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**Technical paper on options for operationalizing the guidance
on cooperative approaches referred to in Article 6,
paragraph 2, of the Paris Agreement and in decision
2/CMA.3**

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I. Introduction

A. Background

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its fifty-sixth session, requested the secretariat to prepare, with a view to facilitating the understanding of the relevant issues but without prejudging possible outcomes, and considering the relevant work undertaken in the first intersessional period of 2022 and views expressed by Parties¹ at the session, a technical paper without formal status, which includes analysis of the linkages between the following elements and, inter alia, the use of flowcharts and other visual representations on:

(a) Recommendations for guidelines for the reviews referred to in paragraph 7 of decision 2/CMA.3 and pursuant to chapter V (Review) of the annex to the same decision, including in relation to the Article 6 technical expert review (Article 6 TER) team, in a manner that minimizes the burden on Parties and the secretariat;

(b) Options for the tables and outlines that are simple and user-friendly while providing for Parties to report information required pursuant to chapter IV (Reporting) of the annex to decision 2/CMA.3 and in accordance with chapter III (Corresponding adjustments) of the annex to the same decision;

(c) Recommendations relating to infrastructure, including guidance for registries, the international registry, the Article 6 database and the centralized accounting and reporting platform referred to in chapter VI (Recording and tracking) of the annex to decision 2/CMA.3;

(d) The connection between the registry for the mechanism established by Article 6, paragraph 4, of the Paris Agreement and the international registry.²

2. The SBSTA further requested the secretariat to conduct a survey of Parties on their choice between implementing a registry, having access to a registry and using the international registry with a view to including the results of the survey in the technical paper referred to in the paragraph above.³

3. This technical paper has been prepared for consideration at SBSTA 57, to be held in November 2022, as well as in the intersessional period.

4. The period for developing this technical paper was not sufficient for the secretariat to consider submissions that may be made by Parties in response to the call for submissions at SBSTA 56.⁴ The technical paper will serve an input to the work of the SBSTA, parallel to Parties' submissions.

B. Structure and approach

5. The paper is structured according to the SBSTA 56 conclusions. Each of the four topics as per paragraph 1 above is allocated a section (sections II to V). Each section discusses key issues and possible solutions, considering linkages between the topics and with Article 6.4 elements. Wherever several possible solutions are identified in relation to an issue, the most suitable one is highlighted. A summary of possible solutions is included in section VI. Examples of the proposed tables and outlines, including for the report of the Article 6 TER team, are included as annexes, along with other supporting information. The results of the survey as per paragraph 2 above are also included as an annex to this paper.

6. The discussions of the key issues are based on analysis of the agreed Glasgow outcome on Article 6.2 (decision 2/CMA.3) and Article 6.4 (decision 3/CMA.3), where relevant. As requested by SBSTA 56, relevant work undertaken by Parties in the first

¹ Parties to the Paris Agreement.

² FCCC/SBSTA/2022/L.12.

³ FCCC/SBSTA/2022/L.12.

⁴ FCCC/SBSTA/2022/L.12.

intersessional period of 2022 and views expressed by Parties at SBSTA 56 are considered. Decisions related to the modalities, procedures and guidelines (MPGs) for the transparency framework for action and support referred to in Article 13⁵ are also analysed and considered, where relevant to Article 6.

7. The paper is prepared with the view to encouraging a holistic approach towards further elaboration and implementation of the guidance.⁶ Understanding the paper requires good familiarity with the Glasgow outcome on Article 6.2 and relevant sections of Article 6.4.⁷

8. In identifying and discussing possible solutions to the issues, the secretariat has drawn on its experience with the relevant systems and processes under the Kyoto Protocol and its broader expertise and knowledge of practices associated with the operations of carbon-pricing policy instruments globally. Due to the short time frame for the delivery of this technical paper, focused research and analysis of relevant practices outside of the Kyoto Protocol were not conducted.

9. The assessment criteria for possible solutions are informed by principles provided in the guidance and through Parties' interventions as reflected in the outcomes of the intersessional work and SBSTA 56. Assessment criteria include:

- (a) Promoting transparency, accuracy, completeness, consistency and comparability (TACCC);
- (b) Effectiveness and efficiency;
- (c) Simplicity, flexibility and user-friendliness;
- (d) Robustness and secure operations;
- (e) Minimizing the reporting burden on Parties;
- (f) Eliminating undue burden on the secretariat;
- (g) Building on existing solutions and continuous improvement;
- (h) Impact on stakeholders, including maximizing participation;
- (i) High-level assessment of implementation effort as a measure of future cost.

10. Throughout the document, paragraphs, chapters and Articles are referred to. Paragraphs and chapters without a reference to a decision are those from the annex to decision 2/CMA.3. In any other instance, reference is made to the relevant decision. Articles are those of the Paris Agreement. In any other instance, reference is made to the relevant treaty or regulation.

C. Assumptions and interpretations

11. In identifying and elaborating possible solutions, assumptions and interpretations in relation to aspects that could benefit from further clarification are stated. Due to the short timeframe for producing this paper, assumptions and interpretations have not undergone a thorough legal analysis. Assumptions and interpretations would need to be confirmed or rejected in the context of any possible solutions that Parties may wish to take forward.

12. Rejection of certain assumptions and interpretations may have implications for more than one area of analysis, thus necessitating an impact assessment.

⁵ Decisions 18/CMA.1 and 5/CMA.3.

⁶ The "guidance" is the guidance included in the annex to decision 2/CMA.3.

⁷ Relevant sections of the annex to decision 3/CMA.3 include chapters I (Definitions), IV (Participation responsibilities), V (Article 6, paragraph 4, activity design), VI (Mechanism registry), VII (Levy of share of proceeds for adaptation and administrative expenses), VIII (Delivering overall mitigation in global emissions), IX (Avoiding the use of emission reductions by more than one Party) and X (Use of emission reductions for other international mitigation purposes).

II. Options for the tables and outlines to report information required pursuant to chapter IV (Reporting) and in accordance with chapter III (Corresponding adjustments)

A. Principles

13. The key guiding principles for this section are:

(a) Simple, flexible and user-friendly: the outlines, tables and reporting process should be easy to understand and to complete from the user's perspective, while ensuring the reporting requirements are met;

(b) Respecting the nationally determined nature and diversity of nationally determined contributions (NDCs): the reporting Party should be able to complete the tables and outlines and follow the processes regardless of its underlying systems, provided these systems meet the requirements of the annex to decision 2/CMA.3;

(c) TACCC.⁸

B. Key issues

14. The key issues impacting the design of reporting tables and outlines, including elements not addressed in the text,⁹ are identified and discussed in this section, including possible solutions.

15. Figure 1 presents the information required to be reported by a participating Party as per chapter IV (Reporting) for a reporting cycle of an NDC implementation period:

(a) Initial report (IR);

(b) Updated initial report (UIR) (also jointly referred to with the IR as IR/UIR);

(c) Annual information as per paragraph 20 submitted through an agreed electronic format (AEF);

(d) Regular information (RI) as an annex to the biennial transparency report (BTR) that is submitted in accordance with paragraph 10(b) of the annex to decision 18/CMA.1,¹⁰ including annual information as per paragraph 23 (reported biannually as part of the RI).

16. Figure 1 is a simplified illustration of what information may be submitted per year of an NDC implementation period. Regular information is submitted once every two years with the BTR.

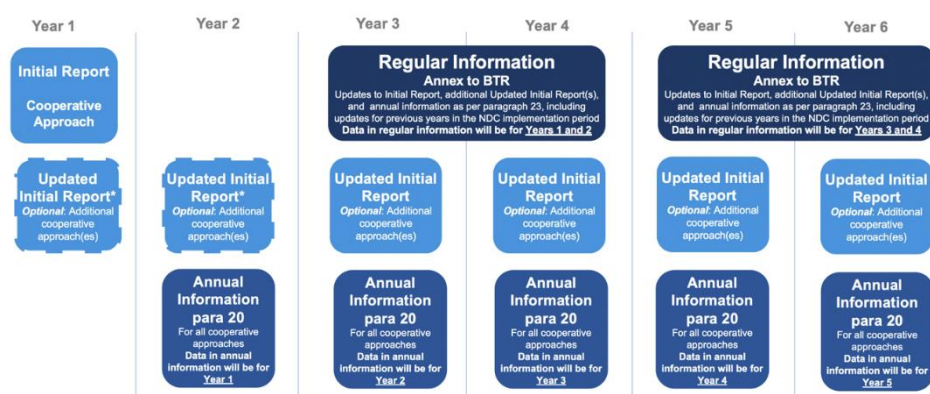
⁸ As per paragraph 7, TACCC are required in the context of corresponding adjustments and therefore are an overarching principle for all elements (processes and reports) leading to emissions balances and adjusted indicators for tracking progress towards the implementation and achievement of NDCs.

⁹ "Text" is used interchangeably with decision 2/CMA.3 and its annex.

¹⁰ Annex 4 "Information in relation to the Party's participation in cooperative approaches, as applicable" of the outline of the BTR as per Annex IV to decision 5/CMA.3.

Figure 1: Information required as per chapter IV (Reporting)

*To be clarified if UIR could be submitted separately from BTR.



1. Reporting obligation: who reports

17. According to paragraphs 18, 20 and 21, “each participating Party” shall provide the reports detailed in the respective paragraphs. Participation in a cooperative approach materializes through the authorization of the approach by a Party as per paragraph 18 (g).¹¹ A participating Party may be a “host Party”¹² and/or a “using participating Party”.¹³

18. With respect to the Article 6.4 mechanism (the mechanism), a participating Party may be a “host Party” that approves activities and authorizes internationally transferred mitigation outcomes (ITMOs) and entities,¹⁴ or an “other participating Party” that authorize entities¹⁵ in a given activity of the mechanism. Participating Parties in the mechanism are subject to the reporting requirements of Article 6.2 with respect to authorized Article 6, paragraph 4, emission reductions (A6.4ERs).¹⁶

19. Paragraphs 42 and 43 of the annex to decision 3/CMA.3 are understood¹⁷ to provide for the issuance of A6.4ERs that are not authorized and, therefore, are not ITMOs. Host Parties approving only activities for which unauthorized A6.4ERs will be issued are not required to report in accordance with the requirements of Article 6.2 as they would not handle ITMOs. Similarly, other participating Parties in the mechanism only involved in activities for which unauthorized A6.4ERs will be issued are not required to report in accordance with the requirements of Article 6.2.

20. Chapter IV (Participation responsibilities) of the annex to decision 3/CMA.3 sets out requirements only in relation to host Parties. However, Article 6.2 reporting obligations in relation to authorized A6.4ERs (ITMOs) apply to any participating Party in the mechanism that handle authorized A6.4ERs.

21. Only Parties to the Paris Agreement that engage in cooperative approaches as per Article 6, paragraph 2 and in Article 6, paragraph 4 activities that issue authorized A6.4ERs have reporting obligations under the guidance. Actions of authorized entities in relation to ITMOs are reported by the respective participating Parties that authorize the entities.¹⁸

¹¹ Paragraph 18 (g) requires a participating Party to “Provide, for each cooperative approach, a copy of the authorization.”

¹² Paragraphs 18 (f) and 23 (a).

¹³ Paragraphs 20 (b) and 23 (j).

¹⁴ See paragraph 7 of decision 3/CMA.3.

¹⁵ Paragraph 45 of the annex to decision 3/CMA.3.

¹⁶ Paragraph 1 (g) and section IV (Reporting).

¹⁷ The use of the terms “understood”, “appear” or “assumed”, indicate an assumption in the context of this paper.

¹⁸ Reporting on annual information related to the share of proceeds for adaptation as per paragraph 66, annex, decision 3/CMA.3 is discussed in section II.D.8 of this paper.

2. Reporting scope: what to include

22. Reporting obligations are discussed from the perspective of the reporting participating Party. Thus, a participating Party is understood to report on actions with ITMOs it carries out and on elements it is responsible for with respect to the cooperative approaches in which it participates. Specifically, a participating Party is responsible for reporting on authorizations it has issued and ITMOs it tracks through its tracking arrangements but not on authorizations issued by other participating Parties in the cooperative approach and/or ITMOs from a cooperative approach it does not track.

23. A notable exception to this principle appears to arise in relation to ITMOs authorized for other international mitigation purpose(s) (OIMP) by a host Party that specifies first transfer to be the use or cancellation as per paragraph 2 (b), when such ITMOs are internationally transferred.¹⁹ To enable the application of corresponding adjustments, a communication mechanism would be needed from the using participating Party (when using or cancelling such ITMOs) to the host Party (also first transferring Party) to notify it of first transfer being effected. The host Party should include information on all actions with ITMOs it has authorized that are first transfers within its reported information in order to ensure completeness, accuracy and transparency, including in relation to corresponding adjustments (see further discussion in relation to section II.D AEF).

24. Another possible exception that could arise in practice is when ITMOs from the same generating activity are allocated among participating Parties and recorded (upon verification) directly in the registry of the acquiring participating Party (in full or partially).²⁰ Should such instances arise in the Article 6.2 practice, it is understood that the host Party will report authorization and transfer of the ITMOs and the acquiring Party will report acquisition.

3. Reporting timeline: when to report

25. Chapter IV (Reporting) provides for sequencing in submitting information, whereby the IR/UIR is due before the annual information as per paragraph 20, including when the IR/UIR is submitted with the BTR. This sequencing is important to ensure transparency, understandability, comparability and consistency of information.

(a) Initial report

26. The chapeau of paragraph 18 states that “Each participating Party shall submit an Article 6, paragraph 2, initial report (...) no later than authorization of ITMOs from a cooperative approach or where practical (in the view of the participating Party) in conjunction with the next biennial transparency report (...) for the period of NDC implementation.”

27. The formulation “no later than authorization of ITMOs” raises the question if no later than *any* authorization of ITMOs for the cooperative approach or *its* authorization of ITMOs. Furthermore, clarification on “where practical (...) in conjunction with the next biennial transparency report” is also relevant to enable Parties to determine the submission timeline without a doubt. An associated issue is the sequencing in submitting information by a participating Party.

(i) Trigger

28. The trigger for the submission of an IR²¹ is assumed to be the point in time when a Party becomes a participating Party by authorizing the cooperative approach as per paragraph 18 (g).

(ii) Timeline

29. Interpreting the timeline for reporting (after the trigger) to be no later than “*its* authorization of ITMO” has the advantage of the participating Party having control over the

¹⁹ The ITMO may be authorized for NDC and OIMP, so international transfer cannot be excluded.

²⁰ This is the current practice of the Joint Implementation Mechanism.

²¹ A reporting trigger is considered to be a starting point for a reporting submission, rather than the latest possible time, as mentioned in paragraph 18 chapeau “no later than...”.

information related to its reporting obligation (by controlling the process of issuing *its* authorizations of ITMOs) and appears to be the intended notion in the context of the principle of Parties acting independently of one another.

30. Alternatively, a participating Party may opt to submit an IR “in conjunction with the next BTR”, where practical in the view of the participating Party. Important in this regard is the notion of “next” BTR and what this BTR is next to. It is assumed that the next BTR is in relation to the Party becoming a participating Party by authorizing a cooperative approach in the period between previously submitted BTR and the submission date for the subsequent BTR, for instance between BTR1 and BTR2. Therefore, the chapeau of paragraph 18 could be interpreted to mean that an IR should be submitted by a participating Party between its authorization of a cooperative approach and its first authorization of ITMOs or its next BTR, at the Party’s discretion. Such interpretation clarifies that:

(a) The BTR following an authorization of a cooperative approach is the latest possible time for submission of an IR by a participating Party, irrespective of when the Party joins in the lifecycle of the cooperative approach (at its foundation or after it has operated for some time);

(b) The timeline for an IR by a participating Party that does not issue authorizations of ITMOs (a using participating Party) is between its authorization of a cooperative approach and its BTR following the authorization of a cooperative approach. This is significant in the context of consistency checks on ITMOs as per paragraph 33 (a) as it ensures that a participating Party’s IR will be submitted in a comparable timeframe to other Parties in the same cooperative approach.

(iii) *Participating Parties in the Article 6.4 mechanism*

31. For participating Parties in the Article 6.4 mechanism, the obligation for an IR may be linked to the time of first authorization of A6.4ERs or first authorization of entities in activities for which A6.4ERs are authorized, whichever occurs first for the participating Party. This would ensure a distinction between participating Parties that engage with authorized A6.4ERs (and therefore should report as per Article 6.2) and participating Parties that engage with unauthorized A6.4ERs (see also section II.B.1 on reporting obligation).

32. The reporting timeframe would be the same as for Parties participating in cooperative approaches (the latest submission time for IR being the next BTR of the Party). This would ensure a comparable timeframe for reporting between Parties which is relevant to consistency checks.

33. This issue may be addressed in the context of the rules, modalities and procedures (RMPs) for the mechanism.²²

(iv) *Period of validity*

34. The validity of the IR is set out in relation to an NDC implementation period.

35. **Possible solutions:** The IR trigger in relation to the mechanism is (this clarification may be made either in the RMPs or in the guidance):

(a) For host Parties, the first authorization of A6.4ERs;

(b) For other participating Parties, the first authorization of entities in an Article 6.4 activity that involves authorized A6.4ERs.

(b) **Further cooperative approaches**

36. Paragraph 19 presents a challenge with respect to understanding when (and how many times) the information on further cooperative approaches is to be submitted, namely the requirement for submission of an UIR (for each further cooperative approach) and for inclusion in the centralized accounting and reporting platform (CARP) and to include it (the UIR) in the next BTR due.

²² The RMPs for the mechanism established by Article 6, paragraph 4 of the Paris Agreement.

37. Paragraph 19 could be interpreted to mean one of the following:

- (a) The UIR shall be included in the next BTR; or
- (b) The UIR could come as a stand-alone report and could be included in the next BTR, at the discretion of the Party, similar to the IR.

38. Submission of a IR/UIR with the next BTR is intended to minimize the reporting burden on Parties and the secretariat. However, if a participating Party that wishes to submit an UIR ahead of its next BTR, it should be able to do so.

39. **Possible solution:** The submission of an UIR with the next BTR is at the participating Party's discretion.

(c) Annual information as per paragraph 20

40. According to paragraph 20, AEF is due no later than 15 April, with information on the preceding calendar year. As previously mentioned, chapter IV (Reporting) provides for sequencing in submitting information, whereby the IR is due before the annual information as per paragraph 20.

41. When a Party submits an IR with a BTR, its AEF would not be due until the following 15 April.²³ If the reporting Party had already engaged in operations with ITMOs for the BTR period, it would be expected to report on paragraph 23. If the IR/BTR is submitted after 15 April, this raises the issue of the treatment of annual information as per paragraph 23, as its corresponding data set as per paragraph 20 may not be available. The following options may be considered:

- (a) The participating Party submits an AEF(s)²⁴ with the IR/BTR submission;
- (b) The participating Party submits an AEF(s) by the first 15 April after the IR/BTR.

42. Option (a) would promote TACCC and would enable the timely processing of the consistency check and review. This is because without the AEF information, the annual information as part of the BTR could not be checked for consistency. The requirement of option (a) could be established through the reporting practice or through the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) guidance.

43. Similar sequencing issue arises in relation to UIRs. However, UIRs do not include information relevant to participation, and the reporting Party is already known in the system. Therefore, it is considered that a UIR could come with a BTR even after the first set of annual information for the additional/further cooperative approach is included in the AEF. Inclusion of annual information in relation to a further cooperative approach(es) in the AEF before the submission of a UIR is discussed in section II.E.3 below.

44. **Possible solution:** For an IR submitted with the BTR, the reporting Party shall submit relevant AEF(s), at the time of the IR/BTR submission.

(d) Regular information

45. The RI as per chapter IV.C is submitted with the BTR. The MPGs for Article 13 guide the submission of the first BTR and subsequent BTRs, every two years.

4. Reporting elements: what to report

(a) Cooperative approach

46. The cooperative approach is the framework within which ITMOs are authorized, transferred and used. This aspect is significant for recording, tracking and reporting because

²³ Except for submission on 15 April (when the AEF is due) and the reporting Party would be expected to make a full submission of all reporting elements.

²⁴ The first submission may require an AEF for more than one year.

consistency with the guidance includes consistency of information within a cooperative approach, where required.²⁵

47. The name of a cooperative approach is required by different reports (IR, RI and AEF) and should be unique and consistent for the NDC implementation period of each reporting participating Party. A cooperative approach (name) should be associated with a unique identifier to enable consistency checks and review of information. An unique identifier also has the advantage of handling changes to the name of a cooperative approach, which may be needed in the course of its implementation. The method for assigning and maintaining unique identifiers for cooperative approaches through a centralized function of the CARP is discussed in section III.G.4(viii) below.

(b) ITMOs

48. ITMOs are the subject of voluntary cooperation under Article 6.2 and are central to the accounting and reporting requirements. All the reports require the provision of information on ITMOs, including their intended use, quantity, metrics, actions performed on them, information related to their quality, and so on.

49. Paragraph 1 stipulates the requirements ITMOs must meet. Paragraphs 1 (a), 1 (c) and 1 (e) are straightforward and are understood to apply to all ITMOs. Regarding other ITMO characteristics, it may be less clear if and how the requirements combine.

50. Paragraphs 1 (b) (“when internationally transferred”) and possibly 1 (d) (“involves the international transfer”) link mitigation outcomes (MOs) to international transfer, resulting in ITMOs. However, a requirement for international transfer is not stipulated by paragraphs 1 (f) and 1 (g), which specify that MOs²⁶ result in ITMOs when authorized.

51. The issue of whether a MO must be internationally transferred in order to be an ITMO, in addition to being important for Parties in designing their national systems, has an impact on the design of tables and outlines for reporting, particularly in relation to the annual information (paragraphs 20 and 23). With the evolution towards the idea that MOs become subject to corresponding adjustments at first transfer (which may not be the first international transfer), the issue of when MOs become ITMOs has lost its clear definition.

52. For the analysis in this paper, and with a view to ensuring TACCC, it is assumed that information on MOs is reported from the point of authorization, including when authorized for NDCs only (see further discussion in section II.D on the AEF).²⁷

53. Another aspect requiring common understanding of the combination of requirements for ITMOs is in relation to authorized use(s). This is discussed below in section II.B.4(d) Authorizations.

(c) Reporting according to methods for tracking ITMOs

54. The method for tracking ITMOs is a matter of cooperative approach design. It is understood that participating Parties may determine the legal and technical approach to tracking ITMOs according to their national circumstances, consistently with the guidance and in a manner that enables them to meet their accounting and reporting obligations.

55. This paper identifies and discusses possible methods for tracking ITMOs:

- (a) Serialized units;
- (b) Uniquely identifiable accounting amounts (UIAAs);
- (c) Balance-only accounting amounts (BOAAs);

²⁵ For example, information on actions of ITMOs between participating Parties must be consistent.

²⁶ For instance: A6.4ERs, and possibly MOs authorized for OIMP, can be cancelled by the host Party before any international transfer.

²⁷ This is significant in light of the definition of first transfer in relation to ITMOs authorized for NDC to be the first international transfer (as per para. 2(a)). Reporting ITMOs authorized for NDC in the annual information from the point of their first international transfer, and not from their authorization, would obscure reporting and would diminish TACCC.

(d) Balance in a higher-tier accounts (BHTA).

56. The methods are described in section III.D.1. Implications for infrastructure are discussed in sections III.E - III.H and for reporting in section II.D.6(b).

57. Serialized units is the standard method that is used in existing practice. It remains to be seen if other methods are adopted or further methods are identified. With the view to TACCC, it is considered that each cooperative approach should adopt one of the methods for each metric,²⁸ and use it consistently for the duration of the NDC cycles of the participating Parties. The information on the method(s) should be included in the IR/UIR for each cooperative approach.

58. With regard to the possibility for a Party to participate in various cooperative approaches that utilize different methods for tracking ITMOs, this would place additional requirements on its tracking arrangements.

59. Further analysis may be conducted in the area of methods for tracking ITMOs.

60. Non-technical considerations in relation to the four approaches, such as legal form and ownership of ITMOs, are not discussed in this paper.

61. **Possible solutions:** The rules for combining methods for tracking ITMOs are as follows:

(a) A cooperative approach adopts a single method for tracking ITMOs for each metric and the method should be reported in the IR/UIR;

(b) More than one method for tracking ITMOs may be used by a participating Party engaging in multiple cooperative approaches.

62. The SBSTA may wish to conduct further analysis in the area of reporting according to methods for tracking ITMOs.

(d) Authorization

63. Authorization is central to reporting, with multiple implications across the system. The arrangements for authorization are under the responsibility of the participating Party according to paragraph 3(c). This section discusses issues related to authorization from the perspective of reporting requirements.

(i) Types of authorization

64. Authorization²⁹ by a participating Party is used in different reporting requirements, with or without clarification as to what it refers to. Authorization is used in relation to the following topics:

(a) Authorization of ITMOs towards use(s) (paragraphs 1 (d), 1 (f), 20 (a) and 21 (c));³⁰

(b) Authorization of a cooperative approach as per the requirement of paragraphs 18 (g) and 21 (c);

(c) Authorization of entities (paragraphs 18 (g) and 23 (d)).

65. A host Party may authorize ITMOs for use(s) without other participating Party joining the cooperative approach. For example, a host Party may authorize ITMOs for OIMP to be used domestically (a unilateral cooperative approach).

²⁸ Method for tracking per metric within a cooperative approach is the minimum requirement. However, one method per cooperative approach is desirable for simplification.

²⁹ Or “authorized”, which implies authorization has taken place.

³⁰ “Authorization of ITMOs” as per the chapeau of paragraph 18 is also understood to relate to authorization of ITMOs towards uses.

(ii) Timing of authorizations

66. With respect to timing of authorizations, it would be helpful to consider, and possibly clarify, the sequencing of authorizations, particularly in the context of the IR. Clarifying that a participating Party has to first join/authorize a cooperative approach before it can authorize ITMOs from that cooperative approach (or at the same time) is relevant to planning activities by participating Parties and for the review of information.

67. A second issue related to timing is the granting of authorization towards use(s) in the lifecycle of an ITMO. It appears sufficiently self-evident that an authorization towards use(s) has to be granted before, or at the time of, first transfer to ensure that first transfer will be identified correctly in relation to the ITMOs for the purposes of accounting, tracking, reporting and review, including consistency checks.

(iii) Authorization of ITMOs from a cooperative approach

68. According to paragraph 1, ITMOs are from a cooperative approach. Furthermore, paragraph 3 provides that "Each Party participating in a cooperative approach that involves the use of ITMOs (...) shall ensure that its participation in the cooperative approach and the authorization, transfer and use of ITMOs is consistent with this guidance (...)". This is interpreted to mean that ITMOs are linked to the cooperative approach into which they are authorized. This is consistent with the various reporting paragraphs, such as 20 (a), 20 (b) and 23, where ITMOs are required to be reported by cooperative approach. Therefore, there is a link between the cooperative approach and the authorizations of ITMOs in relation to that cooperative approach. The following implications are worth considering:

(a) The authorization of ITMOs needs to provide a link to the cooperative approach it is from;

(b) The cooperative approach to which ITMOs are authorized is a characteristic of the ITMOs;

(c) ITMOs can only be transferred to other participating Parties in the cooperative approach from which the ITMOs are.

69. In this context, more than one cooperative approach may be based on a single crediting standard or an offsetting scheme. However, each ITMO is from just one cooperative approach (as per paragraph 1). Parties that generate ITMOs have to make an irrevocable choice of the cooperative approach to which the ITMO will belong before authorising the ITMO. Parties that may wish to acquire ITMOs would have to join the cooperative approach that the ITMO is associated with. This is necessary to clearly establish the boundaries of cooperation, ensure TACCC and prevent potential disputes between participating Parties in different cooperative approaches on the basis of ITMOs that cross boundaries of cooperative approaches.

(iv) Scope of authorization for ITMOs towards use(s)

70. With respect to scope of authorization for ITMOs towards use(s), paragraph 1(d) stipulates that a MO has to be from an approach involving the international transfer of MOs for use towards an NDC to be an ITMO. The same appears to be inferred by paragraph 4(c), which stipulates that each participating Party shall have arrangements in place for authorizing the use of ITMOs towards achievement of an NDC. This requirement could be interpreted to mean that all MOs/ITMOs have to be authorized for NDC use. However, such interpretation would not be aligned with paragraphs 1(f) and 1(g), which stipulate that MOs can be authorized for OIMP only. For the analysis in this paper, it is assumed that ITMOs can be authorized for NDC, for OIMP or for both NDC and OIMP.³¹

71. Further in this regard, paragraph 20(b) requires information on "the other international mitigation purpose authorized by the Party" in relation to the elements of paragraph 20 (a). For authorized A6.4ERs, paragraph 55 of the annex to decision 3/CMA.3 requires "(...) the mechanism registry to distinguish A6.4ERs that are authorized for use towards the achievement of NDCs and/or for use for other international mitigation purposes pursuant to chapter V.C above (Approval and authorization), including any specified uses for which the

³¹ This is aligned with the approach for authorized A6.4ERs as per paragraph 1(g).

A6.4ERs are authorized.” “Specified uses” appears to be an optional subset of the OIMP and appears related to the requirement of paragraph 20(b). It may be helpful to clarify how “the OIMP” may be tracked in order to be reported on.

72. See further discussion in section II.D.6(c) below.

(v) *Authorizing participating Parties of ITMOs towards use(s)*

73. With respect to the question of which participating Parties may authorize ITMOs, the obligation for corresponding adjustment accrues on the authorizing host Party (the participating Party where the MO is generated) when first transfer is effected.³² Therefore, authorization of MOs/ITMOs, including the respective authorized quantities (amounts), is the first transferring (host) Party’s prerogative and reporting obligation as per paragraphs 20, 23(d) and 23(j).

74. Furthermore, a host Party would need to ensure that its authorization enables a link to the authorized ITMOs in a manner that avoids possible confusion in the context of tracking ITMOs as authorized towards use(s).

(vi) *Format and method for authorizing ITMOs*

75. The guidance is not specific on the format and method for authorizing ITMOs towards use(s). It is possible to envisage that the authorization of ITMOs could be granted through a dedicated document (evidence).

76. Other methods for documenting authorizations of ITMOs towards use(s) could also be envisaged and may emerge with practice. A degree of standardization of the authorizations across participating Parties and across cooperative approaches, including a voluntarily adopted one, could benefit TACCC. Standardization could be sought in relation to the method or/and the requisites of the authorizations.

77. Agreement on the minimum requisites (elements) of an authorization of ITMOs for use(s) may be helpful from the outset to ensure that relevant information is communicated, while formats to support usability and transparency are of less urgency. Possible requisites may include (in order of importance):

- (a) Date;
- (b) Number of authorization;
- (c) Party;
- (d) Issuing authority, contact information and elements for authentication;
- (e) Cooperative approach from which MOs/ITMOs are authorized;
- (f) Amount and details of MOs/ITMOs authorized towards NDC;
- (g) Amount and details of MOs/ITMOs authorized towards OIMP and authorized entities (in a manner that enables linking the MOs/ITMOs to tracking information);
- (h) NDC implementation period;
- (i) Other authorized entities, including scope of authorization;
- (j) Special condition applicable to the authorization, including permissible changes, if envisaged;
- (k) Details related to the OIMP;
- (l) Link to a public repository of the authorization;
- (m) Details of the mitigation activity, including but not limited to methodology/sector, type, crediting period, and monitoring.

78. The mechanism has a separate approval and authorization process. The list above may be extended to include elements for approval of Article 6, paragraph 4 activities.

³² As per paragraphs 8(a), 9(a) and 10(a).

79. The possible use of unique identifiers for authorizations is discussed in section II.D.6(c) below, in relation to the AEF. Unique identifiers of authorizations could be assigned by the authorities of the participating Parties, responsible for issuing authorization as per paragraph 4(c), in a manner that makes them unique and traceable for a cooperative approach.

80. With regard to an issuing authority, for transparency and validation of authorization purposes, it would be prudent if a participating Party designates a national authority in relation to paragraph 4 (c). Such an authority may assume all responsibilities in relation to international reporting and review for Article 6.

(vii) *Authorized entities*

81. Authorized entities are to be reported in the IR as per paragraph 18(g) (authorized entities for each cooperative approach), in annual information as per paragraph 20(b) (the using authorized entity or entities, as soon as known), and in RI as per paragraph 21(c) (pertaining to authorizations and changes to authorizations) and as per paragraphs 23(d) and 23(j) (entities authorized to use MOs authorized for OIMP).

82. The question of what authorized entities are authorized for is significant in the context of tracking, reporting and review, including the consistency check as per paragraph 33(a). Are entities authorized to engage in a cooperative approach in general or are they authorized to handle specific ITMOs for specific uses? Furthermore, which participating Parties authorize entities?

83. According to **paragraph 23(d)**, a participating Party is required to report “Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes and entities authorized to use such mitigation outcomes, as appropriate”, implying that entities are authorized specifically to use MOs authorized for OIMP domestically by the host Party. It is unclear if the link between authorized entity and the MOs authorized for OIMP goes deeper to the level of any “specific” OIMP.³³

84. With respect to paragraph 45, annex, decision 3/CMA.3, other participating Parties (that are not host Parties) may authorize public or private entities. It appears that such other participating Parties may authorize entities to use authorized A6.4ERs towards OIMP. It would be helpful to clarify if such other participating Parties have reporting obligations in relation to paragraph 23(d). Other aspects, e.g. in relation to registry accounts opening in the mechanism registry, could be clarified by the Supervisory Body (SB)³⁴.

85. The reporting of using authorized entities in the annual information as per paragraph 20 (b) maybe challenging (particularly for a large number of actions on ITMOs) unless the information on using authorized entities is tracked in the registries as per section VI.A (Tracking). A simple option would be for a reporting Party to provide a link to the public information it maintains on authorizations.

86. Considerations in relation to the format and method for authorizing entities is similar to those in relation to authorizing ITMOs.

(viii) *Changes to authorizations*

87. Any changes to authorizations are required to be reported as per paragraph 21(c). However, the scope and timing of the possible changes are not defined in text, which makes it difficult to assess the impact of envisaged changes. Changes to authorizations, if and when permitted, may cover a wide range of cases with wide-ranging implications, some of them potentially significant in relation to all aspects of the guidance (accounting, tracking, reporting and review). For example, a change in the period of authorization³⁵ or withdrawal

³³ Paragraph 20(b) requires reporting of “the OIMP authorized by the Party”.

³⁴ The Supervisory Body of the Article 6.4 mechanism.

³⁵ For comparison, extended provisions were necessary under the Kyoto Protocol to regulate long-term CERs for which the permitted period of use could be extended.

of authorization³⁶ could impact on the value held by acquiring participating Parties and on the design of the AEF, even if the change occurs before first transfer (see section II.D).

(ix) *Further analysis*

88. It is recommended that further analysis be conducted in the area of authorizations, including in relation to:

(a) The scope of possible changes, as well as the way in which changes to authorizations are to be reported for transparency. In the absence of guidance in this area, it is not possible to design templates and outlines that cover changes to authorizations in a specific fashion. Therefore, the outlines and tables provided in this document accommodate changes in a generic fashion and will need to be reviewed if the CMA provides guidance in this area;

(b) Potential benefits from authorizations to include minimum elements (requisites), including benefits from common format(s) with a view to TACCC;

(c) Methods for tracking authorizations to clarify how the business controls in relation to effecting a “use” according to the authorization scope could be enabled (for example a the use or cancellation account-level).

89. Parties may also draw on work by other stakeholders in relation to authorization.

90. **Possible solutions:** The following are possible solutions in relation to authorization:

(a) A host Party authorizes a cooperative approach before it authorizes ITMOs from the cooperative approach towards use(s);

(b) An authorization of ITMOs towards use(s) has to be granted before, or at the time of, first transfer;

(c) For authorization of ITMOs towards use(s), a clarification of the following is requested:

(i) The method/format and minimum elements;

(ii) The scope of authorization for entities;³⁷

(iii) Possible changes.

91. The SBSTA may wish to conduct further analysis in the area of authorizations with the view to providing further guidance in this regard, as necessary.

(e) **First transfer**

(i) *Specification of first transfer as per paragraph 2(b)*

92. As per paragraph 2(b), participating Parties are required to specify which of three options is “first transfer” in relation to ITMOs authorized for OIMP. This specification is to be tracked by the registries for accounting purposes and to fulfil the requirements of section VI (Recording and tracking).

93. In relation to paragraph 2(b), it is understood that the host participating Party provides the specification. This raises the question of how the host Party is to specify this information critical for the application of corresponding adjustments. Related is the question of the level of specification, i.e. in relation to each ITMO or at the cooperative approach level.

94. There are no provisions permitting communicating changes to specification. It is assumed that the specification is permanent. Should changes be possible, impact assessment would be required to ensure the integrity of the transactions and tracking systems.

³⁶ For comparison, the clean development mechanism (CDM) Executive Board adopted procedures to regulate changes in the approval and authorization of activities in the CDM, including their withdrawal.

³⁷ In relation to the mechanism activity participants, clarification may be provided through the work of the SB.

95. Specifying first transfer by the host Party at the level of cooperative approach offers significant simplification. It would be a one-off statement that could be provided by the host Party in its IR. Furthermore, the first transfer specification may have to be passed onto the acquiring registry for ITMOs authorized for OIMP if an ITMO is tracked between registries. External registry transfers³⁸ of such ITMOs could benefit from a simplified method for tracking first transfers (further discussion see section III.H below).

96. Providing specification for each ITMO would be complex to track, including in categorizing ITMOs (authorized for OIMP) as subject to corresponding adjustment, because potentially different events could be specified as first transfer for different ITMOs. If provided for each ITMO, the first transfer specification would have to be tracked at the ITMO level, similar to its authorized use. If Parties prefer this approach, the specification could be best provided as part of the authorization of the ITMO for a use(s). Tracking of first transfer specification may be required as an ITMO attribute (characteristic) to enable reporting of annual information (see further discussion in section II.D.6(b) below).³⁹

(ii) *First transfer as an attribute to ITMO actions*

97. From reporting perspective, the first transfer specification (defined by the first transferring Party) is considered a “logical attribute” of an action/transaction with ITMOs.⁴⁰ As first transfer of ITMOs triggers corresponding adjustment for the first transferring Party, the following issues could be considered in the context of the need for further CMA guidance:

(a) When an ITMO is authorized for both OIMP and NDC, the action to be considered as the first transfer may be ambiguous, as both paragraphs 2 (a) and 2 (b) are relevant to the ITMO;

(b) For an ITMO authorized for NDC only, first transfer would not occur if the ITMO is used domestically (as per paragraph 2 (a)). An ITMO authorized for NDC and used for the Party’s own NDC or cancelled for overall mitigation in global emissions (OMGE) prior to its international transfer is to be reported, but there is no requirement for applying corresponding adjustment for such ITMO at use/cancellation.

98. In relation to (a) the earlier possible action that is first transfer will trigger a corresponding adjustment.

99. The current provisions do not exclude the use of ITMOs authorized for use towards NDC to be used by the authorizing Party towards its own NDC but do not require the application of corresponding adjustments (as per paragraphs 13 and 14) in case of such direct domestic use where no first (international) transfer occurs.⁴¹ If the host Party transfers and re-acquires ITMOs it has authorized, corresponding adjustments shall be applied (as per paragraphs 13 and 14).

100. The current provisions also do not exclude the cancellation of ITMOs authorized for NDC only towards OMGE as per paragraph 39. If such ITMOs are cancelled domestically without first transfer, no corresponding adjustments would apply. Non-application of corresponding adjustment for such cancellations towards OMGE would be accompanied by retaining the MOs in the inventory of the host Party. This treatment would be inconsistent with the cancellation of ITMOs authorized for OIMP towards OMGE for which corresponding adjustment will be required.

101. For the analysis in this paper, it is assumed that if a host Party authorizes and uses its own ITMO towards NDC or OMGE, it will report the ITMOs from the point of authorization until their domestic use.

102. **Possible solutions:** The following are possible solutions in relation to first transfer:

³⁸ External registry transfer is when information on an ITMO for further tracking is passed from the holding registry onto an acquiring registry.

³⁹ A common definition of data attribute is a single-value descriptor for a data point or data object.

⁴⁰ Examples of actions on/transactions with ITMOs are authorization, issuance, acquisition, transfer, use and cancellation.

⁴¹ The host Party uses its own ITMOs towards NDC without transfer and re-acquisition.

(a) For ITMOs authorized for OIMP, the host Party provides the specification of first transfer at the level of the cooperative approach in its IR;

(b) For ITMOs authorized for both NDC and OIMP, the first chronological event that occurs as per paragraph 2 (b) is the first transfer;

(c) For ITMOs authorized for use towards NDC only, the definition of first transfer is extended to include direct domestic cancellation towards OMGE;

(d) For ITMOs authorized for use towards NDC only, the authorizing Party shall not count such ITMOs towards its own NDC, if used directly (without international transfer).

(f) Actions and holdings of ITMOs

103. Authorization, transfer, acquisition and use towards NDC and cancellation (voluntary or not) are required to be reported in the annual information as per chapter IV.B (Annual information). For the purpose of this paper, these are understood as **“actions” on ITMOs** that are required to be tracked in the Party’s registry referred to in section VI.A (Tracking).

104. Another term for action on ITMO is **“transaction” with ITMO**. Authorization could also be regarded as a transaction as it assigns/modifies ITMO attributes (e.g. the authorized use). In this paper, “action” on ITMO and “transaction” with ITMO are used interchangeably.

