A comment was submitted proposing to add in the discussion on leakage effects due to the rebound effect that this type of leakage is not considered for simplicity and because although low operating cost may lead to a rebound effect, this effect is largely compensated by the substitution effect (from fossil to electric end uses), market creation and suppression (decline of high emission products: transformative changes). Such effects may outweigh the rebound effect. The MEP did not implement the proposed change since the mechanism methodology does not account for rebound effects, and the effect referred to in the public input falls outside the boundary of the methodology and is not relevant to renewable power plants applying this mechanism methodology.

5. Impacts

97. Approval of this mechanism methodology will enable the development of Article 6.4 activities that install greenfield power plants that use renewable sources and feed electricity into an electricity system.

6. Subsequent work and timelines

98. The MEP notes that the proposed mechanism methodology is only applicable to activities implemented at the project level. The mechanism methodology will be amended in the future, following the revision to the “Standard: Demonstration of additionality in mechanism methodologies”, the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004) and the leakage standard to include methodological requirements for other scales (e.g., Programmes of Activities or large-scale crediting programmes).

99. The MEP also notes that the proposed mechanism methodology should be revised once the work on the revision of the CDM TOOL03 “Tool to calculate project or leakage CO_2

emissions from fossil fuel combustion”[16] has been concluded and the tool has been adopted by the Supervisory Body.

100. If the Supervisory Body approves the draft mechanism methodology, the MEP will reflect the approach of a relative downward adjustment applied in this mechanism methodology in a future revision of the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004) once the standard will be reviewed.

7. Recommendations to the Supervisory Body

101. The MEP agreed to recommend that the Supervisory Body consider the draft mechanism methodology, including the options on policy matters included in the mechanism methodology, and adopt the draft mechanism methodology.

[16] See https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v3.pdf.

TABLE OF CONTENTS **Page**

1. INTRODUCTION 27

1.1. Scope 27

1.2. Entry into force and validity 27

1.3. Applicability of sectoral scopes 27

2. DEFINITIONS 27

2.1. General terms 27

2.2. Methodological terms and definitions 27

3. NORMATIVE AND INFORMATIVE REFERENCES 29

4. APPLICABILITY 30

5. ACTIVITY BOUNDARY 34

6. DEMONSTRATION OF ADDITIONALITY 36

6.1. Regulatory analysis 36

6.2. Assessment of lock-in risk 37

6.3. Investment analysis 38

6.4. Common practice analysis 39

7. BASELINE SCENARIO 40

7.1. Selection of the baseline approaches from paragraph 36 of the rules, modalities and procedures 40

7.2. Application of the selected approach, prior to implementation of a downward adjustment 41

7.2.1. Procedure for the identification of the baseline scenario 41

7.2.2. Calculation of the unadjusted baseline emissions from electricity generation from the Article 6.4 activity 41

7.3. Application of the downward adjustment 43

7.3.1. Step 1. Determination of the initial downward adjustment ($DA_{initial}$) 43

7.3.2. Step 2. Determination of the annual increase in the downward adjustment (*INDA*) 45

7.3.3. Step 3. Determination of the downward adjusted baseline emissions ($BE_{adj,EG,y}$) 45

7.4. Determination of a conservative ‘business-as-usual’ (BAU) baseline and comparison of the downward adjusted baseline and the conservative business-as-usual baseline 46

8. ACTIVITY SCENARIO 46

8.1. Activity emissions from fossil fuel consumption ($AE_{FC,y}$) 47

8.2. Activity emissions from electricity consumption ($AE_{EC,y}$) 48

8.3. Activity emissions from the operation of geothermal power plants ($AE_{GP,y}$) 49

9. LEAKAGE 51

10. EMISSION REDUCTIONS 52

11. AVOIDANCE OF DOUBLE COUNTING 52

12. DEMONSTRATION OF ALIGNMENT WITH THE POLICIES, OPTIONS AND IMPLEMENTATION PLANS OF THE HOST PARTY WITH REGARD TO ITS NDC AND LT-LEDS AND THE LONG-TERM TEMPERATURE GOAL OF THE PARIS AGREEMENT AND LONG-TERM GOALS OF THE PARIS AGREEMENT 53

13. DATA AND PARAMETERS NOT MONITORED 53

14. DATA AND PARAMETERS MONITORED 55

APPENDIX 1. BACKGROUND INFORMATION ON THE INCLUSION AND EXCLUSION OF EMISSION SOURCES 69

APPENDIX 2. NUMERICAL EXAMPLE OF THE DETERMINATION OF THE DOWNWARD ADJUSTMENT 74

1. Introduction

1.1. Scope

1. This mechanism methodology applies to Article 6.4 activities that generate electricity from certain types of renewable energy sources connected to an electricity system, such as hydropower without the construction of a new reservoir, hydropower constructed in an existing reservoir without changing the volume and surface area of an existing reservoir, wind, solar, and geothermal.

2. Article 6.4 Emission Reductions (A6.4ERs) issued based on this mechanism methodology represent emission reductions that are not subject to reversal risks.

1.2. Entry into force and validity

3. This mechanism methodology enters into force on DD Month YYYY.

4. This mechanism methodology remains valid for five years, until DD Month YYYY, unless an earlier date applies if the mechanism methodology is revised or withdrawn in accordance with the “Procedure: Development, revision and clarification of methodologies and methodological tools” (A6.4-PROC-METH-001).[1]

1.3. Applicability of sectoral scopes

5. Designated operational entities (DOEs) validating and verifying Article 6.4 activities that use this mechanism methodology shall apply sectoral scope 1: Energy industries (renewable/ non-renewable sources).

2. Definitions

2.1. General terms

6. The following general terms apply in this mechanism methodology:

   (a) “Shall” is used to indicate requirements that must be followed;

   (b) “Should” is used to indicate that, among several options, one course of action is recommended as particularly suitable; and

   (c) “May” is used to indicate what is permitted.

2.2. Methodological terms and definitions

7. The following methodological terms and definitions apply in this mechanism methodology:

   (a) **Backup generator**: a generator used in an emergency or contingency event to meet electricity demand of the project equipment at the site of the project power plant;

[1] See https://unfccc.int/sites/default/files/resource/A6.4-PROC-METH-001.pdf.

(b) **Binary geothermal power plant**: a geothermal technology that utilizes heat from a geothermal fluid through heat exchangers to vaporise an organic fluid with a low boiling point (e.g., butane or pentane in the Organic Rankine Cycle (ORC) or an ammonia-water mixture in the Kalina cycle) and drive a turbine. Binary geothermal plants are categorised as closed cycle technologies;

(c) **Dry steam geothermal power plant:** a geothermal technology that directly utilises dry steam that is piped from production wells to the plant and then to the turbine. Dry steam geothermal plants are categorised as open cycle technologies;

(d) **Flash steam geothermal power plant:** a geothermal technology that is designed for high-temperature, water-dominated reservoirs. In these high-temperature reservoirs, the liquid water component boils, or “flashes”, as pressure drops. Separated steam is piped to a turbine to generate electricity and the remaining hot water may be flashed again twice (double flash plant), or three times (triple flash plant) at progressively lower pressures and temperatures, to obtain more steam. Flash steam geothermal plants are categorised as open cycle technologies;

(e) **Greenfield power plant:** a new power plant that is constructed and operated at a site where no power plant was operated prior to the implementation of the Article 6.4 activity;

(f) **Hydraulic residence time:** the ratio of reservoir volume to mean inflow, representing the average time water remains within the reservoir under steady-state conditions;

(g) **Installed power generation capacity (or installed capacity):** capacity, expressed in Watts or one of its multiples, for which a power unit has been designed to operate at nominal conditions. The installed power generation capacity of a power plant is the sum of the installed power generation capacities of its power units;

(h) **Peatlands:** wetland ecosystems where soils are dominated by peat. In peatlands net primary production exceeds organic matter decomposition as a result of waterlogged conditions, which leads to the accumulation of peat. In absence of a host country definition, peat shall be defined as soft, porous or compressed, sedimentary deposit of plant origin with high water content in the natural state (up to about 90 per cent);

(i) **Power plant/unit:** a facility that generates electric power. Several power units at one site comprise one power plant, whereas a power unit is characterized by the fact that it can operate independently from other power units at the same site. Where several identical power units (i.e., with the same capacity, age and efficiency) are installed at one site, they may be considered as one single power unit;

(j) **Reservoir:** a natural or artificial water body created to store water, often made by the construction of a dam;

(k) **Run-of-river hydropower plant:** a hydropower plant that draws the energy for electricity production mainly from the available flow of the river, such that the generation profile will, to varying degrees, be dictated by local river flow conditions;[2] and

(l) **Storage duration:** the equivalent time, expressed in hours, for which a hydropower plant can operate at rated turbine discharge using only its usable storage volume between maximum and minimum operating levels, assuming zero inflow.

8. Furthermore, the terms in the “Glossary: Article 6.4 mechanism terms” (A6.4-GLOS-GOV-001)[3] and the definitions and terms in this mechanism methodology referred to in section 3, shall apply.

3. Normative and informative references

9. The mechanism methodology is based on elements from version 22.0 of the Clean Development Mechanism (CDM) methodology “ACM0002: Grid-connected electricity generation from renewable sources"[4] and version 18.0 of the small-scale CDM methodology “AMS-I.D.: Grid connected renewable electricity generation”.[5]

10. The following documents are indispensable for the application of this mechanism methodology. When applying this mechanism methodology, a valid version of the documents listed below shall be used:

(a) “Methodological tool: Common practice analysis” (A6.4-AMT-001);[6]

(b) “Methodological tool: Investment analysis” (A6.4-AMT-002);[7]

(c) “Methodological tool: Emissions from electricity generation and consumption” (A6.4-AMT-007);[8] and

(d) “Methodological tool: Analysis of lock-in risk” (A6.4-AMT-008).[9]

11. The following documents provide background information of this mechanism methodology:

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2 This definition is informed by the discussion on page 451 of the *Special Report on Renewable Energy Sources and Climate Change Mitigation* (IPCC, 2011).

3 See https://unfccc.int/sites/default/files/resource/A6.4-Glossary.pdf.

4 See https://cdm.unfccc.int/methodologies/DB/XB1TX7TAZ6SLWM9B7BC67THHVD16JV.

5 See https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK.

6 See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amt-001.

7 See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amt-002.

8 See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amt-007-emissions-from-electricity-generation-and-consumption.

9 See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amt-008.

(a) Intergovernmental Panel on Climate Change (IPCC), Special Report on Renewable Energy Sources and Climate Change Mitigation (Cambridge and New York, Cambridge University Press, 2011);[10]

(b) Intergovernmental Panel on Climate Change (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 2: Energy. IPCC, Geneva, Switzerland;[11] and

(c) Intergovernmental Panel on Climate Change (2019). 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 1: General Guidance and Reporting. IPCC, Geneva, Switzerland.[12]

4. Applicability

12. This mechanism methodology is applicable to Article 6.4 activities that install a greenfield power plant that generates electricity from renewable sources and feeds all the net electricity generated into an electricity system. [13]

13. The types of renewable energy power plants eligible under this mechanism methodology are hydropower plants, wind power plants, solar photovoltaic power plants, solar thermal power plants, and geothermal power plants.

[Option A1

14. The methodology is applicable to plants implemented in host Parties that are classified as LDCs or SIDS at the time of the start date of the Article 6.4 activity.[14]*]*

[Option A2: No text]

15. This methodology may also be applied to power plants that incorporate a battery energy storage system (BESS). The BESS shall be:

(a) Located at the same site as the renewable energy power plant;

(b) Solely charged with electricity provided by the Article 6.4 renewable power generation plant; and

(c) Installed before the electricity metering point for the Article 6.4 activity.

[10] See https://archive.ipcc.ch/pdf/special-reports/srren/SRREN_Full_Report.pdf.

[11] See https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html.

[12] See https://www.ipcc-nggip.iges.or.jp/public/2019rf/vol1.html.

[13] This version of the mechanism methodology does not apply to activities at an existing power plant (e.g., capacity addition, retrofit, rehabilitation, or replacement), as it does not provide the procedures or requirements for establishing a baseline for such activities. Stakeholders may propose a revision to this mechanism methodology to extend its applicability.

[14] The MEP may consider differentiating between plants with and without co-located BESS in future revisions of the methodology.