105. Concerning transfers and acquisitions, because the reporting is at a Party level, it is understood that transfers and acquisitions are reported only when they are international (between Parties).

106. Parties shall also report their **holdings** as per paragraph 20 (a). The holdings are understood as ITMOs held in accounts (or on accounts) of Parties’ registries (or in the registries to which Parties have access, as per paragraph 29). Holdings are balances at a given point in time, derived on the basis of all ITMOs authorized and acquired less ITMOs transferred, used, retired or cancelled. Holdings of ITMOs are reported annually and therefore balances are reported as at 31 December of the respective year.

(g) Sectors and activity types

107. Information on sector(s) and activity type(s) is a reporting requirement for the annual information as per paragraph 20. Information on the sector (used in singular) is a reporting requirement for the annual information as per paragraph 23(j).

108. This raises the issue of whether MOs/ITMOs could be attributed to only one or to more than one sector or activity type. A MO may be generated as a consequence of a cross-cutting activity or technology that affects several sectors and may even produce a negative impact in one sector and a positive impact in another, resulting in mitigation based on adding the impact in both sectors.

109. Allocation to sectors/activity types may need to be done at the time of MO/ITMO creation through a suitable methodology. Alternative methods, including post-creation of MO/ITMO, may be available.

110. Activity type(s) appear to relate to the methodology used in the generating activities. The reporting of activity type(s) may benefit from further clarification.

111. For the purposes of this paper, it is assumed that:

(a) Cooperative approaches would implement methods for allocation of ITMOs to a single sector for the requirements of paragraph 23 (j);

(b) Activity types refer to the type of mitigation activity and therefore the information provided should describe the mitigation activity.

112. Allowing the allocation of ITMOs to sectors and activity types to be determined at the cooperative approach level has the advantage of resolving the issue at the expense of comparability of information.

113. This issue is separate from but linked to the issue of nomenclature, discussed later (see section II.B.5).

114. *Possible solution:* The methods for allocating ITMOs to sectors and to activity types may be reported as part of the cooperative approach design.

(h) ITMOs in non-greenhouse gas metrics

115. Paragraph 1 (c) and paragraph 9 establish that ITMOs from a cooperative approach may be measured and traded in non-greenhouse gas (non-GHG) metrics determined by the participating Parties that are consistent with their NDCs. Information on the non-GHG metrics used by a participating Party is required in the IR as per paragraph 18 (c). Where a MO is measured and first transferred in a non-GHG metric, paragraph 22 (d) requires RI on how the cooperative approach ensures that the method for converting the non-GHG metric into tonnes of carbon dioxide equivalent (t CO₂ eq) is appropriate for the specific non-GHG metric and the mitigation scenario in which it is applied. Furthermore, an annual emissions balance⁴² is required in the RI as per paragraph 23 (k) (i) for t CO₂ eq and for non-GHGs.

116. It would be useful to examine if participating Parties have a common understanding on the reporting requirements related to non-GHG metrics, including on their application, in order to produce the required information.

(i) Annual information in relation to non-GHG metrics

117. Paragraph 20 (on annual information) does not require the quantities of ITMOs to be reported in non-GHG metrics, where relevant. However, in order to perform additions and subtractions as per paragraph 9 and to produce the annual information as per paragraph 23 (k) (ii), it is necessary to perform such operations in the respective non-GHG metric (i.e. the ITMOs and the indicator⁴³ being adjusted have to be measured in the same non-GHG metric).

118. Therefore, it is assumed that the ITMO metric must be specified when reporting annual information, both in the AEF and in relation to the annual information as per paragraph 23 (as both include information on first transfers and uses).

(ii) Application of conversion methods

119. Paragraph 1 (c) states that ITMOs from a cooperative approach are measured in non-GHG metrics determined by the participating Parties that are consistent with their NDCs. Further, paragraph 9 refers to a cooperative approach involving ITMOs traded in non-GHG metrics and includes the requirement for tracking the ITMOs in a metric-specific registry account as a basis for applying corresponding adjustments.

120. On the basis of these provisions, it is understood that participating Parties may trade ITMOs in the same non-GHG metric. It appears that the guidance does not provide for participating Parties to trade (first transfer and use) the same ITMO in more than one metric.⁴⁴

121. Paragraph 22 (d) specifies that non-GHG ITMOs are converted to t CO₂ eq when measured and first transferred. As first transfer relates to corresponding adjustments, the purpose of conversion is the calculation of an emission balance.

122. Furthermore, paragraph 22 (d) requires the cooperative approach to ensure that the method for converting non-GHG quantities into t CO₂ eq is appropriate for the mitigation scenario, which would guarantee that the MO is well estimated in t CO₂ eq independently of the mitigation scenario in which it takes place.

123. What is not explicitly stated but appears necessary is that, when participating Parties trade ITMOs in a non-GHG metric, but have different mitigation scenarios (e.g. trading ITMOs measured in megawatt hours (MWh) between participating Parties with different electricity generation mix), the using participating Party has to (re)estimate the amount of

⁴² Emissions balance is the adjusted value of emissions after application of corresponding adjustments.

⁴³ Indicator refers to the indicator selected by a participating Party in accordance with the MPGs for tracking progress towards the implementation and achievement of its NDC.

⁴⁴ Conversion between non-GHG metrics (in contrast to simple conversion from non-GHG metric to t CO₂ eq and vice versa) has significant complexity in terms of assessing implications in the context of specific mitigation scenarios. More so, conversion between non-GHG metrics could allow for ITMOs measured in t CO₂ eq to be traded for use towards non-GHG indicators.

ITMOs in the non-GHG metric based on the mitigated t CO₂ eq of the selling participating Party. This is necessary so that the using Party could apply corresponding adjustments equivalent to the same amount of t CO₂ eq as achieved by the host Party (but in the non-GHG equivalence appropriate to its domestic mitigation scenario), thus ensuring the overall consistency of emissions balances across participating Parties.⁴⁵

(iii) *Consistency in the application of conversion method*

124. For the purposes of TACCC (paragraph 7 chapeau), once non-GHG ITMO quantities are converted into t CO₂ eq, the t CO₂ eq value should remain constant, as further actions may be performed on the ITMOs. This implies that the conversion methods should be consistently applied throughout the NDC implementation period of the relevant participating Parties.

(i) **Global warming potential of ITMOs**

125. Participating Parties may use different GWP values for their first NDC, which could have an impact on the transparency and comparability of data related to ITMOs. Therefore, it would be relevant for participating Parties to provide information on the GWP values used in generating ITMOs in their first NDC (implementation) period.

126. Addressing the issue of transparency in relation to GWP values used, and associated comparability of information on ITMOs, in the context of cooperative approaches is challenging. Further analysis would be relevant to assess the significance of the potential impact of use of different GWP values.

127. Considering the requirement for aligning the use of GWP values for NDC from the second NDC implementation period onwards, enhancing transparency with regard to the use of GWP values for the first NDC implementation period may be sufficiently appropriate. Such transparency could be delivered through the IRs or in relation to the submission of annual information, the former option being simpler and straightforward.

128. **Possible solution:** Provision of information on GWP values in relation to ITMOs generated in the first NDC implementation period may be provided with the IR (on a voluntary basis).

(j) **Annual basis**

129. The provision of “annual information” is a requirement of chapter IV.B (Annual information), paragraph 20, and chapter IV.B (Regular information), paragraph 23. Annual information is understood to be:

(a) In relation to a calendar year (from 1 January to 31 December);

(b) Reported on an annual basis (as per paragraph 20) or biannually (as per paragraph 23).

130. Annual information is reported in relation to a “reported year”, the calendar year when the actions take place. If the reported year is YYYY, all actions that took place between 1 January YYYY and 31 December YYYY should be included in the annual information. Annual information submitted biannually entails two sets of data (one set for each of the reported years in the biannual period) submitted together.

(k) **ITMO time frame**

131. Paragraph 12 establishes a time limit on performing additions and subtractions for an NDC implementation period in relation to the initiation of the review of the first BTR that contains information on the end year or end of the period of the NDC, as determined by the CMA.

⁴⁵ This will ensure that the first transferring and using participating Parties will adjust their emissions with the same t CO₂ eq value, while their respective indicators may be adjusted with different amounts of ITMOs in the non-GHG metric, according to each domestic mitigation scenarios.

132. Considering that corresponding adjustments for the host Party are performed based on first transfer (additions or subtractions depending on the ITMO metric),⁴⁶ the following questions arise:

- (a) How to treat ITMOs that are not first transferred by the time limit of paragraph 12?;
- (b) How to treat ITMOs that are first transferred but not used or cancelled (i.e. held)?

133. With respect to (a) above, the authorized MOs (including authorized A6.4ERs) could not be claimed without the risk of double-counting once the time limit of paragraph 12 is reached for the host Party (because further additions or subtractions would not be possible for the NDC implementation period). Retaining such ITMOs in the system would create risks for market participants that would need to be managed.

134. A possible solution for MOs/ITMOs as per (a) above would be to “downgrade” them by updating their validity for uses(s). This may be particularly relevant to authorized A6.4ERs considering that unauthorized A6.4ERs would not be subject to a time limit as per the provisions of decision 3/CMA.3. Other solutions could also be explored.

135. With regard to (b) above, ITMOs that have been first transferred by the time of the limit as per paragraph 12 will be subject to additions or subtractions (in accordance with their metric) and would not carry a risk of double-counting (double-claiming). However, if such adjusted ITMOs are authorized for NDC use, but are not used by the end of the NDC periods of the participating Parties in the cooperative approach,⁴⁷ the objective of their subsistence⁴⁸ in the system becomes unclear. Such ITMOs may be repurposed for use towards OIMP or be cancelled for OMGE.

136. The question remains open as to the treatment of ITMOs authorized for OIMP and already adjusted for (by the host Party) at the time of the limit as per paragraph 12. Arguably, such ITMOs would retain their quality and desirability for their purpose (OIMP). While there is no risk of double counting associated with such ITMOs, their validity for ongoing use would have implications for the reporting of annual information. A straightforward approach for dealing with such ITMOs has not been identified; therefore, further analysis may be useful in this context.

137. It should be noted that the time limit set out in paragraph 12 is a date to be determined by the CMA that is prior to the initiation of the review of the first BTR that contains information on the end year or end of the period of the NDC. If the date to be determined by the CMA is not sufficiently in advance of the finalization and submission of the first BTR that contains information on the end year or end of the period of the NDC, the additions and/or subtractions for the NDC implementation period by the host Party may not be available until the subsequent BTR⁴⁹ to the one that contains information on the end year or end of the period of the NDC.

138. **Possible solution:** Clarification on the treatment of ITMOs in relation to the time limit as set out in paragraph 12, including through further analysis.

5. Nomenclature

139. Participating Parties, the secretariat, review experts and other stakeholders need a common understanding of the various elements to be reported and reviewed and in relation to the TACCC principles. The following is a non-exhaustive list of examples of terminology that have an impact on multiple reports and on the infrastructure: annual information, acquisition, cancellation, voluntary cancellation, transfer, holdings and registry accounts.

⁴⁶ See paragraphs 8, 9 and 10.

⁴⁷ As per paragraphs 8(b), 9(b) and 10(b), ITMOs are adjusted according to the year in which they are used; therefore, ITMOs cannot be used towards NDC after the last year of the NDC period of the using Party.

⁴⁸ Continued presence.

⁴⁹ Due to time lag in relation to vintage-based accounting for corresponding adjustments.

Furthermore, various lists of names are relevant to ITMO attributes. For example, sectors, activity types and international mitigation purpose.

140. To meet this need, the following, not mutually exclusive, options could be considered in relation to reporting but with an application to the guidance in general (i.e. with application to areas other than reporting):

(a) Providing instructions, including pre-defined lists (for example a list for possible actions with ITMOs or types of international mitigation purpose), directly in the tables and outlines on what is expected to be reported for a reporting element, to be adopted together with the tables and outlines;

(b) Producing a glossary of terms maintained by the secretariat;

(c) Keeping a nomenclature of cooperative approaches, sectors, activity types, such as the United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism (CDM) or Intergovernmental Panel on Climate Change (IPCC) methodologies, by the secretariat;

(d) For activity types that may be specific to one Party or one cooperative approach, the CARP could provide a function to register an activity type and receive a standardized code for use in ITMO data structures (see also section III.G.4).

141. The option of providing instructions directly in the tables and outlines improves their usability, as the necessary information is directly available to users when they prepare a report. It also offers more flexibility to Parties, as the instructions would aim only at improving the shared understanding with no strict normative function. This approach was used in developing the proposed tables and outlines included in this paper.

142. **Possible solutions:** The following are possible solutions in relation to nomenclature:

(a) Tables and outlines are agreed with a minimum level of instructions, thus enabling reporting Parties to provide consistent and comparable information;

(b) Nomenclature is clarified, including the methods for maintaining nomenclature and the role of the secretariat.

6. Confidentiality

(a) Party prerogative on identifying information as confidential

143. The reporting Party may identify what information in its submission is confidential (paragraph 24) so that non-confidential information is made public on the CARP (paragraph 24 and paragraph 36 (a)), including in relation to the consistency check performed by the secretariat (paragraph 33 (d)).

144. The tables and outlines need to be designed and implemented in the reporting tools in a manner that enables reporting Parties to identify confidential information. In addition, all information systems and tools (including reporting tools) need to be designed to protect and securely store confidential information.

145. Information identified by Parties as confidential will not be made public. Confidential information will be made available to the secretariat for consistency check (as per paragraph 33 (a)) and to the Article 6 TER team to conduct reviews. Both actors will be required to handle confidential information according to guidance to be agreed by Parties (see also section III.G.4 for discussion on how processes and tools could be designed to handle confidential information).

(b) Common criteria for identifying information as confidential

146. In addition to the provisions for Parties to identify information as confidential, there are reporting areas where a harmonized approach on the criteria for identifying information as confidential may be beneficial. This would promote comparability and would simplify the design of tables, outlines and reporting tools.

147. With regard to the **IR and the qualitative RI**, certain information on authorized entities could be regarded as sensitive (e.g. their representatives and contact details, other than postal address and registration number). With regard to authorized entity names, such information has been public in the Kyoto Protocol and is commonplace for different carbon offset standards and schemes.

148. No other information required in the IR and the qualitative RI appears to be sensitive and in need of protection, noting Parties' prerogative to determine otherwise.

149. With regard to the **annual information as per paragraph 20**, Parties may wish to consider designating detailed information as confidential to protect the private nature of legal arrangements and transactions across cooperative approaches. While the level of granularity of information in the AEF is not agreed, this paper takes the approach of low-level granular information captured in the AEF in support of enhanced consistency checks and resolution of reconciliation issues (see further discussion in section II.D.4).

150. Learning from the practice of the Kyoto Protocol, a straightforward approach to protecting confidential information would be to publish the AEF with aggregated information. Information on transactions and holdings in the Kyoto Protocol is reported aggregated in a standard electronic format. Detailed level transactions and holdings information was available to the secretariat through the international transaction log (ITL), including to identify and assist with the resolution of inconsistencies in data, but was not made public.⁵⁰

151. With regard to the annual information as per paragraph 23, most of the information is aggregated, with the exception of paragraphs 23 (d) and (j).

152. Irrespective of any further guidance on confidentiality that may be adopted by the CMA, participating Parties may practice a higher degree of transparency of information in the implementation of their cooperative approaches than what may be required by the guidance.

153. Discussions on the methods for identifying confidential information are included in sections II.C.5 and II.D.9 below.

154. **Possible solutions:** Approaches that may be incorporated in the reporting process in relation to confidential information:

- (a) Parties are enabled to identify confidential information through the reporting tables and outlines, as appropriate (to be agreed as part of the reporting formats);
- (b) Quantitative annual information as per paragraphs 20 and 23 is published at agreed aggregation level (to be agreed as part of the reporting formats);
- (c) The secretariat is requested to incorporate agreed confidentiality approaches in the reporting tools (Article 6 database and the CARP).

7. Alignment in the reporting by participating Parties in the same cooperative approach

155. Parties involved in the same cooperative approach are required to report information about:

- (a) The cooperative approach itself – in the IR (paragraphs 18 (g) to 18 (i) and paragraph 19) and in the RI (paragraph 22) – for inclusion in the CARP;
- (b) ITMOs from that cooperative approach in the annual information (paragraph 20) and the RI (paragraph 23), for inclusion in the Article 6 Database.

⁵⁰ It should be noted that decision 3/CMP.1 "Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol" and decision 13/CMP.1 "Modalities for the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol" required transaction-level information to be published. However, these requirements were not fulfilled by Annex B Parties, citing domestic legislation on data protection as the basis, and the practice of the CDM registry was aligned accordingly.

156. In line with the TACCC principles, the information reported by Parties about the same cooperative approach should be consistent.

(a) Consistency in quantitative information

157. For quantitative information, “consistent” could be interpreted as “equal” when the same amount is required to be reported by two or more participating Parties. For example, in the case of a transfer of ITMOs between participating Parties, the same (equal) quantitative information for t CO₂e would be expected to be reported by each participating Party.

158. Different methods could be employed to assist participating Parties with providing accurate, consistent and complete quantitative information. The following options are not mutually exclusive:

(a) Reliance on the consistency checks as per paragraph 33 (a) (ex-post, after information is submitted);

(b) Preventative controls (ex-ante), enabling pre-consistency checks to assist in preparing reporting formats;

(c) Encouraging participating Parties to adopt reconciliation procedures (including through their tracking arrangements) before submitting information;

(d) Prefilling annual information formats (AEF and for paragraph 23) on the basis of previously submitted information.

(b) Consistency in qualitative information

159. For qualitative information, in providing information from their respective perspectives, reporting Parties’ information pertaining to national circumstances and arrangements does not need to be aligned with other participating Parties’ information to satisfy TACCC (e.g. reporting on paragraph 18(i)(iii) is specific to a participating Party).

160. Qualitative information pertaining to a cooperative approach, such as in relation to sustainable development objectives as per paragraph 18(i)(ii), could be expected to be reported from the perspective of the reporting Party. In such case, there would be no expectation for full alignment with other participating Parties’ reporting.

161. Less clear is the situation with reporting requirements related to characteristics of the cooperative approach. For example, information in relation to paragraph 18(h) of the IR and the equivalent requirement as per paragraph 22(b) relate to the overall design of the cooperative approach, and it is unclear whether such information could be reported differently by participating Parties from the perspective of their national circumstances and arrangements. Clarity on any need for alignment of reported information may be achieved over time as experience is gained through the reporting and review processes.

162. If qualitative information is expected to be aligned between participating Parties’ reports to any extent, “consistent” could be interpreted at the minimum standard of being “free from contradiction”. Different methods could be employed to assist participating Parties with aligning relevant information. These same methods may be used by a reporting Party to ensure alignment with the information it reports over time:

(a) Search functions on the CARP to enable Parties to easily identify information from existing reports and copy/paste it to their next reports;

(b) Drop-down menus and prefilling. This could be particularly helpful in ensuring consistent use of cooperative approach identification across reporting tables and outlines.

163. Both methods involve reusing previously submitted information. For this to be possible, the information must be captured in a structured format from the outset. This has implications for the reporting format for the qualitative information. Ideally, the qualitative information would be collected through a template developed on the basis of agreed outlines. A template could the structure of the outlines and be available for completion offline or

online. The template would enable capturing and storing the submitted information in the CARP's data model so that it could be reused, including in online searches.⁵¹

164. The applicability of the methods discussed would depend on the interest among Parties to agree on structuring the information in the reporting formats and tools with the view to reusing previously submitted information. A structured approach to reporting formats is a simple, user-friendly and cost-effective method. It holds significant potential to enhance the consistency, accuracy and completeness of information. Clarity on if and what information should be aligned in the reporting by participating Parties would also be relevant. This discussion is continued in sections II.C.2(c) and III.G.4 below.

165. **Possible solutions:** The following are possible solutions in relation to consistency in qualitative information:

- (a) Use of methods to assist with alignment of qualitative information in the IR and RI within the reports of the same Party and between participating Parties, as appropriate;
- (b) Agreed reporting formats enabling qualitative information to be provide in the structured manner;
- (c) Request the secretariat to design and implement reporting tools with built-in methods that assist participating Parties with reproducing already submitted information (prefilling in generating/preparing reports).

8. Reporting by participating Parties in the mechanism established by Article 6, paragraph 4

166. The reporting obligations of Parties participating in the mechanism are discussed in section II.B.1 above.

(a) Level of reporting

167. There is a need to clarify if the mechanism is equivalent for reporting to a single cooperative approach, or if each activity in the mechanism is equivalent for reporting to a cooperative approach because it is at that level (of the activity) that the host Party provides approval and that other participating Parties provide authorization.

168. Reporting organized on activity level may increase the number and frequency of IR/UIRs, duplicating activity design information submitted in the mechanism. Therefore, it should be possible for participating Parties in the mechanism to report at the level of the mechanism, as well as on activity level. Certain accommodations would be needed to assist participating Parties with reporting information in relation to the mechanism that is not in their control.

(b) Initial report and the regular information

169. For host Parties in the mechanism, the majority of the IR requirements have corresponding requirements in the annex to decision 3/CMA.3, pertaining either to the participation of the Party in the mechanism (i.e. at Party level) or pertaining to the mechanism activities (activity design, approval and authorization).

170. Some provisions in the annex to decision 3/CMA.3 apply only to the host Party, in particular in relation to the participation requirements in the mechanism, the contribution to sustainable development, and the contribution to the implementation of the NDC, whereas the requirements to report on these elements apply to all Parties in the annex to decision 2/CMA.3.

171. To assist Parties participating in the mechanism with their reporting requirements, the following could be considered:

- (a) The SB could prepare standard information for reporting requirements of the IR and the RI and make it available to participating Parties in a suitable format. The standard

⁵¹ Information submitted in the form of PDF documents is not suitable for reuse.

information may be reproduced by the reporting Party or simply referenced (if made publicly available). The reporting Party may complement the standard information, as necessary;

(b) The reporting Party is able to pull a list of mechanism activities in which it participates, distinguishing where it is host Party and where it is other participating Party, and information on its authorizations from the mechanism information system.

172. Alternatively, the reporting Party could compile its own customized narrative for each of the requirements.

173. **Possible solution:** The SB to prepare standard information on the mechanism for use by participating Parties in the mechanism in their reporting under the guidance.

(c) Annual information

174. Authorized A6.4ERs are tracked in the mechanism registry. The mechanism registry may support prefilling AEFs or provision of the information necessary for inclusion in the AEF to each participating Party.

175. Paragraph 20 (a) requires the reporting of “voluntary cancellation of MOs and ITMOs towards OMGE”. Paragraph 69 (a), annex, decision 3/CMA.3 stipulates cancellation towards OMGE of A6.4ERs, including those that are ITMOs (authorized A6.4ERs). As those cancellations are relevant to corresponding adjustments, the AEF should include them.⁵²

176. **Possible solution:** The AEF includes cancellation for OMGE in addition to voluntary cancellation for OMGE as per paragraph 20.

(d) Use of certified emission reductions in the first NDC cycle

177. If Parties use certified emission reductions (CERs) towards achieving their first or first updated NDC in accordance with paragraph 75, annex, decision 3/CMA.3, the use will be subject to corresponding adjustment. This information would be relevant to reporting as per paragraph 23. Currently, paragraph 23 does not envisage reporting on pre-2021 CERs used towards NDC. This topic is a subject of a separate technical paper in relation to Article 6, paragraph 4. However, due to its relevance to reporting it is mentioned here and further in section II.C.4(b) below.

178. **Possible solution:** Reporting of use of pre-2021 CERs towards first or first updated NDC as per paragraph 75, annex, decision 3/CMA.3 is reflected in the reporting format for paragraph 23 in a coordinated manner with the structured summary as part of the BTR.

C. Tables and outlines for the initial report and the regular information

1. Content

179. In the UNFCCC practice, outlines are developed for reports containing primarily qualitative information. The outlines for reporting should address all elements of chapter IV.A (Initial report) and chapter IV.C (Regular reporting) of the annex to decision 2/CMA.3.

180. The outlines may include example text to serve as an instruction to Parties in drafting information, underscoring that any examples should not introduce further requirements. However, agreeing upon such example text as part of the outlines may be premature and difficult to achieve and have suggested that targeted capacity-building (training) materials could suitably fulfil the purpose of supporting Parties with completing reporting formats.

181. As reporting practice is built, example text could be elaborated at a later stage and considered further for incorporation in the outlines, if still relevant and needed.

⁵² Cancellations of unauthorized A6.4ERs towards OMGE may be handled through the reporting practice of the mechanism registry.

2. Structure and format

182. The outlines may usefully be organized in chapters and subchapters according to reporting requirements, which is a common practice in UNFCCC reporting.

(a) Organizing reporting elements in the outlines

183. Several approaches to organizing the provision of qualitative information through an outline are possible. The approaches could be combined:

(a) Capture in an allocated box (or similar) the information for the requirements in each paragraph as per the relevant reporting subchapter of the annex;

(b) Reporting requirements that have multiple elements or refer to other requirements could be broken down by those elements (for example, paragraph 18 (a) refers back to chapter II (Participation), which has multiple elements);

(c) Each box could bear a title as close as possible to the reporting requirement;

(d) Each box could be referenced to the underlying provision (paragraph).

184. Option (b) would promote completeness by facilitating the capture of all reporting requirements, without making it more difficult for the reporting Party. Not applicable (NA), or similar symbol, could be used to denote non-provision of information (to make it clear the entry is not omitted). Options (b), (c) and (d) are used in the proposed outlines.

(b) Format

185. The outlines could be made available to reporting Parties through a template via the reporting tool interface (the submission portal of the CARP).⁵³ The template could be very simple and offer the benefits of capturing information in a structured manner. The template could take the format of:

(a) A document with sections;

(b) Common tabular format (CTF), noting that tabular formats can include narrative information;⁵⁴

(c) A combination of both (a) and (b), where (b) would be used for information suitable for tabulation. For example, the requirements of paragraphs 18 (d) to 18 (e); 18 (g) “the expected mitigation for each year” and “the participating Parties involved and authorized entities” may be usefully tabulated. MPGs CTFs for information relevant to Article 6 reporting⁵⁵ have been suggested for use (see sections II.C.3 and II.C.4 below).

186. Each of the above formats could be converted to a portable document format (PDF) for publication. A template could be completed online or offline and be submitted through a submission portal or via an email. A template could be designed to support supplemental information.

187. The key advantage of a template is that it would capture qualitative information in a structured fashion, suitable for machine-reading and storage as per the data model of the CARP, and be available for reuse (through easy extraction) for later reports by any participating Party in the same cooperative approach. Thus, a template could offer significant benefits by simplifying and reducing the reporting burden on Parties and on secretariat and the Article 6 TER and is strongly recommended.

⁵³ The CARP, which includes the Article 6 database, is proposed to be implemented with a submission portal to manage communications and interactions with reporting Parties, similar to other reporting tools supported by the secretariat. For further information see section G.4(iv).

⁵⁴ This approach is used in Article 13 MPGs reporting formats.

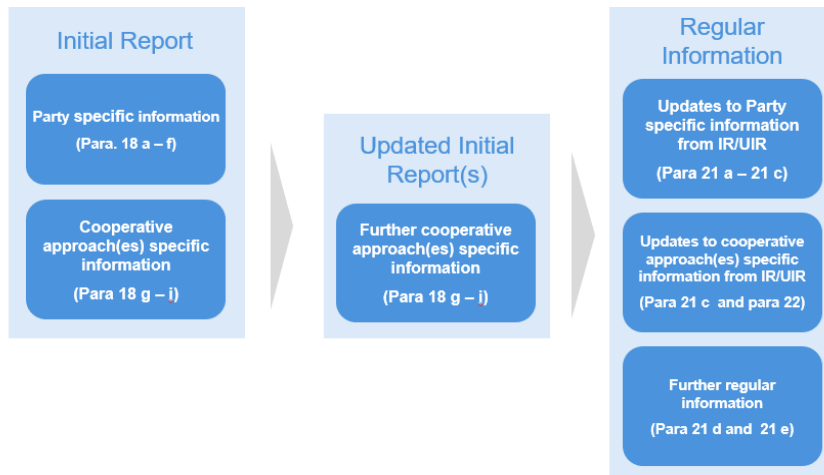
⁵⁵ For example, paragraph 64, annex, decision 18/CMA.1.

(c) **Overlapping reporting requirements**

188. Simplification opportunities for reporting on overlapping requirements⁵⁶ may arise in one of the following (see figure 2 below):

- (a) When an IR/UIR is submitted with the BTR;
- (b) When the RI in the BTR updates previously reported information.

Figure 2: Information from updated/initial report through reporting cycle



189. Possible methods for addressing the issue include:

- (a) *Cross-referencing* of previous submission/last update, including indication that there is no change from the previous submission/last update. For example, if an IR/UIR is submitted with the BTR, the repository of the information may be the IR/UIR with the annex 4 of the BTR (for the Article 6 regular information) cross-referencing the IR/UIR;
- (b) Reproducing previously submitted information through:
 - (i) *Copy-paste*; or
 - (ii) *Automated pre-filling*⁵⁷ of a reporting template.

190. Cross-referencing may be sufficiently transparent in the context of the CARP public interface, which is envisaged to maintain sections for each reporting Party, utilizing active navigation links for moving between submissions.

191. Structure and format are further discussed below in relation to each subchapter of chapter IV (Reporting).

3. Initial report

192. For structuring of the IR (as an alternative to no structuring), up to four sections have been identified by Parties which were considered.

193. The proposed outline includes the following sections:

- (a) Section A. Participation responsibilities;
- (b) Section B. Description of the Party's NDC, ITMO metrics, methods for corresponding adjustments, and quantification of NDC;

⁵⁶ Overlapping requirements are those where the RI updates information from the IR/UIR – for example para. 21(b) overlaps with 18(b) and so on.

⁵⁷ Prefilling a semi-automated pre-population of a reporting format (table or outline) with data/information already available in the reporting tool that supports pre-filling of reporting formats. The CARP (which also contains the Article 6 database and international registry) could be built with capabilities to prefill reporting formats on a demand basis to ease the reporting burden on Parties. It should be noted that the responsibility for final checks and overall validation of the reporting format content before submission would rest with the reporting Party.

(c) Section C. Information on each cooperative approach (one section per cooperative approach).

194. The proposed approach of grouping similar reporting elements aims to improve readability and user-friendliness. In addition, the outline incorporates simple tables, including:

(a) For the requirement of paragraph 18(b) on information in relation to paragraph 64 of the annex to decision 18/CMA.1, the table “Reporting format for the description of a Party’s nationally determined contribution under Article 4 of the Paris Agreement, including updates” from the Appendix to Annex II of decision 5/CMA.3, could be used (on a voluntary basis);

(b) Table for authorized entities, listing the entity names, country of incorporation and national/incorporation identifications numbers (assuming that a participating Party may issue authorization to foreign entity).

195. Following from the analysis in section II.B.4, reporting on several additional elements in sections B and C would appear to be helpful. The additional elements, except for the information on first transfer and methods for tracking ITMOs, could provide flexibility to Parties that may wish to provide such information on a voluntary basis (those elements are identified as optional in the outlines).

196. The reporting Party could also be given the possibility to include annex(es) – for instance, to include the list of project activities for Parties participating in the mechanism or any other relevant information they deem necessary. Supplementing information through an annex would simplify the template and improve consistency and comparability of reports.

197. The outline for the UIR should follow the outline of the IR for the relevant section on “Information regarding each cooperative approach”.

198. The proposed outline for the IR is contained in Annex I of this paper.

4. Regular information

199. In general terms, the RI includes qualitative information (paragraphs 21 and 22) and quantitative information (paragraph 23). The type of information indicates the need for different reporting formats (outlines for the qualitative and tables for the quantitative).

200. The qualitative information is to be submitted as Annex 4 “Information in relation to the Party’s participation in cooperative approaches” as part of the BTR.⁵⁸ The quantitative information is to be submitted to the Article 6 database. For the requirements of paragraph 23(j), the guidance specifies that this information should be submitted as part of the Annex 4 to the BTR. According to this, three reporting formats are proposed:

- (a) Annex 4 to the BTR outline for paragraphs 21 and 22;
- (b) CTF for paragraph 23 without paragraph 23 (j);
- (c) CTF for paragraph 23 (j), for inclusion in Annex 4 to the BTR.

(a) Paragraphs 21 and 22

201. The proposed outline for Annex 4 to the BTR for RI follows the approach for the IR, with relevant issues outlined below. It includes the following sections:

- (a) Section A. Information in relation to participation in cooperative approaches;
- (b) Section B. Information on each cooperative approach (one section per cooperative approach).

⁵⁸ See Annex IV to decision 5/CMA.3.

(i) *Updates to the information provided in the initial report as per paragraph 21(b)*

202. There is an overlap in the reporting requirements of the IR/UIR and the qualitative RI, which is the vehicle for keeping information from the IR/UIR up to date. Any of the methods as per section II.C.2(c) above could be adopted and made available.

(ii) *Information on authorizations as per paragraph 21(c)*

203. Paragraph 21(c) requires the reporting Party to provide information on “authorizations and information on its authorization(s) of use of ITMOs towards achievement of NDC and authorization for use for OIMP”. This information could be provided through documents, with descriptive and/or quantitative information or through references to public information. The extent of overlap with the requirements of paragraphs 20 and 23 could benefit from clarification.

204. With regard to reporting on changes to earlier authorizations, the scope of changes may be clarified (see also section II.B.4(d)).

205. The proposed outline for Annex 4 to the BTR for the qualitative RI mirrors the language of the requirements from the text. It is contained in Annex II of this paper.

(b) Paragraph 23 without paragraph 23(j)

(i) *Common tabular format for annual information as per paragraph 23 without paragraph 23(j)*

206. Paragraph 23 requires annual information reported biennially, i.e. the actions on ITMOs that took place from 1 January to 31 December should be provided for each year in the BTR period. The required information is quantitative in nature, is to be submitted to the Article 6 database and is to be included in the structured summary required pursuant to paragraph 77(d) of the annex to decision 18/CMA.1 as part of the BTR (further referred to as structured summary).⁵⁹ The information as per paragraph 23 reports the corresponding adjustments as applied by the reporting Party and will be checked for consistency with the AEF as per the requirements of paragraph 33(a).

207. The agreed formats “Table 4. Structured summary” as included in Annex II to decision 5/CMA.3 (where the information for paragraph 23 will be included) is an appropriate basis for the development of a reporting format for paragraph 23, except for the information as per paragraph 23(j), for which a separate format and repository⁶⁰ are envisaged in the guidance.

(ii) *Implications from vintage-based accounting*

208. Although the annual information as per paragraph 23 includes all actions that have taken place in the reported year, due to the vintaged-based accounting for first transfer, the first transfers (occurring in the reported year) of ITMOs with vintages older than the reported year would have to be presented and calculated with the corresponding adjustments for the corresponding vintage year. In other words, whenever “older than the reported year” vintages are first transferred in the reported year, the Party would be required to update the information submitted for the previous (vintage) years in the NDC implementation period as per the chapeau of paragraph 23, in order to recalculate the corresponding adjustments for the vintage years.

209. The proposed approach is that the CTF for paragraph 23 (without paragraph 23 (j)) includes previous years (before the reported years but within the NDC implementation period) to reflect vintages of the ITMOs transacted in the reported years. Recalculation of the corresponding adjustments for previous years, as relevant, will happen directly in the structured summary included in the BTR.

⁵⁹ See decisions 18/CMA.1 and 5/CMA.3.

⁶⁰ The repository for this information is understood to be the CARP.

210. Corrections in relation to previous years (before the BTR period and within the NDC implementation period) could be submitted through re-submission of CTFs for the previous years.

(iii) *Implications of multiple indicators*

211. The purpose of the information as per paragraph 23 (which feeds into the structured summary of Article 13) is to produce adjusted indicators and an emission balance for comparison with the reporting Party's NDC targets and emission trajectories (as per paragraph 7).

212. For transparency, the corresponding adjustments and related reporting elements (the net annual quantity of ITMOs calculated as the difference between first transfers and uses towards NDC) should be reported for each indicator (in non-GHG metrics) and for the emission balance (in t CO₂ eq). Therefore, it is proposed that the requirements related to indicators be reproduced for each indicator (a separate row allocated per indicator). This would enable the reader to understand the calculations.

(iv) *Paragraph 23 (d)*

213. It would be helpful to clarify the granularity in which Parties will report on paragraph 23 (d). The structured summary of Article 13⁶¹ includes a single line to cover paragraph 23 (d), with no space to capture granular information on the authorized entities. The "annual amount" may be understood as an aggregated value relating to OIMP or its sub-uses (Other or international mitigation purpose of even lower level). The capture of a list of entities with each amount will make the entry and reading more complex.

214. The single-line approach is retained for the CTF for paragraph 23. One options for providing information would be to provide a link to where it is publicly available. Should granular information be needed, a possible solution is to supplement the line for paragraph 23 (d) with a supporting CTF. See a proposal in the section II.C.4(c) on reporting format for paragraph 23 (j) below.

(v) *Paragraph 23 (h)*

215. Paragraph 23 (h) requires the cumulative information in respect of the annual information referred to in paragraph 23 (f), as applicable. Although the proposed CTF for paragraph 23 is for annualized data, the line for information as per paragraph 23 (h) would have to be a cumulative value as at the end of the reported year, summing up all previous years of the NDC period and the reported year. See example in the Excel version of the CTF for paragraph 23 in Annex IV of this paper.

(vi) *Use of CERs towards first or first updated NDC*

216. Paragraph 23 does not clarify how corresponding adjustments in relation to the potential use of CERs towards first or first updated NDC in accordance with paragraph 75, annex, decision 3/CMA.3, would be applied. For the purposes of TACCC, the application of corresponding adjustments for the use of CERs would require a resolution, including at the level of the CTF for paragraph 23 and with corresponding implications for the structured summary as part of the BTR. This issue is a subject of a separate technical paper as per the SBSTA 56 conclusions on item 13.⁶² Concrete proposals could be developed, once Parties are able to consider the issue. Use of CERs is not accommodated in the proposed tables and outlines, included in this paper.

(vii) *Other considerations*

217. As with any reporting format, it should be possible to offer prefilling of the CTF for paragraph 23 on the basis of the records in the Article 6 database, the international registry

⁶¹ See table 4 of annex II to decision 5/CMA.3.

⁶² See SBSTA 56 conclusion on item 13 "Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement and referred to in decision 3/CMA.3" available at: <https://unfccc.int/event/sbsta-56#eq-25>.

and the CARP (which contains the above two systems). Information relevant to the prefilling of the CTF for paragraph 23 would also be available in the mechanism registry and in the enhanced transparency framework (ETF) reporting tools (information in relation to national inventories).

218. To the extent that Parties wish to utilize prefilling of reporting formats, the secretariat may be requested to explore possibilities for pulling together information from the CARP, the ETF reporting tools and the mechanism registry database to provide comprehensive prefilling of reporting formats.

219. A proposed CTF for paragraph 23 is contained in Annex IV of this paper. In addition, a table with example entries is provided in Excel format (referenced in the same annex).

(c) Paragraph 23(j)

220. Paragraph 23 (j) requires an additional level of detail in relation to the information for paragraphs 23 (c-e) in a separate reporting format to be included in the annex referred to in paragraph 22 of the guidance. The reference to paragraph 23 (c-e) appears to refer to paragraphs 23 (c), 23 (d) and 23 (e).

221. One of the required details for the information as per paragraph 23 (j) is “sector” (used in singular), implying that a given ITMO is attributed to a single sector. This is in contrast to the annual information in the AEF, where it is required that annual information be provided in relation to sector(s). For the reporting format for paragraph 23(j), a literal interpretation of the word “sector” suggests that ITMO quantities will be allocated to a single sector (which may be achieved through allocation/estimation of quantities per sector). See discussion in section II.B.4(g) above.

222. As the information required as per paragraph 23 (j) is mostly in relation to quantitative information and is suitable for tabulation, the proposed format is a CTF. For the purposes of this paper, a CTF for paragraph 23 (j) in relation to paragraph 23 (d) is also included, with some modifications, but it may be dropped if not required or further modified to possibly cater for paragraph 23 (d).

223. Paragraph 23 (j) requires the information to be in the annex referred to in paragraph 22. This information will not be submitted to the Article 6 database.

224. Depending on the aggregation level that may be agreed for the AEF, the CTFs for paragraph 23(j) in relation to paragraphs 23(c) and 23(e) may be generated from the AEF (if the AEF is agreed at a lower granularity level as proposed).⁶³

225. Corrections in relation to previous years (before the BTR period and within the NDC implementation period) could be submitted through re-submission of CTFs for the previous years.

226. Proposed CTF for paragraph 23 (j) is contained in Annex IV of this paper. In addition, a table with example entries is provided in Excel format (referenced in the same annex).

5. Confidential information

227. Issues related to confidential information are discussed in section II.B.6 above.

228. With regard to enabling Parties to identify confidential information that is not to be published, any of the following methods may be adopted:

(a) Templates for the outlines and CTFs contain specific fields for confidential information;

(b) Outlines and CTFs are submitted in two versions, where one of the versions contains only non-confidential information;

(c) A variant of (a) and (b) is to provide for a separate annex to each outline or CTF for Parties to submit confidential information.

⁶³ The issue of use of “sector(s)” in paragraph 23 (b) and “sector” in paragraph 23 (j) is discussed in section II.B.4(g).

Option (a) could not be implemented for non-structured submissions (PDFs). Option (c) is proposed.

229. **Possible solutions:** The following are possible solutions in relation to the tables and outlines:

(a) The proposed tables and outlines for IR and RI included in Annex I and Annex II;

(b) The proposed CTF for paragraph 23 without paragraph 23 (j) and proposed CTF for paragraph 23 (j) included in Annex IV;

(c) Providing for the application of corresponding adjustments on the basis of use of CERs towards first or first updated NDC in a coordinated manner with the structured summary as part of the BTR;

(d) Corrections in relation to previous years (before the BTR period and within the NDC implementation period) can be submitted through re-submission of CTFs for the previous years;

(e) To the extent that Parties wish to utilize prefilling of reporting formats, request the secretariat to explore possibilities for pulling together information from the CARP, the ETF reporting tools and the mechanism registry database to provide comprehensive prefilling of reporting formats to interested Parties;

(f) Identification of confidential information through a dedicated annex to each table and outline.

D. Agreed electronic format

1. Content

230. The information to be included in the AEF is provided in paragraph 20. The information is tracked in registries as per chapter VI.A (Tracking) and is to be provided on an annual basis (for a calendar year) by 15 April of the subsequent year, for recording in the Article 6 database. The AEF is the main reporting vehicle for quantitative information on ITMOs and is an input to the consistency checks on ITMO data between participating (trading) Parties as per paragraph 33(a). The annual information in the AEF is closely linked to the annual information as per paragraph 23, the latter submitted biannually with the BTR. Considerable part of the annual information as per paragraph 23 is an aggregated view of the annual information submitted in the AEF.

231. The guidance as per paragraph 20 leaves scope for interpretation. A thorough analysis of the content of the AEF, considering links to other reporting elements, has resulted in identifying minimum additional elements for inclusion in the AEF and specific approaches for capturing and presenting the information. Those are discussed below.

2. Structure and format

232. According to paragraph 20 (a), the information to be reported can be divided into two categories: actions on ITMOs; and holdings of ITMOs. The two categories are essentially different sets of information, the first being the operations performed on ITMOs, also actions or transactions, over a period of time; the second being the balances of ITMOs at a given point in time.

233. Paragraph 20 does not require actions to be reported according to the dates on when they occur.⁶⁴ This is based on the assumption that the attributes of IMTOs and authorizations remain stable. As no date-related information is required in the guidance, it can be assumed that the information on holdings is required as at the end of the reporting period (the respective calendar year).

⁶⁴ It is assumed that date/time information on transactions will be tracked in the registries even when not reportable.

234. Combining the actions and holdings in a single table appears impractical, as each reported action would require a recalculation of the holdings. Furthermore, as no chronology of the actions could be established in the absence of information on dates, such combination may be confusing. A suitable option for structuring the AEF is to organize the data in two tables:

- (a) CTF for actions (transactions) with ITMOs;
- (b) CTF for holdings at the end of each calendar (reported) year.

3. ITMO attributes

235. A key assumption for the construction of the AEF is that ITMO characteristics (attributes) are immutable. The AEF is not chronological in nature⁶⁵ but captures all actions for a reporting period. If changes to attributes are permissible (e.g. to authorizations), the AEF would need to be extended to capture additional information, such as date of action. This would be required to perform the consistency check as per paragraph 33(a).

4. Granularity

236. Paragraph 20(b) requires data elements to be reported in relation to the information required as per paragraph 20(a). As such, the elements of paragraph 20(b) establish the highest possible aggregation of the information as per paragraph 20(a). However, it is not clear if granular or aggregated information on ITMOs should be presented. Both possibilities are available:

- (a) Reflecting operations processed on ITMOs in the registries;
- (b) Reflect aggregated operations on ITMOs in the registries at the maximum aggregation level as per paragraph 20(b).

237. Both options are valid. The difference between the two options lies mainly in the consistency checks that can be performed and the usefulness of the information from the consistency checks to the Parties in case inconsistencies are detected.

238. It is **important to note** that neither the level of granularity nor the consistency checks could in themselves guarantee the avoidance of double-counting. The avoidance of double-counting rests primarily with the registries that track the underlying MOs/ITMOs, including ITMO exchanges between registries (where applicable) and the application of corresponding adjustments according to paragraph 7. The methods through which registries achieve the avoidance of double-counting and the minimum standards they need to meet are discussed in section III.E below.

239. With regard to the consistency checks that could be performed according to the level of aggregation of data, the following may be considered:

(a) For disaggregated information – actions are reported at the registry record level, allowing for detailed consistency checks to easily identify matching entries between two participating Parties and to pinpoint errors that may be identified. This could assist Parties with reviewing their records and remedying any inconsistencies quickly;

(b) For aggregated information – if inconsistencies are identified, more than two Parties in a cooperative approach may be forced to review all actions that have occurred to resolve inconsistencies, potentially complicating, and making more effort-intensive, the process of inconsistency resolution.

240. The approach taken in developing the CTFs for the AEF is the provision of disaggregated information, considering that this can be a good starting point if aggregation is to be pursued. Aggregated versions of the CTFs are also included in the proposed AEF but as a method of protecting sensitive (confidential) information for publishing.

⁶⁵ No chronological information is specified in paragraph 20.

5. Common lists of values

241. Paragraph 20(b) requires reporting ITMOs by sector(s) and activity type(s). However, the guidance does not provide clarity about how sectors or types are defined, or how those lists are maintained. Relevant issues are highlighted in section II.B.5 above.

6. Actions with ITMOs

242. This section includes considerations related to the fields in the CTF for actions with ITMOs.

(a) Cooperative approach

243. It is assumed that tracking and reporting of ITMOs is in relation to a cooperative approach and that ITMOs can be exchanged between the participating Parties to the cooperative approach. As discussed in the section on reporting elements II.B.4(a), a cooperative approach should be identifiable, tracked and recorded consistently for the duration of the NDC implementation period of the reporting Party.

244. Data in the proposed AEF is organized according to a cooperative approach. The identification of a cooperative approach⁶⁶ would be determined by the participating Party that first submits an IR/UIR for the cooperative approach. The field for the cooperative approach may contain the name of the cooperative approach or a unique identifier or both.

(b) ITMOs details

245. This section should be read in conjunction with section II.B.4.

(i) Unique identifiers for ITMOs

246. A key consideration in the construction of the AEF is the utilization of unique identifiers. The mention of unique identifiers at the end of paragraph 20 (b) "(...) and unique identifiers" leaves open to interpretation what the unique identifiers are related to. It has been suggested that the use of unique identifiers in paragraph 20(b) is not necessarily in relation to ITMOs but to each of the reportable elements as per paragraph 20(a).

247. What is worth noting is the value added by the use of unique identifiers. The unique identifiers permit the unique identification and accurate tracking of data elements such as ITMO amounts, but also authorizations, transactions (transfer, acquisition, use, cancellation), accounts and so on. Unique identifiers are a widely used method for organizing data, and their application in databases is ubiquitous.

248. Methods for tracking ITMOs are outlined in section II.B.4(b) above and discussed in section III.D.1 below. For ease of reference, the methods are reproduced here:

- (a) Serialized units;
- (b) Uniquely identifiable accounting amounts (UIAAs);
- (c) Balance-only accounting amounts (BOAAs);
- (d) Balance in a higher-tier accounts (BHTA).

249. Two of those methods – (a) and (b) – involve the assignment of unique identifiers to ITMOs by the registries that track them that are unique for the cooperative approach within which ITMOs are tracked.⁶⁷

⁶⁶ A cooperative approach could be identified through a name or a unique identifier. See section II.B.4(a).

⁶⁷ Cooperative approaches that may utilize crediting standards with an existing legacy system (such as registries) may adopt approaches to securing the uniqueness of unique identifiers within the cooperative approach – for example, by attributing (supplementing) the unique identifier of the tracking registry to the unique identifier of an ITMO. Such approaches could be accommodated in the AEF, if envisaged.

250. The AEF contains four columns for the section “ITMO IDs”. This is designed to accommodate different methods of tracking ITMOs (units or UIAAs), noting the following in relation to the intended use of those columns:

- (a) “ID/First ID” is to be used for:
 - (i) The unique identifier of an ITMO tracked as an individual amount for a certain quantity in the respective metric;
 - (ii) The first unique identifier of a block⁶⁸ of serialized units;
- (b) “Last ID” is to be used for the last unique identifier in the block. Not applicable (NA)” would be indicated for ITMOs tracked as individual amounts;
- (c) “First serial number”; and
- (d) “Last serial number”.

251. First/Last serial numbers are supplemental information only for ITMOs tracked as serialized units and is intended to capture the serial number of the first and the last ITMO in the block from within the full ITMO unique identifiers, without imposing rules on constructing the ITMO unique identifiers.⁶⁹

252. Because more than one tracking method may be adopted for ITMOs (between cooperative approaches), flexibility at the AEF level to accommodate the diversity of ITMOs should be pursued. The proposed AEF is designed to achieve this aim. For reporting ITMOs tracked as BOAAs (discussed in section III.D.1(c) below), the method associated with the highest data consistency risk, supplemental information, including on a voluntary basis, may be accepted in relation to the AEF. For example, if a BOAA is created annually for all domestic uses towards OIMP, disaggregated supplemental information related to individual MOs may be provided by the reporting Party.

253. For reporting of ITMOs as UIAAs, the possible split of UIAAs (discussed in section III.D.1(b) below) would require separate entries in the AEF for the resulting split amounts, under a dedicated action type “UIAAs split”. If the UIAAs method for tracking ITMOs is permitted, the AEF will be modified to accommodate for the split action.

254. For reporting of ITMOs as BHTAs (discussed in section III.D.1(d) below) the unique identifiers of the underlying tracking instruments may be provided in lieu of ITMO unique identifiers. If the BHTAs method for tracking ITMOs is permitted, the AEF will be modified to accommodate for an indication that the reported unique identifiers relate to underlying tracking instruments.

255. Non-inclusion of ITMO unique identifiers in the AEF corresponds to aggregation of information on the actions and holdings of ITMOs with the corresponding limitations on the consistency check and the potential resolution of inconsistencies. This is discussed in section II.D.4 above, where it is also recognized that disaggregated information and consistency checks are, in themselves, not strong enough methods to guarantee TACCC. However, reporting disaggregated information on the basis of unique identifiers for key data elements (e.g. ITMOs, authorizations, possibly actions) could significantly increase the contribution of the international reporting process towards TACCC, owing to the traceability of the ITMOs to the source registry.

(ii) *Metric and quantity*

256. Metrics and quantities are not explicitly required in paragraph 20. However, they are needed to accommodate the reporting of ITMOs measured in non-GHG metrics as per

⁶⁸ A “block” of serialized units is a concept used in the Kyoto Protocol and carbon-crediting schemes that track offsets as units. The block is a group of sequentially serialized units that are tracked together until divided.

⁶⁹ This is intended to improve the readability of information. For example, in a block of ITMO unique identifiers that is CO202312345NO - O202312347NO, the numbers 12345 and 12347 correspond to the serial numbers to be included in the columns for first/last serial number.

paragraph 1 (c) and to reconcile (check for consistency) the information in the AEF with the information required by paragraph 23 for ITMOs measured in non-GHG metrics.

(iii) *Sector(s) and activity type(s)*

257. Sector(s) and activity type(s) are required as additional information when reporting on ITMOs as per paragraph 20 (b) and paragraph 23 (j). This poses the question of how ITMOs are allocated to a sector(s) or activity type(s). See also section II.B.4(g).

258. Concerning *sectors*, the guidance does not specify how these are defined. There are several possibilities, of which the following two were considered:

(a) 2006 IPCC sectorial separation in the "2006 IPCC Guidelines for National Greenhouse Gas Inventories" (four sectors);⁷⁰

(b) According to the sectorial scope of the CDM (15 sectors).⁷¹

259. Other options may be available such as reference to indicators. For the proposed AEF, the IPCC guideline option was incorporated.

260. For *activity types*, the option of specifying the mitigation type is used in the proposed AEF. For a discussion on nomenclature (list of values), see section II.B.5.

(c) **Authorization**

261. Paragraph 20 requires information on authorization towards use(s). The three possible options are NDC, OIMP, and NDC and OIMP. Any specific uses as per paragraph 55, annex, decision 3/CMA.3 are not considered for the AEF.

262. Authorization is an action (also a transaction)⁷² on ITMOs and should be included in the AEF either at the time the authorized ITMO is created for tracking in the registry of the reporting Party or at the time a MO tracked in the registry is authorized. Authorized ITMOs (including before any other actions being performed on them) become holdings.

263. Identification of authorizations of ITMOs towards use(s) (through the use of unique identifiers) would facilitate the traceability to the underlying MOs/ITMOs. The reporting of authorization unique identifiers could be considered in the light of a trade-off with the provision of ITMO unique identifiers in assisting with verification of reported ITMO quantities. Authorization is discussed in section II.B.4(d) above.

(d) **First transfer definition**

264. First transfer definition is an element necessary to identify actions that are first transfers. First transfer is discussed in section II.B.4(e) above.

(e) **Actions**

(i) *Actions*

265. Actions (transactions) are the elements included in paragraph 20(a) – transfer, acquisition, cancellation, voluntary cancellation, voluntary cancellation towards OMGE, use towards NDCs. Retirement as per paragraph 63, annex, decision 3/CMA.3 is also included.

⁷⁰ Energy; Industrial Processes and Product Use (IPPU); Agriculture, Forestry and Other Land Use (AFOLU); and Waste.

⁷¹ Energy industries (renewable/non-renewable sources); Energy distribution; Energy demand; Manufacturing industries; Chemical industry; Construction; Transport; Mining/Mineral production; Metal production; Fugitive emissions from fuels (solid, oil and gas); Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride; Solvents use; Waste handling and disposal; Afforestation and reforestation; and Agriculture.

⁷² Authorization is regarded as a transaction because it assigns/modifies ITMO attributes, i.e. the authorized use.

(ii) *Levy of share of proceeds for adaptation*

266. Paragraph 58 of the annex to decision 3/CMA.3 requires first transfer of 5 per cent of the issued A6.4ERs to an account held by the Adaptation Fund (AF) as a mandatory contribution for assisting developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the cost of adaptation.

267. The AF account is therefore a special-purpose account, enabling the Trustee to the AF to monetize the A6.4ERs. This AF account does not “belong” to any Party. Therefore, transfers from the AF would not fall under the reporting of participating Parties⁷³ but need to be recorded in the Article 6 database to ensure the completeness of data. The following approaches were considered:

(a) Including the AF in the list of values for “Parties” to allow transfers and acquisitions from/to the AF account to be identified;

(b) Including “Transfer to the Adaptation Fund” and the “Transfer from the Adaptation Fund” in the list of actions.

268. Option (b) is used for the proposed CTF for action, as it is considered to better reflect the nature of the action.

269. It is considered that only transfers to and from the AF account for authorized A6.4ERs (ITMOs) would be reported (transfers of any unauthorized A6.4ERs would not be reported in the AEF).

(iii) *Cancellation*

270. Cancellation is used in the guidance without differentiation. In the case of voluntary cancellation, a distinction is made between voluntary cancellation towards OMGE and voluntary cancellation in general. Likewise, it is expected that cancellations would also need differentiation for tracking purposes. Types of cancellations that may be envisaged in addition to use for OIMP and cancellations towards OMGE are cancellations for reversal in removals (if relevant rules are agreed) or administrative cancellations (e.g. for corrective actions or in relation to “end of life” removal of ITMOs from the system).

271. For the proposed CTF for actions, action “Cancellation” is considered to be in relation to use towards OMIP.

272. “Cancellation for OMGE”, which is mandatory as per paragraph 69, annex, decision 3/CMA.3, is also included to capture the cancellation of authorized A6.4ERs.

273. Further cancellation types may be included, as necessary.

(iv) *External use or cancellation*

274. According to paragraph 2(b), it appears that first transfer may occur in the registry of another participating Party, which is not the host Party, when an ITMO is internationally acquired.

275. With the view to TACCC, the following should be considered:

(a) The host Party should report all first transfers that relate to it in the context of application of corresponding adjustments (see also section II.B.1 above);

(b) A participating Party should report cancellation or use that is first transfer for ITMOs acquired through an international transfer.

276. Thus, cancellation or use that is first transfer after international transfer would be reported by the host Party and by the participating Party that performs the action. The consistency check would be designed to reconcile such information between the host Party and the other participating Party, without identifying duplications.

⁷³ Host Parties will report the transfers to the AF account.

(v) *Unique identifiers for actions on ITMOs*

277. Unique identifiers for actions/transactions on ITMOs could be a supplement to or a substitution for the reporting of unique identifiers for ITMOs. Reporting the transaction unique identifiers under similar conditions as for ITMO unique identifiers (i.e. uniqueness within a cooperative approach, including in conjunction with a tracking registry) could play a role in enhancing the consistency check and potential for fast resolution of any potential inconsistencies.

(vi) *Transfers and acquisitions*

278. With respect to transfers and acquisitions, to interpret the information unambiguously, it is necessary to specify who is the transferring participating Party and who is the acquiring participating Party.

(vii) *The other international mitigation purpose*

279. Paragraph 20(b) requires information on “the other international mitigation purpose authorized by the Party” in relation to the elements of paragraph 20(a).

280. As per paragraph 1(f), there is no requirement for authorization of ITMOs towards a subset of OIMP. This raises the question of how such information is tracked and towards which elements it is supposed to be reported. For example, is it reported in relation to all actions or only towards uses/cancellations when the OIMP is realized?

281. For the proposed AEF, a separate column “OIMP” is included in the section on “Actions”. However, placement in relation to “Authorizations” may be considered, according to the clarification of the issues discussed in section II.B.4(d) above.

(viii) *Using participating Party or authorized entity or entities*

282. Paragraph 20(b) requires reporting of “the using participating Party or authorized entity or entities, as soon as it is known”. Given that there is no requirement to authorize entities in relation to a specific use(s), the proposed AEF includes this information in relation to: "Cancellation", "Voluntary cancellation", "Voluntary cancellation towards OMGE", "Use towards NDC", "External use or cancellation", or "Retirement".

(ix) *First transfer*

283. For the AEF, first transfer is understood to be an indicator (or a flag) if an action is a first transfer or not, as per paragraph 2. “Yes” is required if the action constitutes a “first transfer”. For ITMOs authorized for NDC and OIMP, the “first transfer” is the earliest occurring action that meets the criteria for a first transfer. Not to be confused with “First transfer definition” element.

7. Holdings of ITMOs

284. The CTF for holdings of ITMOs presents the holdings of ITMOs as at the last day of the reported year. The CTF for holdings is the CTF for actions without the section on “Actions” (i.e. without the last seven columns of the CTF for actions).

285. Considerations in relation to the CTF on actions apply to the relevant sections (columns) of the CTF on holdings.

8. AEF from the administrator of the mechanism registry

286. Transactions with authorized A6.4ERs from the AF account are not associated with any participating Party (see section II.d.6(e) above). For completeness of information and to enable the consistency check, the administrator of the mechanism registry should be required to produce an AEF to record the transactions with authorized A6.4ERs⁷⁴ to and from the AF account into the Article 6 database. As such, the AEF would relate to a specific account (AF

⁷⁴ Paragraph 37 is not understood to include in-kind contributions to the AF through its account with the mechanism registry.

account) but it should not be made public.⁷⁵ Its submission should align with the submission of AEFs by participating Parties.

287. Another special case is the mechanism registry cancellation and use accounts. While participating Parties would report their cancellations and use actions, cancellation and use accounts may be shared at the mechanism registry level. Therefore, the holdings in such cancellation/use accounts may be usefully included in the AEF of the administrator of the mechanism registry to enhance the consistency check as per paragraph 33 (a).

288. In addition to the AEF by the mechanism registry administrator, it is proposed that the full set of mechanism registry data related to authorized A6.4ERs and A6.4ERs involved in share of proceeds for adaptation and cancellations for OMGE be made available to the Article 6 database to support the consistency check as per paragraph 33 (a). See discussion in section II.E.6(e).

289. If relevant, similar considerations may be applied in relation to the international registry once its functions are clarified.

9. Confidential information

290. Issues related to confidential information are discussed in section II.B.6 above.

291. With regard to enabling Parties to identify confidential information, which is not to be published, the following methods may be considered:

(a) Common approach for all participating Parties, whereby only an aggregated AEF (aggregated CTF for actions and aggregated CTF for holdings) is published;

(b) Parties are enabled to identify confidential information on a line-by-line basis or on an individual cell/field basis for a disaggregated AEF;

(c) AEF to be submitted in two versions, where one of the versions contains only non-confidential information;

(d) A variant of (c) is to provide for a separate annex to the AEF CTFs for Parties to submit confidential information.

292. The time lag in submitting annual information (once per year, 105 days after the end of the year) brings into question the use of disaggregated information to the public. Furthermore, a common rule has the benefit of uniform treatment at the level of the guidance (across cooperative approaches). Therefore, publishing aggregated AEFs is considered the suitable approach. This would be consistent with the de facto practices⁷⁶ under the Kyoto Protocol and various voluntary standards that align with domestic legislation on data protection.

10. Proposed AEF

293. A proposed AEF is included in Annex III (aggregated and disaggregated). In addition, tables, with example entries, are provided in Excel format (referenced in the same annex).

294. **Possible solutions:** The following are possible solutions in relation to the AEF:

(a) The proposed AEF included in Annex III;

(b) The administrator of the mechanism registry to submit a defined AEF with data not captured by Parties' AEFs;

⁷⁵ In the Kyoto Protocol practice, the CDM registry administrator produces and submits, to the administrator of the international transaction log, a standard electronic format which is not a public document.

⁷⁶ Decision 3/CMP.1 "Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol" and decision 13/CMP.1 "Modalities for the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol" required transaction-level information to be published. However, these requirements were not fulfilled by Annex B Parties, citing domestic legislation on data protection as the basis, and the practice of the CDM registry was aligned accordingly.

- (c) Publishing of aggregated AEFs.

E. Submission process

295. This section discusses the submission process for the IR, annual information and RI. Discussion is also included on how to correct previously submitted information, including in response to issues identified by the consistency check.

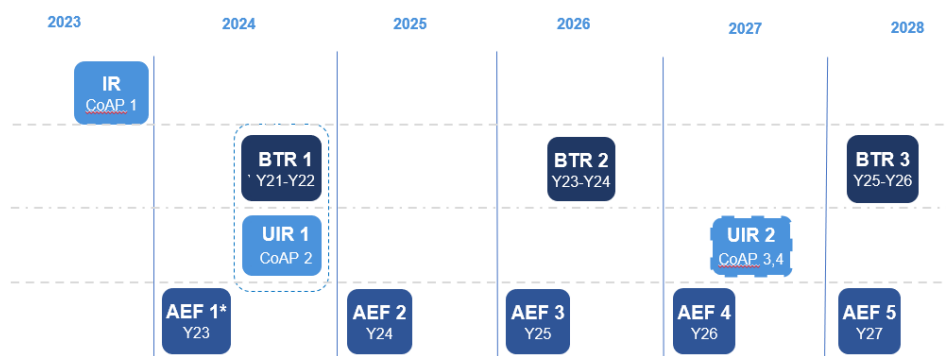
1. Submission timeline

296. The information required as per chapter IV (Reporting) is summarized in figure 1 above. Assumptions in relation to the submission timeline are discussed in section II.B.3.

297. Figure 3 is an illustrative example of a submission timeline for reporting. The years are the years in an NDC implementation period for a reporting Party. The illustration is not representative of the first NDC implementation period, noting that most Parties would not be able to submit an IR before the third year of their NDC implementation period due to ongoing elaboration of elements related to implementation of reporting.

298. It appears that an IR should be submitted prior to reporting ITMOs in an AEF (or at the same time). A UIR appears to be required with the BTR. It is unclear if a participating Party that may wish to submit a UIR ahead of its next BTR is able to do so (UIR 1 in the example may have to be submitted with BTR 1). Annual information as per paragraph 20 is submitted through an AEF by 15 April for the previous year. RI is submitted as an annex 4 to the BTR, which covers two reporting years. The BTR is submitted according to the MPGs for Article 13.

Figure 3: Example of a timeline for reports by a participating Party



*AEF 1 may come in more than one set, i.e. for year 2023 and any previous year, as relevant.

2. Initial report and updated initial report

299. An IR is submitted prior to reporting ITMOs in an AEF and through annual information as part of the BTR, or at the same time, to ensure the legitimacy of information submitted to the Article 6 database. See discussion on IR/UIR submission timeline in section II.B.3 above.

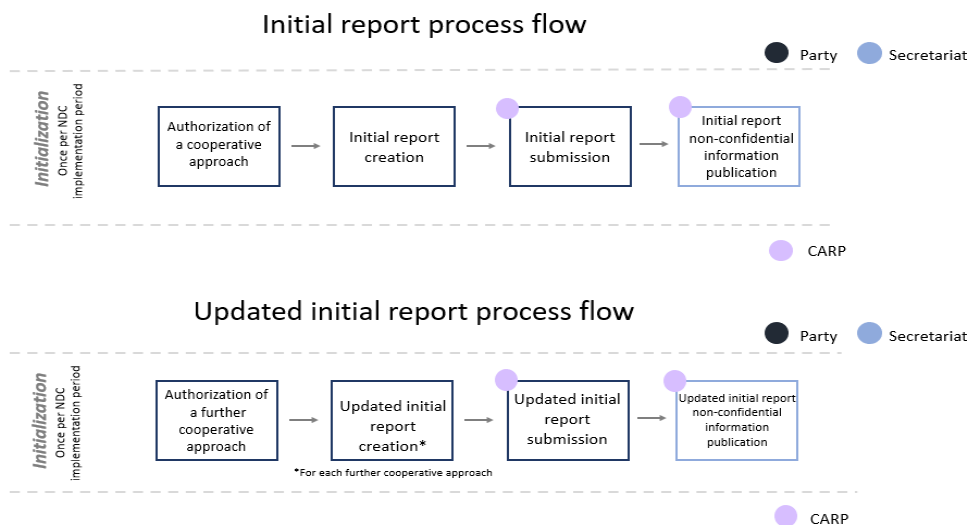
300. Although there is no specific mention of how the IR will be submitted (i.e. to what reporting tool), any UIRs will be included in the CARP as per paragraph 19. Both the IR and UIR will be made available on the CARP as per paragraph 24. Therefore, it is understood that IRs are submitted to the CARP's submission portal.⁷⁷

301. For information submitted with the BTR, the submission will come through the Article 13 reporting tools. The IR/UIR is not relevant to Article 13 reporting and it is understood that if those are submitted at the time of the BTR in the Article 13 reporting tool, the IR/UIR will be submitted directly to the submission portal of the CARP.

⁷⁷ See discussion on the CARP functionalities in section III.G.

302. Figure 4 illustrates the process flow for the IR/UIR. A Party may initiate creation at any time, including before authorization of a cooperative approach. After publication, the reports will be subject to review as per chapter V (Review).

Figure 4: Initial report and updated initial report process flow



3. Agreed electronic format

303. According to paragraph 20, an AEF is due no later than 15 April, with information on the preceding calendar year, for recording in the Article 6 database. For transparency, it should be noted that an AEF may be due in an empty state, if no authorized ITMO was created in the reporting Party's registry and/or other actions with ITMOs have taken place for the reported year after the IR/UIR.

304. It is unclear if UIR may be submitted as a stand-alone document, as an alternative to submission with the BTR (see section II.B.3). A linked issue is the question of whether the AEF may include information for any further cooperative approach(es) before the UIR for the further cooperative approach(es) is submitted. It appears practical and desirable to permit the AEF to precede the UIR for a given cooperative approach. The sooner after authorization of a cooperative approach a Party includes the cooperative approach in its AEF, the higher the likelihood that all participating Parties' relevant information for the cooperative approach will be covered in the same AEF cycle.

305. However, the following two issues may require consideration:

(a) If a further cooperative approach is included in an AEF by a participating Party before the UIR for that further cooperative approach, there should be a step in the submission of an AEF indicating that the reporting Party is about to submit a UIR with its next BTR;

(b) The identification of the cooperative approach could be handled in relation to the first participating Party that submits information on the cooperative approach, through either the IR or the UIR. Other participating Parties would have to ensure that they identify the cooperative approach correctly in their submissions.

306. Both issues could be managed through the reporting practice, not requiring CMA guidance. It should be noted that if other issues affect the understanding of an AEF submission before relevant information may be submitted with a UIR, a process step in the AEF submission should accommodate for the reporting Party to provide clarifying information.

307. The process flow for the submission of the AEF is included in relation to the consistency check as per paragraph 33 (a) elaborated below in section II.E.7.

4. Regular information

308. RI as per chapter IV.C (Regular information) is an overarching term for several reporting elements submitted with the BTR:

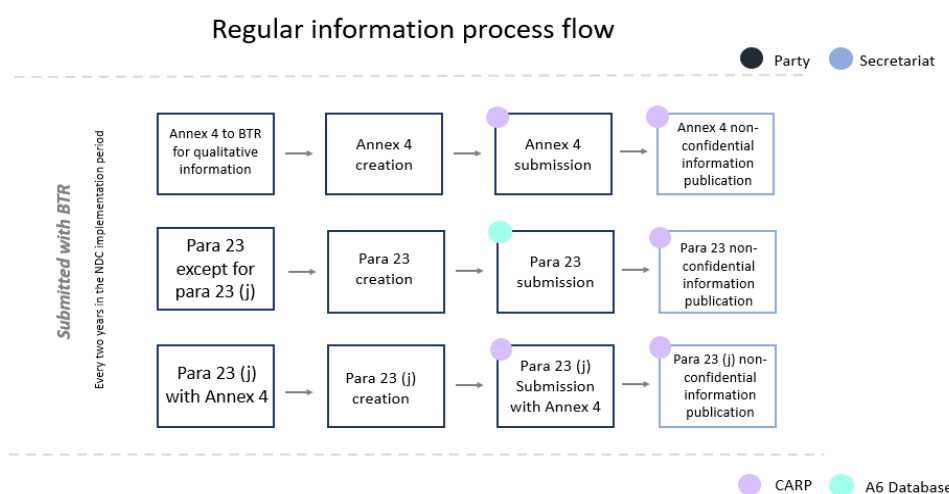
(a) Updates to already submitted qualitative information, with certain supplemental elements (paragraphs 22 (d) and (e)), submitted as annex 4 to the BTR;

(b) Annual quantitative information as per paragraph 23 without paragraph 23 (j), submitted biannually to the Article 6 database and included to the structured summary of the BTR;

(c) Annual quantitative information submitted biannually as per paragraph 23 (j), together with annex 4 to the BTR.

309. Figure 5 illustrates the elements of and the process flow for RI. After publication, the reporting elements (reports) will be subject to review as per chapter V (Review).

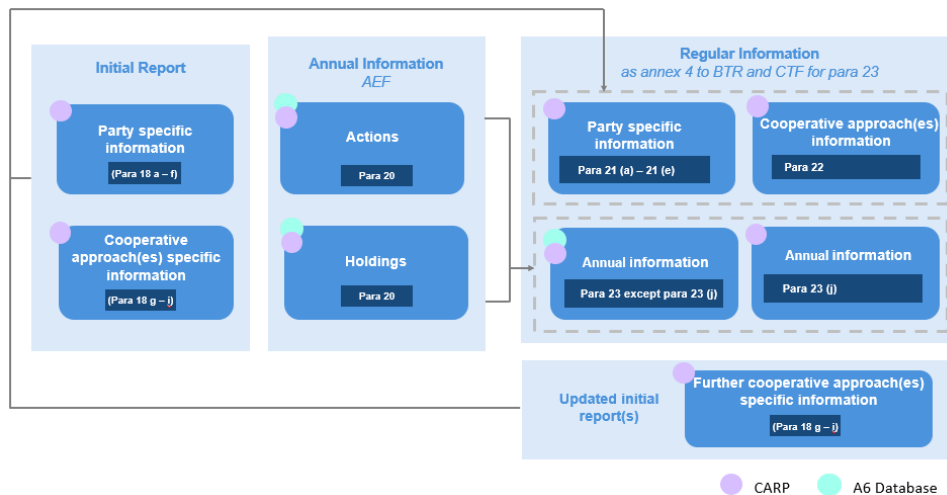
Figure 5: Regular information process flow



310. The annual information as per paragraph 23 has a clear repository – the Article 6 database. The other two elements will be submitted as an Annex 4 to the BTR. The submission of Annex 4 to the BTR could be managed through the ETF reporting tool for BTRs, but the information would have to be published on the CARP (either only on the CARP or on the CARP and on the ETF platform where the BTR will be published). Further implications from the links between the two reporting processes (for Article 6 and for Article 13) are discussed immediately below.

5. Reporting requirements and information flows across reports

311. The relations between the reporting requirements of chapter IV (Reporting) have already been discussed. The RI as per paragraphs 21 and 22 primarily updates previously submitted information. The annual information in the AEF is mostly summarized in the annual information as per paragraph 23. These relations are presented in figure 6.

Figure 6. Information flows across reports

312. The submission of Article 6 information with the BTR requires integrated and streamlined management between Article 6 and Article 13 to ensure that the reporting burden on Parties and the secretariat is minimized and to ensure transparency of public information in relation to each Article. Possible options for streamlining submissions include:

- (a) Integrated submissions portal for Article 6 and Article 13;
- (b) Submission of Annex 4 of the BTR, the proposed CTFs for paragraph 23 and for paragraph 23 (j) directly to the submission portal of the CARP (while the rest of the BTR is submitted to the ETF submission portal).

313. The systems in support of each Article – the CARP, which includes the Article 6 database (for Article 6) and the ETF reporting tools (for Article 13) – are not explicitly required to operate in an integrated manner. Although the secretariat strives to design information systems in an integrated manner, managing reporting across Articles may benefit from explicit CMA guidance. In this connection, Parties may wish to consider requesting the secretariat to explore opportunities for streamlining submissions between Article 6 and Article 13 and to consult Parties – for example by making test versions of proposed solutions available to Parties for feedback.

6. Consistency check

(a) Requirements for consistency check

314. In relation to the operation of the Article 6 database, paragraph 33 requires the secretariat to:

- (a) Check the consistency of information submitted by a participating Party to the Article 6 database with the requirements of the guidance and across the participating Parties in a cooperative approach (consistency check);
- (b) Notify participating Party(ies) of any inconsistencies identified within own data and with relevant information provided by other participating Parties;
- (c) Provide to the Article 6 TER the information relevant to the participating Party's cooperative approach(es) and other participating Parties, as relevant, including the consistency check results;
- (d) Publish non-confidential information on the consistency check on the CARP.

315. Paragraph 33(a) defines the consistency check.

(b) Objective

316. The objective of the consistency check is to detect, over time, reporting inconsistencies evident through the Article 6 database data set and to assist Parties with

timely resolution of such inconsistencies. The consistency check is constrained by the availability of data in the Article 6 database.

317. The consistency check results are input to the review as per chapter V (Review) and, non-confidential information in relation to consistency checks will be made public.

(c) Scope

318. With regard to *scope*, the consistency check will compare annual information by a participating Party for an NDC implementation period against any of the following:

(a) Current (latest) AEF data by the reporting Party and relevant current AEF data by the participating Parties (in the same cooperative approach(es));

(b) Historical AEF data by the reporting Party and relevant historical AEF data by the participating Parties;

(c) Current (latest) annual information as per paragraph 23 by the reporting Party and the participating Parties' relevant annual information as per paragraph 23;

(d) Historical annual information as per paragraph 23 by the reporting Party and the participating Parties' relevant historical annual information as per paragraph 23.

319. The consistency checks as applied to data on ITMOs reported as per paragraph 20 (AEF) assesses consistency between the data on ITMOs of Parties participating in the same cooperative approach and within the records of the reporting Party. The consistency checks as applied to data on ITMOs reported as per paragraph 23 is an internal consistency check for the data reported by a Party.

320. *Outside the scope* of the consistency check are the annual information submitted for paragraph 23 (j) and the structured summary as part of the BTR.

(d) Method

321. An effective and efficient consistency check could be performed through an automated algorithm applied on the relevant information in the Article 6 database. The algorithm would be developed based on the detailed requirements analysis as part of the Article 6 database development, further discussed in section III.H below.

322. A key consideration is that automated consistency check results may return null values if the corresponding Parties' data is not available at the time. Null value means that some checks have not been performed and there is no guarantee that the submitted information is complete and coherent. Null values would be eliminated when the data set relevant to the scope of a given consistency check is complete in the Article 6 database (i.e. the annual information as per paragraphs 20 and 23 of all participating Parties in a cooperative approach, including all historic submissions for the relevant NDC implementation period, is submitted).

(e) A6.4ERs data

323. The mechanism registry is expected to maintain all information on A6.4ERs up to date in real time and in line with state-of-art data security standards.⁷⁸

324. To enhance the consistency check, including the pre-check (see figure in section II.E.6(f)), the secretariat, as the mechanism's registry administrator and the administrator of the CARP, could make arrangements for the use of the full set of the mechanism registry data related to authorized A6.4ERs and A6.4ERs involved in share of proceeds for adaptation and in cancellations for OMGE. Further analysis of the optimal method could be made in the context of infrastructure development.

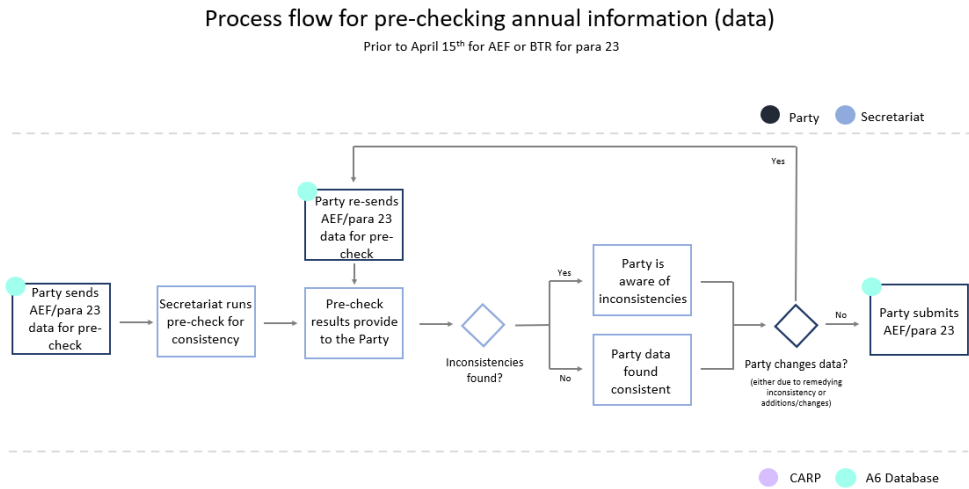
(f) Pre-check process flow for the consistency check

325. To facilitate the submission process and promote TACCC, informal submissions of annual information (AEF and CTF for paragraphs 23 without paragraph 23 (j)) could be pre-checked on request by a reporting Party, noting any constraints in relation to non-availability

⁷⁸ The operations of the mechanism registry are subject to a separate technical paper.

of relevant data from other participating Parties in the cooperative approach(es) of the Party requesting the pre-check or in relation to any gaps in the Party’s own information. Figure 7 depicts how the pre-check could be implemented.

Figure 7: Pre-check process flow for consistency checks



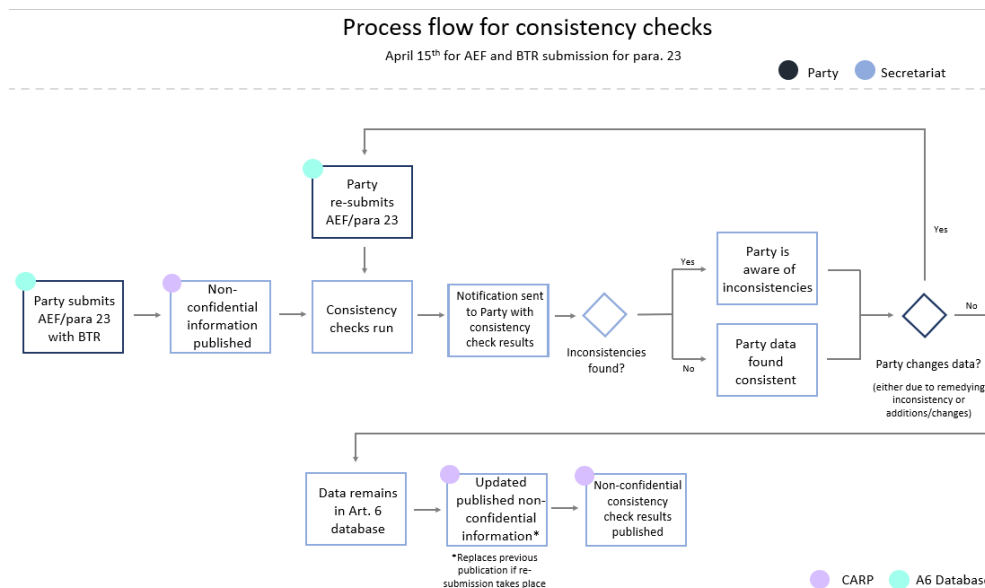
326. As mentioned, pre-checks would be voluntary. They would be informal, and the pre-check results would only be communicated (informally) to the requesting reporting Party. Should any inconsistencies with the information of other participating Parties be detected in the pre-check, it would be the responsibility of the requesting pre-check reporting Party to liaise with such other participating Parties.⁷⁹

(g) Consistency check process flow

327. Formal submissions⁸⁰ of annual information (as per paragraphs 20 and 23) will be recorded in the Article 6 database, and non-confidential information will be published on the CARP. Submissions of annual information will undergo a consistency check against data available from other formal submissions. Late submissions will undergo a consistency check as soon as possible. Figure 8 depicts the proposed process flow for a consistency check.