16. In the case of hydropower plants, one of the following conditions below shall apply:[15]

(a) The Article 6.4 activity involves the establishment of a run-of-river hydropower plant for which all of the following conditions are satisfied:[16]

(i) The storage duration is not larger than 24 hours;

(ii) The hydraulic residence time is below 2 days; and

(iii) The implementation of the Article 6.4 activity does not involve the flooding of forests[17] or peatlands; or

(b) The Article 6.4 activity is implemented at one or more existing reservoir(s) for which all of the following conditions are satisfied:

(i) One of the following two conditions apply:

a. The reservoir(s) have been established at least 10 years prior to the start date of the Article 6.4 activity; or

b. The reservoir(s) have been established at least 3 years prior to the start date of the Article 6.4 activity and it can be demonstrated that the reservoir(s) have been planned, approved and financed without a power plant.

(ii) The implementation of the Article 6.4 activity does not lead to an increase in the average volume of water in the existing reservoir, relative to pre-activity levels. This shall be assessed ex-ante in the PDD based on the design of the reservoir and the Article 6.4 activity. Where the volume of water changes within a calendar year due to seasonal variations, this requirement shall be satisfied throughout all seasons;

(iii) The implementation of the Article 6.4 activity does not reduce the availability of water for irrigation; and

[15] These conditions are introduced because this version of the methodology does not include provisions to estimate carbon dioxide, methane, and nitrous oxide emissions from reservoirs. It is assumed that the fulfilment of these conditions ensures that such emissions are very small. Activity participants are encouraged to submit a proposed revision to this methodology to cover reservoirs that do not satisfy these conditions.

[16] These factors were identified based on different studies. Storage duration is commonly used to distinguish run-of-river plants. Hydraulic residence time influences methane emissions because longer water retention promotes stratification, oxygen depletion and anaerobic decomposition. Available research also suggests that the amount of available biomass influences emissions. See, for example: World Bank. 2017. Greenhouse Gases from Reservoirs Caused by Biogeochemical Processes. World Bank, Washington, DC. https://documents1.worldbank.org/curated/en/739881515751628436/pdf/Greenhouse-gases-from-reservoirs-caused-by-biogeochemical-processes.pdf and Tittel, J., Hüls, M. & Koschorreck, M. Terrestrial Vegetation Drives Methane Production in the Sediments of two German Reservoirs. Sci Rep 9, 15944 (2019). https://doi.org/10.1038/s41598-019-52288-1.

[17] Under this mechanism methodology, a forest shall meet the national definition of forests of the applicable host Party.

(iv) The hydropower plant operates in full compliance with the reservoir's authorized operating rules and water rights.

[Option B1: Limitation of hydropower plants to a capacity

17. In the case of hydropower plants, furthermore:

{Start of sub-options B1.1 or B1.2}

[Option B1.1: Limitation to 15 MW for all countries

(a) The plant has an installed electricity generation capacity of up to 15 MW or, where available, any lower threshold used by the host Party for defining small-scale hydro power; and]

[Option B1.2: Limitation to different capacities for LDCs/SIDS and non-LDCs/SIDS

(b) The plant has an installed electricity generation capacity of up to 15 MW for host Parties that are neither LDCs nor SIDSs and 50 MW for host Parties that are LDCs or SIDS at the time of the start date of the Article 6.4 activity or, where available, any lower threshold used by the host Party for defining small-scale hydro power; and]

{End of sub-options B1.1 or B1.2}

(c) The implementation of the Article 6.4 activity is not designed in way that it could lead to a reduction in electricity generation at upstream or downstream hydropower plants that rely on the same water resource by demonstrating that the implementation of the activity does not change the water resource distribution within the water system.]

[Option B2: No such limitation

18. In the case of hydropower plants, furthermore, the implementation of the Article 6.4 activity is not designed in way that it could lead to a reduction in electricity generation at upstream or downstream hydropower plants that rely on the same water resource, by demonstrating that the implementation of the activity does not change the water resource distribution within the water system.]

19. In the case of solar photovoltaic power plants and solar thermal power plants, the power plants are not installed on land that has been classified as agricultural land or forestland by relevant authorities.

20. In the case of binary geothermal power plants, hydrocarbons and not any fluorinated gases are used as working fluid.

21. Furthermore, the mechanism methodology is only applicable under the following conditions:

(a) The activity participants have not entered into any agreements to supply the electricity from the Article 6.4 activity through the electricity system to specific consumers;[18]

(b) The equipment[19] installed under the Article 6.4 activity is:[20]

(i) Newly produced; and

(ii) Demonstrably unused, meaning that it has not previously been installed, commissioned, or operated in any other plant.

(c) Where the investment comparison analysis is applied in section 6.3 below, the most financially viable scenario is electricity generation by existing or new grid-connected power plants and, in the case of hydropower plants implemented at one or more existing reservoir(s), operating the reservoir(s) at its/their current size and using it/them for the same purpose as that prior to the implementation of the Article 6.4 activity;

(d) If the Article 6.4 project power plant is equipped with backup generator(s), the backup generator(s) is used solely for maintaining system continuity and safety during emergency or contingency events, and not for supplying electricity to end-users;

(e) The mechanism methodology is applied to a project;[21] and

(f) The mechanism methodology is used on a standalone basis and not in combination with other methodologies, unless the other methodology(ies) specify(ies) how the interaction with this mechanism methodology is taken into account.

22. The mechanism methodology is not applicable to:

(a) Activities that involve switching from fossil fuels to renewable energy sources at the site of the activity;

(b) Activities that involve any biomass consumption; and

(c) Activities that involve any fossil fuel consumption, except for the use in solar thermal power plants, geothermal power plants or back-up generator(s).

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[18] The mechanism methodology does not apply to activities that supply electricity to specific consumers, as the baseline scenario for such projects may not be defined as electricity supplied from the electricity system.

[19] Machinery and tools related to electricity generation facilities, e.g., power plant equipment such as photovoltaic modules, turbines, electric generators, pumps, motors or engines.

[20] This condition is introduced to avoid any leakage from baseline equipment transfer, consistent with paragraph 14(a) of version 01.0 of the “Standard: Addressing leakage in mechanism methodologies” (A6.4-STAN-METH-005).

[21] The mechanism methodology may be amended in the future to also cover activities implemented at other scales (e.g., programmes of activities, policies, sectoral approaches, etc).

23. The above provisions shall be demonstrated as follows:

(a) The provisions in paragraphs 13[, 14], 15, 16(a), 16(b)(i)-(ii), [17][18], 19, 20, 21(b)-(f) and 22 shall be demonstrated in the Project Design Document (PDD) and be assessed at the initial validation; and

Note: the reference to paragraph 14 will be included if Option A1 is adopted. The reference to paragraph 17 will be included if Option B1 is adopted. The reference to paragraph 18 will be included if Option B2 is adopted.

The provisions in paragraphs 16(b)(iii)-(iv), [17][18], 19, 20, and 21(a)-(d) shall be demonstrated in each monitoring report and be assessed at each verification.

Note: The reference to paragraph 17 will be included if Option B1 is adopted. The reference to paragraph 18 will be included if Option B2 is adopted.

24. The applicability conditions included in the methodological tools referred to in paragraph 10 also apply.

5. Activity boundary

25. The activity boundary of the Article 6.4 activity shall include the site of the Article 6.4 project power plant and all power units physically connected to the electricity system[22] to which the Article 6.4 project power plant is connected.

26. Activity participants shall include in the PDD the location of the Article 6.4 activity in the form of Keyhole Markup Language (KML) files or similar formats, represented as one or more polygon(s), by specifying the coordinates of the geographic boundary using a known coordinate system or any other established method.

27. The greenhouse gases (GHGs) and emission sources included in or excluded from the activity boundary are shown in the table below.

Table 1. Emission sources included in or excluded from the activity boundary

	Source	**GHG**	**Included?**	**Controlled / Related to / Affected by?**	**Justification / Explanation**
BASELINE	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the activity	CO_2	Yes	Affected by	The major source of emissions in the baseline
		CH_4	No	Affected by	Excluded for simplification and conservativeness
		N_2O	No	Affected by	

[22] Refer to the "Methodological tool: Emissions from electricity generation and consumption" (A6.4-AMT-007) for definition of an electricity system.

	Source	GHG	Included?	Controlled / Related to / Affected by?	Justification / Explanation
ACTIVITY	For dry or flash steam geothermal power plants, emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam	CO_2	Yes	Controlled	Main emission source
		CH_4	Yes	Controlled	
		N_2O	No	Controlled	Excluded for simplification
	For binary geothermal power plants, fugitive emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam	CO_2	Yes	Controlled	Main emission source
		CH_4	Yes	Controlled	
		N_2O	No	Controlled	Excluded for simplification
	For binary geothermal power plants, fugitive emissions of hydrocarbons such as n-butane and isopentane (working fluid) contained in the heat exchangers	Hydrocarbon refrigerant	Yes	Controlled	Main emission source
	Emissions from combustion of fossil fuels in solar thermal power plants, geothermal power plants or back-up generators	CO_2	Yes	Controlled	Main emission source
		CH_4	Yes	Controlled	Minor emission source
		N_2O	Yes	Controlled	
LEAKAGE	Upstream emissions from construction of the activity	CO_2	No	Affected by	Excluded for simplification, refer to the appendix for the reasoning
		CH_4	No	Affected by	
		N_2O	No	Affected by	
	Upstream emissions from the production, transport and installation of a BESS	CO_2	Yes	Affected by	Can be a significant emission source
		CH_4	Yes	Affected by	
		N_2O	Yes	Affected by	
	Wake effects of wind power plants	CO_2	Yes	Affected by	Accounted for when quantifying the amount of electricity generated
		CH_4	No	Affected by	Excluded for simplification
		N_2O	No	Affected by	
	Rebound effects	CO_2	No	Affected by	Excluded for simplification,
		CH_4	No	Affected by	

	Source	GHG	Included?	Controlled / Related to / Affected by?	Justification / Explanation
		N_2O	No	Affected by	refer to the appendix for the reasoning

6. Demonstration of additionality

28. To demonstrate additionality, activity participants shall apply:

(a) A regulatory analysis (subsection 6.1 below);

(b) A lock-in analysis (subsection 6.2 below);

(c) An investment analysis (subsection 6.2 below);

(d) A common practice analysis (subsection 6.4 below).

29. The proposed Article 6.4 activity shall only be considered additional if all four analyses are concluded positively.

6.1. Regulatory analysis

30. Activity participants shall review relevant legal requirements in the host Party applicable to the proposed Article 6.4 activity and possible alternative scenarios to the Article 6.4 activity, and shall demonstrate and justify, for each relevant legal requirement, that either:

(a) The law or regulation refers to or formally integrates the mechanism as an instrument for implementation;[23] or

(b) The emission reductions resulting from the Article 6.4 activity would not occur as a result of the legal requirement, by confirming that all of the following conditions are met:

(i) The legal requirement does not explicitly require the installation of renewable power plants at the site where the Article 6.4 activity is implemented;

(ii) The legal requirement does not indirectly require the implementation of the Article 6.4 activity, or another form of renewable electricity generation, such as through obligations for the activity participants to achieve a certain greenhouse gas performance; and

(iii) The Article 6.4 activity neither participates in a support scheme, nor is not subject to a penalty scheme, that is designed to achieve a quantitative target or outcome, such as a competitive bidding process (e.g., renewable electricity auctions) for the installation of a certain capacity of renewable power plants.

[23] For example, if regulations explicitly state that the Article 6.4 mechanism and the revenues generated from it are to be used as incentives to achieve emission reductions in a specific sector.

31. If one or more of the legal requirements identified in paragraph 30 do not meet the requirements of that paragraph, then A6.4ERs cannot be claimed.

32. Activity participants shall assess the requirements of paragraph 30 for each monitoring period. Crediting shall cease on the date when a new relevant legal requirement becomes applicable.

6.2. Assessment of lock-in risk

33. In the case of geothermal power plants, activity participants shall conduct a lock-in risk analysis using a valid version of the “Methodological tool: Analysis of lock-in risk” (A6.4-AMT-008).[24] In applying the tool, activity participants shall implement all of the following specifications:

(a) **Technology to be assessed:** assess the lock-in risk for geothermal power plants;

(b) **Lifetime:** consider the operational lifetime;

(c) **Calculation of the greenhouse gas emissions intensity:**[25]

(i) Calculate the emission intensity of the Article 6.4 activity by dividing the activity emissions determined in section 8 by the activity’s annual electricity generation;

(ii) Use the emission factor of the electricity system, as determined in section 7.2.2 as the emission intensity for BAU; and

(iii) Take a value of zero for the emission intensity for the lowest-emissions intensity alternative.