⁷⁹ Only consistency check results will be communicated to other affected participating Parties as per paragraph 33 (b).

⁸⁰ “Formal” for a submission is used in this context to distinguish from “informal” submissions which could undergo pre-checking of annual information.

Figure 8: Consistency check process flow

328. If any inconsistencies are found, a notification with the consistency check results will be sent within an agreed period (e.g. five working days) to the reporting Party, with copy of the notification to any other impacted participating Parties.

329. Participating Parties may cooperate in rectifying inconsistencies; any of the impacted participating Parties, including the reporting Party, may resubmit their information as soon as available.

330. A consistency check will be run upon each resubmission. A timeline may be considered, during which inconsistencies are to be resolved, before consistency check results, including negative results (i.e. no inconsistencies found) are published. The timeline may consider the type of submission (AEF or CTF for paragraph 23).

331. The CARP will maintain, for each reporting Party, the latest submitted AEF and CTF for paragraph 23 for a given reporting period.

(h) Resubmission of annual information in relation to paragraph 23

332. A challenge in relation to resubmission of annual information as per paragraph 23, in order to rectify inconsistencies, is that such resubmission may lead to inconsistencies with the structured summary as part of the BTR (which is not within the scope of the consistency check).

333. Resubmissions of such information may be held in a provisional status, with appropriate communication to the Article 6 TER, until the reporting Party in question could submit its next BTR with updated information. Further analysis in this context would be appropriate.

334. It should be noted that annual information as per paragraph 23 (of which a significant part is based on the AEF) could be expected to be submitted with a considerable time lag to the AEF for the same reported year (as it comes with each BTR rather than by 15 April of the following year as is the case with the AEF). This provides sufficient time for inconsistencies identified through the AEFs to be resolved by the time of the annual information for paragraph 23 is submitted, thus leading to a low level of inconsistencies in annual information as per paragraph 23.⁸¹

⁸¹ Annex B Parties to the Kyoto Protocol have consistently resolved inconsistencies in relation to the standard electronic format, so that no inconsistencies have been forwarded to the technical expert review to date.

(i) **Communication and publication of consistency check results**

(i) *Resolution time frame*

335. It is expected that about three to four months after 15 April would be required to resolve most identified inconsistencies from the AEFs. As the consistency check results would not be submitted to the Article 6 TER until the relevant BTR annual information is submitted (for paragraph 23), an even longer time frame for resolution could be accommodated.

336. Any inconsistencies in relation to the CTF for paragraph 23 would have a shorter time frame for resolution. However, a lower incidence of inconsistencies may be expected in comparison to the AEFs, owing to the fact that paragraph 23 aggregates information from AEFs, that would normally be submitted more than a year before paragraph 23 is submitted with the BTR. Since annual information as per paragraph 23 would be submitted to the Article 6 TER within three weeks after submission (at the minimum), reporting Parties should make every effort to carefully pre-check the CTF for paragraph 23.

(ii) *Notification of consistency check results*

337. Reporting Parties will be officially notified of inconsistencies identified through the consistency check. Other participating Parties that maybe affected by inconsistencies will also be notified. The exact time frame for the notification is to be determined. However, several rounds of resubmissions for corrections should be possible to accommodate before the finalization of the consistency check.

(iii) *Publication of results of the inconsistency check*

338. Non-confidential information⁸² for the consistency check results will be published on the CARP in relation to each reporting Party. This should include the number of inconsistencies found and the number of Parties involved. The information would be updated as inconsistencies are resolved through further submissions, always maintaining the latest information on inconsistencies on the CARP.

7. Freezing resubmissions

339. Resubmission of annual information, to rectify inconsistencies, could remain open after initial submission, except for during the Article 6 TER period (desk or centralized review, as applicable).

340. Resubmission of any other information as per chapter IV (Reporting) could remain open after initial submission, except for during the Article 6 TER period (desk or centralized review, as applicable).

8. Managing complexity over time

341. The consistency check is a potentially complex matter (with complexity increasing with the volume of actions with ITMOs, number of cooperative approaches, and trading Parties and registries). Furthermore, there is a significant novelty in the operations of the Article 6 database in the absence of a third-party validator, a role played by the ITL in the Kyoto Protocol regime.⁸³

342. Over time, experience gained in the process would inform ongoing improvements and any needs for further guidance by the CMA.

⁸² If AEF contains confidential data, pre-checks against such confidential data may reveal it, therefore the results cannot be published.

⁸³ The ITL implemented real time transactions validation in the Kyoto Protocol registry systems ensuring the consistency of data in the system.

9. Interim process for the submission of initial reports

343. As the implementation of the Article 6 submission portal would require time, an interim process for the submission of IRs would be necessary.

344. IRs could be emailed to the secretariat for publication on a dedicated webpage. Confidential information must be considered prior to publication, in line with any further guidance in relation to confidential information that the CMA may adopt.

345. Similar interim arrangements may be put in place for the submission of the AEF, whereby the secretariat stores the AEF data in a manner permitting migration of the AEF data to the Article 6 database, when the latter becomes operational.

346. **Possible solutions:** The following are possible solutions in relation to the submission process:

(a) The secretariat is requested to develop and maintain guidelines for the submission process, including consistency checks, and report on progress in annual reports to the CMA as per paragraph 36(c);

(b) Explore opportunities for streamlining submissions between Article 6 and Article 13 and consult Parties – for example, by making test versions of proposed solutions available to Parties for feedback;

(c) Explore the use of mechanism registry data in the context of the consistency check;

(d) Consider implications of resubmissions of annual information as per paragraph 23 for the information in the structured summary, as part of the BTR, with the view to elaborating the reporting process.

III. Recommendations relating to infrastructure, including guidance for registries, the international registry, the Article 6 database and the centralized accounting and reporting platform

A. Principles

347. The key guiding principles for this section are:

(a) TACCC;

(b) Support for traceability through proper tracking and reporting in order to avoid double-counting;

(c) Interest of stakeholders, including enabling accounting, trading, review, maximizing participation;

(d) Design principles, including robust, transparent, accessible, secure operations, including preventing unauthorized access;

(e) Efficiency and cost-effectiveness, including functionality in response to needs;

(f) Flexibility through avoiding prescriptive approaches;

(g) Continuous improvement.

B. Terminology

348. Terminology is defined in this section to reflect the meaning of terms used in this technical paper. These terms and definitions are rooted in the words and their meanings as used in United Nations Framework Convention on Climate Change (UNFCCC) negotiations

and technical work of the UNFCCC bodies and the secretariat on Kyoto Protocol and Paris Agreement systems. Some terms, acronyms and definitions may differ from the ones commonly used in computer science and financial accounting.

349. **Serialised unit** or simply **unit**⁸⁴ is a record held in a registry database and representing minimal, indivisible unit of accounting of MOs. Units have unique identifiers that include certain metadata pertaining to the mitigation outcome, such as the country and the year of origin, and the serial number of the unit in a unit range. Units in Kyoto systems and major voluntary market offset schemes represent a t CO₂ eq emissions reduced or removed. Non-greenhouse gas (non-GHG) units are also allowed under Article 6.

350. **Balance-only accounting amount (BOAA)** is a record held in a registry database and representing an amount of MOs. BOAAs do not have unique identifiers and may be transferred between Parties to a cooperative approach. Due to the lack of unique identifiers, BOAAs may not be accounted for record by record, which narrows the choice of methods of assuring consistency to less precise bookkeeping ledger methods, introducing consistency and reconciliation risks.

351. **Uniquely identifiable accounting amount (UIAA)** is a record held in a registry database and representing an amount of MOs. UIAAs have a unique identifier and may be transferred between Parties to a cooperative approach in whole only. To enable partial transfers, an exchange operation would be required for UIAAs whereby one UIAA is transformed into two UIAAs whose total amount of MO is equivalent to the amount of MO in the original UIAA.

352. **Balance in a higher-tire account (BHTA)** is an aggregated materialised view⁸⁵ of records held in an account in the same registry or another registry, representing the balance of ITMOs accounted for as units, BOAAs or UIAAs.

353. **Fungibility bucket** is a definition of a set of ITMOs that are fully fungible i.e., completely equal in their characteristics from the business perspective. Fungibility bucket boundaries may be set differently for different cooperative approaches and for different approaches to storage and tracking ITMOs (see figure 9).

Figure 9: Examples of fungibility buckets



⁸⁴ In order to avoid confusion between serialised units frequently referred to as “units” in this paper with units of measurement, the latter is always spelled out. Any reference to “units” is about serialised units.

⁸⁵ A view is a result of a calculation, aggregation, or another transformation of data held in a database, that is presented as a separate database collection or table. Views can be transient or materialized. Transient views execute the necessary transformation each time they are queried. Materialized views execute the transformation on the first query and store the result persistently. Further queries to a materialized view do not automatically trigger re-calculation of its content; such re-calculation (update) may be triggered separately. For practical reasons, BHTAs are best implemented as materialized views. As is the case with other computer science and systems engineering terms in this paper, “materialised view” should be seen conceptually applied to the consideration of the entirety of registry systems as one database, rather than as guidance for technical implementation in any specific database management system.

354. **Availability** is the quality of a system's readiness to perform its functions and respond to user requests at a particular time. Increased availability of the system and the associated widening of the bounds of its working time increases systems' complexity and cost, while intentional limitation of a system's availability (as a result of network partition) may help achieve other system qualities, such as consistency (for example limitation of a system's availability during which transaction validation takes place).

355. **Network partition** is a situation when registry systems cannot communicate to each other for large enough amount of time as to not allow delaying a data-modifying operation, such as a new transaction.

356. **Consistency** of a data management system is the quality of it being able to store and present correct and uncontradictory data to all observers within the system scope. Levels of consistency include:

(a) **Strong consistency** is consistency that is maintained at all times, whereby a valid change in data introduced by one user is immediately reflected in all views on these data and is available for retrieval to the user who introduced the change and to all other users. Strong consistency may be impossible to achieve in distributed systems that require constant availability to the user because they may suffer from network partitions;

(b) **Eventual Consistency** is a weaker form of consistency that is implemented when strong consistency is impossible or impractical. Eventually consistent systems do not guarantee correctness of data in all views or for all users immediately after a change, but they use different techniques to *eventually*⁸⁶ synchronise data and eliminate any possible contradictions for all users and views;

(c) **End-of-period consistency** is a type of eventual consistency where achieving consistency is not attempted after each data modification; instead, data is periodically reconciled to check for and correct any inconsistencies that occurred during the last reconciliation period. End-of-period consistency presents the risk of second- and higher-order inconsistencies appearing in the database between the time of introduction of the initial inconsistency and the next reconciliation.

357. **Reconciliation** is a process of comparing datasets that should contain the same, consistent and/or non-contradictory data, and correcting detected differences, inconsistencies or contradictions.

358. **Transaction** – any intervention that changes the overall state of data in the system, such as the creation or deletion of one or more records, or change of their attributes. Transactions are atomic i.e. they may contain multiple changes to data that are either applied all together or not at all.

359. **Transaction log** is a data management system that is external to a set of registries and used by the registries, primarily in a fully automated mode, to maintain consistency across registries participating in a cooperative approach, enforce their business rules or advise registries about violations thereof.

360. **Non-repudiation** is a quality of a multi-user data management system where all users must authenticate any data modification they introduce in the system, to other users, and may not repudiate taking this action at a later point. Non-repudiation is typically achieved through the use of cryptographic signatures on data modification requests.

361. **Double-entry bookkeeping** is a method of bookkeeping that requires simultaneous entries of any operation into at least two accounts, with at least one account for debit and at least one account for credit, where the sum of amounts reflected in accounts being debited is equal to the sum of amounts reflected in accounts being credited. It used to reduce errors in

⁸⁶ Inconsistencies should be found and eliminated as early as possible. In most eventually consistent databases that are equipped with online replication mechanisms, depending on their size and network conditions, consistency is normally achieved within seconds or minutes of the change. In data systems that have slower methods of replication and reconciliation, achieving consistency may take much longer

accounting by increasing transparency of flow of accounting amounts and lowering the risks associated with operating in balance-only amounts.

C. Consistency guarantees

362. Cooperative approaches under the Paris Agreement may take different configurations and unite various subsets of Parties. Furthermore, Parties may participate in multiple cooperative approaches. Although ITMOs are to be recorded and tracked within the boundaries of the cooperative approach they are generated in, overall consistency of registry systems worldwide is a mission critical goal and an essential element in maintaining trust in Article 6 markets.

363. The system should strive to maintain consistency, take measures to prevent situations where inconsistency could occur, and efficiently recover from inconsistencies that occur despite all measures.

364. It is useful to evaluate consistency guarantees of registry systems by imagining the entirety of Article 6 registries as a single database. Consistency can then be looked at from the viewpoint of when and how transactions such as issuance, authorization, transfer, cancellation or retirement are taking place, and how the information about these transactions propagates to other parts of the registry systems where accounting may be affected by a given transaction. Computer science offers a solid body of research and methods in the area of consistency guarantees of different ways of executing transactions, which are directly applicable to the analysis of consistency guarantees of the registry systems.

365. The CAP⁸⁷ theorem describes the basic design landscape for distributed databases: it states that in the presence of an interruption in communication between different parts of the database (a “network partition”), a choice has to be made between the possibility to transact at all (“availability”) and consistency of the outcome. **Availability** and **consistency** together are only possible when there are no network partitions.

366. Strong and permanent point-in-time worldwide consistency of registry systems is therefore only possible if all registries are implemented as one centralised database in which network partitions cannot occur, which is not in line with the Parties’ intent. Consequently, and due to the fact that ITMOs do not leave the cooperative approach that generated them, a cooperative approach that operates a centralized registry for all Parties to the approach will benefit from the best consistency guarantees⁸⁸.

367. Limiting the availability of registry systems may be an acceptable solution for some cooperative approaches, especially for registry systems that operate on reliable networks⁸⁹. In the presence of a network partition, such cooperative approach registries would need to enter a “network partition mode” and temporarily refuse to accept new transactions. It should be sufficient that one registry detects a network partition (cannot communicate with one other registry or a transaction log used by the cooperative approach) to enter the network partition mode.

368. A variant of sacrificing availability for consistency is the use of a transaction log, a shadow registry or a meta registry. A registry may request validation of a transaction from an international or a mechanism-specific transaction log before going ahead with any transaction. If, in the ‘opinion’ of the transaction log, the transaction is based on an inconsistent state of the originating registry, the validation is not granted. Effectively, the use of a transaction log delegates ensuring consistency to a centralised entity; if the transaction log is not available, transacting is not possible. Shadow registries or meta registries may provide a “second opinion” on whether they consider the proposed transaction to be valid

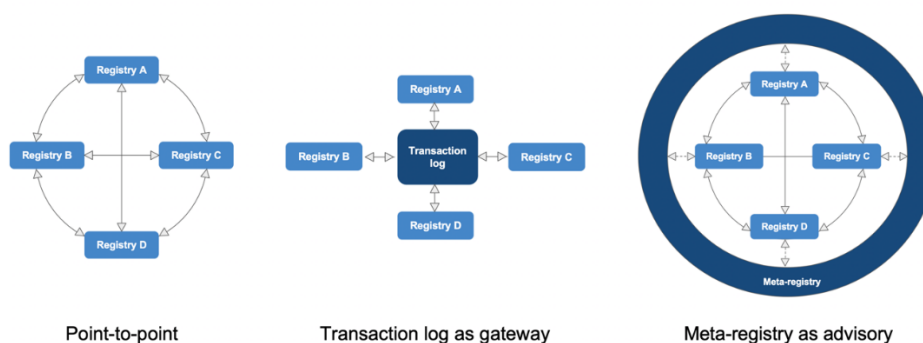
⁸⁷ CAP stands for consistency, availability and partition tolerance.

⁸⁸ Availability of such systems may still be reduced for some users in case there is a disruption of connectivity between the user and the registry.

⁸⁹ A reliable network in this context is a network that provides connectivity between systems at all times when the systems are expected to operate and any intermittent breakdowns are short enough for the delaying of operations until the breakdown is over to be a viable remediation strategy.

and consistent, so the participating registries could decide whether to go ahead with the transaction (see figure 10).

Figure 10: Registries with point-to-point, transaction log as the gate and with meta registry as a consultative/advisory side



369. Where neither centralisation nor limitation of availability is an option, consistency cannot be guaranteed in all cases. In these cases, the cooperative approach would be functioning in the end-of-period consistency mode and should therefore employ one of the mechanisms of detection and recovery from arising inconsistencies. Reconciliation is a form of inconsistency detection and recovery that was successfully used by Kyoto registry systems. The temporal dimension of action to detect and recover from inconsistencies is very important. Inconsistent and contradictory views on the global state of data in the registries participating in a cooperative approach may lead to second- and higher-order inconsistencies in subsequent transactions, and become extremely difficult to recover from. Trade-offs between checking the overall consistency in the cooperative approach very frequently (after each transaction or every few minutes) and risking getting inconsistently recorded ITMOs involved in subsequent transactions should be carefully evaluated with the preference given to the most frequent reconciliation that is legally and technically feasible.

370. An alternative to frequent reconciliation is the use of a distributed ledger technology (DLT) with a consensus protocol⁹⁰ that could algorithmically enforce consistency of transactions, as long as the majority of registries (or other infrastructure components that assume the role of nodes in the DLT network) remain available and trustworthy. Depending on the consensus protocol, DLT-based implementations will, generally, take longer and require higher availability of nodes than classical registry system solutions. DLTs would also be hard to set up for international use because permissionless⁹¹ DLTs are impossible to guard from participation of any member of the public, while permissioned DLTs require a mechanism to issue permissions to participate i.e. they present the same legal and sovereignty challenges as much simpler solutions based on the use of transaction logs.

371. Should confidentiality of individual transactions be required, DLTs with zero-knowledge proofs (ZKP) may be used.⁹² For practical implementation reasons, one common DLT cannot be implemented for all cooperative approaches and registries in the world. While ZKPs are used in some publicly accessible DLTs, they are still a young research area lacking solid implementations that are sufficiently tested, available for modification and

⁹⁰ A consensus protocol is an algorithm used by a computational system composed of multiple independently-operating devices (nodes) to agree on a data value. Consensus protocols typically employ a mix of voting mechanisms and cryptographic techniques preventing falsification of data to establish highly trustworthy results.

⁹¹ A permissionless DLT is a DLT that allows any system to join it and become a node with equal rights to participate in the operation in the DLT and its consensus protocol which determines the "truth" in the DLT. Permissionless DLTs are not suitable for Article 6 infrastructure due to the low number of legitimate nodes and the differentiation in the nodes' permitted functions. A permissioned DLT is a DLT that allows for an administrator or administrators who are allowed to permit access to the DLT network.

⁹² ZKP is a method to prove correctness of a statement without communicating the statement itself or any useful information about it. ZKP may be used to achieve provable correctness of the operations ledger while keeping the content of the transactions within it confidential.

adjustment, and otherwise ready for the international arena. Monitoring developments in this area and further analysis may be relevant for future generations of systems supporting cooperative approaches.

372. It should also be noted, that some voluntary market offset trading platforms are adopting approaches that combine the conventional method of unitization with a DLT layer, where units are represented and traded on the platform as tokens recorded on a public distributed ledger. The tokens are issued against a collateral of underlying units collected by a depository "platform". When tokens are "burned" (cancelled), the underlying units are cancelled in the holding registry. It should be noted that the DLT application in such a hybrid approach does not alone provide consistency guarantees, and requires additional methods for reconciling the movements of tokens and underlying units.

373. If Parties wish to utilize DLTs, advantages and disadvantages of DLTs should be considered by individual cooperative approaches.

374. **Possible solutions:** The following are possible solutions in relation to consistency guarantees:

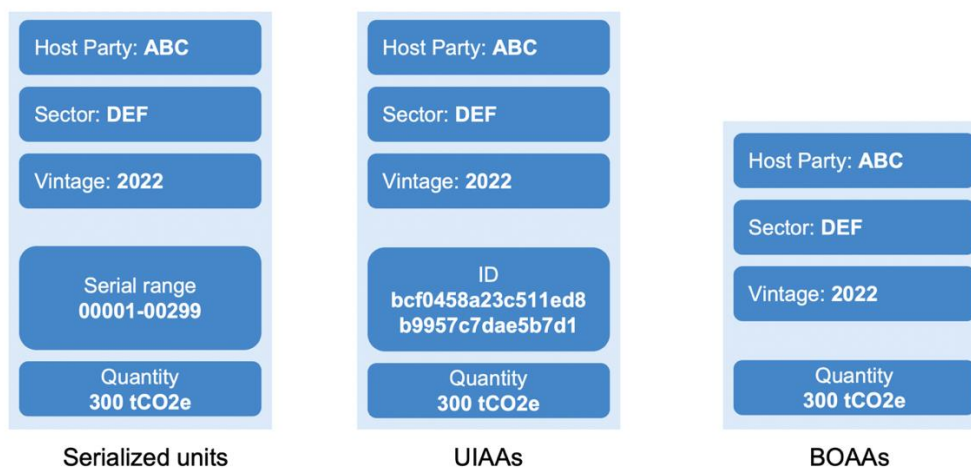
(a) Adopt the maximum possible level of consistency guarantees in designing tracking infrastructure for cooperative approaches;

(b) Any use of DLT, including in the future, and in particular for secretariat operated systems, should be considered on the basis of specific technical merits, risks, potential, and cost of implementation compared to classical systems design.

D. Recording and tracking of ITMOs

375. This section discusses the range of possible solutions for recording and tracking of ITMOs. Figure 11 shows an example of representation for the basic three methods – serialized units, UIAAs and BOAAs.

Figure 11: Methods for tracking ITMOs



1. Methods for recording and tracking of ITMOs

(a) Serialised units

376. The core feature of this method is the notion of a unit, which is a uniquely identified, indivisible amount of MOs. This method is preferred among the Parties that have identified a preference for a method of tracking ITMOs.⁹³

⁹³ When surveyed, 41 per cent of Parties responded that serialised units is their preferred method of recording and tracking ITMOs.

377. t CO₂ eq is taken as the indivisible amount.⁹⁴ For non-GHG metrics, the indivisible amount is determined by Parties in a cooperative approach⁹⁵.

378. The serialised units approach benefits from both technical and historical factors which make it the least risky way to record and track ITMOs:

(a) The Kyoto systems used units to account for assigned amounts and emission reductions. Their successes, as well as lessons learnt, can be considered in designing systems for Article 6;

(b) Units offer the highest possible level of transparency in accounting and tracking, allowing tracing of the history of each unit by unique identifier throughout its lifetime;

(c) Units avoid the complexities of non-integer number calculations, provide clarity on the minimum indivisible amount of the metric, and therefore manage the users' expectations as to the precision of accounting;

(d) Operations in units are straightforward to reconcile using easy "head count" methods.

379. Fungibility of units can be defined by the sides of any contract involving ITMOs. The sides may agree either very broad terms of fungibility (e.g., any ITMOs originating from a certain year) or narrow them down to specific countries, projects and even specific ranges of serial numbers. This quality of units may affect pricing and liquidity of ITMOs in the market.

380. The potentially very high number of units (each unit traditionally representing a t CO₂ eq for GHG metrics) presents a challenge for the technical solutions and databases that store and operate registries of units. For this reason, units are typically not stored individually but grouped in serial number ranges⁹⁶. Should a transaction require only a part of a serial number range, the splitting of the range require neither active participation of the user nor a special reportable operation. It is possible to ascertain consistency of serial number ranges having only the list of such ranges that have been issued in a cooperative approach. User interfaces of registries and other systems that operate with units may display information about the unit holdings in the form of the total balance, subtotals by fungibility bucket, and a detailed view with a list of contiguous serial number ranges that constitute the balance.

381. A high number of units in circulation for a long time may lead to the situation where serial number ranges (unit blocks) are split many times, causing the so-called "fragmentation" of the accounting system, ultimately leading to the challenge of storing and operating on too many records, as described above. Fragmentation was a potential, long-term issue identified in the Kyoto systems. While severe impact from fragmentation never materialized, mitigation measures were defined. Multiple strategies may be employed to address fragmentation:

(a) Choosing a large enough indivisible amount of MOs – as per paragraph 1 (c), ITMOs are measured in t CO₂ eq for GHG metrics or in other non-GHG metrics determined by the participating Parties. A unit representing one t CO₂ eq is the common standard for GHG metrics. Parties may wish to consider fragmentation when picking the indivisible amount for non-GHG metrics they wish to use;

(b) Designing communication protocols in a way that metadata is transferred only once for all serial number ranges that share the same metadata;

(c) Merging of serial ranges - in addition to the splitting of a serial number range, an operation of merging serial number ranges on one account, if the ranges represent a contiguous range of serial numbers, may reduce already existing fragmentation. Merging

⁹⁴ In line with paragraph 1(c).

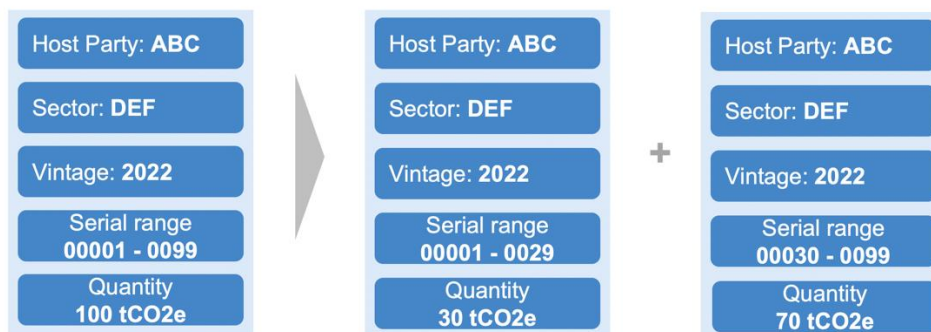
⁹⁵ An evaluation of the potential that the same non-GHG metrics would be used by multiple cooperative approaches should be conducted in order to standardise the minimal indivisible amounts and express them in the same amount and measurement unit as much as possible in order to harmonise reporting at the international level. To the extent possible, the measurement units should be SI units, SI derived units or non-SI units accepted for use with SI, with or without SI prefixes.

⁹⁶ Also known as "blocks" of units in the Kyoto Protocol terminology.

may be particularly useful on accounts that act as the final destination of units, such as cancellation and retirement accounts;

(d) Designing the algorithms for the selection of serial number range(s) to be transferred in a way to minimise the necessity to split serial number ranges (see figure 12).

Figure 12: Splitting serial number ranges of units



(b) Uniquely identifiable accounting amounts

382. UIAAs are amounts of MOs that share the same metadata making them internally fungible within one amount. When surveyed, 11% of Parties responded that UIAAs is their preferred method of recording and tracking ITMOs.

383. Each UIAA has a unique identifier and a set of metadata pertaining to the entire amount. Unlike units, UIAAs are generally divisible and can be split into parts.

384. When ITMOs are generated and recorded in the form of UIAAs, one record containing the amount of MOs and corresponding metadata is created in the registry database.

385. The unit of measurement for the amount of MOs is one t CO₂ eq for GHG metrics; for non-GHG indicators, the unit of measurement is to be determined by the Parties to the cooperative approach, bearing in mind the recommendations for the selection of measurement units above.

386. Unlike units, UIAAs do not have a minimum or indivisible amount. However, fractional accounting is complex, error-prone, and sometimes technically impossible using common approaches to managing data in databases⁹⁷. It is therefore recommendable that the Parties define a minimum decimal increment of an accounting amount:

(a) For GHG metrics, consider if accounting with the precision of one metric ton provides sufficient granularity. Opting for one metric ton as the minimum decimal increment would provide for familiar metrics and casual compatibility with cooperative approaches that work with units. If further division of the metric ton is required, the minimum increment may be one kilogram;

(b) For non-GHG metrics, it is recommended to select the measurement unit in a way that one whole unit of it is the minimum increment of the accounting amount.

387. Accounts in UIAAs can display the amounts of MOs as a total balance and provide detail of sub-balances grouped by fungibility bucket.

388. If there is no UIAA that holds the amount of MOs necessary for a transfer, a registry system needs to combine the necessary amount out of available UIAAs and/or split available

⁹⁷ Consider a contract in which one party is entitled to one third of the total amount of mitigation outcomes produced by a project. Unless the total amount in the respective measurement unit is divisible by 3, there is no finite decimal notation that can express the amount. Hence, a limit to the length of the significand should be defined, and decimal arithmetic, with simple and predictable rounding rules, should be used.

UIAAs. For UIAAs, the splitting and the optional merging operations are internationally reportable.

389. The splitting operation is defined as:

- (a) Taking the subject UIAA out of service;⁹⁸
- (b) Creating two new UIAAs that are equivalent to the original UIAA in all metadata, where the sum of amounts of MOs in the new UIAAs is equal to the amount of MO in original UIAA.

390. The merging operation is defined as:

- (a) Taking two or more UIAAs with equivalent metadata out of service;
- (b) Creating one new UIAA that is equivalent to the original UIAAs in all metadata and representing the amount of MO which is equal to the sum of amounts of MO in the original UIAAs.

391. UIAAs offer a similar picture of consistency risks as units while not presenting MOs as serialised securities. They require one or two additional reportable operations to ensure consistency of registry systems at the international level, which may slightly increase the development costs for both international systems, such as the Article 6 database, and systems servicing cooperative approaches that employ UIAAs. If the merging operation is implemented, UIAAs also present a lower risk of fragmentation than units.

392. Unit serial numbers that are set at issuance are the key data element in establishing consistency of accounting in units. If units were to be transferred into accounts that track UIAAs which do not track serial numbers, their serial number data would be lost. Conversely, if an amount from an account that tracks UIAAs were to be transferred to an account in units, there would be no way to assign serial numbers to such newly created units. The necessity to track sufficiently large indivisible amounts of MO is also unique to units; UIAAs may have more flexibility in choosing the granularity level. UIAAs are therefore not compatible with units within the scope of one cooperative approach and metric. Each cooperative approach would need to decide if it is going to use units or UIAAs for any given metric.

(c) Balance-only accounting amounts

393. BOAAs are amounts of MO that share the same metadata making them internally fungible within one amount, akin to financial accounting amounts. BOAAs do not have unique identifiers.

394. When ITMOs are generated and recorded in the form of BOAAs:

- (a) If a record containing the MOs with the same metadata does not exist, such a record is created in the registry database;
- (b) If a record containing the MOs with the same metadata exists, this record is updated by adding the newly generated MOs.

395. When MOs recorded as a BOAA are transferred, the amount to be transferred is subtracted from the original amount recorded as a BOAA. When MOs are received, the same logic as the logic of generation of new ITMO applies.

396. Unlike units and UIAAs, BOAAs require the underlying systems to operate with mutable⁹⁹ data structures. Simple reconciliation approaches for BOAAs are closest in substance and structure to traditional financial accounting and the respective traditional methods of maintaining consistency, such as the double-entry bookkeeping, are applicable. At the same time, BOAAs present additional consistency risks that may be difficult to fully

⁹⁸ For example by invalidating or retiring and archiving the record.

⁹⁹ Mutability of a data structure is the ability of underlying data in the structure to change. Mutable data structures are more difficult to track, as in addition to tracking their creation and deletion, any change within the data structure needs to be located and tracked; reasoning about a set of mutable data structures is also more complex as it needs to include the complexity of each data structures' internal state.

remediate in the international setting in which the registry systems will be operating, for the following reasons:

(a) Due to the possibility of double errors, reporting on account holdings alone will not allow the Article 6 database to ascertain overall consistency of reporting;

(b) Consistency checks¹⁰⁰ and resulting investigations after multiple transfers of ITMOs may present an unmanageable scope of work. Additional information would be required to perform the consistency checks, such as the full history of transactions from all participating Parties, including unique identifier and non-repudiation data for individual transactions;

(c) Confidentiality of third-party transactions may be compromised as a result of investigations of an apparent consistency issue; and

(d) In case transaction-level data is not available, unresponsiveness of just two reporting entities to a consistency investigation may lead to irremovable ambiguities¹⁰¹ about the potential source of the inconsistency.

397. In order for the financial accounting methods to remain applicable at the stage of ITMO generation, special “issuance shadow accounts” that may hold a negative balance of ITMOs could be created. The generation of ITMOs as BOAAs is done via a transfer of ITMOs from the issuance shadow account to the account in which ITMOs need to appear after generation (see figure 13). This arrangement:

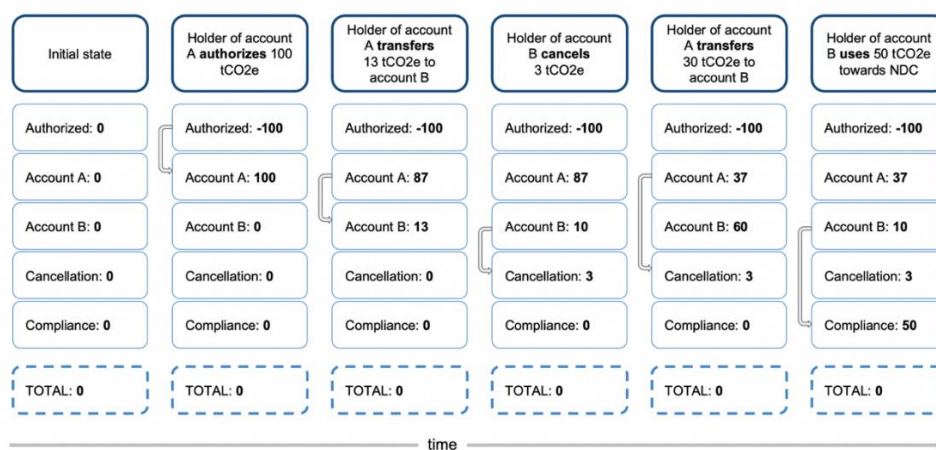
(a) Makes the accounting system simpler by leaving only one, trivially defined operation of transfer that creates a debit in one account and an equivalent credit in another;

(b) Enables a simple and robust check of overall consistency of the accounting system where the sum of balances in all accounts should always be equal to zero;

(c) Provides a natural place that holds the total amount of all ITMOs issued in the given fungibility bucket, with a negative sign (see figure 13 below).

398. Overall, BOAAs may be considered for simple tracking scenarios that relate to domestic tracking and do not require multiple transfers of BOAAs (i.e. domestic OIMP uses).

Figure 13: Consistency assurance for BOAAs



¹⁰⁰ Not to be confused with the consistency check as per para. 33(a).

¹⁰¹ Consider a situation where country A generated a 100 t CO₂ eq balance and transferred 50 t CO₂ eq of it to country B. Country C received 30 t CO₂e from country B and 30 tCO₂e from country D. At the reporting level, 100 t CO₂ eq was generated and 110 t CO₂ eq are observed in account balances, which indicates an inconsistency. Without the cooperation of at least one of the registries of countries B and D, it is impossible to conclude whether the discrepancy happened because country B double-transferred the amount it had or that country D transferred an amount it never had. Unresponsiveness to investigations may be caused by benign reasons of administrative and logistical delays in transferring messages through official channels, during which wrongly transferred amounts may take part in further transactions, further complicating the inconsistency.

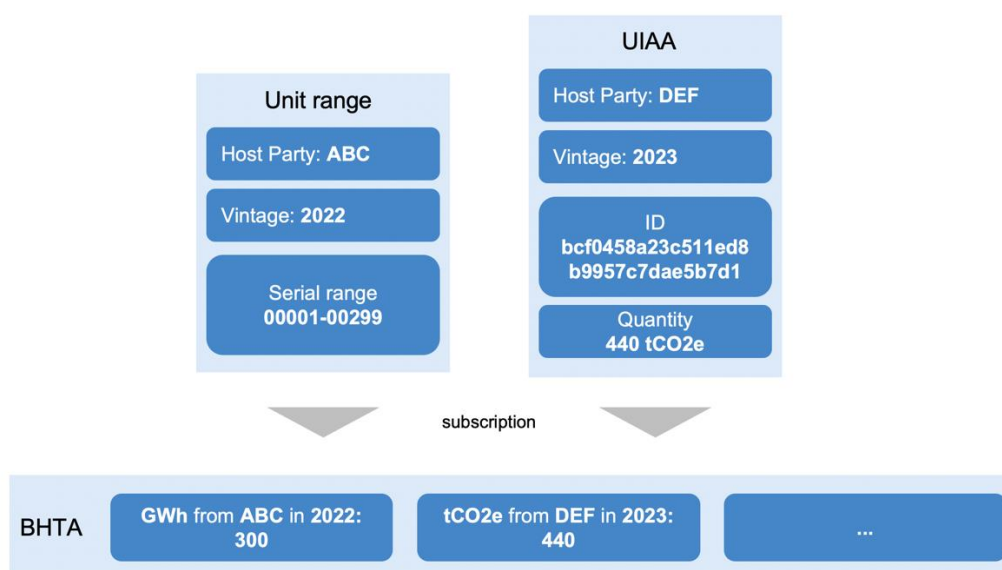
(d) Balances in higher-tier accounts

399. BHTAs are accounts that represent a balance of ITMOs that tracks the amount in units, UIAAs or BOAAs in other accounts in the same or another registry (referred to as “underlying account” and “underlying registry”, respectively). Similarly to BOAAs, BHTAs record a balance for each fungibility bucket. They do not, however, allow for transacting in these balances; instead, they react to the changes in the underlying registry by reflecting the new balance. Legally, BHTAs may be dedicated as ITMOs, whereas the underlying units or accounting amounts could be interpreted as technical means of settlement in ITMOs. Technically, BHTAs are read-only views on balances of another account.

400. BHTAs should be able to subscribe¹⁰² to changes in the underlying registry accounts (see figure 14). The technical arrangements for that bring in an additional layer of complexity to the overall system, which may be on par with the additional layer of complexity brought in by the double-entry accounting checks required by BOAAs. While BHTAs may, technically, track any type of underlying account, tracking a BOAA does not make practical sense and a choice should be made between using a BOAA or using a BHTA to track either units or UIAAs.

401. BHTAs may record source and destination of ITMOs for every transaction happening in the underlying registry account. However, BHTAs do not keep a reconcilable history of the underlying registry account and cannot be used for consistency checks. Consistency check mechanisms rely on the technical means of tracking in the underlying registry.

Figure 14: Data transfer for balances in higher-tier accounts



2. ITMO data structure, identification of units and UIAAs, and extensibility

402. ITMOs are characterised by identifying data elements and other data elements (aka meta-data). The identifying data elements constitute the primary unique identifier (primary key¹⁰³) of an ITMO of a set of internally fungible ITMOs.

¹⁰² Publish/subscribe or pub/sub is a software architectural pattern of passing informational messages between systems where one system categorises data so that it can be picked up by interested subscribers, and subscribers obtain the necessary data by specifying the categories they are interesting in. Pub/sub is used to achieve decoupling of effort, resources, and otherwise “lighten the contract” between the producer and the consumer of data.

¹⁰³ A primary key in a database is the unique minimal set of a record’s attributes that enables identification of the record. Primary keys may be simple, consisting of one data element, or compound, consisting of multiple data elements. When elements of the key have a business meaning, such as the name of the host Party, the monitoring methodology or the vintage year, such keys are

403. When all ITMOs are stored in a database as units or UIAAs, a surrogate¹⁰⁴ component, a serial number¹⁰⁵ for units or a unique identifier for UIAA, is added to the primary key. This enables separate storage of ITMOs that belong to one fungibility bucket. In the case of BOAAs, all ITMOs that belong to one fungibility bucket are stored in one balance and may not be separated.

404. Some registries may contain and track ITMOs from multiple cooperative approaches. To avoid confusion, an ITMO should be able to clearly associate itself with the cooperative approach from which it originates. The nomenclature of cooperative approaches needs to be controlled centrally. One option to implement such a nomenclature is to establish a procedure whereby any Party may declare the establishment of a cooperative approach in the CARP and receive a short unique alphabetic identifier from the secretariat. Other Parties may then accede to an already established cooperative approach according to its rules and use the same identifier in their registries and reporting.

405. ITMOs should carry the identification of their first-transferring (host) Party.¹⁰⁶ Party identification may be done using ISO 3166-1 alpha-3 country codes¹⁰⁷ for the best usability.

406. The period of activity that generates the ITMO is a required identifying data element associated with the concept of a vintage. The vintage may be coded as a four-digit year number. The ITMOs associated with the vintage may be generated during a shorter period, but the period needs to fall within one calendar year for ITMOs to belong to the same vintage. As an option for a more precise control of the period, the ISO 8601 no-dash format could be used to specify the date range using two eight-character strings composed of a four-digit year, two-digit month and two-digit day of the month.

407. ITMOs may differ in the authorization. Authorizations may vary and be complex in their structure depending on the cooperative approach (see discussion in section II.B.5(d) above). A mechanism needs to be elaborated for the storage of authorization-related data and separation between ITMOs that have different authorizations. For international reporting level, only the authorization for NDC and the authorization for OIMP are important. These may be stored as logical/Boolean data elements of the ITMO.

408. Paragraph 20 require ITMOs to be reported according to sectors and activity types. Different cooperative approaches may use sectoral and activity type breakdowns coming from various sources and authorities. Therefore, those characteristics are identified by two parameters:

- (a) The source, authority, scientific, standardisation body or think tank that produces the breakdown;
- (b) The unique code or code name of the sector or activity type given by the source.

409. Unique codes or names of sectors and activity types need to be standardised. The secretariat could keep a nomenclature of codes and names for well-recognised sources, such as the UNFCCC CDM. For other sources that may be specific to one Party or one cooperative approach, it may be impractical for the secretariat to control the nomenclature. The CARP could provide a function to register a new sector or activity type and receive a standardised code for use in ITMO data structures for such sources.

410. Activity locations may be useful to track within the ITMO data structure as meta-data. Activity locations may require different approaches to storage and data structuring depending

called natural keys. When elements are added specifically for the purpose of distinctive identification, without adding a business meaning of their own, such as serial numbers or unique identifiers, they are called surrogate keys.

¹⁰⁴ A surrogate identifier or a surrogate component of the identifier of an object is not derived from any natural property of the object, but instead generated just to serve for identification. Serial numbers, unique random numbers or unique non-repeating alphanumeric strings are examples of surrogate identifiers.

¹⁰⁵ A serial number is a unique identifier that is assigned incrementally or sequentially.

¹⁰⁶ Paragraph 20 (b) specifies “first transferring Party”. The guidance uses “host Parties” in other provisions.

¹⁰⁷ Where an entity that does not have an ISO 3166-1 code is recognised as a Party to the Paris Agreement, a provisional code may be issued by the secretariat after the necessary legal review.

on the activity type and geographical features. In particular, activity locations may be represented by points, polygons or sets thereof, defined by geocoordinates of their vertices or stored in one of the commonly accepted geographic information system data file formats¹⁰⁸. Activity locations are not internationally reportable; cooperative approaches that find tracking activity useful for project identification and avoidance of double counting may include location data in their registry databases.

411. Other data may be stored and tracked by registries with respect to ITMOs. It is recommended that internationally reportable data is distinctively identified in the registry solution¹⁰⁹ as such in order to simplify developers' reasoning about its status and access thereto. Other data should also be specific to ITMOs that carry it, serve a useful purpose within the cooperative approach and be sufficiently succinct to not present bandwidth or storage-related challenges when transacting.

412. **Possible solutions:** The following are possible solutions in relation to recording and tracking ITMOs:

(a) Except BOAAs, the other three methods offer an acceptable level of consistency risk. Strong encouragement for BOAAs to be considered only in the context of simple tracking scenarios such that relate to domestic tracking and do not require multiple transfers of BOAAs (i.e. domestic OIMP uses);

(b) Choosing one way of tracking ITMOs within one cooperative approach or for the same metric by one Party may produce confusing reporting. It is recommended to decide in favour of one method for tracking ITMOs per cooperative approach (or at the minimum per metric used in the cooperative approach);¹¹⁰

(c) Data structures used would depend on the preferred method for tracking ITMOs;

(d) Standardization / nomenclature approach for ITMO attributes should be clarified;

(e) The nomenclature of cooperative approaches needs to be controlled centrally.

E. Registry

413. The concept of a registry is not defined directly in the guidance. Paragraph 29 requires that each Party participating in a cooperative approach that involves the use of ITMOs should either have, or have access to, a registry, and defines a number of characteristics and features of registries that, combined, suggest a limited number of options for the design of what may be called a compliant registry under the existing guidance.

414. Although not specifically included in the guidance, there are no technical limitations to individual Parties having, or having access to, multiple registries. Reporting formats have been designed in a way to allow Parties to participate in multiple cooperative approaches; MOs never cross the boundaries of their approach; therefore, combining the reporting from multiple sources is therefore a trivial operation similar to concatenation of lists. In order to avoid unnecessary complexity and confusion, it is, however, not recommended for one Party to track its participation in one cooperative approach in more than one registry.

415. It has been suggested by Parties that a registry may take the form of an electronic database that:

(a) Supports the notion of an "account" for ITMOs;

¹⁰⁸ Open GeoJSON standard, RFC 7946, <https://geojson.org/> or Shapefile (free-to-use format regulated by Esri).

¹⁰⁹ Some examples of such a distinction are keeping data in a separate collection or a separate table, prefixing field names, or, for Excel-based registry solutions, colour-coding of the cells.

¹¹⁰ See the proposed outline for the IR in Annex I to this paper, which includes a proposed option for reporting the tracking method.

(b) Can issue/create, hold, transfer ITMOs and otherwise track changes in their status.

416. Despite significant differences in the possible approaches to identification and tracking of ITMOs, implementation of technical arrangements to support different approaches should not be a major factor in the cost and complexity of the overall registry solution. Therefore, in order to achieve flexibility to participate in different cooperative approaches, it may be recommendable to develop or acquire registries that support all approaches to identification and tracking.

417. For cooperative approaches anticipated to have very low transaction volumes, transaction densities, or integration needs, simplified systems, such as ones based on standard office software (e.g., Microsoft Excel) could be used. This would entail manual completion of reporting formats.

1. Registry models

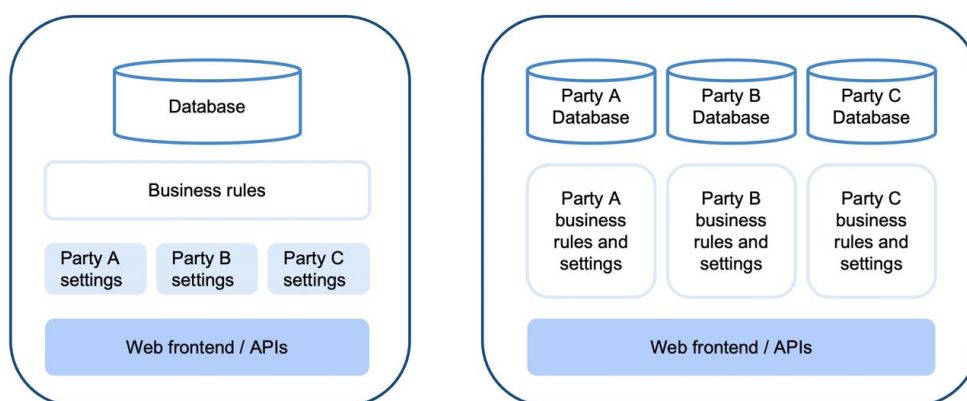
418. As discussed above, registries may be built differently and, consequently, offer different functionalities, performance, usability¹¹¹ and consistency guarantees. In discussing approaches to build registries, the Parties have highlighted the following main models:

- (a) Nationally-designated registry that track ITMOs as units;
- (b) Nationally-designated registry that track ITMOs as accounting amounts;
- (c) Centralised registries namely the international registry and the mechanism registry, that issue and track ITMOs as units.

419. Nationally-designated registries may be used by one or several Parties. Some cooperative approaches may elect to use a common registry for all Parties to the approach to save costs, simplify processing and achieve additional consistency guarantees. Servicing multiple Parties, may be achieved in two ways (see figure 15):

- (a) Designing a common internally-consistent system where the registry enforces its consistency rules across the Party-specific registry services;
- (b) Designing a multi-tenant system where each Party receives access to an independent set of registry services that is not affected by operations of other Parties that use the registry.

Figure 15: Common vs. multi-tenant arrangement for a registry



420. In addition to the economies of scale in operation, common registry systems with a guarantee of internal consistency have a potential to significantly reduce the burden of international reporting and eliminate the risks of inconsistency in reporting between Parties that use such a registry system. At the same time, they are less flexible and require more commonality in approach to handling ITMOs between Parties. Prescribing the use of a

¹¹¹ Usability can be described as the capacity of a system to provide a condition for its users to perform the tasks safely, effectively, and efficiently.

common registry system to all participating Parties is the least technically challenging way of implementing technical arrangements for the turnover of ITMOs within a cooperative approach.

421. Multi-tenant systems are similar to multiple independent registries run on the same code base and equipment. They achieve some of the economies of scale in operation and provide greater flexibility and opportunity to differentiate between Parties, but they do not facilitate cross-Party consistency or international reporting.

422. Nationally-designated registries used by several Parties may present specific challenges related to trust, institutional and legal arrangements for running them. In order to reinforce the stability of such registries' institutional arrangements, it may be advisable to place operations of common registries under the auspices of already established intergovernmental bodies, rather than a single-issue entity established solely to implement the registry and falling under one Party's jurisdiction. Another alternative is the use of a commercial provider that is granted independence and immunity to national discovery or enforcement in the questions of running the registry system.

423. Some of the trust-related risks may be addressed by using the DLT with nodes in all participating Parties. At the same time, such an approach foregoes most of the economies of scale in operation; it requires additional, scarce and expensive capacity from all Parties; and it may also make legal and institutional arrangements more complex and inflexible.

424. Advantages, disadvantages and risks that are specific to the four methods for tracking of ITMOs are discussed in section III.D.1 above.

425. There is no theoretical limit on the number of registries a Party may use. It is however assumed that Parties will not use more than one registry to participate in one cooperative approach. The structure of reporting formats allows Parties to report on the basis of information from multiple registries.

426. The model of the international registry is discussed below; the mechanism registry is discussed in detail in a separate technical paper titled.¹¹²

2. Recording and tracking functions

427. According to paragraph 29, all registries should implement accounts. Depending on the agreements within the cooperative approach, registries may implement all or a subset of the following functions. Registries may implement other functions as long as they do not conflict with the principles and accounting approaches described above.

(a) Accounts

428. Registry accounts hold records of holdings in ITMOs which accumulate as result of transactions involving the account. An account is specific to an account holder (a registry administrator, a Party or another entity) and a metric, including the accounting unit.

429. Where ITMOs are identified as units or UIAAs, accounts group together the uniquely identified ITMOs and augment them with metadata designating the account's purpose, account holder and other parameters.

430. Where ITMOs are stored as BOAAs, accounts keep a balance or multiple balances of ITMOs grouped by the fungibility bucket according to the rules of the respective cooperative approach.

431. BHTAs, where required, may be set up to track underlying accounts regardless of their type.

¹¹² A technical paper on "Operations of the registry for the mechanism established by Article 6, paragraph 4 of the Paris Agreement" is to be published here: <https://unfccc.int/process/the-paris-agreement/cooperative-implementation>.

(b) Operations log

432. Registries should keep an operations log with a comprehensive, time-stamped record of business activity of the registry. It is recommended that the operations log be made replayable, i.e., that the content of the operations log would be sufficient to re-create the state of the registry database at any point in time.

433. Simplified registries based on standard office software that are technically unable to keep an adequate operations log may opt for creating a time stamped data backup after each operation or use a version control system to record a version of registry data after each operation.

(c) Generation of ITMOs

434. The generation of ITMOs in units consists of the creation of a record of a new serial number range of units with all the metadata required in the ITMO data structure.

435. If the new serial number range is within a fungibility bucket that already exists, the first serial number is the consecutive number after the last serial number generated in the given fungibility bucket. If there are no ranges in the fungibility bucket, the first unit in the range is a number, commonly 1.

436. The generation of ITMOs in UIAAs consists of the creation of a new UIAA with an unique identifier. UIAAs are not serialised as units, therefore it is recommendable that they be identified with help of random, globally-unique identifiers as surrogate primary key. The metadata of an UIAA may further include the identifier of the cooperative approach, sector and other data points.

437. The generation of ITMOs in BOAAs, where no BOAAs in the same fungibility bucket already exist, consists of (see also section III.D.1):

(a) Creation of a zero holding balance in the shadow issuance account for the fungibility bucket in question;

(b) Transfer of the amount of ITMOs to be generated from the shadow issuance account to the account where ITMOs need to be generated.

438. The generation of ITMOs as BOAAs, where a BOAA in the same fungibility bucket already exists, is implemented in the form of a transfer from the respective shadow issuance account to the account where ITMOs need to be generated.

(d) Authorizations

439. An authorization transaction is a change in the status of a subset of ITMOs that defines and limits the allowed use of such ITMOs. Paragraph 1 prescribes specific scopes of authorizations, namely authorization for the use towards achievement of the NDC and/or authorization for OIMP. The guidance on authorization for “other purposes” (as part of OIMP) is not specific with regard to what these purposes may be and how much granularity is required in the registry data model to track and technically enforce such authorizations. However, paragraph 20(b) requires reporting of “the other international mitigation purpose authorized by a Party”. Furthermore, paragraph 55, annex, decision 3/CMA.3 mentions specific uses for which Article A6.4ERs may be authorized.

440. Only the authorizations for the use towards achievement of the NDC and/or for OIMP are internationally reportable. Other authorization elements may be used to parametrise business rules within a cooperative approach.

441. An authorization that is issued for a subset of MOs stored in the registry may require reconfiguration of storage records according to the newly established boundaries of fungibility buckets: there may be a need to split a unit range or a UIAA or create a new balance of BOAAs and transfer the amount of newly-authorized ITMOs.

442. Authorizations may be provided by a Party that does not operate the registry in which the MO being authorized is tracked. For this reason, and in order to maintain the immutability of ITMO data structures, the authorizations may be recorded in a way that they are made available to the business rules of the registries processing transactions with the respective

ITMOs but not become part of the ITMO data structure itself. This may be achieved in several ways:

(a) Authorization may be recorded in any registry serving the cooperative approach (with the best choice being recording the authorization in the registry of the Party that is issuing the authorization), available for other registries for polling. When an operation that requires authorization is attempted by the registry that holds the ITMO in question, this authorization is polled from all other registries serving the cooperative approach and cached in the registry that required the authorization for an attempted transaction. This approach is “lazy” (in technical terms) - it does not attempt to ensure awareness of the authorization in all concerned registries upfront, which may make sense as most registries may not need to know about the authorization of this particular ITMO for their operations;

(b) Authorization may be recorded in any registry serving the cooperative approach and proactively pushed to all other registries (where registries are connected). This approach creates some excess information in registries, but ensures higher availability of the operations that require information about authorizations;

(c) If a cooperative approach uses a transaction log, a meta-registry or is based on a common data medium, such as a distributed ledger, the authorization may be stored in one of those media and become immediately available to all participating registries’ business rules.

443. Authorization information is internationally reportable by the Party that has issued the authorization. In most cases, authorization information will originate from the same Party’s registry; in other cases, authorization information for reporting purposes may be obtained in the same way as for transaction purposes.

444. Authorization information should include:

(a) A unique surrogate authorization identifier. This identifier may be used in the AEF;

(b) Unique identification of the ITMO(s) being authorized,¹¹³ according to the approach to tracking of ITMOs for the ITMOs in question;

(c) Scope of authorization: NDC, OIMP, or both. Further conditions of authorization may be used by Parties and/or cooperative approaches, which are not internationally reportable.

(e) First transfer

445. First transfer is a designation of a transaction that changes the status of ITMOs being first transferred vis-a-vis business rules. First transfers are therefore very similar to authorizations with regard to the circumstances when and where information about them becomes available. Therefore, similar mechanisms can be used to propagate information about first transfers to any registry or system that requires such information in its business rules.

(f) Splits of uniquely identifiable accounting amounts

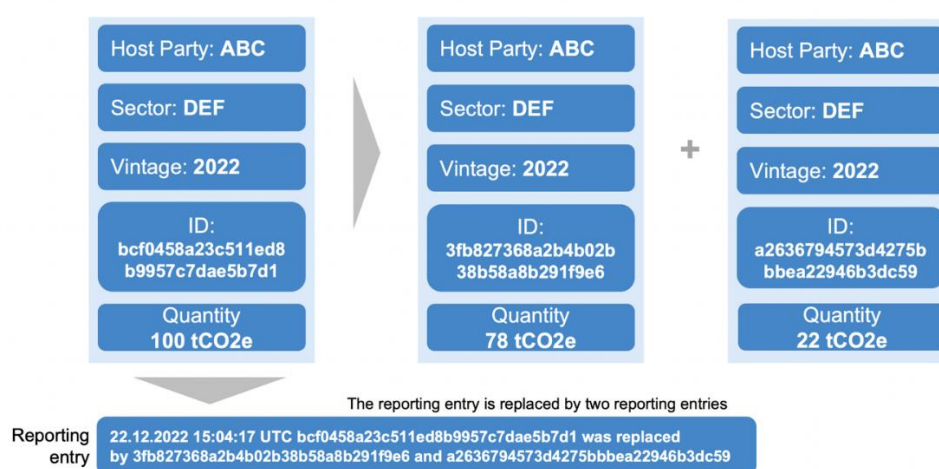
446. UIAAs have a unique identifier attached to the amount as a whole. When only a part of the amount needs to participate in a transaction, e.g., be transferred to another account, the UIAA needs to split into two UIAAs.

¹¹³ There is a natural difficulty with unique identification of ITMOs tracked in BOAAs. At the same time, authorization, along with its scope, establishes new fungibility boundaries which may require splitting of BOAAs into different fungibility buckets to separate authorized from non-authorized ones. Reasoning about which BOAA-stored ITMOs are authorized is hindered by the need to track the authorized status of data objects that do not have a clear way to refer to; there may also be issues in transacting and reporting about ITMOs tracked in BOAAs. Possible solutions are to use natural keys to identify the ITMOs being authorized or to never have partial authorizations for ITMOs tracked in BOAAs.

447. Unlike the serial number of units, the unique identifiers of UIAAs do not carry any information about the ordering and unique identification of indivisible amounts of ITMOs in them. It is therefore impossible to reason about consistency and possibility of double counting using the unique identifiers of UIAAs alone.

448. In order to provide transparency at the international level, the splitting operation needs to be internationally reportable and the AEF will need to be incorporate a way to report the splitting operation. The unique identifier of the original UIAA and the unique identifiers of the UIAAs that are generated in the course of the split, along with amounts of ITMOs in each, will be required at the international level. With this information, it is possible to account for all ITMOs in UIAAs and establish that there no additional amount was generated during the splits. The proposed version of the AEF provides for reporting of ITMOs tracked as UIAAs but it does not include an action type for splitting UIAAs. If this method is approved and splitting is required,¹¹⁴ the AEF would need to incorporate an action type for splitting operation (see figure 16).

Figure 16: Uniquely identifiable accounting amount split



(g) Transfers, acquisitions, uses and cancellations

449. Following the principle of minimising the number of elementary operations supported by registries, it is recommendable that most of the business activity of a registry consist of transactions moving MOs between accounts – involving an initiation of a transfer from a transferring account to an acquiring account that may be a holding account (for acquisition), a cancellation account (for cancellation) or a specific purpose account such as a retirement account (for a specific use).

450. Thus, distinct transaction types are implemented via transfers to accounts designated for holding, use or cancellation of ITMOs, respectively. As a principle, a transaction should be conditioned by all the necessary business rules that ensure that the transaction is valid, does not introduce inconsistencies, and is compliant to all international requirements and rules of the cooperative approach. For example, business rules applicable to use or cancellation accounts should not allow further transfer of acquired ITMOs, making these accounts the “final destination” for the ITMOs transferred into them. A registry that has acquired ITMOs into accounts designated for use or cancellation should be able to report it internationally and certify the use or cancellation to stakeholders.

451. Every transaction should carry a unique identifier for tracking purposes. Unique identification of transactions should facilitate the following mandatory characteristics of transactions:

¹¹⁴ Splitting of UIAAs may not be required in the context of a simple trading arrangement, where an ITMOs is generated, transferred, and used.

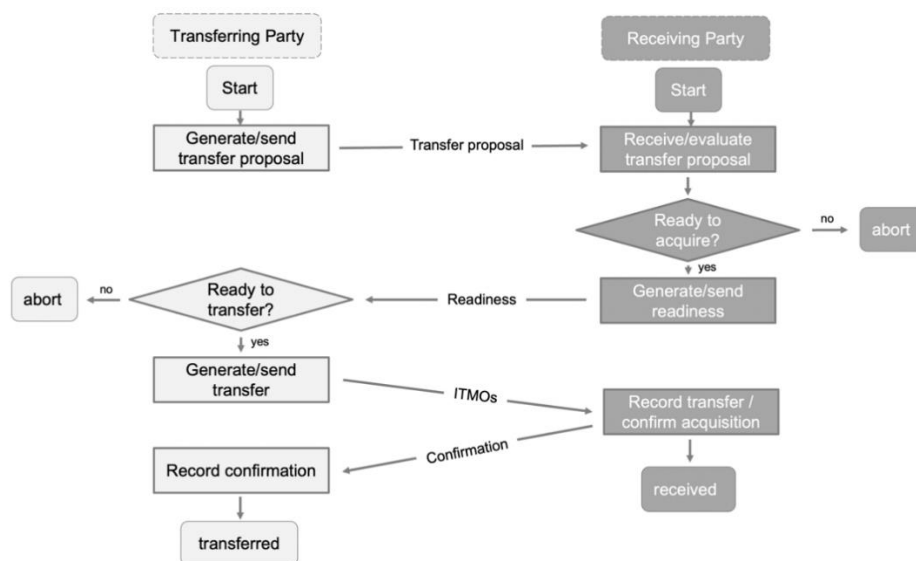
(a) The idempotence, or the guarantee that a single transaction, attempted multiple times, will only have effect once; and

(b) The possibility of linking to the transaction, e.g. in a scenario where a corrective or amending transaction needs to be executed.

452. In most cases, a transaction needs to be agreed upon by both the transferring and the acquiring sides. The possible transfer flow to cover for such an agreement may include the following steps (see figure 17):

- (a) Generation of a transfer proposal message by the transferring side;
- (b) Delivery of the transfer proposal to the acquiring side;
- (c) Generation of a readiness to acquire message¹¹⁵ on the acquiring side;
- (d) Delivery of the readiness to acquire message to the transferring side;
- (e) Generation of a transfer message by the transferring side;
- (f) Delivery of the transfer message to the acquiring side;
- (g) Recording of the transfer by the acquiring side;
- (h) Generation of a confirmation of acquisition message by the acquiring side;
- (i) Delivery of the confirmation of acquisition message to the transferring side;
- (j) Recording of the confirmation of acquisition message with the transfer by the transferring side.

Figure 17: Transfer flow concept (positive path, without reconciliation follow-up)



453. The protocol described above leaves the possibility of a failure to deliver the confirmation of acquisition to the transferring side. Depending on the network situation between the registries participating in the cooperative approach, such failures may be either handled immediately or within the scope of the next reconciliation.

454. Transactions within one registry (being executed inside one trust boundary) may forgo arrangements for non-repudiation. Between registries, it is recommendable that non-repudiation be implemented, for example in the form of digital signatures on all messages

¹¹⁵ Readiness to acquire is fundamental to sovereignty and the voluntary nature of Parties' participation in a given cooperative approach. For DLT-based registry systems, the ledger protocol should allow for an active, mandatory acceptance of incoming transfers

that constitute a transfer transaction and the inclusion of triggering message digest¹¹⁶ and signature in the follow-up messages.

455. Sequencing of transactions is essential for overall consistency. It is technically impossible to synchronise the clocks of disparate registry systems exactly, so registries are never guaranteed to have the exact same view on the timing of their operations. Efforts should be made to ensure synchronisation of system clocks of all registries, but transaction protocols and messages should also include the originating¹¹⁷ registry's view on the timing of the operation in question and/or its sequence number. This way, the receiving registry is enabled to reason about the integrity of the message and to decide on the course of further action.

456. Synchronisation of system clocks between registries participating in a cooperative approach, as it may be the case, is best done using the same strategy for all participating registries. Both the standard NTP¹¹⁸ using publicly available services and cooperative approach-specific methods, such as entrusting the time service to a transaction log, or some central system may be used. This may also be the best option for registries serving multiple cooperative approaches.

457. A possible approach to the implementation of mobility of ITMOs between registries is the "re-creation" of units or accounting amounts where ITMOs in the transferring registry are cancelled, documentation certifying the cancellation is transferred to the acquiring registry and used there to generate new or "replacement" ITMOs. The advantage of the "re-creation" approach is the optionality of interoperability and automation of transfers, enabling a very simple, manual implementation. Although this approach has practical implementations and 48 per cent of surveyed Parties either intend to use or consider using this approach in their Article 6 registries, it comes along with significant risks to consistency guarantees in an international setting, present issues with reporting, and may also have implications for security and resilience of registry systems against fraud. Implementation of robust safeguards for consistency and security is similar in the required effort and cost to the implementation of automated transfer operations. The latter should be the preferred architectural choice for practical implementation reasons, and because of the good practice to give preference to direct implementation of business needs over workaround solutions producing a similar effect.

458. Non-repudiation and the fully-fledged transfer flow described above are not possible for registries that are based on simple office software-based solutions. It is recommendable that cooperative approaches that allow office software-based registries are consolidated within one file, e.g. one Excel workbook, that is managed centrally to the cooperative approach by one mutually trusted entity and made available in read-only mode to all participating Parties.

459. The absence of non-repudiation arrangements presents a risk of impossibility to establish the ownership of ITMOs and exclusion of double use, which presents a serious legal and reputational risks to the operations of the registry systems.

(h) Reconciliation and internal data consistency check of a cooperative approach

460. Efforts should be made to prevent data consistency issues within a cooperative approach and contradictions in international reporting by Parties that participate in one cooperative approach. Despite all technical arrangements to prevent data consistency issues at the transaction level, inconsistencies may still arise due to miscommunication, network issues, defects in registry software, data corruption or intentional tampering with registry data by unauthorized persons or rogue authorized personnel.

¹¹⁶ A message digest is short numeric representation of the contents of a message. The rules used to calculate this representation, called the hash function, are selected in a way that even small changes to the original message lead to a large change in the message digest and that it is very difficult to find a "collision" or a second message with the same digest.

¹¹⁷ In this text, "transferring" and "acquiring" are used to refer to the direction of the transfer, whereas "originating" and "receiving" to refer to the direction of a single message sent in the course of the transfer.

¹¹⁸ Network Time Protocol, RFC 5905 <https://datatracker.ietf.org/doc/rfc5905/>

461. Out of the processes in managing registry data, reconciliation is by far the most complex one. Other ways of ensuring consistency across the cooperative approach, such as the consolidation of all registries involved therein in one database with strong consistency guarantees and run by a mutually trusted entity, if legally and institutionally possible, holds a significant potential for simplification. It is also impractical to implement formal reconciliation in registry systems that are based on office software.

(i) *Reconciliation with units and UIAAs*

462. Units and UIAAs have unique identifiers which avail them for a “head count”¹¹⁹ approach to reconciliation. A similar approach, consisting of three phases, was used, successfully, by the ITL for Kyoto units. In the first phase, the balances in accounts in each of the fungibility buckets were tallied and compared. Then, for those where balances did not match, lists of individual serial ranges¹²⁰ in accounts were requested and compared. Finally, for individual serial ranges found to be inconsistent, transaction history was requested and compared.

463. The “head count” approach is capable of delivering partial reconciliation in cases when some registries are unresponsive to reconciliation-related data requests. For units, it can establish that new units have not been created outside of the expected registries of issuance for such units, and that no units are believed to be in two different registries at the same time. For UIAAs, it can establish that all accounting amounts are properly authenticated by registries that have issued or exchanged them, and that no accounting amounts are believed to be in two different registries at the same time. Reconciliation in Kyoto systems was always done between one registry and the ITL.

464. Direct reconciliation between two registries that participate in a cooperative approach that does not use transaction logs may be organised on the basis of transaction history. Attempts at direct reconciliation between three and more registries are likely to create either an entity that is similar in function to a transaction log, or a system similar to a DLT; these approaches are discussed in the respective sections of this document.

(ii) *Reconciliation with BOAAs*

465. BOAAs do not have unique identifiers, they may only be reconciled using financial accounting and clearing methods. It is impossible to reason about the correctness of balances in accounts without having the overall picture of balances in the entire cooperative approach. The first phase of reconciliation for BOAAs is to collect balances in all accounts in a given fungibility bucket and check whether the total amount of MOs in all accounts (including the shadow issuance accounts) is zero. If it is not zero, the only way of investigating inconsistency is to audit transaction histories and balances of all accounts within the fungibility bucket across the cooperative approach. Partial reconciliations are not possible with BOAAs; unresponsiveness of just two registries to reconciliation-related data exchanges may lead to unresolvable ambiguities about the correct state of account balances.

(iii) *Higher-tier account balances*

466. The reconciliation of a HTAB is a check that the balance in the higher-tier account is the same as the balance in the account in the underlying registry.

3. Minimum requirements for registries

(a) **High-level requirements**

467. To fulfil their purpose for tracking ITMOs, and with a view to TACCC, registries should adhere to minimum standards for implementation and operation.

¹¹⁹ For information on the “head count approach” see information and reconciliation behaviour diagramme as included in the DES: <https://unfccc.int/process/the-kyoto-protocol/registry-systems/international-transaction-log>.

¹²⁰ UIAAs were not transacted in Kyoto systems but the logic of “head count” reconciliation applies to them as well.

468. A registry SHALL¹²¹ be based on a database management system with strong internal consistency. The database SHOULD contain the entire state of business objects in the registry. Larger data items, such as supporting documentation MAY be stored separately and not be covered by strong consistency arrangements as long as it is possible to rebuild a consistent state of the entire registry dataset after the last transaction.

469. Operations in the registry SHALL be serializable i.e., for any two operations, it shall be possible to identify which operation happened first.

470. A registry SHALL keep a time-stamped log of all of its business operations, changes in settings, and communications with other registries. The log SHOULD be re-playable i.e., it should be possible to recover the state of the registry at any moment of its operation.

471. A registry SHOULD implement arrangements for backup, business continuity and disaster recovery that are appropriate to the business risks related to the loss of data and extended unavailability of the registry.

472. A registry SHALL have access control for its users. Access control SHOULD be sufficiently robust to effectively counter existing threats to the registry operation and data integrity, and comply with the access security practices and guidelines prescribed in its jurisdiction and/or by agreements within the cooperative approaches that the registry is participating in.

473. A registry SHALL implement at least the access of the main registry administrator and MAY implement other levels and scopes of access for additional administrators, account holders, verification bodies and other user types as called for by the rules of the cooperative approaches that the registry is participating in.

474. A registry SHOULD NOT depend on being constantly connected to other registries, transaction logs or secretariat systems, as it may be the case, in order to remain responsive to users. A registry SHOULD be able to detect that it is working offline to other systems it normally connects to, and disable business functionalities that depend on currently unavailable connectivity.

475. A registry SHALL be capable of keeping ITMOs in all forms (units, UIAAs, BOAAs, BHTAs) in which ITMOs are kept in cooperative approaches in which the registry participates.

476. If HTAs are stored in the registry, the registry SHALL be able to connect to, and receive the state and history of, the underlying accounts.

477. A registry SHOULD operate in a protected network environment. Networking arrangements SHOULD limit access to the registry to authorized users and other registries, transaction logs or other authorized systems that are essential for the operation of the cooperative approaches that the registry is participating in.

478. A registry SHALL implement a concept of an account. Accounts MAY contain ITMOs from different fungibility buckets, but the registry SHALL NOT allow ITMOs from different cooperative approaches¹²² or accounted for according to different metrics to be kept in one account. It SHOULD be possible for an authorized user of a registry to have at least one account for any given metric. The registry SHALL enforce that the account is set up for the form of ITMOs that is accepted in the cooperative approach for the given metric.

479. A registry SHALL implement at least one account type. The basic account type MAY be the holding account, but the registry MAY also implement cancellation accounts, use accounts, levy accounts and any other account types as required by the cooperative approach the registry is participating in.

480. A registry SHALL implement the transaction functionality. The functionality SHALL be in line with basic transaction flows for the form of ITMOs in the participating accounts. Transactions SHALL obey the business rules defined, if any.

¹²¹ In order to be useful for software specifications, key words that designate requirement levels are capitalised and used as defined in RFC 2119 <https://www.ietf.org/rfc/rfc2119.txt>

¹²² For example, mixing metrics of IMTOs would prevent calculating holdings correctly.

481. A registry SHOULD implement a way to define business rules that are able to attach validation conditions on all transaction types and create supplementary transactions¹²³ as necessary. The definition of business rules SHOULD be part of the configuration; changes in business rules SHOULD NOT require changes in the implementation of basic transactions.

482. A registry SHOULD¹²⁴ implement the authorization functionality.

483. A registry SHALL implement support to the reconciliation mechanisms defined in the cooperative approach.

484. A registry SHALL be able to produce the information according to the relevant reporting requirements of the guidance. Any captions and titles in international reporting SHALL be according to the agreed formats and in English language.¹²⁵

485. A registry SHALL implement a user interface in at least one language. It MAY be internationalised and localised to multiple languages for the convenience of participating Parties.

486. A registry SHOULD implement a function of internal consistency check.¹²⁶

487. A registry, or a set of registries participating in a cooperative approach SHOULD implement a mechanism for non-repudiation. Each registry SHOULD be able to provide immutable and tamper-proof evidence of the transaction for all changes to data contained therein.

(b) Recommended operational practices

(i) Role of operational practices

488. Operational practices should respond to the business needs and risks associated with the specific registry. Robust operational arrangements are expensive and the assurances they provide should be measured against the value of ITMOs and transaction volumes involved. Potential reputational damage for the registry operator, participating Party, cooperative approach and Article 6 markets as a whole should also be taken into consideration when determining the appetite to operational risk a registry administrator is prepared to take in operating the registry.

489. The operational practices listed here are discussed in the context of a single registry. They are, however, applicable to consolidated registry installations, such as the international registry, transaction logs and other systems and software solutions that the Parties may decide to use for data and transaction management in their cooperative approach. Operational arrangements for a registry should be thoroughly documented.

(ii) Operational practice elements

490. The server side of registry software should be hosted in operationally mature, professionally-run, physically protected data centres that implement appropriate measures to ensure security and reliability of operations¹²⁷. Public cloud services should be afforded due consideration as their operational maturity and security are frequently higher than what national data centres have to offer, despite some concerns over data sovereignty which may be addressed with technical means.

¹²³ For example, some transfers may automatically trigger additional transfers of any levies due under the applicable rules.

¹²⁴ Registries that are not under control of authorising Parties may not need to implement authorization functionalities. They SHALL, however, take authorizations into consideration in their business rules for transactions.

¹²⁵ English language is used in the UNFCCC reporting practice.

¹²⁶ Not to be confused with the consistency check as per paragraph 33(a).

¹²⁷ The level of data centre maturity and certification should be determined as at least the most stringent of the ones required by the national IT standards for this type of systems and/or specific provisions of the cooperative approach(es) serviced by the registry. Recognised standards of service management, such as ISO 20000 series, COBIT and Information Technology Infrastructure Library are also good reference points for operational maturity standards.

491. Backups of data in the registry systems should be offline, off-site and encrypted. There should be no way to access backups from the registry application or the operating system under which the registry software is running. Backups should be frequent enough to capture common risks, such as the sudden loss of power supply or physical destruction of the server equipment. Backups should also be frequently tested by attempting to restore and operate a test registry system on the basis of restored data.

492. Registries' operational stability may further benefit from the availability of a geographically separated hot, warm, or cold standby¹²⁸ instance of the registry.

493. Registry should define recovery actions in case of operational events and disasters, and establish business continuity plans, in particular, for:

(a) The site¹²⁹ loss scenario which assumes the loss of all operational arrangements on the hosting site and all data that is stored on this site;

(b) The site malfunction scenario, which assumes the loss of all operational arrangements on the hosting site without losing data;

(c) The catastrophic hardware or system software breakdown, which assumes the loss of the ability to run operational arrangements on the same equipment or the same operating system, but retains the ability to run them in the same data centre, and may involve losing some data;

(d) Hacking, which may lead to different types of loss depending on the attack vector used and requires an elaborate "what if" response strategy.

494. Business continuity and disaster recovery plans should be tested periodically in order to stay on top of any changes in the operational environment which may go unnoticed.

495. A structured system for the provision of user support is important for registries that provide services to multiple users. Good practices for service management systems include:

(a) Splitting support into two or three levels with lower levels being the most accessible and responsive to users and further levels, to which a request may be escalated, more competent in the way the system works and empowered to make custom changes;

(b) Availability via multiple channels, such as a web portal, email, and phone;

(c) Numbering and identification of requests and cases;

(d) Service Level Agreements indicating timelines for response and resolution of typical user requests;

(e) Dashboards and automated prioritisation for service operators;

(f) Integration between the user authentication systems of the registry and the service management system.

¹²⁸ A hot standby system runs simultaneously with an identical primary system. Should the primary system fail, the hot standby system takes over immediately and continues operation. Data loss in hot standby arrangements is very rare. Implementation of hot standby is the most expensive and requires complex operational configurations and testing. A warm standby system runs in parallel with the primary system and receives a stream of data (state) changes from the primary system. Minor data loss is possible in warm standby arrangements but it is typically recoverable if streaming of state changes is set up correctly. Warm standby is reasonably easy to set up and arrangements for it come out of the box with major databases and enterprise-grade systems. Testing warm standby is reasonably straightforward. A cold standby system is a system that is not running in the normal scenario, it is only brought up if the primary system fails. In order to bring the state of the cold standby to the latest state of the primary system before failure, the latest backup of the primary system's state is updated with the recorded stream of state changing events. Cold standby is as reliable as warm standby, but it may require some time for it to become operational once failure condition is established. It is slightly more difficult to set up than a warm standby, but it is much cheaper to operate as most of the time the standby system is switched off.

¹²⁹ "Site" in the context of operational arrangements is the physical hosting location, such as a data centre.

496. The developer of the system integrator of the registry software should be retained¹³⁰ and available to address any defects discovered in the registry software or add new features as required.

497. **Possible solutions:** The following are possible solutions in relation to registries:

(a) The minimum high-level requirements for registries could be maintained as a standard or as a recommended standard to which registries adhere and Parties use as a basis for their reporting on the readiness of their tracking arrangements;

(b) Exemption to meeting the minimum high-level requirements is acceptable for when Parties justify the use of simplified registry solutions;

(c) Use of a transaction log or a similar system to store information that is relevant to the functioning of a cooperative approach;

(d) Promote clear matching of ITMOs to their authorizations (including avoiding the use of methods to tracking that prevent it, such as BOAAs).

F. International registry

1. Functions

498. According to paragraph 30, the international registry shall be implemented for Parties that do not have or do not have access to a registry. The international registry shall have the same function as those set out for participating Party registries as per paragraph 29.

499. Parties using the international registry should be able to generate, store and transact in their ITMOs under one or more cooperative approach. The international registry therefore should be capable of working with:

(a) Multiple Parties;

(b) Multiple cooperative approaches;

(c) Multiple approaches to identifying and tracking ITMOs; and

(d) Multiple definitions of metrics that are specific to one or more cooperative approaches.

500. It could be envisaged that the international registry hosts entirely some cooperative approaches, whereby participating Parties could benefit from cross-Party consistency. Other Parties may not participate in such cooperative approaches or may not accept cross-Party consistency on the sovereignty grounds. Fulfilling both types of needs may become a technical challenge in the development of the international registry. This challenge may be addressed in one of the four ways, in order of growing technical complexity and associated cost (see also section III.F.1 above):

(a) Offer one common, internally consistent - including across Parties – registry solution using one database (integrated system). The international registry built in this way will not suit the needs of Parties and cooperative approaches that are not comfortable with data in other Parties' registries creating constraints for activities in their own registry;

(b) Offer a multi-tenancy system where registries share the software code, but every Party's registry has its own database, which is internally consistent, but does not offer cross-Party consistency even with Parties whose registries are also part of the international registry. Ensuring cross-Party consistency in such a system will be a challenging task without using additional software. Such software will either have to be developed by the secretariat, as discussed in the bullet (d) below, or by the Parties themselves, which would defeat most of the benefits of using the international registry and not having to develop a national registry;

(c) Offer a multi-tenancy system for registries that are run independently of one another and for entire cooperative approaches that opt for keeping cross-Party consistency within the approach;

¹³⁰ Highly specialized software are characterized with dependency on the services of the developer.

(d) Offer a multi-tenancy system and an additional reconciliation mechanism¹³¹ that operates on the business rules layer and can be set up to support selected levels and kinds of consistency across subsets of registries, according to the requirements of their owners.

501. The user interface of the international registry software should be internationalised¹³². The first localisation of the user interface should be English, followed by other United Nations languages¹³³ and/or other languages requested by Parties, subject to the availability of resources.

502. The international registry shall provide the data and information required for reporting purposes to the Parties that use it in suitable format(s).

2. Communication with other registries

503. For an integrated system, the registries will be connected by virtue of being part of the same database. Registry tenants within a multi-tenant international registry will communicate via a standard protocol. Some cooperative approaches may also include registries within and outside the international registry. The international registry will be connected to the Article 6.4 mechanism registry (see section IV below). Therefore, it will be necessary to establish a protocol of communication between registries.

504. Although the experience of the ITL and Kyoto systems offer a success story of inter-registry communication and robust Data Exchange Standards¹³⁴ (DES), it is not immediately transferable to Article 6.2 registries for a number of reasons:

(a) The DES is dealing exclusively with serialised units;

(b) The DES assumes the presence of the ITL, for which there may not be a counterpart in some cooperative approaches;

(c) The communication protocol used in DES is SOAP¹³⁵. SOAP used to be the protocol of choice in the software industry for financial systems and asynchronous communications. SOAP is going out of mainstream use even in the niches where it was used the most¹³⁶ and may become difficult to maintain for the expected lifetime of Article 6 systems.

505. The most economical way for Article 6 systems would be to develop one, common, extensible protocol that degrades gracefully¹³⁷ in case some registry systems, transaction logs or other connected systems do not support non-critical features. The development of the protocol should be organised in an open way that allows, as a minimum, all stakeholders to communicate their potential use cases to the secretariat for analysis. The model implementation of this communication protocol may be developed by the secretariat to be applied and tested for the communication between the international registry and the mechanism registry. The international registry will then be able to offer connection to other

¹³¹ The ITL assumed the function of a reconciliation mechanism between disparate national registries in Kyoto systems. A transaction log service could be offered to tenant registries of the international registry as a reconciliation mechanism.