(d) **Assessment of resources:** do not conduct this assessment;[26] and

(e) **Scale assessment:** do not conduct a scale assessment.[27]

34. In the case of hydropower plants, solar power plants and wind power plants, activity participants do not need to conduct an assessment of lock-in risk as these technologies are not deemed to cause a lock-in risk under the applicability conditions of this mechanism methodology.

[24] Data from Fridriksson et al. (2017) indicate an emission intensity range of 4 - 740 g/kWh for geothermal electricity generation. This suggests that some geothermal power plants have a high emission intensity and thus carry a lock-in risk. Therefore, a lock-in risk analysis is required for geothermal power generation projects. See Fridriksson, T., Mateos, A., Audinet, P. and Orucu, Y. (2017). *Greenhouse Gases from Geothermal Power Production*. ESMAP Technical Report 09/16. World Bank, Washington, DC.

[25] The mechanism methodology specifies how the emission intensity of the technology, the BAU emissions and the lowest emission intensity for the proposed Article 6.4 activity are calculated; therefore, the determination of comparable technologies and the applicable geographical area is not relevant.

[26] For renewable power plants, a resource important for mitigating climate change or achieving other policy objectives is land use. However, for a geothermal power plant, land is used primarily for the construction of wells, pipelines, and the plant itself, all of which are located in a limited area. Therefore, an assessment of possible inefficient use of resources is not required.

[27] Given the overall electricity demand and the installed capacity of individual renewable power plants, a scale assessment is not required.

6.3. Investment analysis

35. Activity participants shall use a valid version of the “Methodological tool: Investment analysis” (A6.4-AMT-002) to conduct the investment analysis. In applying the tool, activity participants shall implement all of the following specifications:

(a) **Identification of alternative scenarios:** identify realistic and credible alternative scenarios to the proposed Article 6.4 activity, which shall include, but are not limited to, the following scenarios:

(i) For all type of activities, scenarios for electricity generation:

a. Implementation of the proposed Article 6.4 activity without registering it under the Article 6.4 mechanism;

b. Electricity generation by existing or new grid-connected power plants; and

c. Electricity generation by greenfield power plants of any type other than the Article 6.4 activity; and

(ii) For Article 6.4 activity implemented at a one or more existing reservoir(s), scenarios related to the existing reservoir(s) which shall be considered in conjunction with the scenario referred to in paragraph 35(a)(i)a:

a. Decommissioning the reservoir within the crediting period;

b. Retrofitting the reservoir to increase its size;

c. Retrofitting the reservoir to reduce its size; and

d. Operating the reservoir at its current size and using it for the same purpose as that prior to the implementation of the Article 6.4 activity throughout the crediting period.

(b) **Analysis method:** use the investment comparison analysis or, if the only alternative to the proposed Article 6.4 activity is electricity generation by existing or new grid-connected power plants and if the Article 6.4 activity is not implemented at one or more existing reservoir(s), use the benchmark analysis;

(c) **Financial indicator:** use the net present value (NPV) as the financial indicator where the investment comparison analysis is applied and choose an appropriate indicator where the benchmark analysis is applied, such as internal rate of return (IRR) or NPV;

(d) **Implementation entity:** either assume that the Article 6.4 activity could be implemented by the activity participants or other entities, or demonstrate with appropriate evidence that, in the specific context of the proposed Article 6.4 activity, the activity can only be implemented by the activity participants and not by any other entities; and

(e) **Sensitivity analysis:** in conducting the sensitivity analysis, apply a variation of at least +/- 10 per cent to the input values which constitute more than 20 per cent of the total costs or total revenues. If it can be demonstrated by evidence that the input value has already been fixed, the variation may not be applied for sensitivity analysis.[28]

36. Where the investment comparison analysis is applied, activity participants shall also determine which of the scenarios is the most financially viable scenario. Where the sensitivity analysis shows that different scenarios could be the most financially viable, depending on the variation in the input values, the scenario with the lowest baseline emissions among these scenarios shall be identified as the most financially viable scenario.

6.4. Common practice analysis

37. Activity participants shall use a valid version of the "Methodological tool: Common practice analysis" (A6.4-AMT-001) to conduct the common practice analysis. In applying the tool, activity participants shall implement all of the following specifications:

(a) **Approach for common practice analysis:** approach A (which is based on the identification of existing "comparable activities" and differentiation between "similar" and "different" activities) shall be used;

(b) **Indicator of common practice:** the installed power generation capacity, expressed in MW, shall be used;

(c) **Stock-based or time-bound approach:** a time-bound approach shall be used (i.e., considering all comparable activities implemented within the reference period). The reference period shall be defined as the most recent 3 calendar years prior to the earlier of: (i) the start of operation of the Article 6.4 activity and (ii) the submission of the PDD for validation;

(d) **Applicable geographical area:** the physical boundary of the electricity system shall be used as the default applicable geographical area. Where the applicable geographical area must be further widened in accordance with step 4 of the methodological tool (A6.4-AMT-001), the widening shall be conducted as follows:

(i) Use host country as applicable geographical area;

(ii) Where the widening based on sub-paragraphs (i) above is not sufficient, or Article 6.4 activities implemented in a least developed country (LDC) or small island developing state (SIDS), the applicable geographical area shall consist of all LDCs and SIDS. For Article 6.4 activities implemented in countries other than LDCs or SIDS, the applicable geographical area shall correspond to the relevant continent; or

(iii) Where the widening based on sub-paragraphs (ii) above is still not sufficient, the applicable geographical area shall be global (i.e., including all countries);

(e) **Consideration of scale of output or capacity of the technology, measure, or practice:** all capacity sizes of comparable activities shall be used;

[28] For example, if the investment cost of the Article 6.4 activity can be demonstrated by contracts, the variation for the total investment is not needed.

(f) **Common practice threshold:** the common practice factor thresholds to be applied under this mechanism methodology shall be:

(i) [2.5] [5] [10] per cent for Article 6.4 activities located in countries that are neither LDCs nor SIDS; and

(ii) [5] [10] [15] per cent for Article 6.4 activities located in countries that are LDCs or SIDS.

(g) **Comparable, similar and different activities:**

(i) Comparable activities shall be all power plants connected to the electricity system;

(ii) Similar activities shall be specified as follows:

a. For onshore wind power plants: all other onshore wind power plants;

b. For offshore wind power plants: all other offshore wind power plants;

c. For solar thermal power plants: all other solar thermal power plants;

d. For solar PV plants: all other solar PV power plants; [29]

e. For geothermal power plants: all other geothermal power plants; and

f. For hydropower plants: all other hydropower plants.

7. Baseline scenario

7.1. Selection of the baseline approaches from paragraph 36 of the rules, modalities and procedures

38. The following approach from the Rules, Modalities and Procedures (RMPs), as per decision 3/CMA.3, is used to determine the baseline in this mechanism methodology:[30]

☐ Best available technologies that represent an economically feasible and environmentally sound course of action, where appropriate.

☐ An ambitious benchmark approach where the baseline is set at least at the average emission level of the best performing comparable activities providing similar outputs and services in a defined scope in similar social, economic, environmental and technological circumstances.

☒ An approach based on existing actual or historical emissions, adjusted downwards to ensure alignment with paragraph 33 of the RMPs.

[29] The MEP may consider differentiating between solar PV plants with and without co-located BESS in future revisions of the methodology.

[30] The approach is selected considering that the electricity generation by existing or new grid-connected power plants may differ between Article 6.4 activities and regions, depending on the intermittent nature of the activity, the power generation technologies, and the natural resources (e.g., wind or precipitation) available in the respective electricity system.

7.2. Application of the selected approach, prior to implementation of a downward adjustment

7.2.1. Procedure for the identification of the baseline scenario

39. The baseline scenario shall be deemed as electricity generation by existing and new grid-connected power plants and, in the case of hydropower plants implemented at one or more existing reservoir(s), operating the reservoir(s) at its/their current size and using it/them for the same purpose as that prior to the implementation of the Article 6.4 activity.

7.2.2. Calculation of the unadjusted baseline emissions from electricity generation from the Article 6.4 activity

40. Activity participants shall use a valid version of the “Methodological tool: Emissions from electricity generation and consumption” (A6.4-AMT-007) to calculate the unadjusted baseline emissions from electricity generation from the Article 6.4 activity in year y ($BE_{EG,y}$). In applying the methodological tool, activity participants shall implement all of the following specifications:

    (a) **Electricity generation or consumption sources s:** the only source s to be considered for determining baseline emissions is the electricity generated by the Article 6.4 project power plant and fed into the electricity system;

    (b) **Determination of the amount of electricity generated or consumed:** the electricity generation from the Article 6.4 activity ($EG_{PJ,y}$ or $EG_{PJ,h}$ in this mechanism methodology) corresponds to the general parameters $EG_{s,y}$ or $EG_{s,h}$ in the methodological tool (A6.4-AMT-007);

    (c) **Type of electricity generation sources:** for solar and wind power plants, the electricity generation shall be considered as intermittent, regardless of whether the plants are operated with an integrated BESS.[31] For geothermal power and hydropower plants, the electricity generation shall be considered as non-intermittent;

    (d) **Applicable scenarios:** scenario A in step 2 of the methodological tool shall apply;

    (e) **Whether Case 1 or Case 2 applies:** case 2 in step 4 of the methodological tool shall apply; and

    (f) **Consideration of uncertainty:** baseline emissions prior to the application of the downward adjustment shall be determined without accounting for the uncertainty of the relevant parameters.

41. For solar thermal power plants, solar PV power plants, geothermal power plants and hydropower plants, the electricity generation eligible for crediting from the Article 6.4 activity ($EG_{PJ,y}$ or $EG_{PJ,h}$) shall correspond to the electricity generated by the Article 6.4 project power plant and fed into the electricity system ($EG_{plant,y}$ or $EG_{plant,h}$).

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[31] This provision is deemed to be a simplified and conservative approach. The mechanism methodology may be revised in the future to include specific provisions to account more accurately for the impact of using a BESS on the emission factor. Activity participants are also invited to submit a revision to this mechanism methodology through the “Procedure: Development, revision and clarification of methodologies and methodological tools” (A6.4-PROC-METH-001).

42. For wind power plants, the electricity generation eligible for crediting from the Article 6.4 activity ($EG_{PJ,y}$ or $EG_{PJ,h}$) shall be calculated based on the quantity of electricity generated by the Article 6.4 project power plant and fed into the electricity system ($EG_{plant,y}$ or $EG_{plant,h}$) and, where applicable, by discounting the reduction in electricity generation by other wind power plants due to wake effects in year *y* ($EG_{wake,y}$), as follows:

$$EG_{PJ,y} = EG_{plant,y} - EG_{wake,y}$$ Equation (1)

or

$$EG_{PJ,h} = EG_{plant,h} - \frac{EG_{wake,y}}{8{,}760}$$ Equation (2)

Where:

$EG_{PJ,y}$	=	Electricity generation eligible for crediting from the Article 6.4 activity in year *y* (MWh)
$EG_{plant,y}$	=	Quantity of electricity generated by the Article 6.4 project power plant and fed into the electricity system in year *y* (MWh)
$EG_{wake,y}$	=	Reduction in electricity generation by other wind power plants due to wake effects in year *y*, where applicable (MWh)
$EG_{PJ,h}$	=	Electricity generation eligible for crediting from the Article 6.4 activity in hour *h* (MWh)
$EG_{plant,h}$	=	Quantity of electricity generated by the Article 6.4 project power plant and fed into the electricity system in hour *h* (MWh)
y	=	Calendar year of the crediting period
h	=	Hour within a calendar year of the crediting period

43. For wind power plants, the reduction in electricity generation by other wind power plants due to wake effects ($EG_{wake,y}$) does not need to be accounted for if:

(a) The distance between the wind turbines installed under the Article 6.4 activity and any other wind power plants is greater than 50 kilometers for onshore wind power plants;

(b) The distance between the wind turbines installed under the Article 6.4 activity and any other wind power plants is greater than 100 kilometers for offshore wind power plants;[32] or

(c) The wake effects affect other wind power plants that are registered under Article 6.4 mechanism.