¹³² Internationalisation or i18n is the process of making the software capable of interacting with the user in multiple languages, without preference to any particular language. A related process of localisation (l10n) is responsible for implementing a single language version of internationalised software. Structuring the development of user interfaces by implementing i18n once, and following up by one or more l10n allows developers to make development of multilingual software standardised, predictable, error-free, and to implement additional languages gradually over time and on an as-needed basis, without affecting the code base of the main business logic and hence requiring less testing each time a language is added.

¹³³ Internationalisation that is capable of supporting right-to-left (RTL) languages is significantly more labour-intensive. A decision on whether such languages will be supported in the future needs to be taken before development of the registry.

¹³⁴ https://unfccc.int/sites/default/files/des_tech_spec_ver_1_final.pdf

¹³⁵ Simple Object Access Protocol <https://www.w3.org/TR/soap/>

¹³⁶ For example, most of the EU Payment Systems Directive 2 (PSD2) APIs are based on RESTful interfaces instead of SOAP.

¹³⁷ Graceful degradation is the ability of a system to maintain limited functionality when business or operational conditions do not allow the use of full functionality, but remain functional overall.

registries and systems using this protocol, enabling the communication between registries serving cooperative approaches that use both standalone registries and registry tenants within the international registry (see further discussion on interoperability between registries in section III.I below).

506. The international registry will maintain authority over accepting any external transactions. Sufficient data to resolve potential inconsistencies will be available in the international registry for transactions within the international registry and between the connected Party registries and the international registry. Following the principle of non-repudiation, Parties need to ensure availability of the necessary data for transactions between Party registries.

3. Administration

507. The international registry should provide for a role of an administrator for each of the Party spaces therein, a role of an administrator of a cooperative approach, for cooperative approaches hosted entirely by the international registry, and a role of an overall administrator, fulfilled by the secretariat:

(a) Party space administrators will be in charge of business settings for accounts and participation parameters for cooperative approaches the respective Party is a member of. Party administrators will decide what entities can hold accounts under the authority of the Party and what transactions they can request;

(b) Cooperative approach administrators will be responsible for the settings, parameters and business rules of specific cooperative approaches, as well as for the connection of specific Party registry spaces to the cooperative approach;

(c) The overall administrator will be in charge of administering lifecycle¹³⁸ of Party spaces, maintaining common nomenclatures, time-keeping, production of international registry reports and statistics, overseeing the inter-registry reconciliation processes where required, and technically maintaining the registry in a secure and reliably functioning condition.

508. Party space and cooperative approach administrators would be responsible for the user management procedures, including know-your-customer related requirements. A certain level of coordination between administrators would be appropriate in setting up common minimum standards that guarantee the operational security of the registry.

509. Thus, the administration of the international registry should include a forum¹³⁹ where Parties whose registries are consolidated on the international registry would be able to coordinate effort, including request additional features and discuss them on the technical level. The ultimate decision on prioritisation of features should be left to a professionalised body. The secretariat alone or the secretariat with a small technical oversight committee appointed by the Parties could fulfil the functions of such a professionalised body.

4. Operational procedure

510. Operational procedure for the international registry would need to be developed, including in relation to:

- (a) Account types, account maintenance processes and transaction flows;
- (b) Account representatives and authentication processes;
- (c) Roles of administrators;

¹³⁸ This can include the registration of requests for a Party space in the international registry. provisioning of the space administrator account, recovery of access credentials for Party space administrators, archiving of Party spaces that are no longer in use and other overall administration functions.

¹³⁹ This body is different from the proposed registry systems administrators forum in section III.K of this paper. However, it may be organized as a sub-group of the proposed registry systems administrators forum with participation of experts nominated by Parties whose registries are consolidated on the international registry.

- (d) Operational level agreements;
- (e) Establishment, maintenance and troubleshooting of communication links to other registry systems (mechanism registry and other registries as it may be permitted);
- (f) Records management, confidentiality and reporting practices;
- (g) Fees;
- (h) Change management.

511. The operational procedure would clarify what functions of the international registry are to be consolidated and what are to be managed at the individual Party level. The operational procedure may be developed and maintained by the secretariat and be reported to the CMA according to paragraph 36(c).

5. Operational level agreements

512. An operational level agreement (OLA) or another form of formal agreement about the demarcation of responsibilities, tasks, reliability and response time expectations, services provided, and other operational conditions and expectations of Parties, should be concluded between the overall registry administrator and each of the Party space administrators. The conclusion of the OLA should be a prerequisite to provisioning of a Party space in the international registry. The provisions of the OLA should underline that:

- (a) The obligations of the Party under the Paris Agreement and relevant decisions remain intact; and
- (b) The Party is solely responsible for submitting any necessary reporting to the UNFCCC on time and to a requisite quality standard.

513. Although the international registry should strive to fulfil the needs of all Parties, it may not guarantee that any particular feature or operational parameter is or will be available. The use of the international registry is a choice that the Party should make after careful consideration about the sufficiency of functionality and operational guarantees for the fulfilment of the Party's obligations under the guidance and under its agreements within the cooperative approaches concerned.

6. Funding model

514. Regarding the funding model of the international registry, Parties have suggested that it can be funded by:

- (a) User fees (particularly if it holds actual assets);¹⁴⁰
- (b) Contributions from all international transactions;
- (c) Allocations from the CDM funds;
- (d) Developed countries;
- (e) Supplementary funding, which is already specified in the decision 2/CMA.3 and should be sufficient for an international registry that is implemented as an accounting ledger.

515. The funding options are not mutually exclusive. It would be necessary to provide a stable and reliable funding model to guarantee the availability and the service levels of the international registry, noting that upfront finance will be required for software development, release and for setting up the administration functions.

516. Once the functions of the international registries are clarified, the options for the funding model may be elaborated, relying on supplementary funding for the initial stages of implementation.

¹⁴⁰ SBSTA mandate on methodology for the collection of ITL fee may be drawn upon: <https://unfccc.int/resource/docs/2010/tp/01.pdf>

7. Development approaches

^{517.} The development of the international registry software and its operational arrangements will be organised through the secretariat. Direct technical contributions from the Parties (co-sourcing) or the general public (open-sourcing) are possible:

(a) Development through the secretariat, which will source technical work from a commercial provider(s), is the most straightforward option, relying on the experience of commissioning software and the secretariat's existing IT governance structures. Code control-specific security concerns will be centralised and addressed in a simpler way;

(b) Development in close technical cooperation with Parties, where Parties are able to contribute technical assets, including code, could enable more rapid development, lower centralised budget requirement, better up-front alignment between the features of the international registry and Parties' needs, and the ability for the Parties that are unable to contribute to the development financially in light of their circumstances, to participate in the common effort by making the time of local IT development talent available. Co-sourcing could also be a tremendous contributor to capacity building and understanding of the registry systems, particularly in developing countries that had no prior exposure to Kyoto registries. Co-sourcing would increase the complexity of the required code control, security procedures, code ownership and liability, and would require additional effort to balance and prioritise development of features, so to avoid situations that only the features that are requested by Parties that can contribute the most effort to the development become part of the international registry. Presently, the secretariat does not possess experience in managing co-sourced IT development;

(c) Open-sourcing the development and allowing general public to contribute to development of the international registry could tap into the creativity of the open-source community and bring in a wealth of bright ideas and original thought in the design and implementation. A good opportunity lies in bringing on board academic institutions and companies with spare capacity that would like to contribute to the future of Article 6 markets. While a core development and community management team would be required in this case, the overall centralised budget requirement would likely be lower than in the case of development through the secretariat. Open-sourcing would, however, significantly increase the complexity of the required code control and security procedures. There is also a risk that the interest in contributing will be low, and a productive community will not form around the effort, making the implementation timelines highly unpredictable. Same as with co-sourcing, the secretariat does not presently possess experience in managing open-sourced IT development.

518. **Possible solutions:** The following are possible solutions in relation to the international registry:

(a) It is implemented to support all methods for tracking;

(b) It is implemented as an integrated, internally consistent system. If this is not acceptable - to be implemented as a multi-tenancy system with an additional mechanism to maintain consistency;

(c) Clarification of the features that the international registry would need to implement in order to go live, including with regard to interoperability;

(d) Clarification of the approach to the administration of the international registry and its funding model;

(e) Request to the secretariat to develop operational procedures for the international registry.

G. Centralized accounting and reporting platform

519. Paragraph 35 defines the functional areas of the CARP:

(a) Transparency in relation to cooperative approaches; and

- (b) Support to the review process.

520. These functions may be delivered by a centralised database system under the control of the secretariat.

521. Conceptually, the CARP also incorporates the international registry and the Article 6 database. While the Article 6 database, being a database system itself, may benefit from an integrated implementation approach with the mandated functionality of the CARP, the international registry is a significantly more advanced transactional system which requires a different approach to development and operation. The conceptual integration of the international registry into the CARP is therefore understood as the requirement of seamless data exchange between the international registry, the Article 6 database and the transparency and review functionalities of the CARP. For data sovereignty reasons, such data exchange should be limited to internationally reportable data.

522. This chapter describes the requirements of the CARP and its components, as well as the elements that ensure overall coherence and effectiveness of the platform.

1. High level requirements

523. Pursuant to the guidance that the international registry and the Article 6 database are conceptual parts of the CARP, the CARP SHALL incorporate requirements that also serve the international registry and the Article 6 database as listed in the respective sections, including:

(a) An interface for submitting structured information and data for international reporting purposes (a submission portal), including an open standard for other systems to interoperate with it and, in particular, submit data without requiring human interventions;

(b) Safe storage for submitted information;

(c) Unstructured communication channel for the communication between participants¹⁴¹ to the review process. The unstructured communication¹⁴² channel SHOULD be based on a mature service management solution that, in addition to providing user-friendly unstructured communication features, is capable of robust case management, document management and preservation of a highly granular audit trail of communications;

(d) Access control for users - access control SHALL be sufficiently robust to effectively counter existing threats to the platform operation and data integrity, and be harmonised with the access security practices in place for similar systems operated by the secretariat;

(e) Workflows for processing submissions;

(f) Public interface for non-confidential information and data submitted by the Parties. It SHOULD be possible to search and query public information and data in a user-friendly manner, at least to the standard of functionality offered in the similar¹⁴³, currently available, systems operated by the secretariat. The CARP MAY provide dashboards and analytical products;

(g) Access to common data and nomenclatures¹⁴⁴ to be used in tracking and accounting for ITMOs under Article 6. The access SHALL be provided both in human-

¹⁴¹ The exchanges related to review may include technical experts, officials from the Party and the secretariat.

¹⁴² Unstructured communication channels provide various information and data exchange media but do not prescribe the schema, structure or even the nature of information and data to be exchanged. These may be defined casually in a dialogue mode between the parties to the communication. Conversely, structured communications are pre-determined in the nature, format and other expectations of data being exchanged.

¹⁴³ The GHG Review Tools <https://rt.unfccc.int/> provide a good example of a user-friendly interface to access public data stored by the secretariat.

¹⁴⁴ Examples of nomenclatures may include the list and operational parameters of recognised cooperative approaches, identifiers and background data of project assessment methodologies, units of measurement for various metrics, Party codes, vintages etc.

readable and machine-readable formats. The nomenclatures **SHOULD** be versioned; it **SHOULD** be possible for a Party to formally initiate changes in nomenclatures;

- (h) Administrator function fulfilled by the secretariat.

2. Recommended operational practices

524. The operational practices of the CARP should be set up in line with operational practices of other secretariat systems fulfilling the mandates of similar level of business criticality and risk.

3. Role of the secretariat

525. The mandated functions of the secretariat in the area of maintaining the CARP are:

- (a) Establishment and maintenance of the CARP – this is to be undertaken according to the secretariat business practices and arrangements. The secretariat may be requested to arrange for regular consultations with Parties in the course of the implementation, including through the provision of interim versions for testing and feedback;
- (b) Extraction and publication of non-confidential information from Party reporting, as well as links thereto – to be enabled by functions of the CARP, as appropriate;
- (c) Provision of annual reports to the CMA on the activities related to the chapter VI. (Reporting and Tracking) – the first report to be submitted in the year after operationalization of the guidance.

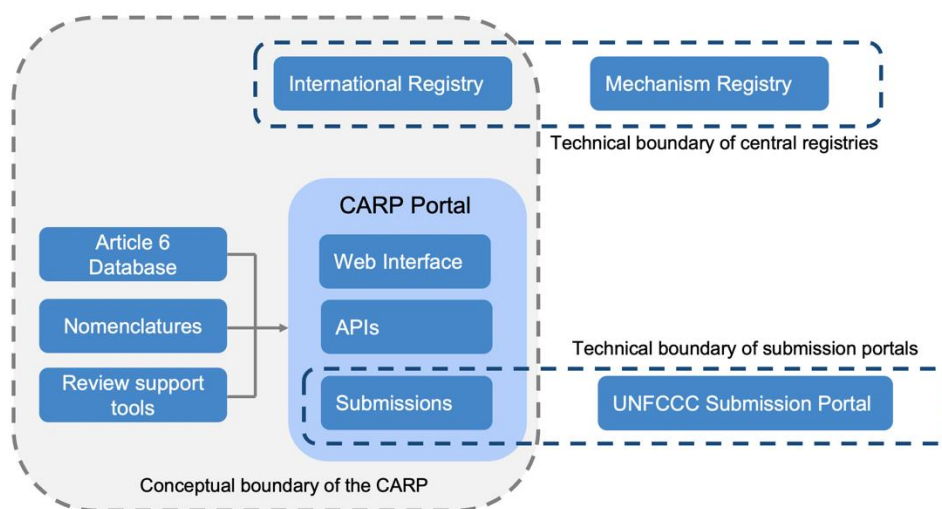
4. Design considerations

526. The CARP can be implemented as a web-based application for use by Parties and the public, comprising the following components:

- (a) Public space for:
 - (i) Non-confidential public information on cooperative approaches and ITMOs reported as per chapter IV (Reporting), namely initial report, annual information and regular information (paragraph 24);
 - (ii) Article 6 TER reports (paragraph 28);
 - (iii) Non-confidential information resulted from the consistency checks (paragraph 33(d));
- (b) Secure section (subject to access control) for:
 - (i) Maintaining contact data of users;
 - (ii) Submitting reports;
 - (iii) Viewing confidential information;
 - (iv) Participating in, and audit trail of, all communications with the Article 6 TER and the secretariat;
 - (v) Accessing information on nomenclatures.

527. Figure 18 illustrates the conceptual boundary of the CARP and how it interfaces with the boundaries of technical solutions for tracking systems (registries) and submission portals. Initially, the CARP will likely support its own submission portal but overtime submission portals of the secretariat should be consolidated.

Figure 18: System context for CARP



528. The design of all CARP's communication interfaces must be governed by the principles of usability and user-friendliness. The design should cater to the needs of different user groups be adapted to their use cases. Regardless of the use case, the web pages of the portal should be fast, compatible with recent versions of major web browsers¹⁴⁵, information-centric, accessible¹⁴⁶ and easy to use and navigate.

529. Standard security measures to secure the network traffic¹⁴⁷ between users or systems and the CARP web pages or application programming interface (API) endpoints should be implemented. The CARP should be hosted on a dedicated subdomain in the unfccc.int zone (e.g. carp.unfccc.int) and be authenticated with its individual TLS certificate or a wildcard UNFCCC certificate (*.unfccc.int). IDS and DDoS protection software¹⁴⁸ used by the secretariat should be set up to allow accepted levels of use of public and private APIs.

(a) Public information

530. The guidance makes it a function of the CARP to publish information submitted by the Parties (paragraph 24). The guidance does not prescribe the location where such information needs to be published. A choice will have to be made between publishing data directly in the CARP, as a separate public web offering of the secretariat, or to prepare web content for publishing through the UNFCCC website. The former approach may be more

¹⁴⁵ At the time of writing, research from various sources identifies recent versions of Chrome, Firefox, Safari and Edge as the most popular desktop browsers. Special effort should be made to make the portal look and behave as expected in these browsers. For other browsers, compliance with Internet standards should be adequate as the amount of effort to maintain compatibility. Due to its data-rich nature, the portal has limited use on mobile phones and other devices with smaller screens. Efforts should be made that the basic pages of the portal look presentable in popular browsers on mobile platforms. At the time of writing, Chrome, Safari and Samsung Internet are the most popular desktop browsers.

¹⁴⁶ W3C Web Content Accessibility Guidelines (WCAG) version 2.1, AA level, is the recommended standard of accessibility that the portal should strive to implement.

¹⁴⁷ Transport Layer Security (TLS) version 1.3 is supported by all major browsers and API connection libraries.

¹⁴⁸ Intrusion detection systems (IDS) monitor network traffic, identify and prevent communications that are considered unusual or unwelcome in the target system. An IDS would typically implement rate limits that allow normal human use of web systems but prevent frequent automated requests. Distributed denial of Service (DDoS) attacks are malicious attacks that employ large numbers of requests to an internet system from a large number of computers simultaneously in order to exceed the capacity of the system to serve such requests and become unresponsive and unable to serve legitimate requests. For systems that offer both a web site for human consumption and APIs, a balance should be struck in configuring the IDS to allow legitimate use of APIs but prevent DDoS and other attacks.

straightforward from the CARP project scoping and implementation viewpoint, which comes with a risk of public information in the CARP staying out of the overall UNFCCC web communication experience and, consequently, being less accessible. The latter approach integrates public information into the standard UNFCCC web offerings, but may require additional effort and/or development of system-to-system communications and APIs between the CARP and the UNFCCC web content management system. The latter approach is preferable.

531. Public information should follow the reporting requirements and be easy for users to download in a structured format¹⁴⁹ for further analysis. Wherever possible from the confidentiality standpoint, raw, disaggregated data should be offered for download. Public information should also be available and searchable through a public API.

532. The publication workflow of the CARP should define the moment of publication of information.

(b) Confidential Information

533. Confidential information is made available to authorized users and systems upon authentication. The technical arrangements for authentication should be determined on the basis of business risk associated with unauthorized disclosure of the information. It is recommended that multi-factor authentication¹⁵⁰ be required to access confidential information in the CARP. The choice of additional authentication factors should be made taking into consideration capacity and connectivity constraints that some users from developing countries may have in using advanced authentication factors and techniques.

534. For a detailed discussion on handling confidential information, see section II.B.6 and section III.G.4(iv) on the submission portal.

(c) Secure section

535. Content and functionality will be made available to users designated by Parties in the secure area of the CARP. Particular content and functionalities may include:

- (a) An unstructured communication facility (a “message wall”);
- (b) Self-service tools for updating of Party-specific configurations, such as the contact details;
- (c) Process information about ongoing submissions and reviews, as well as the information about the upcoming process deadlines applicable to the individual Party;
- (d) Nomenclatures and common values shared between Parties or cooperative approaches;
- (e) The submission portal;
- (f) Any other elements as may be proposed by Parties.

536. The message wall is a key element in the provision of unstructured secure communication between the Party, the secretariat and the Article 6 TER teams. The message wall should keep exchanges secure and provide an option to notify the Party of the arrival of a new message, without mentioning the origin or content, by email. A user-friendly and feature-rich message wall is a complex IT product. Mature, off-the-shelf solutions implementing the necessary functionality are available commercially and in the form of open-source products. A selection and integration of one of these products with the user database

¹⁴⁹ Such as Excel, CSV, or JSON

¹⁵⁰ Multi-factor authentication is a method used to authenticate the user that requires more than one piece of evidence (factor) to prove that the user’s claim of identity in the system is legitimate. The common first factor is the password. Other factors may include codes sent by email or SMS, transaction authentication numbers (TAN), hardware cryptographic tokens, biometric data and other ways for the user to present “something they know, something they have or something they are” to the system in order to confirm their identity.

and security arrangements of the CARP should be the preferred way of implementing the message wall.

537. Self-service tools facilitate the change of basic data such as email addresses, contact details, notifications and alert settings. Self-service tools streamline the interaction between the Party and the secretariat in standard situations and reduce the space for human error. The CARP administrator at the secretariat should however have a possibility to make configuration changes on behalf of Parties. Self-service tools with CARP specifics are custom functionality that is not readily available in off-the-shelf products, so those would need to be custom-developed.

538. The submission portal, accessible through the secure section, is discussed below.

(d) Submission portal

539. Submissions may comprise human readable (PDF), human- and machine-readable (Excel) and machine-readable (CSV, JSON, XML) files. One submission may consist of multiple files of various types. Therefore, it may be convenient for the submission system to operate with the notion of submission profiles that will define the number, kind and designated purpose of documents or data that need to be included with each kind of submission, such as the initial report, annual information or regular information. Submission profiles could also define the business process steps of accepting the submission, basic algorithms of assuring completeness of the submission for pre-check purposes and other metadata to assist a smooth and user-friendly submission process with high quality upfront results.

540. For some kinds of submissions, resubmissions will be possible (for example of an AEF). Resubmissions will typically result from an unstructured exchange between the secretariat and the Party or the Article 6 TER and the Party. Due to the fact that the difference between two versions of a binary file (original submission and resubmission) may be difficult or impossible to calculate, resubmission should only be accepted as replacement of the previous submission in its entirety. i.e. no addenda or corrigenda to previous submissions should be allowed. All versions should be dated, stored and record-managed by the secretariat, including through the capabilities of the CARP.

541. The secretariat is currently maintaining multiple systems with functionalities for accepting submissions from a Party. The official UNFCCC submission portal¹⁵¹, the CDM and JI information systems, the UNFCCC CRF Reporter, the multiple extranet systems based on Microsoft Sharepoint, all accept data and files from Parties for further processing and use in some official business processes. Architecturally, convergence of the ways to submit, at least for file-based submissions, is recommendable for both the overall architectural simplicity of the technology landscape of the secretariat, and to increase the user-friendliness of secretariat systems for the Parties. At the same time, the architectural attractiveness of the integration of the submission functionality necessary for the CARP with the existing official UNFCCC submission portal should be carefully weighed against the complexity and the possible technical issues with integrating the necessary level of granularity of access security, submission structure, pre-checks and other features that are specific to the CARP. An option for prompt-start implementation would be to have a separate, CARP-specific submission functionality in the beginning and institute a longer convergence programme that would eventually integrate the CARP submission functionality with the rest of the submission functionalities maintained by the UNFCCC. Particular consideration should be given to the submission functionalities for the Article 13 reporting, considering that the regular information for Article 6 would be submitted with the BTR.

542. The submission portal should provide maximum transparency and clarity to the Party as to what is being accepted as submission. To that end, the submission portal could generate a report on the submission package, listing all data entered by the user manually as well as the names, designations to purpose, and checksums of all files contained therein. It should also be possible for a Party to access and download any submission they previously made.

¹⁵¹ <https://www4.unfccc.int/sites/submissionsstaging/Pages/Home.aspx>

(e) Submission templates and pre-populated submissions

543. The CARP should make templates for all submissions it accepts available to the Parties.

544. For some submissions and configurations of Party activity in cooperative approaches vis-a-vis the systems run by the secretariat, the secretariat may be in technical possession¹⁵² of parts or all information and data that would be expected in a submission¹⁵³. In these situations, the CARP could be implemented to generate fully or partially pre-filled templates that will eliminate or greatly facilitate the Parties' efforts to prepare submissions.

545. Where pre-filling the templates is possible, the CARP should make them available to the Party:

- (a) For download in bulk, in the submission interface; and
- (b) For file-by-file download beside the space where upload of the respective file is expected.

546. Where the file can be substantially or fully pre-populated by the CARP, the Party may be offered an option of confirming its intention to submit the file without uploading, upon the presentation of a checksum and/or other control data in the CARP interface. This may be particularly useful for larger files.

547. Confidentiality level and classification may be available on the level of individual data points and on the file level. Designation of any element inside the file as confidential should make the entire file confidential. Should some data in such a file be available to the public, another file containing only the public data should be created¹⁵⁴ and published.

(f) Automated submissions from other registries and third-party systems

548. The CARP may enable automated, system-to-system submission of information and data. Such automated submissions could be enabled using a secure API provided by the CARP. Should this service be provided, Parties and cooperative approaches will be able to do automated submissions directly from their registries or designate third-party systems to prepare and make submissions on their behalf.

549. Automated submissions should implement non-repudiation arrangements on both sides.

550. The business justification for enabling automated submissions should be evaluated depending on the demand expressed by Parties.

(g) Pre-checks

551. For some submissions and individual file components thereof, in particular data contents, a pre-check service may be offered. The pre-check is an automated action aimed at providing quick feedback to the submitting Party about apparent or potential issues with the submission. In order for an automated action to work, two conditions should generally be met:

¹⁵² All information and data submitted by Parties, regardless of immediate or eventual access thereto by different groups of authorized users or the public, remain in sovereign legal possession of the respective Party. "Technical possession" in this context denotes technical access to the storage of respective data points that enables the secretariat to do the necessary automated or manual analysis of such information and data in the interest of the Party, Parties or internationally mandated processes, as applicable.

¹⁵³ For example, if all cooperative approaches that the Party is participating in base their technical infrastructure entirely on the international registry, the secretariat would be in technical possession of all information necessary to produce most submissions made through the CARP.

¹⁵⁴ This may be achieved either by creating an additional file of a different format that contains only the public fields or by copying the original file and redacting the confidential data. If the latter approach is used, care should be taken to avoid storage of history and undo logs that would enable unauthorized access to redacted data.

(a) The media being checked should be machine-readable¹⁵⁵, and

(b) The information that is required to conduct the pre-check should be available inside the submission in a machine-readable form or be in the secretariat's possession and stored in a machine-readable way prior to the submission.

552. Examples of pre-checks could include:

(a) Internal consistency of data and information in the submission;

(b) Consistency between data in the submission and data in submissions of other Parties participating in the same cooperative approach or approaches;

(c) Correct use of nomenclatures for sectors, units of measurement etc.

553. Pre-checks should have the status of automated advisory to the Party, they are not part of the official consistency check as per paragraph 33 (a) in the reporting sense and do not prevent the Party from going ahead with the submission if it wishes to, irrespective of any detected issues.

(h) Maintenance of common nomenclatures

554. Common nomenclatures of certain values, such as names and codes for sectors, activity types, technologies, vintages, units of measurement, and other, should be maintained centrally in order to be used uniformly across Parties and cooperative approaches.

555. The maintenance of common nomenclatures may become challenging due to the multitude of approaches and preferences of Parties to each of the nomenclatures. Clarity is needed on which nomenclatures should be centralised and controlled by the secretariat e.g., the list of vintages, sectors, activity types, cooperative approaches' names, and which nomenclatures may be specific to individual Parties or cooperative approaches.

556. The CARP should offer both manual and API-based read access to common nomenclatures.

557. The CARP could offer a formalised process of requesting changes to common nomenclatures. To the extent possible, nomenclature elements should be robust and immutable, i.e. any changes should mostly constitute the addition of new nomenclatures or new elements to existing nomenclatures, and avoid changes and removal of existing elements. When changes and removals are unavoidable, a manual review of impact on existing operations by Parties and cooperative approaches should be carried out through consultations with all stakeholders.

558. Nomenclature elements should be assigned unique surrogate identities. The use of natural identities may be allowed in well-justified cases.¹⁵⁶

559. Common nomenclatures should be automatically versioned. See also discussion on nomenclatures in section II.B.5).

560. **Possible solutions:** The secretariat to be requested to implement the CARP considering the elements discussed in this paper and any further input from Parties, including the CARP to support prefilling of reporting formats and the maintenance of nomenclature, through a process to be developed and as clarified by the CMA.

¹⁵⁵ Some automated checks are possible to carry out on media intended for human use. For example, if some PDF report is expected to follow a certain prescribed multi-page template, it is possible to check the number of pages in it and detect the situation that the number of pages is not sufficient. A careful case-by-case evaluation of the usefulness of such checks against the complexity and cost of implementation should be undertaken before commissioning.

¹⁵⁶ The main concern with natural identities is the risk that there may be a group of nomenclature elements that share the same identity. Whereas it is less of a problem for the nomenclature of vintages in case vintages are counted as calendar years, methodology identities and the identities of units of measurement may clash. A justification for using natural identities should consist of evidence of the benefits of its use (e.g. that a spreadsheet with a column for a four-digit year would be more human-readable) and the description of the mechanism of how absolute uniqueness of the natural identity under any circumstances can be assured.

H. Article 6 database

561. Paragraph 32 defines the Article 6 database as a tool for transparency in relation to cooperative approaches, to record and compile the information submitted by participating Parties pursuant to chapter IV.B–C above (Reporting) and to support the review referred to in chapter V (Review). The Article 6 database shall be implemented by the secretariat as part of, and integrated within, the CARP. Paragraph 32 also specifies the enabling functions of the Article 6 database.

562. The Article 6 database functionality goes beyond one of a typical database system and includes:

- (a) Recording information on ITMOs first transferred, transferred, acquired, held, cancelled, cancelled for OIMP, and/or used by participating Parties;
- (b) Recording of information on corresponding adjustments;
- (c) Automatically identifying inconsistencies and accounting errors, extracting evidence and identifying possibilities for elimination of inconsistencies and errors identified and/or further data requirements that need to be fulfilled to address inconsistencies and errors;
- (d) Supporting review of Parties' submissions of annual information (AEF and annual information as per paragraph 23);
- (e) Facilitating preparation and sending of notifications on identified inconsistencies and errors to Parties;
- (f) Facilitating publishing the results of consistency checks.

1. High level requirements

563. Being a conceptual part of the CARP, the Article 6 database should generally meet all non-functional requirements for the CARP and the part of functional requirements that are not related to the specificity of the Article 6 database functionality. A reference is made to section III.G.1 above describing the high-level requirements and recommended operational practices for the CARP.

564. Specifically, the Article 6 database SHALL:

- (a) Convert annual information submitted by Parties into data and store it in a data structure that is optimised¹⁵⁷ for analysis;
- (b) Provide access to data and user-friendly review tools to Article 6 TER reviewers and the secretariat;
- (c) Be able to work with any version of reports submitted by Parties. The default version SHOULD be the latest official submission or re-submission available in the CARP;
- (d) Tally ITMOs authorized and/or transferred and check the numbers against the corresponding adjustments reported by the Party. User-friendly information on the correspondence between the ITMOs and the corresponding adjustments made SHALL be made available to TER reviewers and the secretariat. This information SHOULD support drilldown¹⁵⁸ and identification of possible root causes of non-correspondence;
- (e) Identify inconsistencies in Parties' reporting and prepare materials for cross checks. User-friendly information on the inconsistencies identified SHALL be made available to Article 6 TER reviewers and the secretariat. This information SHOULD support drilldown and identification of possible root causes of inconsistencies.

¹⁵⁷ Various approaches to data analysis exist; the optimal data structures differ in various parameters, such as the required level of data normalisation and interdependence, from approach to approach. A precise analysis of the optimal approach would be required at the design stage of implementation of the Article 6 database. It will both affect and depend on the architectural choices made and therefore goes beyond the scope of this technical paper.

¹⁵⁸ Drilldown is a modification of view on the data that enables examining data in more detail, typically along one or multiple analytical axes.

565. Furthermore, the Article 6 database SHOULD:

- (a) Prepare notifications to Parties on the issues identified with their reporting;
- (b) Where reporting issues need to be made public, facilitate publishing on the CARP's public interface.

2. Design considerations

566. The detailed functional requirements for the Article 6 database may be developed only once the formats for reporting of annual information (as per paragraphs 20 and 23) are agreed. This will clarify the scope and parameters for the consistency check, a key input to the functional requirements. Discussion on the consistency check as per paragraph 33(a) is included in section II.E.6.

567. *Possible solutions*: The secretariat to be requested to implement the Article 6 database considering the elements discussed in this paper and any further input from Parties.

I. Interoperability between registry systems

1. Context

568. For the purpose of this document, interoperability is understood as the ability of registry systems to exchange information. Such information includes, but is not necessarily limited to, the information required to transfer ITMOs and A6.4ERs.

569. Exchange of information between Party registry systems is not explicitly addressed in the guidance. However, interoperability between registry systems is common and has been the modus operandi of registry systems under the Kyoto Protocol. Acknowledging that it is the participating Parties' prerogative to determine, in the context of their cooperative approaches, if and how their registry systems would interoperate, the topic of interoperability is significant for the secure and reliable performance of the regime, with implications for TACCC. Therefore, like the discussion on the high-level requirements for registries, interoperability is discussed with the view to highlighting best practice.

570. Connecting Party registry systems to the international registry and/or the mechanism registry is also not provided for neither in the guidance nor in the RMPs for the mechanism. Enabling such connection would require CMA guidance. The business case for connectivity would strengthen in the context of larger trading volumes. Also, it is reasonable to expect that the international registry, as a host for Parties that are unable to implement their own registries, should be able to support interoperability with the registries of other participating Parties in the same cooperative approaches. Many of the respondents to the survey on registry systems mandated by SBSTA 56¹⁵⁹ have indicated.

571. Parties have suggested alternatives to interoperability, such as the method of cancellation of ITMOs in one registry and recreation of the same ITMOs in another registry and the option for Parties to maintain accounts in multiple registries that do not interoperate. Both alternatives have shortcomings such as elevated risk of inconsistencies for the cancel/re-created method or complicating trading arrangements and increased transaction cost in the context of using multiple registries. Those methods are not elaborated as their operationalizations is related to business processes rather than to technology and infrastructure.

572. The connection between the mechanism registry and the international registry as defined in decision 3/CMA.3, annex, paragraph 63, is covered in section IV below and is aligned with the discussion in this section.

573. Information exchange between registry systems and other systems¹⁶⁰ is not covered in this paper.

¹⁵⁹ The results of which are included in the Annex VII of this paper.

¹⁶⁰ Such as the business process management systems of the Article 6.4 mechanism, the CARP, transaction logs and meta-registries.

2. Real-time and non-real-time-based interoperability

574. Real-time interoperability is a form of interoperability that guarantees response times within short time intervals, such as a few seconds, whereas non-real-time interoperability is a form of interoperability that does not offer such guarantees.

575. If CMA provides for interoperability between the mechanism registry and registries not consolidated in the international registry, or between the registries consolidated in the international registry and registries not consolidated, such interoperability would be optional and may be infrequent. This points to the need for a non-real-time exchanges of information, such as file-based exchanges.

576. In order to promote interoperability and facilitate communications between registry systems, two key elements are necessary: communication standards and organizational arrangements.

(a) Communication standards

577. Communication standards should be open, that is, accessible and usable by any registry administrator, and use open formats to digitally represent the information being communicated between registry systems without dependencies on any particular software, vendor or platform.

578. The communication standards are best developed through a consultative and inclusive process involving all stakeholders: registry system administrators and the secretariat. These stakeholders would discuss the merits, risks, opportunities, constraints, feasibility, costs etc. of various protocols for the communication between registries and propose a common protocol or common protocols¹⁶¹ after all issues have been considered.

579. Ideally, communication standards should rely on one or more existing, well established, industry standard, to guarantee long-term viability and broad support by all existing software tools and hardware.

580. Communication standards would document at least the following elements:

- (a) The format of data and data transfers;
- (b) What is considered valid data, including what constitutes a valid transfer of ITMO or A6.4ERs;
- (c) The various types of processes and exchanges that may occur between registries, including execution time expectations and timeouts;
- (d) Security of communications between registries;
- (e) How participants keep time synchronized;
- (f) How multiple languages are supported.

(b) Organizational arrangements

581. In order to enable effective interoperability, agreeing on a communication standard is necessary but not sufficient: organizational arrangements, codified in processes and procedures are also necessary.

582. Such processes and procedures may benefit from existing industry standards, such as the Business Process Model Notation ITfor the graphical representation of process flows, or the Information Technology Infrastructure Library for standardized IT service management practices.

583. With regards to interoperability between registry systems, the following processes are essential:

¹⁶¹ For tracking arrangements where Party registries may interoperate in the context of a closed trading club, there would be no dependency on a single common standard.

- (a) Contact management, to guarantee that registry administrators are identified, and their contact details are up-to-date;
- (b) Change management, to manage changes to the communication standards and to the supporting procedures and processes;
- (c) Release management, to coordinate release of changes throughout registry systems;
- (d) Security incident management, to coordinate the response(s) to security incidents;
- (e) Testing, to document how coordinated tests are to be performed before a registry is allowed to interact with other registries in production mode;
- (f) Reconciliation, to manage reconciliation of records between registry systems;
- (g) Correction of transaction, to document how erroneously completed transactions are to be corrected.

3. Prevention of double use

584. In decentralized systems such as registry systems, the prevention of double use, namely the use of the same ITMO or A6.4ER more than once to achieve a mitigation target, either because of errors in software or systems, or maliciously by an attacker who has compromised the registry security, is a major challenge. It is closely related and intertwined with the processes of validation of transactions in ITMOs and reconciliation. Double use is a type of double counting¹⁶² which must be prevented if robust accounting is to be achieved.

585. Two broad approaches are available to address this issue in real-time interoperability scenarios: using an online trusted system or using distributed ledgers. Both can act as a notary service, keeping track of the ownership of ITMOs or A6.4ERs. However, their maturity level, performance, security, organizational arrangements, architectural implications, cost characteristics, dependence on provider(s), etc. may vary significantly.

586. The risk of not putting in place sufficient safeguards in the interoperability layer of registry systems is that double use occurs, potentially leading to a cascade of inconsistencies in registry systems.

587. Characteristics relevant to real-time interoperability, in the context of prevention of double use, include the following:

- (a) Confidentiality of the information exchanged, including confidentiality of the sender, acquirer, and amounts transferred;
- (b) Consensus or how a transaction is deemed to be valid. For example: because the sender, a trusted third party and the receiver agree it is valid, or because two thirds of the registries agree it is valid;
- (c) Transaction finality or the moment when a transaction can be deemed to be final, and if such transaction can be cancelled or reversed between the time it is proposed and the time it is finalized;
- (d) Fees, if and how transaction fees apply, and if yes, the methodology to be used to collect such fees.

588. For non-real time exchanges, the prevention of double use appears to be a very hard problem, and it is unknown at this stage whether such prevention can be achieved at all. It is suggested that a working group be established to investigate further this issue.

4. Digital certificates and digital signatures

589. Digital signatures are used to verify the authenticity (i.e. the sender is known) and integrity of messages and/or documents (i.e. the information was not altered while transiting

¹⁶² Double counting may occur in other forms, including as double creation/issuance. Interoperability is focused on preventing double use, however, it may also mitigate double creation/issuance risk.

to the recipient). In registry systems, digital signatures and digital certificates can be used in many ways:

- (a) To create secure tunnels between data centers hosting registries;
- (b) To provide communications security over the Internet (i.e. HTTPS¹⁶³);
- (c) To secure emails and messages between registry system administrators;
- (d) To ensure non-repudiation;
- (e) To sign critical documents.

590. Given their broad applications and ubiquity and regardless of the technologies, it is highly likely that digital certificates and digital signatures will be needed. In this context, the experience in the context of registry systems under the Kyoto Protocol appears to be particularly relevant. In these systems, external service providers have been relied upon to procure and manage digital certificates.

591. Outsourced digital certificates were not optimal for a highly integrated and standardised Kyoto systems. After a thorough review, the secretariat, in collaboration with registry administrators, established a designated certificate authority specifically for these systems, operated in a highly secure manner by the secretariat. The internalised certificate authority has allowed the secretariat to improve the quality of service and significantly reduce cost and effort associated with certificate management. The certificate authority is one of the elements of Kyoto systems that may be immediately useful to future registry systems without major technical modifications.

592. **Possible solutions:** The following are possible solutions in relation to interoperability:

(a) If the international registry and the mechanism registry are to connect to other tracking systems, an interoperability approach may be identified by the secretariat, including through the work of the cooperative approaches tracking system administrators forum. Such approach could also serve as a recommended practice;

(b) The digital certification authority currently in use in the secretariat to be re-used for the purpose of Article 6, as necessary.

J. Cooperative approaches tracking system administrators' forum

593. To promote collaboration, information sharing and capacity building, and given the highly technical nature and magnitude of the communication standards, procedures and processes to be developed and maintained to ensure interoperability between registry systems, a forum of cooperative approaches tracking system administrators may be established. Participation in the forum should be voluntary. Working groups with special interests may be created to address specific technical topics.

594. The forum and its working groups would be tasked with:

- (a) Promotion of information exchange on registries and capacity-building;
- (b) Development and maintenance of recommended communication standards;
- (c) Development and maintenance of recommended processes and procedures;
- (d) Keeping track of technological developments in other registry systems and similar systems that could benefit registries under Article 6;
- (e) Facilitation of reporting and review of registries.

595. The secretariat could lead the work of the registry administrator's forum and, on an annual basis, report to the CMA on the work of the forum.

596. **Possible solutions:** Establishment of a cooperative approaches tracking system administrators forum (with voluntary participation), including establishing its objectives,

¹⁶³ Hypertext Transfer Protocol Secure

rules of procedure and expected reporting to the CMA. The forum may be requested to consider:

- (a) Interoperability approach(es), including the development of procedures, processes and formats that would facilitate interoperability;
- (b) The issue of double use when non-real time exchanges take place;
- (c) Procedures and processes that would facilitate the review of registries;
- (d) Features related to the international registry.

K. Implementation considerations for infrastructure

597. The following are high-level considerations in relation to the implementation of infrastructure for Article 6 by the secretariat.¹⁶⁴

598. The CARP, including the international registry and the Article 6 database, would require 18 to 24 months for procurement, development, testing and roll out of a minimum viable version. Enhanced capabilities could be rolled out over time.

599. The functionalities of the CARP with respect to pre-populating reporting formats would be complex and may require additional time. Similarly, the consistency check as per paragraph 33(a), to be automated through the Article 6 database, is potentially complex and would require contingencies built into the development plan.

600. Potential integration between the submission portal for the CARP and other submission portals operated by the secretariat, specifically the submission portal for the ETF reporting tools, would require careful technical assessment before recommendations could be made.

601. The international registry could be implemented on the basis of a commercially existing solution with the necessary modifications. The CDM registry is not assessed to be a suitable basis for the international registry.

602. The operational procedures and technical development of the international registry could proceed in parallel.

603. Interoperability between the international registry and other Party registries may be implemented overtime.

604. Work on infrastructure by the secretariat would be subject to availability of resources. Human resources would be required in addition to existing capacities, potentially further extending the implementation timeframe.

IV. The connection between the registry for the mechanism established by Article 6, paragraph 4, of the Paris Agreement and the international registry

605. As per paragraph 63, annex, decision 3/CMA.3 the mechanism registry shall be connected to the international registry. The mechanism registry will account for A6.4ERs in units. Interoperability of the international registry with the mechanism registry may include:

- (a) The provision of accounts for units to receive, hold, and transfer A6.4ERs;
- (b) The provision of BHTAs to reflect balances of ITMOs.

606. Information exchanges between the mechanism registry and the Party registries consolidated in the international registry may be frequent. This points to the need for the

¹⁶⁴ Implementation considerations for the mechanism registry are included in the technical paper “Operations of the registry for the mechanism established by Article 6, paragraph 4 of the Paris Agreement”.

same support for real-time interoperability in both the mechanism registry and the international registry.

607. No technical specificity has been identified in the connection between the mechanism registry and the international registry. Therefore, the connection can operate on the basis of the same common communication protocol as the one discussed in the context of interoperability between registries in section III.I above and that may be implemented for the international registry with any other Party registry.

608. Although Article 6.4 may not be seen as a cooperative approach from the guidance viewpoint due to its specific business rules and issuance of units, some of which may not be ITMOs, as well as other areas, this difference does not transpire on the technical level. Transactions in Article 6.4 units may be executed as if Article 6.4 was a cooperative approach.

609. From business rules perspective, the following is considered:

(a) The exchange of data between the two registries may be one-directional (from the mechanism registry to the international registry only) or two-directional (to and from the two registries);

(b) The specifics of data exchange between the two registries would obey the operational procedures for each of the registries;

(c) Unauthorized A6.4ERs may not be tracked on the international registry;

(d) The Adaptation Fund account on the mechanism registry is not mandated to hold non-A6.4ERs.

610. **Possible solutions:** The connection of the mechanism registry to the international registry to be implemented to enable exchange of data as it may be necessary and determined as per the operational procedures of the two registries, and according to the technical standards discussed in this paper.

V. Article 6 technical expert review

611. The reporting of Parties participating in cooperative approaches referred to in Article 6.2 of the Paris Agreement, including of Parties participating in the Article 6.4 Mechanism with reporting obligations under Article 6.2, serves as input to reporting in relation to tracking progress made in implementing and achieving NDCs under Article 4, as required by chapter III of the MPGs for the transparency framework for action and support referred to in Article 13 of the Paris Agreement.¹⁶⁵ Specifically, the quantitative annual information required as per paragraph 23 of the guidance (except for paragraph 23(j)) is to be included in the structured summary required pursuant to paragraph 77 (d) of the MPGs. Other information reported in relation to the cooperative approaches referred to in Article 6.2 is subject to the reporting requirements of paragraph 77 (d)(iii) and (iv) of the MPGs.

612. Consequently, the Article 6 technical expert review (TER) serves as input to the Article 13 TER. The scope of the Article 13 TER is defined by the MPGs. The Article 6 TER and Article 13 TER would need to be synchronized and coordinated to ensure the overall consistency and integrity of the transparency regime.¹⁶⁶ The two review processes are similar in terms of inputs (reports submitted by Parties), engagement of expert to form review teams, and outputs (review reports). Therefore, the Article 6 TER guidelines need to be informed by and developed in alignment with the MPGs (more specifically chapter VII of the MPGs), and with the relevant provisions of decision 5/CMA.3 that include guidance for operationalizing the MPGs.

613. This section discusses the possible elements for guidelines for the Article 6 TER as per paragraph 7 of decision 2/CMA.3 and chapter V of the annex to the same decision, taking into account views expressed by Parties at SBSTA 56. Annex VI contains a proposed high-

¹⁶⁵ Annex to decision 18/CMA.1.

¹⁶⁶ The transparency regime for the Paris Agreement.

level outline for the Article 6 TER guidelines. Annex VII contains a proposed outline of the Article 6 TER team report.

A. Principles

614. The guidelines for the Article 6 TER need to minimize the burden on Parties and the secretariat. The TACCC principles, and the principle that the same information should be reviewed only once, are also taken into account.

B. Scope and objectives of the Article 6 technical expert review

1. Objectives

615. The Article 6 TER could be elaborated as follow:

- (a) Provides input to the Article 13 TER;
- (b) Promotes integrity and trust in the system by ensuring the avoidance of double-counting, the environmental integrity of cooperative approaches, and the high quality of ITMOs;
- (c) Assists Parties, including through recommendations, to build capacity in order to address and avoid inconsistencies;
- (d) Assists Parties with the exchange of information on cooperative approaches to support the establishment and improvement of national arrangements;
- (e) Facilitates improved reporting and transparency over time.

2. Scope

(a) Party information

616. According to paragraph 7 (a) of decision 2/CMA.3 and paragraph 25 of the annex to the same decision, an Article 6 TER consists of an assessment of the consistency of the information submitted on each cooperative approach pursuant to chapters IV.A (Initial report) and IV.C (Regular information) of the annex to decision 2/CMA.3.

617. The Article 6 TER is an assessment of qualitative and quantitative information:

- (a) With regard to qualitative information, the Article 6 TER assesses transparency and completeness;
- (b) With regard to quantitative information, the Article 6 TER considers the results of the consistency check as per paragraph 33(a) as provided by the secretariat as per paragraph 33(c).¹⁶⁷

618. In this connection, the Article 6 TER would need to identify and make recommendations on areas of improvement for the Party, including in conjunction with the information of other participating Parties in the cooperative approach(es) of the Party for that cooperative approach(s), as the case may be. These recommendations need to be:

- (a) With respect to the assessment of the IR and RI, relevant to the consistency of information on each cooperative approach;
- (b) With respect to annual information, relevant to any inconsistencies identified through the consistency check.

619. The Article 6 TER assesses all activities under a cooperative approach for compliance with the guidance, on the basis of the requirements for ITMOs mentioned in paragraph 1 of the guidance.

¹⁶⁷ The consistency check is discussed in section II.E.6 of this paper.

620. The Article 6 TER team is to pay particular attention to the respective national capabilities and circumstances of developing country Parties.

621. The guidelines for the Article 6 TER, to be adopted at CMA 4, are to be implemented in a facilitative, non-intrusive, non-punitive manner, respectful of national sovereignty.

622. The Article 6 TER team can not:

(a) Make political judgments;

(b) Review the adequacy or appropriateness of a Party's NDC under Article 4 of the Paris Agreement, of its associated description pursuant to chapter III.B of the MPGs, or of the indicators reported as per paragraph 23.

623. For information that has undergone technical assessment under Article 5, including in relation to methodological aspects and how the mitigation activities contribute to the achievement of the NDC, the review may be simplified.

(b) Link between annual information and the structured summary

624. The link between the Article 6 annual information and the information in the structured summary is captured in the chapeau of paragraph 23 which states that the annual information reported as part of the RI, except for the requirements of paragraph 23(j), shall be included in the structured summary.

625. The annual information submitted as per paragraph 23 is within the scope of the Article 6 TER, and the structured summary is within scope for the Article 13 TER. Therefore, it is necessary to clarify how the consistency between the two reporting products (the proposed CTF for paragraph 23¹⁶⁸ and the structured summary) would be assessed.

626. It should be noted that there is a temporal aspect to be considered in any comparison between the two reporting products, namely that that CTFs for paragraph 23 consist of annual information submitted biannually, while the structured summary reflects the status as at the end of the BTR reporting period on the basis of all years elapsed in the NDC implementation period up to that point in time. Therefore, all CTFs for paragraph 23 for the years elapsed in the NDC implementation period up to the end of the BTR reporting period are to be compiled and compared to the structured summary under review.

627. It is proposed that this comparison be done as part of the Article 6 TER. To facilitate the comparison of this information, the Article 6 database may be designed to produce a cumulative report for the relevant CTFs for paragraph 23, which the secretariat could provide for the Article 6 TER together with the results of the consistency check in accordance with paragraph 33(c). The Article 6 TER would review the consistency between the cumulative report on the CTFs for paragraph 23 and the structured summary (relevant lines) and provide recommendations as necessary.

628. The CTFs for paragraph 23 are subject to the consistency check by the secretariat. Therefore, the comparison of the cumulative report for the CTFs for paragraph 23 with the structured summary could be expected to be a straightforward, albeit manual (at least initially), process.

629. Currently, there is no requirement for integration between the CARP and the ETF reporting tools. This aspect is also discussed in section II.E.5 above. To automate the comparison between the CTFs for paragraph 23 and the structured summary and to include it in the consistency check, Parties may wish to request the secretariat to explore integration between the Article 6 and the ETF reporting tools (see recommendations to section II.E.5 above).

¹⁶⁸ Where the CTF for paragraph 23 is mentioned, it does not include the information submitted as per paragraph 23(j), which is reported separately.

(c) **Consistency between the reporting of all Parties participating in the same cooperative approach**

(i) *Consistency of information between participating Parties*

630. Consistency in the annual information of all participating Parties in the same cooperative approach is subject to the consistency check in relation to the AEF,¹⁶⁹ the results of which are provided for the Article 6 TER for consideration.

631. An exception to this is the annual information submitted as per paragraph 23 (j) which is not submitted for inclusion in the Article 6 database. The annual information submitted as per paragraph 23 (j) in relation to paragraphs 23 (c) and 23 (e) would be available through the AEF.¹⁷⁰ To assist the Article 6 TER team with assessing the information submitted as per paragraph 23 (j), the secretariat may be requested to perform a check against the AEF and provide the results for the Article 6 TER.

632. With regard to qualitative information, the Article 6 TER may assess the alignment of information on the characteristics of each cooperative approach (for example, the alignment of submitted information in relation to paragraphs 18(h) and 22(b) or 18(c) on metrics for the cooperative approach). When participating Parties in the same cooperative approach are not reviewed together, the assessment of such alignment would depend on the availability of qualitative information by other participating Parties.

(ii) *Temporal considerations and non-availability of information*

633. As already noted, the consistency of ITMO data between participating Parties is subject to the consistency check of the AEFs. If one or more participating Parties in the same cooperative approach have not submitted their AEF(s) or inconsistencies identified through the consistency check have not been resolved, this would be revealed by the results of the consistency check.

634. If qualitative information (as included in the IR/UIR or BTR) is not available from all participating Parties in the cooperative approach, the review report should include recommendations for a follow-up on the missing information during future reviews, when information becomes available.

635. **Possible solutions:** The following possible solutions in relation to scope may be considered:

(a) The guidelines for the Article 6 TER are to include a section on objectives and scope; and/or

(b) The secretariat is requested to assist the Article 6 TER team with the review of the consistency between the annual information and structured summary.

C. Information to be reviewed

636. As per paragraphs 26 and 33(c), the following information will be reviewed in the Article 6 TER:

(a) IR, UIR and RI of the Party under review;

(b) The results of the consistency check of the annual information of the Party under review;

(c) Information of other participating Parties for the cooperative approach(es) of the Party under review that relates to the characteristics of such cooperative approach(es);

¹⁶⁹ Annual information submitted as per paragraph 23 is checked for internal consistency. Any data elements related to transfers of ITMOs between participating Parties are derived from the AEF. The consistency check would ensure they are correctly included in the CTF for paragraph 23.

¹⁷⁰ The only difference is that paragraph 20 specifies “sector(s)” and paragraph 23(j) specifies “sector”. See discussion in section II.B.4(g).

(d) Previous Article 6 TER recommendations to the Party under review, including relevant information that may have been submitted after the time when the recommendations were made;¹⁷¹

(e) Previous Article 13 TER recommendations in relation to cooperative approaches and ITMOs under Article 6.

637. The annual information provides supporting data for the review, as does the information from the consistency check performed by the secretariat in the Article 6 database.

638. The Article 6 TER team needs to have access to:

(a) The annual information of the Party under review in the Article 6 database;

(b) Information that the Party may have identified as confidential. The Article 6 TER team will be required to treat any confidential information in accordance with guidelines for the reviews;

(c) The latest Article 13 TER reports of other participating Parties in the cooperative approach(es) of the Party under review.

639. The Article 6 TER team should also be provided with and have access to any clarifying and/or voluntarily submitted information by the Party in relation to their reporting pursuant to chapter IV (Reporting) of the guidance. The Article 6 TER team may consider how best to use such information.

640. Access by the Article 6 TER team to information stored in the Article 6 reporting tools will also be available.

641. *Possible solution:* The guidelines for the Article 6 TER are to include a section on information to be reviewed.

D. Article 6 technical expert review format

1. Definitions

642. As per paragraph 25, an Article 6 TER may be conducted as a desk or centralized review (including a hybrid centralized review).

643. The following definitions are based on the definitions included in the MPGs:

(a) A centralized review is a review when the members of an Article 6 TER team conduct the review from a single, centralized location. During a centralized review, a single Article 6 TER team could review several Parties. Centralized reviews are typically organized in review weeks;

(b) A desk review is a review when the members of an Article 6 TER team conduct the review remotely from their respective countries. Reviewers and Party representatives interact virtually;

(c) A review week is the period of time (normally up to one week, i.e. up to five working days) during which the Article 6 TER team conducts its work by performing the completeness and transparency checks of the reported information;

(d) A hybrid centralized review is when there is an opportunity for reviewers to participate remotely.

¹⁷¹ For example, if the consistency check could not be completed partially or in full due to the unavailability of AEF(s) of another participating Party(ies) in the cooperative approach(es) of the Party under review. Or, if the IR/UIR/BTR are not available from such Parties, to the extent cross checks on information related to the cooperative approach(es) would be made between participating Parties.

2. Applicability

644. A participating Party who submits an IR and/or RI annex to the BTR should undergo a centralized or a desk review.

645. Based on the current experience in conducting reviews under the Convention and the Kyoto Protocol, centralized reviews could be used as a default option for Article 6 TERs. Centralized reviews at a single location allow for better engagement, coordination and communication among reviewers, which would be an advantage particularly in the initial phase of Article 6 implementation, when large number of new experts and Parties under review are expected.

646. Centralized reviews could be suitable for:

(a) The review of the IR and RI as part of the BTR containing information on the last years of the NDC implementation period;

(b) When a previous Article 6 TER report indicates multiple recommendations;

(c) Where the information of several participating Parties is reviewed together;

(d) Complex submissions, for example where the IR/UIR and BTR are submitted together.

647. It should be noted that virtual participation may in some cases encourage reviewers to join an Article 6 TER team. However, the use of hybrid centralized reviews should be weighed against the usefulness of desk reviews.

648. Desk reviews could be utilized for the review of UIR and RI with less complex or fewer cases of cooperative approaches and should involve more experienced reviewers, to the extent possible.

649. The scope of activities for both review types is the same.

650. **Possible solution:** The guidelines for the Article 6 TER are to include a section on format for the reviews.

E. Procedures

651. Like for other elements of the proposed guidelines, the proposed procedures for the Article 6 TER follow the sequence of activities, responsibilities and timelines included in the review procedures established by decision 18/CMA.1, with necessary adjustments. Experience from the current review processes¹⁷² under the Convention and the Kyoto Protocol was also considered, in line with the views of the Parties expressed during SBSTA 56.

1. Procedural steps

652. Information within the scope of the Article 6 TER is submitted at different times as separate reports. Separate reviews should be organized for:

(a) IR/UIR¹⁷³ when submitted as a stand-alone report;

(b) Submissions with BTRs (annex 4 to the BTR, including when submitted together with the IR/UIR).

653. Proposed procedures for the review of the IR/UIR and annex 4 to the BTR may include the following:

¹⁷² Referring to review and technical analysis under the Convention and the Kyoto Protocol, namely biennial reports, biennial updated reports, national communications, GHG inventory submissions and reducing emissions from deforestation and forest degradation in developing countries (REDD+) reviews/technical analysis.

¹⁷³ For discussion on whether a UIR may be submitted as a stand-alone report, see section II.E.2.

- (a) The secretariat commences the preparation of the Article 6 TER process immediately following the submission of the IR/UIR and/or the BTR,¹⁷⁴ including:
- (i) Preparing the Article 6 TER schedule, including the grouping of Parties, in coordination with the preparation of the Article 13 TER schedule;
 - (ii) Checking experts' availability and composing the Article 6 TER team;
 - (iii) Allocating review officers from the secretariat (or external consultants) to each TER team;
- (b) The Party¹⁷⁵ agrees the dates of the Article 6 TER (i.e. the review week) with the secretariat;¹⁷⁶
- (c) The secretariat composes the Article 6 TER team from the roster of experts;
- (d) The Article 6 TER team communicates clarification questions to the Party before the review week regarding the information provided;
- (e) The Party provides the responses and requested information to the Article 6 TER team;
- (f) During the review week, the Article 6 TER team communicates to the Party preliminary recommendations on how to improve consistency, including on how to address inconsistencies in quantified information, prepares a draft Article 6 TER report and sends it to the Party through the secretariat;
- (g) The Party provides comments on the draft Article 6 TER report, including any follow-up information (as may be agreed during the review week), to resolve issues;
- (h) The Article 6 TER team prepares the final version of its report, taking into account the comments and responses by the Party, and submits it to the secretariat for publishing on the CARP and forwarding to the Article 13 TER team.

2. Timelines

(a) Information submitted with the BTR, including the initial report and updated initial report

654. The Article 6 TER serves as input to the Article 13 TER. The Article 6 TER timeline for information submitted with the BTR needs to ensure that the process is completed sufficiently in advance of the Article 13 review week in order for the Article 6 TER report to be considered by the Article 13 TER team. Therefore, the timelines for the Article 6 TER are developed taking into account the timelines for the Article 13 TER, which are stipulated in paragraph 162 of annex to decision 18/CMA.1.

655. Timelines for the Article 6 TER of information submitted with the BTR are presented in figure 19 below. This is the shortest possible timeline that aligns with the Article 13 TER timeline. Whenever the Article 13 TER for a Party does not follow the shortest possible timeline, the timeline for the Article 6 TER may be adjusted as appropriate. See also the discussion on the planning and coordination between the two processes in section V.L.1 below.

¹⁷⁴ According to paragraph 3 of decision 18/CMA.1, the first BTR must be submitted at the latest by 31 December 2024. According to current secretariat practice, the planning phase should be finalized well before Parties submit their respective reports, usually between three to four months before the submission deadline. This implies that scheduling for reviews of the first BTRs should be completed September–October 2023.

¹⁷⁵ Or Parties if several Parties are reviewed together. This applies for subsequent steps as well.

¹⁷⁶ “Review week” in this context means the calendar week in which the TER team will work together either in a desk or centralized review setting. The number of effective days allocated to reviews may vary depending on the type of the review, number of Parties under review and number of review experts involved, but should be no more than five days.

(b) Provision of consistency check results for consideration in the Article 6 TER in conjunction with the review of information submitted with the BTR

656. The Article 6 TER will consider the results of the consistency check defined in paragraph 33(a) whenever the Article 6 TER team reviews information submitted with the BTR. The Article 6 TER will consider only consistency check results in relation to annual information for the BTR period. Any consistency check results produced for an annual period after the BTR period should be provided to the Article 6 TER that will review information for the next BTR period. In other words, the periods for information under review should match (see also discussion on reporting timelines in section II.B.3).

657. The secretariat could provide the results of the consistency check, in accordance with paragraph 33(c), together with all other information to be reviewed, upon the formation of the Article 6 TER team. Considering that the AEF is submitted annually by 15 April for the previous year and that the BTR is expected to be submitted normally during the second year after the end of the BTR period, the secretariat should be in position to complete the consistency checks in time, relying on automatic processes in the Article 6 database.¹⁷⁷

(c) Initial report and updated initial report as stand-alone reports

(i) Review timeline

658. The timeline for the review of the IR/UIR, when submitted as a stand-alone report, should follow the same timeline as the review of information submitted with the BTR.

659. The Article 6 TER report on the IR/UIR submitted and reviewed as a stand-alone report could be submitted for the Article 13 TER together with the Article 6 TER report on information submitted with the next BTR.

(ii) Initial report considerations

660. With regard to the sequencing of reviews for the same Party, some Parties have noted that the review of the IR should be completed before other information may be reviewed. Considering that an IR can be submitted in conjunction with a BTR, such sequencing would pose the following challenges:

(a) Delay in scheduling reviews of information submitted as part of the BTR, with an impact on the Article 13 TER schedule;

(b) If the Party reacts to findings from the review of the IR, this may cause misalignments with the BTR, as there is no process for the resubmission of BTRs.

661. Furthermore, it is proposed that the Article 6 TER of the IR does not need to be completed in advance of the review of other information by the Party, in consideration of the following points:

(a) Any findings and recommendations by the Article 6 TER team relevant to other participating Parties in the cooperative approach(es) of the Party under review should be communicated to such other participating Parties and serve as a warning for possible further negative implications unless the participating Parties address the issues, jointly or otherwise (see section V.K below);

(b) There may be consistency benefits in reviewing the IR and RI together for the same Party;

(c) Reviewing the IR and RI together would minimize effort by the secretariat and Article 6 TER teams (at minimum due to fewer reviews being conducted individually).

(d) Possibility for reviewing the information of Parties participating in the same cooperative approach(es)

662. The consistency in the ITMO quantitative information of Parties participating in the same cooperative approach is assessed through the consistency check.

¹⁷⁷ See discussion on the consistency check in section II.E.6 of this paper.

663. The consistency of information on the characteristics of a cooperative approach may best be assessed (if confirmed to be in the scope of the Article 6 TER) when Parties participating in the same cooperative approach are reviewed together. This would simplify the process for the Article 6 TER team of following up on any recommendations impacting more than one participating Party. However, there may be practical challenges to arrange for such joint reviews, for example because:

(a) Parties participate in more than one cooperative approach with different participating Parties;

(b) Participating Parties do not follow the same timeline for the submission of the IR/UIR;

(c) Participating Parties do not follow the same timeline for the submission of BTRs, noting that attempts to align the reviews of several Parties may have an impact on the strict timelines for the Article 13 TERs.

664. To realize the advantages of joint reviews of Parties participating in the same cooperative approach(es), the secretariat should make an effort to arrange for joint reviews, where practically possible.

(e) **Consistency between the information of Parties participating in the same cooperative approach(es) when the Party under review submits or re-submits information that impacts the information of other participating Parties**

665. When, for practical or other reasons, it is not possible to review together the information of all Parties participating in the same cooperative approach, a situation may arise where the Party under review submits or resubmits information in response to the ongoing review that may have implications for the information of other participating Parties.

666. With a view to ensuring the consistency of information of all Parties participating in the same cooperative approach, when the Party under review submits or resubmits information in the course of the review with potential implications on other participating Parties, the Party will clarify how the overall consistency of information on the cooperative approach will be maintained between the participating Parties (see also information on the role of the Party in section V.G.1 below).

667. The Article 6 TER team may record such clarifications in its final report, including to assist when the Article 6 TER teams of other participating Parties consults the Article 6 TER report of the Party under review.

668. With the practice for Article 6 TER building on, the approaches to maintaining consistency between the information of all participating Parties in the same cooperative approach, after submission/resubmission of information in response to reviews, may be refined.

Figure 19: Shortest possible timeline for the Article 6 technical expert review of information submitted with biennial transparency reports

A6 TER: Timeline as per shortest possible A13TER			month	1				2				3				4				
Step	Activity	month	week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	BTR submission including A6 regular information annex	Party	SUB																	
2	Start of preparation of review (immediately after submission)	Secretariat		START																
3	Agreement of the RW dates (6 weeks after the agreement)	Party+Secretariat		AGR																
4	Formation of a A6 TER team (4 weeks before RW)	Secretariat				A6TER														
5	Clarifying questions to the Party	TER							Qs											
6	Answers by the Party	Party								As	As									
7	A6 review week	TER+Party+Secretariat										RW								
8	Final version of the review report (within 2 weeks)	TER+Secretariat											FINAL							
9	Publication of the A6 TER report and forwarding to A13 TER	Secretariat												PUB						

A13 TER: The shortest possible timeline			month	1				2				3				4				
Step	Activity	month	week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	BTR submission including A6 regular information annex	Party	SUB																	
2	Start of preparation of review (immediately after submission)	Secretariat		START																
3	Agreement of the review week (RW) dates (14 weeks after agreement)	Party+Secretariat		AGR																
4	Formation of a A13 TER team (10 weeks before RW)	Secretariat						TER team												
5	Preliminary questions to the Party (4 weeks before RW)	TER												Qs						
6	Answers by the Party (within two/three weeks after the request)	Party																As	As	
7	A13 review week	TER+Party+Secretariat																		RW
8	Draft areas of improvements to Party	TER																		
9	Draft review report (within 2 months after RW)	TER+Secretariat																		
10	Comments on draft review report (up to one month)	Party																		
11	Final version of the review report (within one month)	TER+Secretariat																		
12	Publication of the A13 TER report	Secretariat																		

669. **Possible solutions:** The guidelines for the Article 6 TER should include a section on procedures, including a request to the secretariat to schedule joint reviews of Parties participating in the same cooperative approach(es), where practically possible.

F. Confidentiality

670. In addressing confidential information, the approach used in paragraph 164 of decision 18/CMA.1 may be considered. For example, where the Party designates information provided to the Article 6 TER teams during the review as confidential, the Party should provide the basis for protecting such information. In such cases, the Article 6 TER team and the secretariat shall not make the information publicly available. Furthermore, the obligation of the members of the Article 6 TER team to maintain confidentiality shall continue after the completion of the TER.

671. **Possible solution:** The guidelines for the Article 6 TER are to include a section on confidentiality.

G. Role of the Party

1. Role of the Party

672. In defining the role of the Party, the approach used in paragraph 165 of decision 18/CMA.1 may be considered. For example, the Party concerned shall cooperate with the Article 6 TER team and the secretariat and make every reasonable effort to respond to all questions and provide additional clarifying information and comments for the Article 6 TER report in a timely manner.

673. A participating Party is responsible for:

- (a) Preparing and submitting information;
- (b) Responding to clarifications and queries from the Article 6 TER team;
- (c) Responding to communications from the secretariat and the Article 6 TER team;
- (d) Carrying out all communications and coordination of effort with other Parties participating in the cooperative approach(es) of the Party in resolving any inconsistencies as related to the Party;
- (e) Providing clarifications on how overall consistency of information on the cooperative approach(es) in which it participates will be maintained between the participating Parties when the Party submits information, in the course of the review, in response to Article 6 TER observations, as relevant;
- (f) Including information on how they have addressed any inconsistencies and recommendations in the Article 6 TER in the next BTR.

674. The following Article 6 TER will therefore assess whether identified inconsistencies and recommendations were considered by the Party under review.

2. Non-responsiveness to inconsistencies and recommendations

675. If a Party has not addressed inconsistencies that are under its control (not related to other participating Parties) in a timely manner or has not responded to recommendations in the Article 6 TER and has repeatedly resisted undertaking actions, the following measures may be considered, including for reflection in the review guidelines:

- (a) The secretariat is to publish on the CARP information on cases of non-responsiveness in relation to the Article 6 TER reports;

(b) Information on non-responsiveness should be included in the annual compilation and synthesis of the results of the Article 6 TER report of the secretariat, including on the delay in responding.

676. It should be noted that a process already exists within the Article 13 TER for addressing inconsistencies that are identified and continually not resolved by submitting them to the Paris Agreement Implementation and Compliance Committee, which was established under Article 15.

677. **Possible solution:** The guidelines for the Article 6 TER are to include a section on the role of the Party under review.

H. Role of the secretariat

678. In defining the role of the secretariat, the approach used in paragraphs 168–171 of the annex to decision 18/CMA.1 may be considered. For example, the secretariat should be responsible for:

(a) Organizing the Article 6 TER, including the coordination of a schedule and the logistical and administrative arrangements of the reviews;

(b) Compiling and providing to the Article 6 TER team all submissions and relevant materials to be reviewed, as well as review tools, as necessary. This includes the results of the consistency checks, carried out as per paragraph 33(a), which are relevant to the review period;

(c) Together with the lead reviewers referred to in see section V.J.3 below, facilitating communication between the Party and the Article 6 TER team;

(d) Under the guidance of the lead reviewers, compiling and editing the final Article 6 TER reports;

(e) Forwarding the Article 6 TER report to the Article 13 TER team and publishing it on the CARP;

(f) Notifying other Parties participating in the same cooperative approach(es) as the Party under review of the publication of an Article 6 TER report;

(g) Facilitating annual meetings of the lead reviewers;

(h) Submitting its annual compilation and synthesis of the results of the Article 6 TER as per paragraph 13 of decision 2/CMA.3 to the global stocktake.

679. The role of the secretariat in conducting the consistency check is defined in chapter VI (Infrastructure) of the guidance, which implies that the consistency check process is linked to the operations of the infrastructure. The consistency check is discussed in section II.E.6 above, along with a proposed solution for the secretariat to develop and maintain guidelines for the submission process, including the consistency check, and to report on progress in its annual report to the CMA,

680. **Possible solution:** The guidelines for the Article 6 TER are to include a section on the role of the secretariat.

I. Role of the Article 6 technical expert review team

681. The role of the Article 6 TER team is to conduct the review of the Party's information while adhering to the mandates and processes of the Article 6 TER guidelines (to be adopted). In conducting the review, while reviewers may be nominated by Parties and potentially international organizations, they are responsible for executing the Article 6 TER in their individual expert capacity. In defining the role of the Article 6 TER team, the approach used in paragraph 166 of decision 18/CMA.1 may be considered. For example:

(a) Article 6 technical experts, in conducting reviews, shall adhere to the (future) Article 6 TER guidelines; and

(b) Article 6 technical experts shall participate in the Article 6 TER in their individual expert capacity.

682. *Possible solution:* The guidelines for the Article 6 TER are to include a section on role of the Article 6 TER team.

J. Article 6 technical expert review team and institutional arrangements

1. General

683. Based on the experiences of the secretariat with other review processes under the UNFCCC, the standard practice is for Article 6 technical experts to be nominated to a roster of experts by Parties and, as appropriate, by intergovernmental organizations. This roster could be a standalone roster or subroster of the Article 13 TER roster of experts, noting that experts can be nominated to multiple rosters. It is also standard practice for technical experts to undergo training appropriate to the review and to be required to pass an exam at the completion of the training. In relation to the assignment of reviews, it is standard practice for each set of submitted documents from a Party to be assigned to a single technical expert team.

684. Parties may wish to consider the following approach for the Article 6 experts, adapted from paragraphs 172–174 of the annex to decision 18/CMA.1:

(a) Technical experts shall be nominated to the UNFCCC roster of experts by Parties and, as appropriate, by intergovernmental organizations;

(b) Technical experts shall complete the training programme prior to serving on a Article 6 TER team;

(c) Each IR/UIR and/or annex 4 to the BTR shall be assigned to a single Article 6 TER team with members selected from the UNFCCC Article 6 roster of experts.

685. A single team reviewing both the IR and the RI (as part of the BTR) may be an additional consideration for assigning teams when they are not submitted together. However, in line with (i) the chapeau of paragraph 18, the IR and BTR could be submitted together; and (ii) the proposal to proceed with the review of the entire submission in V.E.2 above, no special provisions are proposed for assigning separate teams to the review of the IR and RI.

2. Composition

686. Based on the experiences of the secretariat with other review processes under the UNFCCC, the Article 6 technical experts will need to have recognized competence in Article 6 and review processes. Collectively, the Article 6 TER team will need to have the required skills and competencies to conduct the Article 6 TER. These skills can also include, if possible, fluency in the language of the Party being reviewed.

687. In composing a review team, standard practice is to have, to the extent possible, a balance of experts from developed and developing country Parties, while considering geographical origin and gender within the review team. It is also standard practice for the review team to include technical experts from the least developed countries (LDCs) and small island developing states (SIDS) when such a Party is being reviewed.

688. Further considerations in the composition of a review team include that successive reviews of a Party's submission cannot be performed by the same TER team, and that lead reviewers must have prior experience in undertaking UNFCCC reviews.

689. It is also standard practice that review teams are led by two lead reviewers, with one from a developed country Party and another from a developing country Party. However, since an Article 6 TER team may be smaller and only consist of two reviewers (i.e. in the case of the review of a single Party), both reviewers by default can be considered as co-lead reviewers. In centralized reviews where a single review team may review multiple Parties, the Article 6 TER team may consist of more than two reviewers, in which case the standard practice of two lead reviewers would be followed. Desk reviews may be possible to complete by one lead reviewer. Based on the experiences of the secretariat with other review processes

under the UNFCCC, the secretariat will consider all factors and reconcile them, to the extent possible, when forming the Article 6 TER teams.

690. Parties may wish to consider the following approach, adapted from paragraphs 175–182 of the annex to decision 18/CMA:

(a) Article 6 technical experts shall have recognized competence in the areas to be reviewed;

(b) The secretariat shall compose an Article 6 TER team in such a way that the collective skills and competencies of experts correspond to the information to be reviewed, and that the teams include experts on cooperative approaches and ITMOs under Article 6;

(c) At least one team member should be fluent in a language of the Party under review, to the extent possible;

(d) The secretariat shall select the members of the Article 6 TER team with a view to achieving a balance between experts from developed and developing country Parties. The secretariat shall ensure geographical and gender balance among the Article 6 technical experts to the extent possible. When selecting members of the Article 6 TER team for centralized group reviews of LDCs and SIDS, the secretariat shall strive to include technical experts from the LDCs and SIDS;

(e) Two successive reviews of a Party's submission cannot be performed by the same Article 6 TER team;

(f) The Article 6 TER team shall include two lead reviewers, one from a developed country Party and another from a developing country Party. In the event that there are only two members of the Article 6 TER team, at least one shall be a lead reviewer.

3. Lead reviewers

691. Under the UNFCCC review processes, those reviewers that have been qualified as lead reviewers play an important role, not only in the conduct of individual reviews that they are assigned to lead but also in developing and disseminating best practices for reviews in general.

692. Based on the experiences of the secretariat with other review processes under the UNFCCC, an Article 6 lead reviewer would have the responsibilities of overseeing the work of the Article 6 TER team and act as co-lead reviewer. These responsibilities would include ensuring that the Article 6 TERs that they lead are conducted in accordance with the Article 6 review guidelines; ensuring the quality of the review; communicating necessary information to the Article 6 TER team; monitoring the progress of the Article 6 TER; coordinating the submission of queries to the Party and ensuring the inclusion of the responses; and providing advice to the members of the Article 6 TER team.

693. In addition to the responsibilities in relation to individual Article 6 TERs, the standard practice would be for lead reviewers to have a role in improving the quality, efficiency and consistency of Article 6 TERs. This would be done through annual meetings of the lead reviewers where these would be discussed and recommendations and conclusions agreed.

694. Parties may wish to consider the following approach, adapted from paragraphs 183–186 of the annex to decision 18/CMA:

(a) Article 6 lead reviewers shall oversee the work of the Article 6 TER team and act as co-lead reviewers, in accordance with the Article 6 TER guidelines (to be adopted);

(b) Article 6 lead reviewers should ensure that the Article 6 TERs in which they participate are conducted in accordance with the Article 6 TER guidelines. The lead reviewers should also ensure the quality and objectivity of the Article 6 TER and provide for the continuity, consistency across Parties and timeliness of the Article 6 TER;

(c) Article 6 lead reviewers shall communicate necessary information to the Article 6 TER team; monitor the progress of the Article 6 TER; coordinate the submission of queries of the Article 6 TER team to the Party concerned and coordinate the inclusion of the

responses in the Article 6 TER report; give priority to issues raised in previous Article 6 TER reports; and provide technical advice to the members of the Article 6 TER team;

(d) Article 6 lead reviewers shall meet annually at a lead reviewers' meeting to discuss how to improve the quality, efficiency and consistency of Article 6 TERs and develop conclusions on these meetings.

4. Training

695. Based on the experiences of the secretariat with other review processes under the UNFCCC, standard practice is for nominated experts to complete a mandatory training programme and be required to pass an exam at the completion of the training to become qualified as reviewers. This ensures that the nominated experts have the requisite knowledge and competence to perform reviews under the UNFCCC.

696. Parties may wish to consider the following approach, adapted from annex VI to decision 5/CMA.3:

(a) General section: The aim of the courses forming part of the training programme is to train technical experts participating in the Article 6 TERs;

(b) Availability section: The training programme will be available to Article 6 experts included on the UNFCCC roster of experts. All courses will be available online all year round, with an option to download them;

(c) Examinations section: All courses will have an examination. Examination procedures will be standardized, objective and transparent. Examinations will be offered either online or in person. When participants attend an in-person training seminar, the examination may take place during that seminar. Other arrangements for examinations may also be made, provided that the examinations take place under the supervision of the secretariat;

(d) Instructed courses section: The secretariat is to offer online training courses, ensuring user-friendliness and efficiency. The modalities of delivery of the training, such as whether they are in-person or online, and the facilitation of the online courses will be operationalized by the secretariat subject to the availability of resources;

(e) Courses of the training programme: The following courses relating to the review of information specified in decision 2/CMA.3 will be developed:

(i) Requirements of the IR under paragraph 18 of the annex to decision 2/CMA.3;

(ii) Requirements of the RI under paragraphs 22–23 of the annex to decision 2/CMA.3.

5. Remuneration

697. The practice with regard to remunerating the work of technical experts under UNFCCC processes is not uniform. Under the CDM procedures, reviewers are compensated for their effort. Under the ETF, there are no such arrangements. Remuneration of experts may help to ensure that experts of the right skills and background are engaged in the Article 6 TER process. With the growing demand of the review processes under the Paris Agreement, it may not be possible to source all experts from governments and intergovernmental organizations due to their ongoing workloads.

698. Any consideration of remunerating the work of experts should be done in the context of the wider review services coordinated by the secretariat and on the basis of further assessment of such options, including options for funding the costs.

699. **Possible solutions:** The following are possible solutions in relation to Article 6 TER team and institutional arrangements:

(a) The guidelines for the Article 6 TER are to include a section on the Article 6 TER team and institutional arrangements;

(b) The secretariat is requested to develop a training programme for Article 6 technical experts according to the elements discussed above and taking into account

experience and lessons learned from developing existing training programmes, in particular the training programme for Article 13;

(c) Consideration may be given to the option of renumeraling the work of Article 6 technical experts in the context of the wider review services coordinated by the secretariat and on the basis of further assessment of such options, including options for funding the costs.

K. Article 6 technical expert review report

700. Paragraph 27 requires the Article 6 TER team to produce a report on the outcomes of the reviews, including recommendations as applicable, that will go to the Party concerned and be made publicly available.

701. Parties may wish to consider the following approach, adapted from paragraphs 187–188 of the annex to decision 18/CMA.1:

(a) An Article 6 TER report shall contain the results of the Article 6 TER in accordance with the scope identified for the Article 6 TER;

(b) Article 6 TER reports shall be made publicly available on the CARP.

702. Additionally, based on the experiences of the secretariat with other review processes under the UNFCCC, it is standard practice for the Article 6 TER team to provide their reports of the reviews in a standard format/template. The template for the Article 6 TER report should provide for following-up, during future reviews, on information required but unavailable at the time of the review, including in relation to the relevant reporting of other Parties participating in the same cooperative approach(es) as the Party under review.

703. Due to the nature of Article 6 cooperation, which includes requirements for ensuring consistency between the submitted information of Parties participating in the same cooperative approach(es), when the Article 6 TER report is published, other Parties participating in the same cooperative approach(es) should be notified.

704. *Possible solutions:* A proposed outline of the Article 6 TER report, adapted from annex VI of decision 5/CMA.3, is included in annex VII to this paper. When an Article 6 TER report is published, other Parties participating in the same cooperative approach(es) as the Party under review should also be notified.

L. Coordination of the Article 6 technical expert review with the Article 13 technical expert review

1. Planning and coordination of the Article 6 and Article 13 technical expert reviews

705. Considering (i) the total number of Parties to the Paris Agreement whose BTRs need to be reviewed in regular review cycles; (ii) the agreed procedures and timelines for the Article 13 TER; and (iii) the requirement that the Article 6 TER should be completed in advance of the Article 13 TER for a Party under review, it is clear that efficient and effective planning and sequencing between these two TERs needs to be established in order to fulfil the given mandates.