[32] The MEP reviewed studies that provided different values for the wake effect and also consulted with industry experts. The MEP notes that the wake effect depends on the local conditions where the power plant is installed (e.g., geography, climate). The distance thresholds are considered by the MEP as a conservative approach where such wake effects can be deemed to be negligible.

44. The distance between the wind turbines installed under the Article 6.4 activity and any other wind power plants in paragraph 43 shall be determined as the shortest horizontal distance between the convex hulls of the turbine positions of two wind power plants.

45. Where the conditions in paragraph 43 are not satisfied, activity participants shall determine $EG_{wake,y}$ based on a third-party assessment by a certified or suitably qualified expert through the application of wake models. The expert shall document the model employed and the input values used for the assessment and ensure that:

(a) The model used has been peer-reviewed;

(b) The input values used are either representative of local conditions at the site of the Article 6.4 project wind power plant, or are conservative; and

(c) The output of the model is the reduction in the electricity generation in the other affected wind power plant(s).

46. The unadjusted baseline emissions from electricity generation from the Article 6.4 activity in year *y* ($BE_{EG,y}$) shall be calculated in accordance with step 10 of the methodological tool (A6.4-AMT-007), by multiplying the electricity generation eligible for crediting from the Article 6.4 activity ($EG_{PJ,y}$ or $EG_{PJ,h}$) with the respective emission factor for the electricity system.

7.3. Application of the downward adjustment

47. The downward adjusted baseline emissions from electricity generation shall be determined in the following steps:

(a) Step 1: Determination of the initial downward adjustment ($DA_{initial}$);

(b) Step 2: Determination of the annual increase in the downward adjustment (*INDA*);

(c) Step 3: Determination of the downward adjusted baseline emissions ($BE_{adj,EG,y}$).

7.3.1. Step 1. Determination of the initial downward adjustment ($DA_{initial}$)

48. The sub-steps below shall be followed to determine the initial downward adjustment for baseline emissions from electricity generation ($DA_{initial}$).

7.3.1.1. Step 1.1. Determine the initial downward adjustment based on uncertainty ($DA_{initial,UNC}$)

49. Activity participants shall determine the initial downward adjustment as the uncertainty at the lower bound of the 95 per cent confidence interval relative to the central estimate of the estimated unadjusted baseline emissions from electricity generation from the Article 6.4 activity during the first crediting period ($UNC_{BE,EG,CP1}$), as follows:

$$DA_{initial,UNC} = UNC_{BE,EG,CP1} \quad \text{Equation (3)}$$

Where:

$DA_{initial,UNC}$	=	Initial downward adjustment for baseline emissions from electricity generation based on uncertainty (Dimensionless)

$UNC_{BE,EG,CP1}$	=	Uncertainty of the unadjusted baseline emissions from electricity generation during the first crediting period (fraction)

50. The uncertainty of the unadjusted baseline emissions from electricity generation during the first crediting period *($UNC_{BE,EG,CP1}$)* shall be determined ex-ante in the PDD, following the relevant provisions in the "Methodological tool: Emissions from electricity generation and consumption" (A6.4-AMT-007). In applying the tool, activity participants shall consider uncertainty in both emission factor for electricity generation, following the provisions in the tool, and the electricity generation eligible for crediting from the Article 6.4 activity ($EG_{PJ,y}$ or $EG_{PJ,h}$). Activity participants shall document the uncertainties assigned to each parameter, specify assumptions made, and include any associated references for estimating the uncertainties of parameters in the PDD. This documentation and the derivation of the overall uncertainty through error propagation or Monte Carlo simulation methods, shall be provided together with the PDD (e.g., in a spreadsheet).

7.3.1.2. Step 1.2. Determine the minimum initial downward adjustment ($DA_{initial,min}$)

51. The minimum initial downward adjustment ($DA_{initial,min}$) shall be determined as follows:

$$DA_{initial,min} = \frac{\left(BE_{EG,y1} - AE_{y1}\right)}{BE_{EG,y1}} \times 0.1$$ Equation (4)

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Where:

$DA_{initial,min}$	=	Minimum initial downward adjustment for baseline emissions from electricity generation (dimensionless)
$BE_{EG,y1}$	=	Unadjusted baseline emissions from electricity generation in year y_1 (t CO_2eq)
AE_{y1}	=	Activity emissions in year *y1* (t CO_2eq)
0.1	=	Default factor to determine the minimum downward adjusted baseline provided in the "Standard: Setting the baseline in mechanism methodologies" (A6.4-STAN-METH-004)[33]
$y1$	=	Calendar year of the start date of the first crediting period

52. The unadjusted baseline emissions and the activity emissions in year *y1* shall be determined ex-ante in the PDD, consistent with the provisions in this section and section 8, respectively.

7.3.1.3. Step 1.3. Compare $DA_{initial,UNC}$ and $DA_{initial,min}$

53. To determine the initial downward adjustment ($DA_{initial}$), activity participants shall use the higher of the two values determined in steps 1.2 and 1.3 above, as follows:

$$DA_{initial} = max\left(DA_{initial,min}\ ;\ DA_{initial,UNC}\right)$$ Equation (5)

[33] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf.

Where:

$DA_{initial}$	=	Initial downward adjustment for baseline emissions from electricity generation (dimensionless)
$DA_{initial,min}$	=	Minimum initial downward adjustment for baseline emissions from electricity generation (dimensionless)
$DA_{initial,UNC}$	=	Initial downward adjustment for baseline emissions from electricity generation based on uncertainty (dimensionless)

7.3.2. Step 2. Determination of the annual increase in the downward adjustment (*INDA*)

54. A value of 0.01 shall be applied for the annual increase in the downward adjustment (*INDA)*. The first increase shall be applied in the calendar year following the calendar year of the start date of the first crediting period, following the provisions in step 3 below.

7.3.3. Step 3. Determination of the downward adjusted baseline emissions ($BE_{adj,EG,y}$)

55. For every calendar year *y* of the crediting period, the downward adjusted baseline emissions are determined as follows:

$$BE_{adj,EG,y} = BE_{EG,y} \times \left(1 - DA_y\right)$$ Equation (6)

Where:

$BE_{adj,EG,y}$	=	Downward adjusted baseline emissions in the calendar year *y* (t CO_2eq)
$BE_{EG,y}$	=	Unadjusted baseline emissions from electricity generation from the Article 6.4 activity in calendar year *y* (t CO_2eq)
DA_y	=	Downward adjustment applicable to calendar year *y* (dimensionless)
y	=	Calendar year of the crediting period

56. The downward adjustment applicable to calendar year *y* (DA_y) shall be determined as follows:

(a) For the first calendar year of the crediting period (y_1), $DA_1 = DA_{intial}$.

(b) For the second and subsequent calendar years of the crediting period, DA_y shall be calculated as follows:

$$DA_y = DA_{initial} + \ INDA \times \left[\frac{cd_y}{nd_y} + (y - y1) - 1\right]$$ Equation (7)

Where:

DA_y	=	Downward adjustment applicable to calendar year *y* (dimensionless)
$INDA$	=	Annual increase in the downward adjustment (dimensionless)

cd_y	=	Number of crediting days in the calendar year *y* that belong to the subsequent year of the crediting period[34]
nd_y	=	Number of days in the calendar year *y*
y	=	Calendar year of the crediting period
$y1$	=	Calendar year of the start date of the first crediting period

(c) For the last calendar year *y* of the last crediting period, DA_y shall be calculated as follows:

$$DA_y = DA_{initial} + INDA \times [(y - y1) - 1]$$ Equation (8)

Where:

DA_y	=	Downward adjustment applicable to calendar year *y* (dimensionless)
$INDA$	=	Annual increase in the downward adjustment (dimensionless)
y	=	Calendar year of the crediting period
$y1$	=	Calendar year of the start date of the first crediting period

7.4. Determination of a conservative 'business-as-usual' (BAU) baseline and comparison of the downward adjusted baseline and the conservative business-as-usual baseline

57. The conservative business-as-usual (BAU) scenario for Article 6.4 activities eligible under this mechanism methodology shall be deemed to be the same as the baseline scenario, i.e., that the electricity delivered by the Article 6.4 activity to the electricity system would otherwise be generated by the operation of existing grid-connected power plants and by the addition of new generation sources.[35]

58. Since the conservative BAU scenario and the baseline scenario are the same, the conservative BAU emissions will always be higher than the downward adjusted baseline emissions, except for the calendar year of the start date of the first crediting period. Therefore, for that year the crediting baseline determined in equation (5) shall be multiplied by a factor of 0.99 to ensure that it is lower than the conservative BAU emissions. Activity participants do not need to calculate or compare the conservative BAU emissions in subsequent years.

8. Activity scenario

59. Activity emissions shall be calculated as follows:

$$AE_y = AE_{FC,y} + AE_{EC,y} + AE_{GP,y}$$ Equation (9)

[34] For example, if the start date of the first crediting period is 1 October 2025, then in the year 2028, this parameter includes the days from 1 October 2028 to 31 December 2028 (i.e. 92 days).

[35] Conservativeness is ensured because the "Methodological tool: Emissions from electricity generation and consumption" (A6.4-AMT-007) determines the emission factor for an electricity system reflecting the dynamic trends in the electricity system to which the Article 6.4 activity is connected.

Where:

AE_y	=	Activity emissions in year *y* (t CO_2eq)
$AE_{FC,y}$	=	Activity emissions from fossil fuel consumption in year *y* (t CO_2eq), where applicable
$AE_{EC,y}$	=	Activity emissions from electricity consumption in year *y* (t CO_2eq), where applicable
$AE_{GP,y}$	=	Activity emissions from the operation of dry, flash steam, or binary geothermal power plants in year *y* (t CO_2eq), where applicable

8.1. Activity emissions from fossil fuel consumption ($AE_{FC,y}$)

60. This emission source shall include any fossil fuel consumption occurring during the operation of the Article 6.4 project power plant. This may, for example, include emissions from the operation of backup generators or emissions arising from the maintenance of the Article 6.4 project power plant (e.g., emissions from fossil fuels used in ships or helicopters to maintain offshore wind power plants). Fossil fuel consumption associated with the construction or decommissioning of the Article 6.4 project power plant do not need to be considered. Emissions from the construction of the Article 6.4 project power plant shall not be included.

61. Activity participants shall describe the relevant emission sources in the PDD and justify that all relevant emissions sources from fossil fuel consumption have been considered.

62. This source of activity emissions shall be calculated as follows:

$$AE_{FC,y} = \sum_i \left(FC_{i,y} \times EF_{FC,CO2,i,y}\right) \times \left(1 + F_{CH4/N2O,i}\right) \quad \text{Equation (10)}$$

Where:

$AE_{F,y}$	=	Activity emissions from fossil fuel consumption due to the Article 6.4 activity in year *y* (t CO_2eq)
$FC_{i,y}$	=	Quantity of fuel type *i* combusted during the year *y* (mass or volume unit)
$EF_{FC,CO2,i,y}$	=	CO_2 emission factor of fuel type *i* in year *y* (t CO_2eq / mass or volume unit)
$F_{CH4/N2O,i}$	=	Factor to account for CH_4 and N_2O emissions in relation to CO_2 emissions for fuel type i (dimensionless)
I	=	Fuel types combusted

63. The CO_2 emission factor may be calculated using one of the following three options, depending on the availability of data on the fossil fuel type *i*, as follows:

    (a) Option A.1: calculated based on the chemical composition of the fossil fuel type *i*, if $FC_{i,y}$ is measured in a mass unit:

$$EF_{FC,CO2,i,y} = w_{c,i,y} \times 44/12 \quad \text{Equation (11)}$$

Where:

$EF_{FC,CO2,i,y}$	=	CO_2 emission factor of fuel type *i* in year *y* (t CO_2eq / mass or volume unit)
$w_{c,i,y}$	=	Mass fraction of carbon in fuel type *i* in year *y* (t C / mass unit of the fuel)
$44/12$	=	Unit conversion factor (t CO_2 / t C)

(b) Option A.2: calculated based on the chemical composition of the fossil fuel type *i*, if $FC_{i,y}$ is measured in a volume unit:

$$EF_{FC,CO2,i,y} = w_{c,i,y} \times \rho_{,i,y} \times 44/12$$ Equation (12)

Where:

$EF_{FC,CO2,i,y}$	=	CO_2 emission factor of fuel type *i* in year *y* (t CO_2eq / mass or volume unit)
$w_{c,i,y}$	=	Mass fraction of carbon in fuel type *i* in year *y* (t C / mass or volume unit)
$\rho_{,i,y}$	=	Density of fuel type *i* in year *y* (mass unit / volume unit)
$44/12$	=	Unit conversion factor (t CO_2 / t C)

(c) Option B: Calculated based on net calorific value and CO_2 emission factor of the fuel type *i*, as follows:

$$EF_{FC,CO2,i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$ Equation (13)

Where:

$EF_{FC,CO2,i,y}$	=	CO_2 emission factor of fuel type *i* in year *y* (t CO_2eq / mass or volume unit)
$NCV_{i,y}$	=	Net calorific value of the fuel type *i* in year *y* (GJ / mass or volume unit)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fuel type *i* in year *y* (t CO_2 / GJ)

64. Activity participants shall use options A.1 or A.2, unless they can demonstrate that the necessary data are unavailable. If the necessary data are unavailable, activity participants may use option B.

8.2. Activity emissions from electricity consumption ($AE_{EC,y}$)

65. Activity participants shall use a valid version of the “Methodological tool: Emissions from electricity generation and consumption” (A6.4-AMT-007) to calculate activity emissions from electricity consumption in year *y* ($AE_{EC,y}$). In applying the tool, activity participants shall implement all of the following specifications:

(a) **Electricity generation or consumption sources:** the only source *s* to be considered for determining activity emissions from electricity consumption is the electricity consumed by the Article 6.4 project power plant from the electricity system;

(b) **Determination of the amount of electricity generated or consumed:** the quantity of electricity consumed by the Article 6.4 project power plant from the electricity system in year *y* corresponds to the general parameters $EC_{s,y}$ or $EC_{s,h}$ in the methodological tool;

(c) **Type of electricity consumption source s:** for solar and wind power plants, the electricity consumption shall be considered as electricity consumption sources depending on intermittent generation, regardless of whether the plants are operated with an integrated BESS. For geothermal power and hydropower plants, the electricity consumption shall be considered as electricity consumption sources not depending on intermittent generation;[36]

(d) **Applicable scenarios:** scenario A in step 2 of the methodological tool A6.4-AMT-007 shall apply;

(e) **Whether case 1 or case 2 applies:** case 1 in step 4 of the methodological tool A6.4-AMT-007 shall apply; and

(f) **Consideration of uncertainty:** the upper bound of the uncertainty interval of the emission factor shall be used, determined in accordance with the provisions in the methodological tool. Uncertainty in the quantity of electricity consumed does not need to be accounted for.

66. The activity emissions from electricity consumption in year *y* ($AE_{EC,y}$) shall be calculated in accordance with step 10 of the methodological tool A6.4-AMT-007.

67. In case the electricity consumption is netted from the total electricity generation in accordance with step 4 of the methodological tool A6.4-AMT-007, it shall not be included in activity emissions.

8.3. Activity emissions from the operation of geothermal power plants ($AE_{GP,y}$)

68. Activity emissions from the operation of geothermal power plants in year *y* ($AE_{GP,y}$) shall include the following emission sources:

(a) For dry or flash steam geothermal power plants, activity participants shall account for emissions of CO_2 and CH_4 due to the release of non-condensable gases from produced steam ($AE_{dry\ or\ flash\ steam,y}$). Non-condensable gases in geothermal reservoirs usually consist mainly of CO_2 and H_2S. They also contain a small quantity of hydrocarbons, which are predominantly CH_4. In dry or flash steam geothermal power projects, non-condensable gases flow with the steam into the power plant and come in touch with the atmosphere through the heat exchange process. In such a process, non-condensable and other gases within the geothermal fluid are partially released to the atmosphere. A small proportion of the CO_2 is converted into carbonate/bicarbonate in the cooling water circuit. In addition, parts of the non-condensable gases are re-injected into the geothermal reservoir. However, as a conservative approach, this mechanism methodology assumes that all non-condensable gases entering the power plant in dry or flash steam geothermal technologies are discharged to the atmosphere via the cooling

[36] This requirement for BESS is a temporary provision, and the MEP may incorporate specific provisions in a future revision of the methodology. Activity participants are also invited to submit a revision to this mechanism methodology through the “Procedure: Development, revision and clarification of methodologies and methodological tools” (A6.4-PROC-METH-001).

tower. Fugitive CO_2 and CH_4 emissions due to well testing and well bleeding are not considered, as they are considered negligible (see appendix 1);

(b) For binary geothermal power plants, the underground fluid is re-injected back into the heat source without any exposure to the atmosphere. In this case, non-condensable and other gases within the geothermal fluid are kept within the outgoing geothermal fluid and sent back into the heat source. However, there may be some physical leakage from closed cycle pipes and wells. Therefore, activity participants shall account for emissions from physical leakage of non-condensable gases ($AE_{steam,y}$). In addition, activity participants shall account for emissions from physical leakage of the working fluid contained in heat exchangers ($AE_{working\ fluid,y}$).

69. Accordingly, $AE_{GP,y}$ shall be calculated as follows:

(a) For dry or flash steam geothermal power plants:

$$AE_{GP,y} = AE_{dry\ or\ flash\ steam,y} \quad \text{Equation (14)}$$

Where:

$AE_{GP,y}$	=	Activity emissions from the operation of the project geothermal power plant in year *y* (t CO_2eq)
$AE_{dry\ or\ flash\ steam,y}$	=	Activity emissions from the release of non-condensable gases in a dry steam or flash steam project geothermal power plant in year *y* (t CO_2eq)

(b) For binary geothermal power plants:

$$AE_{GP,y} = AE_{steam,y} + AE_{working\ fluid,y} \quad \text{Equation (15)}$$

Where:

$AE_{GP,y}$	=	Activity emissions from the operation of the project geothermal power plant in year *y* (t CO_2eq)
$AE_{steam,y}$	=	Activity emissions from physical leakage of non-condensable gases in a binary project geothermal power plant in year *y* (t CO_2eq)
$AE_{working\ fluid,y}$	=	Activity emissions from physical leakage of working fluid contained in heat exchangers in a binary project geothermal power plant due to in year *y* (t CO_2eq)

70. Activity emissions from the release of non-condensable gases in a dry steam or flash steam project geothermal power plant in year *y* ($AE_{dry\ or\ flash\ steam,y}$) shall be calculated as follows:

$$AE_{dry\ or\ flash\ steam,y} = \left(w_{steam,CO2,y} + w_{steam,CH4,y} \times GWP_{CH4}\right) \times M_{steam,y} \quad \text{Equation (16)}$$

Where:

$AE_{dry\ or\ flash\ steam,y}$	=	Activity emissions from the release of non-condensable gases in a dry steam or flash steam project geothermal power plant in year *y* (t CO_2eq)

$w_{steam,CO2,y}$	=	Average mass fraction of CO_2 in the produced steam in year *y* (t CO_2 / t steam)
$w_{steam,CH4,y}$	=	Average mass fraction of CH_4 in the produced steam in year *y* (t CH_4 / t steam)
GWP_{CH4}	=	Global warming potential of CH_4 valid for the relevant commitment period (t CO_2eq / t CH_4)
$M_{steam,y}$	=	Quantity of steam produced in year *y* (t steam)

71. Activity emissions from physical leakage of non-condensable gases in a binary project geothermal power plant in year *y* ($AE_{steam,y}$) shall be calculated as follows:

$$AE_{steam,y} = \left(M_{Inflow,y} - M_{outflow,y}\right) \times \left(w_{steam,CO2,y} + w_{steam,CH4,y} \times GWP_{CH4}\right) \quad \text{Equation (17)}$$

Where:

$AE_{steam,y}$	=	Activity emissions from physical leakage of non-condensable gases in a binary project geothermal power plant in year *y* (t CO_2eq)
$M_{Inflow,y}$	=	Quantity of steam entering the geothermal plant in year *y* (t steam)
$M_{outflow,y}$	=	Quantity of steam leaving the geothermal plant in year *y* (t steam)
$w_{steam,CO2,y}$	=	Average mass fraction of CO_2 in the produced steam in year *y* (t CO_2 / t steam)
$w_{steam,CH4,y}$	=	Average mass fraction of CH_4 in the produced steam in year *y* (t CH_4 / t steam)
GWP_{CH4}	=	Global warming potential of CH_4 (t CO_2eq / t CH_4)

72. Activity emissions from physical leakage of working fluid contained in heat exchangers in a binary project geothermal power plant due to in year *y* ($AE_{working\ fluid,y}$) shall be calculated as follows:

$$AE_{working\ fluid,y} = M_{working\ fluid,y} \times GWP_{working\ fluid} \quad \text{Equation (18)}$$

Where:

$AE_{working\ fluid,y}$	=	Activity emissions from physical leakage of working fluid contained in heat exchangers in a binary project geothermal power plant due to in year *y* (t CO_2eq)
$M_{working\ fluid,y}$	=	Quantity of working fluid leaked/reinjected in year *y* (t working fluid)
$GWP_{working\ fluid}$	=	Global Warming Potential for the working fluid used in the binary geothermal power plant (t CO_2eq / t working fluid)

9. Leakage

73. Leakage emissions include upstream emissions from the production, transport and installation of any BESS located at the same site as the renewable energy power plant. Any wake effects of wind power plants are, for simplicity, accounted for in determining the electricity generation from the Article 6.4 activity ($EG_{PJ,y}$ or $EG_{PJ,h}$) in section 7.2.2, and are thus not accounted for in this section. Other leakage emission sources do not need to

be estimated. Further information on the consideration of other leakage emission sources is included in appendix 1.

74. Leakage emissions shall be calculated as follows:

$$LE_y = EG_{BESS,delivered,y} \times EF_{BESS,upstream}$$ Equation (19)

Where:

LE_y	=	Leakage emissions in year *y* (t CO_2eq)
$EG_{BESS,delivered,y}$	=	Quantity of electricity delivered by the BESS in year *y* (MWh)
$EF_{BESS,upstream}$	=	Emission factor for the upstream emissions from the production, transportation and installation of a BESS relative to the electricity delivered by the BESS (t CO_2eq / kWh)
y	=	Calendar years of the crediting period

10. Emission reductions

75. Emission reductions shall be determined as follows:

$$ER_y = BE_{EG,adj,y} - AE_y - LE_y$$ Equation (20)

Where:

ER_y	=	Emission reductions in year *y* (t CO_2eq)
$BE_{EG,adj,y}$	=	Downward adjusted baseline emissions from electricity generation from the Article 6.4 activity in year *y* (t CO_2eq)
AE_y	=	Activity emissions in year *y* (t CO_2eq)
LE_y	=	Leakage emissions in year *y* (t CO_2eq)
y	=	Calendar years of the crediting period

76. Note that in this mechanisms methodology the uncertainty of baseline emissions is addressed through the determination of the initial downward adjustment. With respect to activity emissions and leakage emissions, the methodology addresses uncertainty in the determination of individual parameters and through conservative assumptions (see also appendix 1). It is therefore not necessary to determine the overall uncertainty of the aggregated emission reductions.

11. Avoidance of double counting

77. Activity participants shall demonstrate that the Article 6.4 activity will not result in double counting by:

(a) Providing evidence, in each monitoring report, that the renewable electricity generated by the Article 6.4 activity, together with any associated mitigation outcomes and environmental attributes (e.g., issuance of renewable energy certificates with respect to the renewable electricity generated under the Article 6.4

activity), is not claimed under any other crediting mechanism or certification scheme. This may be ensured by either:

(i) Not issuing any such emission reduction or environmental attributes; or

(ii) Any issued emission reductions or environmental attributes are administratively cancelled without making any claim in association with the cancellation; and

(b) Demonstrating that the reported GHG emission reductions for which they intend to request issuance of A6.4ERs do not overlap with mandatory domestic mitigation schemes (e.g., emissions trading systems), or that measures are in place to ensure that any relevant impacts of the activity (e.g., the GHG emission reductions achieved or the kilowatt-hours of renewable electricity produced) are not counted towards the achievement of targets or obligations under the mandatory domestic mitigation scheme (e.g., by cancelling allowances from the emissions trading system before issuing carbon credits) if an overlap exists, by:

(i) Declaring and providing evidence in each monitoring report that the Article 6.4 activity and the activities displaced in the baseline scenario do not fall within the scope of any mandatory domestic mitigation scheme; or

(ii) Where the Article 6.4 activity or the activities displaced in the baseline scenario fall within the scope of a mandatory domestic mitigation scheme, activity participants shall provide evidence in each monitoring report that the mitigation outcomes of the Article 6.4 activity are not counted in the mandatory mitigation scheme to reduce the obligations of the entities covered by the scheme. For example, in the case of an emissions trading system covering electricity generation, a confirmation from the operator of the emissions trading system may be sought that a number of allowances equal to the A6.4ERs being requested for issuance for the electricity generation component were cancelled before the issuance of the A6.4ERs.

12. Demonstration of alignment with the policies, options and implementation plans of the Host Party with regard to its NDC and LT-LEDS and the long-term temperature goal of the Paris Agreement and long-term goals of the Paris Agreement

78. The activity participants applying this methodology shall ensure that the activity complies with paragraph 10 in Appendix of the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004).

13. Data and parameters not monitored

79. For parameters where the uncertainty was not provided, activity participants shall assume uncertainty based on expert judgement and justify the estimates.

Data / Parameter table 1.

Data / Parameter:	$F_{CH4/N2O,i}$
Description:	Factor to account for CH_4 and N_2O emissions in relation to CO_2 emissions for fuel type i
Data unit:	Dimensionless
Equations referred	Equation (10)
Purpose of data:	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied:	1.002
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	This value was derived from table 2.2 of volume 2, chapter 1 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Treatment of uncertainty	Not applicable (uncertainty was taken into account in determining the above value)
Additional comments	-

Data / Parameter table 2.

Data / Parameter:	GWP_{CH4}
Description:	Global warming potential of CH_4
Data unit:	t CO_2eq / t CH_4
Equations referred	Equation (10)
Purpose of data:	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied:	28
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	This value was derived from table 2.2 of volume 2, chapter 1 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Treatment of uncertainty	Not applicable (uncertainty was taken into account in determining the above value)
Additional comments	-

Data / Parameter table 3.

Data / Parameter:	$GWP_{working\ fluid}$
Description:	Global Warming Potential for the working fluid used in the binary geothermal power plant

Data unit:	t CO_2eq / t working fluid
Equations referred	Equation (18)
Purpose of data:	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied:	Default value depending on the type of working fluid
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	Default value and uncertainty from the IPCC Fifth Assessment Report (AR5). Shall be updated according to any future CMA decisions
Treatment of uncertainty	N/A
Additional comments	-

Data / Parameter table 4.

Data / Parameter:	$EF_{BESS,upstream}$
Description:	Emission factor for the upstream emissions from the production, transportation and installation of a BESS relative to the electricity delivered by the BESS
Data unit:	t CO_2eq / MWh
Equations referred	Equation (19)
Purpose of data:	☐ Baseline Scenario ☐ Activity Scenario ☒ Leakage
Value(s) applied:	0.06
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	The values are based on peer-reviewed technical papers and articles on life-cycle analysis of batteries and BESS
Treatment of uncertainty	NA. This value is deemed to be conservative under different circumstances
Additional comments	-

14. Data and parameters monitored

80. All data collected as part of monitoring should be archived electronically and kept for at least for two years after the end of the last crediting period. One hundred per cent of the data should be monitored, if not indicated otherwise in the tables below. All measurements should be conducted with calibrated measurement equipment, according to relevant industry standards.

81. The parameters $EG_{plant,y}$ and $EG_{plant,h}$, required to determine the unadjusted baseline emissions from electricity generation in year y ($BE_{EG,y}$), shall be monitored as per the monitoring provisions of the parameters $EG_{s,y}$ and $EG_{s,h}$ from the "Methodological tool:

Emissions from electricity generation and consumption” (A6.4-AMT-007). Where a BESS is installed, this shall also include electricity delivered by the BESS to the electricity system.

82. The parameters $EG_{BESS,delivered,y}$, required to determine the leakage emissions in year y (LE_y) shall be monitored as per the monitoring provisions of the parameters $EG_{s,y}$ from the “Methodological tool: Emissions from electricity generation and consumption” (A6.4-AMT-007).

83. The parameters $EC_{s,y}$ and $EC_{s,h}$ shall be monitored as per the provisions from the “Methodological tool: Emissions from electricity generation and consumption” (A6.4-AMT-007).

Data / Parameter table 5.

Data / Parameter:	$EG_{wake,y}$	
Description:	Reduction in electricity generation by other wind power plants due to wake effects in year *y*	
Data unit:	MWh	
Equation referred	Equations (1), (2)	
Purpose of data	☒ Baseline Scenario ☐ Activity Scenario ☐ Leakage	
Measurement methods and procedures	Determined based on a third-party assessment by a certified or suitably qualified expert	
Measurement and updating frequency	The modelling shall be conducted once prior to the first verification and shall be updated when new wind power plants start operations which do not fulfil the conditions specified in paragraph 43 of this mechanism methodology (e.g., their distance is lower than the thresholds and they are not registered as an Article 6.4 activity), but not more frequently than annually	
Entity responsible for measurement	Third-party assessment by a certified or suitably qualified expert	
Measuring instrument(s)	*Type of instrument*	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures	N/A	
Treatment of uncertainty	The outcome from the model shall be adjusted upwards by 50 per cent to account for uncertainties	
Additional comment	-	

Data / Parameter table 6.

Data / Parameter:	$FC_{i,y}$	
Description:	Quantity of fuel type *i* combusted in process *j* during year *y*	
Data unit:	Mass or volume units	
Equation referred	Equation (10)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Measurement methods and procedures	• Use either mass or volume meters; • In cases where fuel is supplied from small daily tanks, ruler gauges can be used to determine mass or volume of fuel consumed, subject to the following conditions: the ruler gauge shall be part of the daily tank, shall be calibrated at least once a year and, shall have a logbook for recording measurements (on a daily basis or per shift); • Accessories such as transducers, sonar and piezoelectronic devices may be used if they are properly calibrated with the ruler gauge and maintained appropriately; and • In the case of daily tanks with pre-heaters for heavy oil, calibration shall be conducted under typical operational conditions	
Measurement and updating frequency	Continuously	
Entity responsible for measurement	Activity participants	
Measuring instrument(s)	*Type of instrument*	Mass or volume meters, ruler gauges (installed in daily tanks), transducers, sonar and piezoelectronic devices
	Accuracy class	As per manufacturer specification
	Calibration requirements	Ruler gauges shall be calibrated at least once a year. Transducers, sonar and piezoelectronic devices shall be calibrated with the ruler gauge and maintained appropriately
	Location	N/A
QA/QC procedures	The recorded data shall be stored monthly in a central database with backup	
Treatment of uncertainty	Uncertainties are determined based on the measuring instruments	
Additional comment	• The consistency of metered fuel consumption quantities shall be cross-checked by an annual energy balance based on purchased quantities and stock changes; • Where purchased fuel invoices can be attributed specifically to the Article 6.4 activity, the metered fuel consumption quantities shall also be cross-checked against available purchase invoices from financial records; and	

	• Where data gaps occur due to meter failure or other unforeseen reasons, activity participants may estimate the quantity of fuel using one of the following options, provided that the gap period does not exceed 30 consecutive days within six consecutive months: - Purchased fuel or energy invoices/bills, where the purchased fuel can be attributed specifically to the Article 6.4 activity; - Energy produced by the equipment, adjusted for efficiency. Conservative default values of 40 per cent for combustion engines and generators and 80 per cent for thermal heaters shall be used. Energy produced shall be measured directly or calculated based on operating hours; or - The highest value of the parameter for the same calendar period in the previous years

Data / Parameter table 7.

Data / Parameter:	$NCV_{i,y}$
Description:	Net calorific value of the fuel type *i* in year *y*
Data unit:	GJ / mass or volume unit
Equation referred	Equation (13)
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Measurement methods and procedures	• Option 1: Values provided by the fuel supplier (preferred source). The NCV of the fuel shall be obtained for each fuel delivery, from which weighted average annual values shall be calculated; • Option 2: Measurements by activity participants undertaken in line with national or international fuel standards (if supplier-provided values are not available). The NCV of the fuel shall be obtained for each fuel delivery, from which weighted average annual values shall be calculated; • Option 3: Regional or national default values (if supplier-provided values are not available and only for liquid fuels). Values shall be reviewed annually; • Option 4: Upper bound of the 95 per cent confidence interval from IPCC default values provided in table 1.2 of chapter 1, volume 2 (Energy), of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, if supplier-provided values are not available. Values shall be updated based on future revisions of the IPCC Guidelines
Measurement and updating frequency	• Option 1: At each fuel delivery; • Option 2: At each fuel delivery; • Option 3: Annually; • Option 4: Updated based on future revisions of the IPCC Guidelines
Entity responsible for measurement	Activity participants or fuel supplier

Measuring instrument(s)	*Type of instrument*	As per the national or international standard if the parameter is measured by activity participants
	Accuracy class	As per the national or international standard if the parameter is measured by activity participants
	Calibration requirements	As per the national or international standard if the parameter is measured by activity participants
	Location	As per the national or international standard if the parameter is measured by activity participants
QA/QC procedures	The recorded data shall be stored monthly in a central database with backup	
Treatment of uncertainty	Verify whether the values under options 1, 2 and 3 fall within the uncertainty range of the IPCC default values as provided in table 1.2, volume 2 of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. If the values fall below this range, additional information shall be obtained from the testing laboratory to justify the outcome, or additional measurements shall be conducted. Laboratories in options 1, 2 and 3 – shall have ISO/IEC 17025 accreditation or demonstrate compliance with similar quality standards	
Additional comment	-	

Data / Parameter table 8.

Data / Parameter:	$\rho_{i,y}$
Description:	Density of the fuel type *i* in year *y*
Data unit:	Mass unit / volume unit of the fuel
Equation referred	Equation (12)
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Measurement methods and procedures	• Option 1: Values provided by the fuel supplier (preferred source). The NCV of the fuel shall be obtained for each fuel delivery, from which weighted average annual values shall be calculated; • Option 2: Measurements by activity participants undertaken in line with national or international fuel standards (if supplier-provided values are not available). The NCV of the fuel shall be obtained for each fuel delivery, from which weighted average annual values shall be calculated; • Option 3: Regional or national default values (if supplier-provided values are not available and only for liquid fuels). Values shall be reviewed annually; • Option 4: Upper bound of the 95 per cent confidence interval from IPCC default values provided in table 1.2 of chapter 1, volume 2 (Energy), of the 2019 Refinement to the 2006 IPCC Guidelines for

	National Greenhouse Gas Inventories, if supplier-provided values are not available. Values shall be updated based on future revisions of the IPCC Guidelines	
Measurement and updating frequency	• Option 1: At each fuel delivery; • Option 2: At each fuel delivery; • Option 3: Annually; • Option 4: Updated based on future revisions of the IPCC Guidelines	
Entity responsible for measurement	Activity participants or fuel supplier	
Measuring instrument(s)	*Type of instrument*	As per the national or international standard if the parameter is measured by activity participants
	Accuracy class	As per the national or international standard if the parameter is measured by activity participants
	Calibration requirements	As per the national or international standard if the parameter is measured by activity participants
	Location	As per the national or international standard if the parameter is measured by activity participants
QA/QC procedures	The recorded data shall be stored monthly in a central database with backup	
Treatment of uncertainty	Verify whether the values under options 1, 2 and 3 fall within the uncertainty range of the IPCC default values as provided in table 1.2, volume 2 of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. If the values fall below this range, additional information shall be obtained from the testing laboratory to justify the outcome, or additional measurements shall be conducted. Laboratories in options 1, 2 and 3 – shall have ISO/IEC 17025 accreditation or demonstrate compliance with similar quality standards	
Additional comment	-	

Data / Parameter table 9.

Data / Parameter:	$EF_{CO2,i,y}$
Description:	CO_2 emission factor of fuel type *i* in year *y*
Data unit:	t CO_2 / GJ
Equation referred	Equation (13)
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage

Measurement methods and procedures	• Option 1: Values provided by the fuel supplier (preferred source), in line with national or international standards. The $EF_{CO2e,i,y}$ of the fuel shall be obtained for each fuel delivery, from which weighted average annual values shall be calculated; • Option 2: Measurements by activity participants undertaken in line with national or international fuel standards (if supplier-provided values are not available). The $EF_{CO2e,i,y}$ of the fuel shall be obtained for each fuel delivery, from which weighted average annual values shall be calculated; • Option 3: Regional or national default values (if supplier-provided values are not available and only for liquid fuels). Values shall be reviewed annually; • Option 4: Upper bound of the 95 per cent confidence interval from IPCC default values provided in table 1.2 of chapter 1, volume 2 (Energy), of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, if supplier-provided values are not available. Values shall be updated based on future revisions of the IPCC Guidelines	
Measurement and updating frequency	• Option 1: At each fuel delivery; • Option 2: At each fuel delivery; • Option 3: Annually; • Option 4: Updated based on future revisions of the IPCC Guidelines	
Entity responsible for measurement	Activity participants or fuel supplier	
Measuring instrument(s)	*Type of instrument*	As per the national or international standard if the parameter is measured by activity participants
	Accuracy class	As per the national or international standard if the parameter is measured by activity participants
	Calibration requirements	As per the national or international standard if the parameter is measured by activity participants
	Location	As per the national or international standard if the parameter is measured by activity participants
QA/QC procedures	• The recorded data shall be stored monthly in a central database with backup; • Laboratories in options 1 and 2 shall have ISO/IEC 17025 accreditation or justify compliance with equivalent quality standards	
Treatment of uncertainty	Verify whether the values under options 1, 2 and 3 fall within the uncertainty range of the IPCC default values as provided in table 1.4, volume 2 of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. If the values fall below this range, additional information shall be obtained from the testing	

	laboratory to justify the outcome, or additional measurements shall be conducted
Additional comment	For option 1, if the fuel supplier provides both the net calorific value (NCV) and CO_2 emission factor on the invoice and these values are based on measurements for the specific fuel delivered, the provided CO_2 emission factor shall be used. If another source is used for the CO_2 emission factor, or no CO_2 emission factor is provided, options 2, 3, or 4 shall be used

Data / Parameter table 10.

Data / Parameter:	$w_{c,i,y}$	
Description:	Mass fraction of carbon in fuel type *i* in year *y*	
Data unit:	t C / mass unit of the fuel	
Equation referred	Equations (11), (12)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Measurement methods and procedures	• Option 1: Values provided by the supplier of the fuel (preferred source); • Option 2: Measurements by activity participants undertaken in line with national or international fuel standards; • Option 3: Regional or national default values (if supplier-provided values are not available and only for liquid fuels)	
Measurement and updating frequency	Continuous of for each fuel batch	
Entity responsible for measurement	Activity participants or fuel supplier	
Measuring instrument(s)	*Type of instrument*	As per the national or international standard if the parameter is measured by activity participants
	Accuracy class	As per the national or international standard if the parameter is measured by activity participants
	Calibration requirements	As per the national or international standard if the parameter is measured by activity participants
	Location	As per the national or international standard if the parameter is measured by activity participants
QA/QC procedures	The recorded data must be stored monthly in a central database with backup	
Treatment of uncertainty	Uncertainties are determined based on the measuring instruments	
Additional comment	Verify if the values measured or obtained from the fuel supplier fall within the uncertainty range derived from the product of the IPCC	

	default values as provided in Table 1.2 and Table 1.3, Vol. 2 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. If the values fall below this range collect additional information shall be obtained from the testing laboratory to justify the outcome, or additional measurements shall be conducted. Laboratories performing measurements in Option 2 should have ISO17025 accreditation or demonstrate compliance with equivalent quality standards

Data / Parameter table 11.

Data / Parameter:	$w_{steam,CO2,y}$	
Description:	Average mass fraction of carbon dioxide in the produced steam in year *y*	
Data unit:	t CO_2 / t steam	
Equation referred	Equations (16), (17)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Measurement methods and procedures	• Non-condensable gases sampling shall be carried out in production wells or at the steam field-power plant interface either using “ASTM Standard Practice E1675 for Sampling 2-Phase Geothermal Fluid for Purposes of Chemical Analysis” (as applicable to sampling single phase steam only) or an equivalent standard. • The CO_2 and CH_4 sampling and analysis procedure consists of collecting non-condensable gas samples from the main steam line with glass flasks, filled with sodium hydroxide solution and additional chemicals to prevent oxidation. H_2S and CO_2 dissolve in the solvent while the residual compounds remain in their gaseous phase. The gas portion is then analyzed using gas chromatography to determine the content of the residuals including CH_4. • All alkanes concentrations may be reported in terms of methane	
Measurement and updating frequency	At least every three months and more frequently, if necessary	
Entity responsible for measurement	Activity participants or third-party laboratory	
Measuring instrument(s)	*Type of instrument*	As per the “ASTM Standard Practice E1675 for Sampling 2-Phase Geothermal Fluid for Purposes of Chemical Analysis” or equivalent
	Accuracy class	As per the “ASTM Standard Practice E1675 for Sampling 2-Phase Geothermal Fluid for Purposes of Chemical Analysis” or equivalent
	Calibration requirements	As per the “ASTM Standard Practice E1675 for Sampling 2-Phase Geothermal Fluid for Purposes of Chemical Analysis” or equivalent

	Location	N/A
QA/QC procedures	-	
Treatment of uncertainty	Uncertainties are determined based on the measuring instruments	
Additional comment	This parameter shall be monitored only for dry, flash steam and binary geothermal power projects	

Data / Parameter table 12.

Data / Parameter:	$w_{steam,CH4,y}$	
Description:	Average mass fraction of methane in the produced steam in year *y*	
Data unit:	t CH_4 / t steam	
Equation referred	Equations (16), (17)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Measurement methods and procedures	As per the procedures outlined for $w_{steam,CO2,y}$	
Measurement and updating frequency	As per the procedures outlined for $w_{steam,CO2,y}$	
Entity responsible for measurement	As per the procedures outlined for $w_{steam,CO2,y}$	
Measuring instrument(s)	*Type of instrument*	As per the procedures outlined for $w_{steam,CO2,y}$
	Accuracy class	As per the procedures outlined for $w_{steam,CO2,y}$
	Calibration requirements	As per the procedures outlined for $w_{steam,CO2,y}$
	Location	N/A
QA/QC procedures	-	
Treatment of uncertainty	As per the procedures outlined for $w_{steam,CO2,y}$	
Additional comment	As per the procedures outlined for $w_{steam,CO2,y}$	

Data / Parameter table 13.

Data / Parameter:	$M_{steam,y}$
Description:	Quantity of steam produced in year *y*
Data unit:	t steam
Equation referred	Equation (16)

Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Measurement methods and procedures	The steam quantity discharged from geothermal wells shall be measured with a Venturi flow meter (or other equipment with at least the same accuracy); Measurement of temperature and pressure upstream of the Venturi meter shall be conducted to define the steam properties, and the calculation of steam quantities shall be conducted on a continuous basis and shall be based on national or international standards	
Measurement and updating frequency	Continuously measured	
Entity responsible for measurement	Activity participants	
Measuring instrument(s)	*Type of instrument*	Venturi flow meter or other equipment with at least the same accuracy
	Accuracy class	According to the national, international, or meter supplier’s instructions
	Calibration requirements	Calibration shall be conducted according to the national, international, or manufacturer’s instructions
	Location	Main steam line
QA/QC procedures	The recorded data must be stored daily in a central database with backup	
Treatment of uncertainty	Uncertainties are determined based on the measuring instruments	
Additional comment	• The measurement results shall be summarized transparently in regular production reports; • Applicable to dry or flash steam geothermal power projects	

Data / Parameter table 14.

Data / Parameter:	$M_{inflow,y}$
Description:	Quantity of steam entering the geothermal plant in year *y*
Data unit:	t steam
Equation referred	Equation (17)
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Measurement methods and procedures	• The steam quantity entering the power plant shall be measured with a Venturi flow meter (or other equipment with at least the same accuracy); • Measurement of temperature and pressure upstream of the Venturi meter shall be conducted to define the steam properties, and the calculation of steam quantities shall be conducted on a continuous basis and should be based on national or international standards

Measurement and updating frequency	Continuously measured	
Entity responsible for measurement	Activity participants	
Measuring instrument(s)	*Type of instrument*	Venturi flow meter or other equipment with at least the same accuracy
	Accuracy class	According to the national, international, or meter supplier's instructions
	Calibration requirements	Calibration shall be conducted according to the national, international, or manufacturer's instructions
	Location	At the steam supply line to the geothermal power plant
QA/QC procedures	The recorded data shall be stored daily in a central database with backup	
Treatment of uncertainty	Uncertainties are determined based on the measuring instruments	
Additional comment	• The measurement results shall be summarized transparently in regular production reports; • Applicable to dry or flash steam geothermal power projects	

Data / Parameter table 15.

Data / Parameter:	$\boldsymbol{M_{outflow,y}}$	
Description:	Quantity of steam leaving the geothermal plant in year *y*	
Data unit:	t steam	
Equation referred	Equation (17)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Measurement methods and procedures	• The steam quantity entering the power plant shall be measured with a Venturi flow meter (or other equipment with at least the same accuracy); • Measurement of temperature and pressure upstream of the Venturi meter shall be conducted to define the steam properties, and the calculation of steam quantities shall be conducted on a continuous basis and should be based on national or international standards	
Measurement and updating frequency	Continuously measured	
Entity responsible for measurement	Activity participants	
Measuring instrument(s)	*Type of instrument*	Venturi flow meter or other equipment with at least the same accuracy

	Accuracy class	According to the national, international, or meter supplier's instructions
	Calibration requirements	Calibration shall be conducted according to the national, international, or manufacturer's instructions
	Location	At the steam line exiting the geothermal power plant
QA/QC procedures	The recorded data shall be stored daily in a central database with backup	
Treatment of uncertainty	Uncertainties are determined based on the measuring instruments	
Additional comment	• The measurement results shall be summarized transparently in regular production reports; • Applicable to dry or flash steam geothermal power projects	

Data / Parameter table 16.

Data / Parameter:	$M_{working\ fluid,y}$	
Description:	Quantity of working fluid leaked/reinjected in year *y*	
Data unit:	t working fluid	
Equation referred	Equation (18)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Measurement methods and procedures	Measured via log books and maintenance reports of the plant	
Measurement and updating frequency	Annually measured	
Entity responsible for measurement	Activity participants	
Measuring instrument(s)	*Type of instrument*	Mass flow meter or other equipment with at least the same accuracy
	Accuracy class	According to the national, international, or meter supplier's instructions
	Calibration requirements	Calibration shall be conducted according to the national, international, or manufacturer's instructions
	Location	Heat exchanger or working fluid storage equipment
QA/QC procedures	Measured based on the quantity of working fluid reinjected into the binary system of the geothermal plant. Cross check with the purchase invoices	

Treatment of uncertainty	Uncertainties are determined based on the measuring instruments
Additional comment	Applicable to binary geothermal power projects

Appendix 1. Background information on the inclusion and exclusion of emission sources

1. This appendix provides additional background information and justification for why certain baseline, project and leakage emission sources are not quantified in this mechanism methodology. For this purpose, this appendix first identifies in section 1 all relevant emissions sources, consistent with the appendix 1 of the “Standard: Setting the baseline in mechanism methodologies”(A6.4-STAN-METH-004) and with the “Standard: Addressing leakage in mechanism methodologies” (A6.4-STAN-METH-005); then, it assesses in section 2 the relevance of the identified emission sources and explains how they have been addressed, and then draws an overall conclusions on why the proposed selection of emission sources ensures conservativeness.

1. Identification of relevant emission sources

2. The physical boundary of Article 6.4 activities applying this mechanism methodology is specified in section 5 of the mechanism methodology as the site of the project power plant and all power units physically connected to the electricity system.

3. The mechanism methodology accounts for the following emission sources:

    (a) Baseline emissions: CO_2 emissions from the combustion of fossil fuel in fossil fuel fired power plants connected to the electricity system. This source is related to the Article 6.4 activity, as it is determined based on the emissions from the combustion of fossil fuels in power plants connected to the electricity system;

    (b) Activity emissions:

        (i) Emissions due to the combustion of fossil fuels in a backup generator. This source is controlled by the Article 6.4 activity, as the quantity of fuel consumed is under the direct control of the activity participants;

        (ii) Emissions from non-condensable gases contained in geothermal steam of dry or flash steam geothermal power plants. This source is controlled by the Article 6.4 activity, as the quantity of steam collected, is under the direct control of the activity participants;

        (iii) Fugitive emissions from non-condensable gases contained in geothermal steam of binary geothermal power plants. This source is controlled by the Article 6.4 activity, as the quantity of steam entering and leaving the power plant is under the direct control of the activity participants; and

        (iv) Fugitive emissions of working fluid contained in the heat exchangers of binary geothermal power plants. This source is controlled by the Article 6.4 activity, as the quantity of working fluid used to operate the heat exchanger is under the direct control of the activity participants; and

(c) Leakage emissions:

(i) Wake effects of wind power plants. This source of emission is affected by the Article 6.4 activity, as the construction of a wind power plant may result in wake effects on other wind power plants and reduce their electricity generation; and

(ii) Upstream emissions from the production, transport and installation of a BESS. This source is affected by the Article 6.4 activity.

4. Several additional emission sources were identified but are not accounted for in this version of the mechanism methodology:

(a) Baseline emissions:

(i) Non-CO_2 emissions from fossil fuel combustion of power plants in the electricity system;

(ii) Emissions from the operation of renewable power plants in the electricity system (e.g., biomass or geothermal power generation);

(iii) Upstream emissions from the construction of power plants in the electricity system. This source is affected by the Article 6.4 activity;

(iv) Upstream emissions from the production, processing and transportation of fossil fuels used in power plants in the electricity system. This source is affected by the Article 6.4 activity;

(b) Activity emissions: all emissions sources are accounted for;

(c) Leakage:

(i) Upstream emissions from the construction of the renewable power plant, including emissions associated with the manufacturing of equipment and the construction of the power plant. This source is affected by the Article 6.4 activity;

(ii) Baseline equipment transfer. This source of emission is affected by the Article 6.4 activity, as emissions would occur due to the use of the equipment at a site outside the project boundary and not under the control of the activity participants;

(iii) Competition for resource use consumed by the project power plant, including wind and water. This source of emission is affected by the Article 6.4 activity, as the construction of the project power plant may impact downstream and upstream water use from a river and may affect the quality of wind (i.e., the speed and turbulence of the air) used by downstream wind energy generators;

(iv) Diversion of existing production processes or outputs. This emission source is affected by the Article 6.4 activity, as the construction of the project power plant may displace the existing production activity to another location;

(v) Increases in release of GHGs from the environment as a result of the Article 6.4 activity. This emission source is affected by the Article 6.4 activity if construction of the project power plant results in deforestation; and

(vi) Increase in the level of service compared to the baseline scenario as a result of the implementation of the Article 6.4 activity (rebound effect). This emission source is affected by the Article 6.4 activity if the electricity generated by the project power plant lowers electricity prices, leading to an increased electricity consumption.

2. Relevance of unaccounted emission sources

5. This section analyses the relevance of the unaccounted emission sources identified.

2.1. Upstream emissions from the construction and operation of power plant

6. The table below provides an overview of upstream emissions from power plants. It shows that upstream emissions from fossil fuel power plants are generally higher than emissions from renewable power plants. Other literature sources and databases were also evaluated and confirmed that the values in the table are within plausible ranges found in the literature. Exclusion of this emission source is therefore deemed to be conservative.

Table 1. Comparison between the upstream emissions from the types of Article 6.4 activities eligible under this mechanism methodology and the upstream emissions from fossil fuel fired power plants[1]

<table>
<tr><th>Type of Article 6.4 project</th><th>Upstream emissions for the Article 6.4 project (g CO_2eq / kWh)</th><th>Upstream emissions for coal power plant (g CO_2eq / kWh)</th><th>Upstream emissions for natural gas power plant (g CO_2eq / kWh)</th></tr>
<tr><td>Wind onshore</td><td>12.15</td><td rowspan="2">163.68</td><td rowspan="2">78.12</td></tr>
<tr><td>Wind offshore</td><td>13.92</td></tr>
</table>

[1] Adapted from United Nations Economic Commission for Europe (UNECE), Life Cycle Assessment of Electricity Generation Options (Geneva: United Nations, 2021). The report identifies the sources of upstream emissions as follows:

(a) Upstream emissions from coal and natural gas power plants: energy carrier supply chains, from extraction to combustion (including methane leakage); infrastructure construction, operation, and dismantling (energy inputs and waste production); and connection to the grid;

(b) Upstream emissions from concentrated solar power plants: infrastructure, site preparation and occupation, operation and maintenance, decommissioning (energy inputs and waste production) and connection to grid;

(c) Upstream emissions from photovoltaic power plants: infrastructure, site preparation and occupation, operation and maintenance, decommissioning (energy inputs and waste production) and connection to grid; and

(d) Upstream emissions from wind power plants: infrastructure, site preparation and occupation, operation and maintenance, decommissioning (energy inputs and waste production) and connection to grid.

Type of Article 6.4 project	Upstream emissions for the Article 6.4 project (g CO_2eq / kWh)	Upstream emissions for coal power plant (g CO_2eq / kWh)	Upstream emissions for natural gas power plant (g CO_2eq / kWh)
Solar PV (poly-Si) ground mounted	36.08		
Solar PV (poly-Si) roof mounted	36.70		
Solar PV (CIGS) – ground mounted	11.98		
Solar PV (CIGS) – roof mounted	11.40		
Concentrated solar – parabolic through	33.18		
Concentrated solar – central tower	14.76		
Hydro	10.47		
Geothermal – binary[2]	23 – 71		
Geothermal – dry or flash steam[2]	3.8 – 5.3		

2.2. Emissions from the combustion of fossil fuel in fossil fuel fired power plants connected to the electricity system

7. This is the main baseline emission source and, therefore, was included in the calculation of emission reductions. For such types of power plants, the main GHG emitted from the combustion of fossil fuels is CO_2, and the mechanism methodology does not consider emissions of CH_4 and N_2O since their concentrations in the exhaust gas are negligible.[3]

2.3. Leakage from the use of pre-used equipment

8. The mechanism methodology requires that the equipment installed under the Article 6.4 activity has previously not been used in any other plant but is newly produced, therefore this emission source is not included in the calculation of emission reductions.

2.4. Competition for water in case of hydro power plants

[2] Adapted from Eberle, A; Heath, G; Nicholson, S; Carpenter, A. (2017) Systematic Review of Life Cycle Greenhouse Gas Emissions from Geothermal Electricity, U.S. National Renewable Energy Laboratory Technical Report NREL/TP-6A20-68474, https://docs.nlr.gov/docs/fy17osti/68474.pdf.

[3] The default CH_4 emission factor for the combustion of fossil fuels from the IPCC (2006) is in the range of 1-10 kg CH_4 / TJ (converted to 28-280 kg CO_2eq / TJ), whereas the N_2O emission factor from the same 2006 IPCC Guidelines is in the range of 0.6-2 kg N_2O / TJ (converted to 159-530 kg CO_2eq / TJ), which is significantly lower in scale when compared to the emissions of CO_2 (e.g., the CO_2 emission factor of natural gas is in the range of 54 300-58 300 kg CO_2eq / TJ).

9. For hydropower plants implemented in an existing reservoir, the mechanism methodology requires activity participants to demonstrate the following to avoid any leakage due to competition for water:

   (a) The implementation of the Article 6.4 activity does not lead to a reduction in electricity generation at upstream or downstream hydropower plants that rely on the same water resource;

   (b) For plants with an existing reservoir:

      (i) The implementation of the Article 6.4 activity does not change average volume of water in the reservoir;

      (ii) The implementation of the Article 6.4 activity does not reduce the availability of water for irrigation; and

      (iii) The hydropower plant operates in full compliance with the reservoir's authorized operating rules and water rights.

2.5. Increase in the level of service as a result of the implementation of the Article 6.4 activity (rebound effect)

10. Due to the low operating costs of some renewable power plants, the expansion of renewable power generation may displace power generation in those plants that have the highest marginal costs of electricity generation, which can lead to lower electricity prices (in some countries, this situation has led to an increasing number of hours where electricity prices are close to zero or negative).

11. The extent of such effects is likely to be highly variable and to depend on the context and country (e.g., demand for electricity may increase anyway due to increased electrification of infrastructure). In some situations, these effects could be significant. Nevertheless, this emission source is not considered here for simplicity, given that other conservative assumptions, in particular the neglect of upstream emissions from electricity generation in the baseline may outweigh this emission source.

12. This issue may be reconsidered, based on further data, in future revisions of this mechanism methodology.

3. Conclusion

13. The main unaccounted emission sources include upstream emissions from the construction and operation of power plants, and potentially rebound effects. Given that upstream emissions from fossil fuel power plants are generally higher than those from renewable power plants, the selected approach is deemed to be conservative.

Appendix 2. Numerical example of the determination of the downward adjustment

1. The following assumptions are made for the numerical example:

   (a) The start date of the crediting period for an Article 6.4 activity is on 01/10/2025, meaning the calendar year of the start date of the first crediting period (*y1*) is 2025;

   (b) The unadjusted baseline emissions in the calendar year of the start date of the first crediting period (BE_{y1}) are equal to 100 t CO_2eq. These emissions are calculated for the period between 01/10/2025 and 31/12/2025;

   (c) The initial downward adjustment ($DA_{initial}$) is equal to 10 per cent of the baseline emissions in year *y1*;

   (d) The annual increase in the downward adjustment is equal to 1 per cent of the baseline emissions in year y1; and

   (e) The type of crediting period selected by the Article 6.4 activity is renewable, and the end of the crediting period is on 30/09/2030.

2. As per step 2 under section 7.3.4, the annual increase in the downward adjustment (*INDA*) is equal to 0.01 and shall be applied in the calendar year following the calendar year of the start date of the first crediting period, i.e., 2026.

3. As per step 3, the downward adjusted baseline emissions during the crediting period are calculated as follows:

   (a) For the calendar year of the start date of the first crediting period:

$$BE_{adj,EG,y} = BE_{EG,y} \times \left(1 - DA_y\right), \text{and}$$

$$DA_y = DA_{initial} + INDA \times \left[\frac{cd_y}{nd_y} + (y - y1) - 1\right]$$

Therefore,

$$BE_{adj,EG,y} = BE_{EG,y} \times \left\{1 - \left[DA_{initial} + INDA \times \left(\frac{cd_y}{nd_y} + y - y1 - 1\right)\right]\right\}$$

   (b) For the last calendar year *y* of the last crediting period, DA_y shall be calculated based on equation (17) as follows:

$$DA_y = DA_{initial} + INDA \times [(y - y1) - 1]$$

4. The yearly downward adjusted baseline emissions determined for the example in paragraph 1 of this appendix and determined based on the equations above are exemplified in the table below, where:

   (a) The baseline emissions between 2026 and the 2029 are equal to 396.74 t CO_2eq/year, determined by multiplying 100 t CO_2eq by 365 days, and dividing the result by 92 days;

(b) The baseline emissions between for the calendar year 2030 are equal to 296.74 t CO_2eq / year, determined by multiplying 396.74 t CO_2eq by 273 days, and dividing the result by 365 days;

(c) cd_y is equal to 92 days for non-leap years and 93 days for leap years; and

(d) nd_y is equal to 365 days for non-leap years and 366 days for leap years.

Table 2. Numerical example of the calculation of the downward adjusted baseline emissions

Calendar year *y*	$BE_{EG,y}$ **(t CO_2eq)**	$DA_{initial}$ **(per cent)**	***INDA***	cd_y **(days)**	nd_y **(days)**	DA_y **(per cent)**	$BE_{adj,EG,y1}$ **(t CO_2eq)**
2025 (01/10/2025 – 31/12/2025)	100	10	-	-	-	10	90.00
2026	396.74		0.01	92	365	10.25	356.07
2027	396.74		0.01	92	365	11.25	352.10
2028	396.74		0.01	93	366	12.25	348.12
2029	396.74		0.01	92	365	13.25	344.16
2030 (01/01/2030 – 30/09/2030)	296.74		0.01	92	365	14.00	255.20
2025 (01/10/2025 – 31/12/2025)	100		-	-	-	10	90.00

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