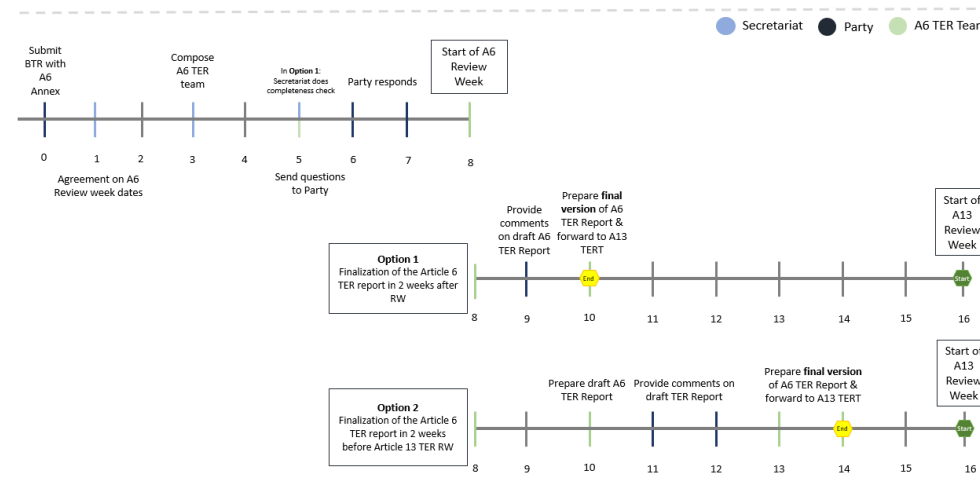
706. The coordination of the Article 6 and Article 13 TERs needs to ensure that: (i) human resources (technical experts and secretariat staff), are used in an optimal manner; (ii) Article 6 and Article 13 TERs complement each other and should not overlap, following the principle that the same information should be reviewed only once; and (iii) Article 6 and Article 13 TERs use the same criteria/principles for the review of the consistency of information, such as completeness and transparency, thus ensuring that the findings of the Article 6 TER are internally consistent with the findings of the Article 13 TER.

707. The scheduling for the Article 6 TER will align with the scheduling for the Article 13 TER, which is expected to be organized in four batches per year starting in February and repeating around April, September and October. The secretariat will make every effort to

coordinate the scheduling of the Article 6 and Article 13 TERs to ensure the effectiveness and efficiency of the process, minimizing the burden to the Parties and secretariat.

708. The submission of a BTR will trigger preparations for the Article 6 and Article 13 TERs. The timeline for the Article 6 TER is discussed in section V.E.2 above. With regard to the finalization of the Article 6 TER report in time for forwarding to the Article 13 TER team (step 8 in figure 19 above), the timeline may be extended from two weeks after the end of the Article 6 review week to up to two weeks before the Article 13 review week. This flexibility is shown in figure 20 below as option 1 and option 2, noting that the finalization of the Article 6 TER report any time up to two weeks before the start of the Article 13 review week would be acceptable.

Figure 20. Article 6 TER and Article 13 TER scheduling: High-level timeline (in weeks)



2. Non-completion of the Article 6 technical expert review in time for the Article 13 technical expert review

709. The scope and content of information submitted under Article 13 through the BTR is much broader and more comprehensive compared to the reporting under Article 6. While Parties should be given time to address any inconsistencies that may arise in the context of the Article 6 TER, a delay in the finalization of the Article 6 TER should not delay the Article 13 TER.

710. Noting that the annual submission of the AEF is due by 15 April of the previous year, Parties participating in the same cooperative approach should have sufficient time¹⁷⁸ to address any inconsistencies between them (arising from the completeness check) by the time they submit a BTR. Inconsistencies identified during the review week are likely to be in relation to the qualitative information and information mentioned in paragraph 23.

711. Should a case arise in which the **Article 6 TER team is not able to provide its review outcome to the Article 13 TER team** prior to the commencement of the Article 13 review week, the Article 13 TER team will follow the procedures defined in decision 18/CMA.1 without consideration of the ITMOs. The Article 6 TER team will provide the outcomes of its assessment at a later stage of the ETF process for consideration of the implementation and achievement of the NDC for the Party under review.

3. Interaction between Article 6 and Article 13 technical expert reviews

712. According to paragraph 28, the Article 6 TER shall review the information, prepare a report on its review and forward it for consideration in the Article 13 TER. Specifically, for the RI that has to be submitted as an annex to the BTR, the information pursuant to paragraph 23 shall be included in the structured summary (decision 5/CMA.3, annex II, CTF table 4) and in the scope of the Article 13 TER.

¹⁷⁸ Parties would also be aided by pre-checks of their AEF submissions.

713. Although those two reviews will not overlap (see discussion on the scope of the Article 6 TER in section V.B.2 above), it is possible that Article 6 TER findings will have an impact on the review under Article 13, particularly with regard to the use of appropriate methodologies, metrics and methods (described in paragraph 22 (c)–(e)) in preparing quantitative information on ITMOs under paragraph 23 that will be included in the structured summary.

714. If Article 6 TER team findings on methodologies, metrics and methods had pointed to any inconsistencies with the reporting requirements (for instance, the Party did not measure its mitigation outcomes in accordance with the methodologies and metrics assessed by the Intergovernmental Panel on Climate Change or the methods for converting the non-GHG metric into t CO₂ eq), the resulting information on ITMOs in the structured summary should also be considered as inconsistent and will lead to recommendations by the Article 13 TER team.

715. Based on these assumptions, there are two possible scenarios for the interactions between Article 6 and Article 13 TER teams, including in relation to:

(a) Methodologies/metrics/methods being consistently and correctly used by the Party;

(b) Methodologies/metrics/methods not being consistently and correctly used by the Party.

716. The former scenario is straightforward: the Article 6 TER team forwards the Article 6 review report, through the secretariat and then, according to the mandated timeline, to the Article 13 TER team. In this scenario, it can be envisaged that the Article 6 TER team will communicate the methodology-related findings, as soon as they are assessed, through the secretariat to the Article 13 TER team.

717. In the case of the second scenario, the action by the Article 6 TER team should be to ask clarification questions or communicate preliminary findings to the Party that could possibly trigger resubmission of regular information and corrections to the structured summary.

718. In both scenarios, the secretariat should serve as a communication point between the Article 6 TER team, the Article 13 TER team, and the Party under the review (see also role of the secretariat in section V.H above).

4. Implications of paragraph 176 of the annex to decision 18/CMA.1 in respect of the composition of the Article 13 review teams

719. According to paragraph 7 (f) of decision 2/CMA.3, in developing its recommendations on the review guidelines for Article 6, the SBSTA needs to consider the implications of paragraph 176, annex, decision 18/CMA.1 in respect of the composition of Article 13 TER teams.

720. The implication of paragraph 176 of the annex to decision 18/CMA.1 is that the Article 13 TER team would have an expert on cooperative approaches and ITMOs under Article 6. This should ensure that the Article 13 TER team would be able to interpret the outcomes of the Article 6 TER in all aspects related to the application of the guidance and review the internal consistency of the structured summary in light of the Article 6 TER outcomes. Furthermore, it would ensure that the Article 13 TER team would be able to carry forward (reflect) any recommendations from the Article 6 TER report into its own report and any possible interactions in relation to the operations of Article 15.

721. With respect to the allocation of Article 6 experts (see also section V.J.2 above), it should be possible for the same expert(s) conducting the Article 6 TER to also be nominated to the Article 13 TER team for the same BTR review cycle. Separate Article 6 experts serving on the two TER teams should also be possible, with the actual arrangements left to the secretariat, according to the availability of experts at the times of the reviews.

722. The final Article 13 TER report should serve as input to the next Article 6 TER (see also section V.B above).

723. As the review practice builds on, special attention should be paid to keeping the scopes of the two TERs as complementary and not overlapping, encouraging communication between the two teams and the secretariat to clear any doubts or issues related to the coordination of the two reviews.

724. **Possible solution:** The guidelines for the Article 6 TER are to include a section on coordination with the Article 13 TER.

VI. Summary of proposed solutions

725. Table 1 contains summary of the proposed solutions according to topics.

Ref	Context	Proposed solutions
35	Reporting: Reporting timeline: when to report	The IR trigger in relation to the mechanism is (this clarification may be made either in the RMPs or in the guidance): (a) For host Parties, the first authorization of A6.4ERs; (b) For other participating Parties, the first authorization of entities in an Article 6.4 activity that involves authorized A6.4ERs.
39	Reporting: Reporting timeline: when to report	The submission of an UIR with the next BTR is at the participating Party's discretion.
44	Reporting: Reporting timeline: when to report	For an IR submitted with the BTR, the reporting Party shall submit relevant AEF(s), at the time of the IR/BTR submission.
61	Reporting: Reporting elements: what to report	The rules for combining methods for tracking ITMOs are as follows: (a) A cooperative approach adopts a single method for tracking ITMOs for each metric and the method should be reported in the IR/UIR; (b) More than one method for tracking ITMOs may be used by a participating Party engaging in multiple cooperative approaches.
90	Reporting: Reporting elements: what to report	The following are possible solutions in relation to authorization: (a) A host Party authorizes a cooperative approach before it authorizes ITMOs from the cooperative approach towards use(s); (b) An authorization of ITMOs towards use(s) has to be granted before, or at the time of, first transfer; (c) For authorization of TIMOs towards use(s), a clarification of: (i) The method/format and minimum elements; (ii) The scope of authorization for entities; (iii) Possible changes.
102	Reporting: Reporting elements: what to report	The following are possible solutions in relation to first transfer: (a) For ITMOs authorized for OIMP, the host Party provides the specification of first transfer at the level of the cooperative approach in its IR; (b) For ITMOs authorized for both NDC and OIMP, the first chronological event that occurs as per paragraph 2 (b) is the first transfer; (c) For ITMOs authorized for use towards NDC only, the definition of first transfer is extended to include direct domestic cancellation towards OMGE;

Ref	Context	Proposed solutions
		(d) For ITMOs authorized for use towards NDC only, the authorizing Party shall not count such ITMOs towards its own NDC, if used directly (without international transfer).
114	Reporting: Reporting elements: what to report	The methods for allocating ITMOs to sectors and to activity types may be reported as part of the cooperative approach design.
128	Reporting: Reporting elements: what to report	Provision of information on GWP values in relation to ITMOs generated in the first NDC implementation period may be provided with the IR.
138	Reporting: Reporting elements: what to report	Clarification on the treatment of ITMOs in relation to the time limit as set out in paragraph 12 is based on further analysis.
142	Reporting: Nomenclature	The following are possible solutions in relation to nomenclature: (a) Tables and outlines are agreed with a minimum level of instructions, thus enabling reporting Parties to provide consistent and comparable information; (b) Nomenclature is clarified, including the methods for maintaining nomenclature and the role of the secretariat.
154	Reporting: Confidentiality	Approaches that may be incorporated in the reporting process in relation to confidential information: (a) Parties are enabled to identify confidential information through the reporting tables and outlines, as appropriate (to be agreed as part of the reporting formats); (b) Quantitative annual information as per paragraphs 20 and 23 is published at agreed aggregation level (to be agreed as part of the reporting formats); (c) The secretariat is requested to incorporate agreed confidentiality approaches in the reporting tools (Article 6 database and the CARP).
165	Reporting: Alignment in the reporting by participating Parties in the same cooperative approach	The following are possible solutions in relation to consistency in qualitative information: (a) Use of methods to assist with alignment of qualitative information in the IR and RI within the reports of the same Party and between participating Parties, as appropriate; (b) Agreed reporting formats enabling qualitative information to be provide in the structured manner; (c) Request the secretariat to design and implement reporting tools with built-in methods that assist participating Parties with reproducing already submitted information (prefilling in generating/preparing reports).
173	Reporting: Reporting by participating Parties in the mechanism established by Article 6, paragraph 4	The SB to prepare standard information on the mechanism for use by participating Parties in the mechanism in their reporting under the guidance.
176	Reporting: Reporting by participating Parties in the mechanism established by Article 6, paragraph 4	The AEF includes cancellation for OMGE in addition to voluntary cancellation for OMGE as per paragraph 20.
178	Reporting: Reporting by participating Parties in the mechanism established by Article 6, paragraph 4	Reporting of use of pre-2021 CERs towards first or first updated NDC as per paragraph 75, annex, decision 3/CMA.3 is reflected in the reporting format for paragraph 23 in a coordinated manner with the structured summary as part of the BTR.
229	Reporting: Outlines for the initial report and the regular information	The following are possible solutions in relation to the tables and outlines: (a) The proposed tables and outlines for IR and RI included in Annex I and Annex II;

Ref	Context	Proposed solutions
		<p>(b) The proposed CTF for paragraph 23 without paragraph 23 (j) and proposed CTF for paragraph 23 (j) included in Annex IV;</p> <p>(c) Providing for the application of corresponding adjustments on the basis of use of CERs towards first or first updated NDC in a coordinated manner with the structured summary as part of the BTR;</p> <p>(d) Corrections in relation to previous years (before the BTR period and within the NDC implementation period) can be submitted through re-submission of CTFs for the previous years;</p> <p>(e) To the extent that Parties wish to utilize prefilling of reporting formats, request the secretariat to explore possibilities for pulling together information from the CARP, the ETF reporting tools and the mechanism registry database to provide comprehensive prefilling of reporting formats to interested Parties;</p> <p>(f) Identification of confidential information through a dedicated annex to each table and outline.</p>
294	Reporting: Agreed electronic format	<p>The following are possible solutions in relation to the AEF:</p> <p>(a) The proposed AEF included in Annex III;</p> <p>(b) The administrator of the mechanism registry to submit a defined AEF with data not captured by Parties' AEFs;</p> <p>(c) Publishing of aggregated AEFs.</p>
346	Reporting: Submission process	<p>The following are possible solutions in relation to the submission process:</p> <p>(a) The secretariat is requested to develop and maintain guidelines for the submission process, including the consistency check, and report on progress in its annual reports to the CMA as per paragraph 36(c);</p> <p>(b) Explore opportunities for streamlining submissions between Article 6 and Article 13 and consult Parties – for example, by making test versions of proposed solutions available to Parties for feedback;</p> <p>(c) Explore the use of mechanism registry data in the context of the consistency check;</p> <p>(d) Consider implications of resubmissions of annual information as per paragraph 23 for the information in the structured summary, as part of the BTR, with the view to elaborating the reporting process.</p>
374	Infrastructure: Consistency guarantees	<p>The following are possible solutions in relation to consistency guarantees:</p> <p>(a) Adopt the maximum possible level of consistency guarantees in designing tracking infrastructure for cooperative approaches;</p> <p>(b) Any use of DLT, including in the future, and in particular for secretariat operated systems, should be considered on the basis of specific technical merits, risks, potential, and cost of implementation compared to classical systems design.</p>
412	Infrastructure: Recording and tracking of ITMOs	<p>The following are possible solutions in relation to recording and tracking ITMOs:</p> <p>(a) Except BOAAs, the other three methods offer an acceptable level of consistency risk. Strong encouragement for BOAAs to be considered only in the context of simple tracking scenarios such that relate to domestic tracking and do</p>

Ref	Context	Proposed solutions
		<p>not require multiple transfers of BOAAs (i.e. domestic OIMP uses);</p> <p>(b) Using more than one method for tracking ITMOs within one cooperative approach or for the same metric by one Party may produce confusing reporting. It is recommended to decide in favour of one method for tracking ITMOs per cooperative approach (or at the minimum per metric used in the cooperative approach);</p> <p>(c) Data structures used would depend on preferred method for tracking ITMOs;</p> <p>(d) Standardization / nomenclature approach for ITMO attributes should be clarified;</p> <p>(e) The nomenclature of cooperative approaches needs to be controlled centrally.</p>
497	Infrastructure: Registry	<p>The following are possible solutions in relation to registries:</p> <p>(a) The minimum high-level requirements for registries could be maintained as a standard or as a recommended standard to which registries adhere and Parties use as a basis for their reporting on the readiness of their tracking arrangements;</p> <p>(b) Exemption to meeting the minimum high-level requirements is acceptable for when Parties justify the use of simplified registry solutions;</p> <p>(c) Use of a transaction log or a similar system to store information that is relevant to the functioning of the entire cooperative approach;</p> <p>(d) Promote clear matching of ITMOs to their authorizations (including avoiding the use of approaches to tracking that prevent it, such as BOAAs).</p>
518	Infrastructure: International registry	<p>The following are possible solutions in relation to the international registry:</p> <p>(a) It is implemented to support all methods for tracking;</p> <p>(b) It is implemented as an integrated, internally consistent system. If this is not acceptable - to be implemented as a multi-tenancy system with an additional mechanism to maintain consistency;</p> <p>(c) Clarification of the features that the international registry would need to implement in order to go live, including with regard to interoperability;</p> <p>(d) Clarification of the approach to the administration of the international registry and its funding model;</p> <p>(e) Request to the secretariat to develop operational procedures for the international registry.</p>
560	Infrastructure: Centralized accounting and reporting platform	<p>The secretariat to be requested to implement the CARP considering the elements discussed in this paper and any further input from Parties, including the CARP to support prefilling of reporting formats and the maintenance of nomenclature, through a process to be developed and as clarified by the CMA.</p>
567	Infrastructure: Article 6 database	<p>The secretariat to be requested to implement the Article 6 database considering the elements discussed in this paper and any further input from Parties.</p>
592	Infrastructure: Interoperability between registry systems	<p>The following are possible solutions in relation to interoperability:</p> <p>(a) If the international registry and the mechanism registry are to connect to other tracking systems, an interoperability approach may be identified by the secretariat, including through the work of the cooperative approaches tracking</p>

Ref	Context	Proposed solutions
		system administrators forum. Such approach could also serve as a recommended practice; (b) The digital certification authority currently in use in the secretariat to be re-used for the purpose of Article 6, as necessary.
596	Infrastructure: Cooperative approaches tracking system administrators' forum	Establishment of a cooperative approaches tracking system administrators' forum (with voluntary participation), including establishing its objectives, rules of procedure and expected reporting to the CMA. The forum may be requested to consider: (a) Interoperability approach(es), including the development of procedures, processes and formats that would facilitate interoperability; (b) The issue of double use when non-real time exchanges take place; (c) Procedures and processes that would facilitate the review of registries; (d) Features related to the international registry.
610	Connection between Article 6.4 registry and the international registry	The connection of the mechanism registry to the international registry to be implemented to enable exchange of data as it may be necessary and determined as per the operational procedures of the two registries, and according to the technical standards discussed in the paper.
635	Article 6 TER: Scope and objectives of the Article 6 technical expert review	The following possible solutions in relation to scope may be considered: (a) The guidelines for the Article 6 TER are to include a section on objectives and scope; and/or (b) The secretariat is requested to assist the Article 6 TER team with the review of the consistency between the annual information and structured summary.
641	Article 6 TER: Information to be reviewed	The guidelines for the Article 6 TER are to include a section on information to be reviewed.
650	Article 6 TER: Article 6 technical expert review format	The guidelines for the Article 6 TER are to include a section on format for the reviews.
669	Article 6 TER: Procedures	The guidelines for the Article 6 TER should include a section on procedures, including a request to the secretariat to schedule joint reviews of Parties participating in the same cooperative approach(es), where practically possible.
671	Article 6 TER: Confidentiality	The guidelines for the Article 6 TER are to include a section on confidentiality.
677	Article 6 TER: Role of the Party	The guidelines for the Article 6 TER are to include a section on the role of the Party under review.
680	Article 6 TER: Role of the secretariat	The guidelines for the Article 6 TER are to include a section on the role of the secretariat.
682	Article 6 TER: Role of the Article 6 technical expert review team	The guidelines for the Article 6 TER are to include a section on role of the Article 6 TER team.
699	Article 6 TER: Article 6 technical expert review team and institutional arrangements	The following are possible solutions in relation to Article 6 TER team and institutional arrangements: (a) The guidelines for the Article 6 TER are to include a section on the Article 6 TER team and institutional arrangements; (b) The secretariat is requested to develop a training programme for Article 6 technical experts according to the elements discussed above and taking into account experience and lessons learned from developing existing training

Ref	Context	Proposed solutions
		programmes, in particular the training programme for Article 13; (c) Consideration may be given to the option of renumeration of the work of Article 6 technical experts in the context of the wider review services coordinated by the secretariat and on the basis of further assessment of such options, including options for funding the costs.
704	Article 6 TER: Article 6 technical expert review report	A proposed outline of the Article 6 TER report, adapted from annex VI of decision 5/CMA.3, is included in annex VII to this paper. When an Article 6 TER report is published, other Parties participating in the same cooperative approach(es) as the Party under review should also be notified.
724	Article 6 TER: Coordination of the Article 6 technical expert review with the Article 13 technical expert review	The guidelines for the Article 6 TER are to include a section on coordination with the Article 13 TER.

726. The SBSTA may consider conducting further analysis in relation to:

- (a) Authorizations, including in relation to:
 - (i) The scope of possible changes, as well as the way in which changes to authorizations are to be reported for transparency. In the absence of guidance in this area, it is not possible to design templates and outlines that cover changes to authorizations in a specific fashion. Therefore, the outlines and tables provided in this document accommodate changes in a generic fashion and will need to be reviewed if the CMA provides guidance in this area;
 - (ii) Potential benefits from authorizations to include minimum elements (requisites), including benefits from common format(s) with a view to TACCC;
 - (iii) Methods for tracking authorizations to clarify how the business controls in relation to effecting a “use” according to the authorization scope could be enabled (for example a the use or cancellation account-level).
- (b) Potential impact of use of different GWP values in the first NDC implementation period;
- (c) The time of the limit as per paragraph 12 and implications for ITMOs;
- (d) Impact of resubmissions of RI in relation to paragraph 23 and other resubmissions, including on the reporting of other participating Parties.

Annex I

Outline of the initial report and updated initial report as referred to in decision 2/CMA.3, annex, section IV.A (Initial report), paras. 18–19

(For the submission of the updated initial report, only section C is required)

<i>Party</i>	
<i>Submission date</i>	DD-MM-YYYY
<i>Report type</i>	Initial report / updated initial report

(References to paras. are to paras. in the annex to decision 2/CMA.3)

A. Participation responsibilities

1. The Party is a Party to the Paris Agreement (para. 18(a), para. 4(a))

2. The Party has prepared, communicated and is maintaining an NDC in accordance with Article 4, paragraph 2 (para. 18(a), para. 4(b))

3. The Party has arrangements in place for authorizing the use of ITMOs towards achievement of NDCs pursuant to Article 6, paragraph 3 (para. 18(a), para. 4(c))

4. The Party has arrangements in place that are consistent with the Article 6.2 guidance and relevant decisions of the CMA, for tracking ITMOs (para. 18(a), para. 4(d))

5. The Party has provided the most recent national inventory report required in accordance with decision 18/CMA.1 (para. 18(a), para. 4(e))

6. The Party's participation contributes to the implementation of its NDC and long-term low-emission development strategy (LT-LEDS), if it has submitted one, and the long-term goals of the Paris Agreement (para. 18(a), para. 4(f))

B. Description of the Party's NDC, ITMO metrics, methods for corresponding adjustments and quantification of NDC

7. Provide, where the participating Party has not yet submitted a biennial transparency report, the information referred to in paragraph 64 of the annex to decision 18/CMA.1 (para. 18(b))

The reporting Party may wish to use the table from the appendix to decision 5/CMA.3 "Reporting format for the description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates", on a voluntary basis.

Description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates^a	
	<i>Description</i>
	<p>Target(s) and description, including target type(s), as applicable^{b,c}</p> <p>Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable</p> <p>Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s), as applicable</p> <p>Time frame(s) and/or periods for implementation, as applicable</p> <p>Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable</p> <p>Intention to use cooperative approaches that involve the use of ITMOs under Article 6 towards NDCs under Article 4 of the Paris Agreement, as applicable</p> <p>Any updates or clarifications of previously reported information, as applicable^d</p>
<p><i>Note: This table is to be used by Parties on a voluntary basis.</i></p> <p>^a Each Party shall provide a description of its NDC under Article 4, against which progress will be tracked. The information provided shall include required information, as applicable, including any updates to information previously provided (para. 64 of the MPGs).</p> <p>^b For example: economy-wide absolute emission reduction, emission intensity reduction, emission reduction below a projected baseline, mitigation co-benefits of adaptation actions or economic diversification plans, policies and measures, and other (para. 64(a) of the MPGs).</p> <p>^c Parties with both unconditional and conditional targets in their NDC may add a row to the table to describe conditional targets.</p> <p>^d For example: recalculation of previously reported inventory data, or greater detail on methodologies or use of cooperative approaches (para. 64(g) of the MPGs).</p>	

8. Communicate the ITMO metrics and the method for applying corresponding adjustments as per chapter III.B for multi- or single-year NDCs that will be applied consistently throughout the period of NDC implementation and where the method is a multi-year emissions trajectory, trajectories or budget, describe the method (para. 18(c))

9. Quantify the Party's mitigation information in its NDC in t CO₂ eq, including the sectors, sources, GHGs and time periods covered by the NDC, the reference level of emissions and removals for the relevant year or period, and the target level for its NDC or where this is not possible, provide the methodology for the quantification of the NDC in t CO₂ eq (para. 18(d))

10. Quantify the NDC, or the portion in the relevant non-GHG indicator, in a non-GHG metric determined by each participating Party, if applicable (para. 18(e))

11. For a first or first updated NDC consisting of policies and measures that is not quantified, quantify the emission level resulting from the policies and measures that are

relevant to the implementation of the cooperative approach and its mitigation activities for the categories of anthropogenic emissions by sources and removals by sinks as identified by the host Party pursuant to paragraph 10, and the time periods covered by the NDC (para. 18(f))

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12. Information on use of GWP for the first/first updated NDC cycle (**optional*)

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C. Information on each cooperative approach (para. 18(g–i), para. 19)

(Repeated for each cooperative approach)

13. Name of the cooperative approach (**including identification, as appropriated*)

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14. Copy of the authorization by the participating Party (para. 18(g))

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15. Description of the approach (para. 18(g))

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16. Duration (para. 18(g))

<i>The reporting Party may wish to use the following table with start date and end date.</i>	
<i>From</i>	<i>To</i>
<u>DD-MM-YYYY</u>	<u>DD-MM-YYYY</u>

17. Expected mitigation for each year of the duration of the approach (para. 18(g))

<i>The reporting Party may wish to provide a table with the information provided for each year – number of columns of the table would be based on the duration provided above.</i>							
<i>Unit,^a as applicable</i>	<i>Year 1</i>	<i>Year 2</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>End year</i>
<i>Expected mitigation</i>	<i>1</i>						
^a t CO ₂ e or non-GHG metric, as applicable.							

18. Participating Parties involved (para. 18(g))

<i>(i) The reporting Party may wish to provide a table with the list of participating Parties.</i>	
<i>Participating Parties</i>	<i>ISO code</i>
<i>Party 1</i>	
<i>Party 2</i>	
<i>Party 3</i>	

...

19. Authorized entities (para. 18(g))

The reporting Party may wish to provide a table with the list of authorized entities.

<i>Entity Name</i>	<i>ID</i>	<i>Country of registration</i>
<i>Entity 1</i>		
<i>Entity 2</i>		
<i>Entity 3</i>		
...		

20. Describe how each cooperative approach ensures environmental integrity: (para. 18(h))

(a) That there is no net increase in global emissions within and between NDC implementation periods (para. 18(h)(i))

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(b) Through robust, transparent governance and the quality of mitigation outcomes, including through conservative reference levels, baselines set in a conservative way and below ‘business as usual’ emission projections (including by taking into account all existing policies and addressing uncertainties in quantification and potential leakage) (para. 18 (h)(ii))

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(c) By minimizing the risk of non-permanence of mitigation across several NDC periods and how, when reversals of emission reductions or removals occur, the cooperative approach will ensure that these are addressed in full (para. 18(h)(iii))

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(d) Description of any other information on how each cooperative approach ensures environmental integrity (para. 18(h))

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21. Description of how the cooperative approach will (para18(i)):

(a) Minimize and, where possible, avoid negative environmental, economic and social impacts (para. 18(i)(i))

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(b) Reflect the eleventh preambular paragraph of the Paris Agreement, acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity (para. 18(i)(ii))

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(c) Be consistent with sustainable development objectives of the Party, noting national prerogatives (para. 18(i)(iii))

(d) Apply any safeguards and limits set out in further guidance from the CMA (para. 18(i)(iv))

(e) Contribute resources for adaptation (chap. VII) if applicable (para. 18(i)(v))

(f) Deliver overall mitigation in global emissions (chap. VII), if applicable (para. 18(i)(vi))

22. Method for tracking ITMOs (**proposed addition element*)

23. First transfer specification for ITMOs authorized for OIMP (para. 2(b)) (**proposed additional element*)

24. Information on conversion methods (**optional*)

25. Information on methods for allocating ITMOs to sectors and to activity types (**optional*)

D. Annex(es) for additional information by the Party

Annex II

Outline for annex 4 “Information in relation to the Party's participation in cooperative approaches” to the biannual transparency report (as per section IV.C (Regular information) of the annex to decision 2/CMA.3, paras. 21–22)

Party

Submission date DD-MM-YYYY

Report type Annex 4 to the BTR on Article 6 regular information

(References to paras. are to the paras. in the annex to decision 2/CMA.3)

A. Information in relation to participation in cooperative approaches

1. Information on how the Party is fulfilling the participation responsibilities referred to in chapter II (Participation), annex, decision 2/CMA.3 (para. 21(a))

(a) The Party is a Party to the Paris Agreement (para. 21(a), para. 4(a))

(b) The Party has prepared, communicated and is maintaining an NDC in accordance with Article 4, paragraph 2 (para. 21(a), para. 4(b))

(c) The Party has arrangements in place for authorizing the use of ITMOs towards achievement of NDCs pursuant to Article 6, paragraph 3 (para. 21(a), para. 4(c))

(d) The Party has arrangements in place that are consistent with the Article 6.2 guidance and relevant decisions of the CMA, for tracking ITMOs (para. 21(a), para. 4(d))

(e) The Party has provided the most recent national inventory report required in accordance with decision 18/CMA.1 (para. 21(a), para. 4(e))

(f) The Party's participation contributes to the implementation of its NDC and long-term low-emission development strategy (LT-LEDS), if it has submitted one, and the long-term goals of the Paris Agreement (para. 18(a), para. 4(f))

2. Updates to the information provided in its initial report as per chapter IV.A above (Initial report), and any previous biennial transparency reports for any information that is not

included in the biennial transparency report pursuant to paragraph 64 of the annex to decision 18/CMA.1 (para. 21(b))

3. Authorizations and information on its authorization(s) of use of ITMOs towards achievement of NDCs and authorization for use for other international mitigation purposes, including any changes to earlier authorizations, pursuant to Article 6, paragraph 3 (para. 21(c))

4. How corresponding adjustments undertaken in the latest reporting period, pursuant to chapter III of decision 2/CMA.3, ensure that double counting is avoided in accordance with paragraph 36 of decision 1/CP.21 and are representative of progress towards implementation and achievement of the Party's NDC, and how those corresponding adjustments ensure that participation in cooperative approaches does not lead to a net increase in emissions across participating Parties within and between NDC implementation periods (para. 21(d))

5. How the Party has ensured that ITMOs that have been used towards achievement of its NDC or mitigation outcome(s) authorized for use and that have been used for other international mitigation purposes will not be further transferred, further cancelled or otherwise used (para. 21(e))

6. Updates on methods for allocating ITMOs to sectors and to activity types (**optional*)

B. Information on each cooperative approach

(Repeated for each cooperative approach)

7. Name of the cooperative approach (**including identification, as appropriated*)

8. Description of how each cooperative approach ensures environmental integrity (para. 22(b))

(a) That there is no net increase in global emissions within and between NDC implementation periods (para. 22(b)(i))

(b) Through robust, transparent governance and the quality of mitigation outcomes, including through conservative reference levels, baselines set in a conservative way and below 'business as usual' emission projections (including by taking into account all existing policies and addressing uncertainties in quantification and potential leakage) (para. 22(b)(ii))

(c) By minimizing the risk of non-permanence of mitigation across several NDC periods and how, when reversals of emission reductions or removals occur, the cooperative approach will ensure that these are addressed in full. (para. 22(b)(iii))

(d) Description of any other information on how each cooperative approach ensures environmental integrity; (para. 22(b))

9. Where a mitigation outcome is measured and transferred in t CO₂ eq, provides for the measurement of mitigation outcomes in accordance with the methodologies and metrics assessed by the Intergovernmental Panel on Climate Change and adopted by the CMA (para. 22(c))

10. Where a mitigation outcome is measured and first transferred in a non-GHG metric determined by the participating Parties, ensures that the method for converting the non-GHG metric into t CO₂ eq is appropriate for the specific non-GHG metric and the mitigation scenario in which it is applied (para. 22(d)), including:

(a) How the conversion method represents the emission reductions or removals that occur within the geographical boundaries and time frame in which the non-GHG mitigation outcome was generated (para. 22(d)(i))

(b) How the conversion method is appropriate for the specific non-CO₂ eq metric, including a demonstration of how the selection of the conversion method and conversion factor(s) applied take into consideration the specific scenario in which the mitigation action occurs (para. 22(d)(ii))

(c) How the conversion method is transparent, including a description of the method, the source of the underlying data, how the data are used, and how the method is applied in a conservative manner that addresses uncertainty and ensures environmental integrity (para. 22(d)(iii))

(d) Description of any other information on how the method for converting the non-GHG metric into t CO₂ eq is appropriate for the specific non-GHG metric and the mitigation scenario in which it is applied (para. 22(d) chapeau)

11. Description of how the cooperative approach provides for, as applicable, the measurement of mitigation co-benefits resulting from adaptation actions and/or economic diversification plans (para. 22(e))

12. Description of how the cooperative approach minimizes and, where possible, avoids negative environmental, economic and social impacts (para. 22(f), *update to para. 18(i)(i)*)

13. Description of how the cooperative approach reflects the eleventh preambular paragraph of the Paris Agreement, acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity (para. 22(g), *update to para. 18(i)(ii)*)

14. Description of how the cooperative approach is consistent with sustainable development objectives of the Party, noting national prerogatives (para. 22(h), *update to para. 18(i)(iii)*)

15. Description of how the cooperative approach applies any safeguards and limits set out in further guidance from the CMA (para. 22(i), *update to para. 18(i)(iv)*)

16. Description of how the cooperative approach contributes resources for adaptation (chap. VII), if applicable (para. 22(j), *update to para. 18(i)(v)*)

17. Description of how the cooperative approach delivers overall mitigation in global emissions (chap. VII), if applicable (para. 22(k), *update to para. 18(i)(vi)*)

C. Annex(es) for additional information by the Party

Annex III

Agreed electronic format

- The agreed electronic format (AEF) for actions and holdings, including example entries and an example of an aggregated CTF, is provided in a spreadsheet format here.

1. CTF actions

Party	Party
Table	Actions
Reported year^a	Year

^a The annual period from 1 January to 31 December during which actions occurred.

<i>ITMO</i>												
		<i>ITMO ID</i>				<i>Metric and quantity</i>			<i>ITMO details</i>			
<i>Line no.</i>	<i>Cooperative approach^a</i>	<i>ID/first ID^b</i>	<i>Last ID^c</i>	<i>First serial number^d</i>	<i>Last serial number^e</i>	<i>Metric^f</i>	<i>Quantity^g (expressed in the metric)</i>	<i>Quantity (t CO₂eq)</i>	<i>First transferring participating Party^h</i>	<i>Vintageⁱ</i>	<i>Sector^j</i>	<i>Activity type^k</i>
	Cooperative approach										Energy	
	Article 6.4										IPPU	
											AFOLU	
											Waste	

Table continues

<i>Authorization</i>			<i>Actions</i>						
<i>Authorization ID</i>	<i>Authorized use/s</i>	<i>First transfer definition^l</i>	<i>Action details</i>						
			<i>Action ID</i>	<i>Action</i>	<i>Transferring participating Party^m</i>	<i>Acquiring participating Partyⁿ</i>	<i>OIMP^o</i>	<i>Using participating Party or authorized entity or entities^p</i>	<i>First transfer^q</i>
	NDC	Authorization		Authorization					Yes
	OIMP	Issuance		Acquisition					No
	NDC and OIMP	Use or cancellation		Acquisition from AF					
				Transfer					
				Transfer to AF					
				Cancellation					
				Voluntary cancellation					
				Voluntary cancellation towards OMGE					
				Cancellation for OMGE (6.4 mandatory)					
				Use towards NDC					
				External use or cancellation					
				Retirement					

^a Name/ID of the cooperative approach as per the initial report.

^b Full ITMO ID, including the first ID for a block of serialized ITMOs. An action entry is required for each block of ITMOs.

^c For a block of serialized ITMOs only, the last ID of the block is required.

^d For blocks of serialized ITMOs only, the first serial number (as part of the ITMO ID) is required separately.

^e For blocks of serialized ITMOs only, the last serial number (as part of the ITMO ID) is required separately.

^f GHG or non-GHG.

^g For non-GHG only, the metric in which the ITMO was generated.

^h Country of the Participating Party in which the mitigation outcome was generated (ISO 3166-1 alpha-2).

ⁱ Year in which the mitigation occurred.

^j Sector where the mitigation outcome was generated as per the 2006 IPCC Guidelines.

^k Description of the mitigation activity.

^l If OIMP is authorized, the first transferring participating Party definition of “first transfer” as per para. 2(b) in the annex to decision 2/CMA.3.

^m Initiating participating Party, including for cancellations and uses.

ⁿ Participating Party receiving the ITMOs.

^o For the actions “Authorization”, “Cancellation” and “Voluntary cancellation”, the specific OIMP towards which ITMOs can be/were used.

^p Required for “Cancellation”, “Voluntary cancellation”, “Voluntary cancellation towards OMGE”, “Use towards NDC”, “External use or cancellation” or “Retirement”.

^q “Yes” is required if the action constitutes a “first transfer” as per para. 2(b) in the annex to decision 2/CMA.3. For ITMOs authorized for NDC and OIMP, the “first transfer” is the earliest occurring “first transfer”, as applicable to each use.

2. CTF holdings

2. The CTF for “Holdings” is the same as the CTF for “Actions” without including the action columns (the last seven columns). The AEF, including example entries and an example of an aggregated CTF, is provided in a spreadsheet format [here](#).

3. Guidance on filling AEF

3. The AEF is divided into two CTFs: actions and holdings. Actions contain all activities (actions/transactions) related to ITMOs during the reporting period. Holdings include the balance at the end of the reporting period.
4. How to fill in “Actions”:
 - (a) It is filled from the perspective of the reporting participating Party;
 - (b) Each line corresponds to a unique action: authorization, transfer, acquisition, use, cancellation;
 - (c) Authorization is an action reported separately from the other actions;
 - (d) To report an authorization fill in the table except for the “Actions” columns;
 - (e) If an ITMO is involved in more than one action in the reporting period, a separate line (entry) per action needs to be included. For example, for acquired and used ITMO: one line for the acquisition, one line for the use;
 - (f) Only the actions that happened in the reported year are included;
 - (g) Actions that happen in the accounts of the reporting Party are included, except for uses or cancellation in third-party registries that are considered as a first transfer for the reporting Party. When reporting use or cancellation in a third-party registry, and this is considered as a first transfer for the reporting Party, include it as an “External use and cancellation”. The reporting Party shall include in its AEF the actions that are first transfers in relation to another Party under the same heading “External use and cancellation”;
 - (h) The fields “Transferring participating Party” and “Acquiring participating Party” are filled in when the action is “Acquisition” or “Transfer”;
 - (i) The field “OIMP” is filled in when the action is “Authorization”, “Cancellation” or “Voluntary Cancellation” and the “Authorized use/s” includes “OIMP”;
 - (j) The field “Using participating Party or authorized entity or entities” is filled in when the action is “Voluntary cancellation”, “Voluntary cancellation towards OMGE”, “Cancellation for OMGE (6.4 mandatory)” or “Use towards NDC”. Enter “NA” when no value has to be reported;
 - (k) Enter “NA” when no value has to be reported.
 - (l) How to fill in “Holdings”: Each line corresponds to a holding.

Annex IV

Common tabular formats for paragraph 23

- The CTF for paragraph 23, including example entries, is provided in a spreadsheet format here.

1. CTF for paragraph 23, except for paragraph 23(j)

Party	Party
Table	Actions
Reported year^a	Year

^a The annual period from 1 January to 31 December during which actions occurred.

	Information present in AEF	Unit ^a	Year 1		Year 2		...	Reported year	
			non-GHG	t CO ₂ eq	non-GHG	t CO ₂ eq	...	non-GHG	t CO ₂ eq
Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, for the emission or sink categories as identified by the host Party pursuant to paragraph 10, annex, decision 2/CMA.3 (as part of the information referred to in para. 77(d)(i) in the annex to decision 18/CMA.1) (<i>para. 23(a), annex, decision 2/CMA.3</i>)	No								
Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from the portion of its NDC in accordance with paragraph 10, annex, decision 2/CMA.3 (<i>para. 23(b), annex, decision 2/CMA.3</i>)	No								
The annual level of the relevant non-GHG indicator that is being used by the Party to track progress towards the implementation and achievement of its NDC and was selected pursuant to paragraph 65 in the annex to decision 18/CMA.1 (<i>para. 23(i), annex, decision 2/CMA.3</i>)	No								
Annual quantity of ITMOs first transferred (<i>para. 23(c), annex, decision 2/CMA.3</i>)	Yes								

Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes and entities authorized to use such mitigation outcomes, as appropriate (<i>para. 23(d), annex, decision 2/CMA.3</i>) ^b	Yes		
Annual quantity of ITMOs used towards achievement of its NDC (<i>para. 23(e), annex, decision 2/CMA.3</i>)	Yes		
Net annual quantity of ITMOs resulting from paragraph 23(c–e), annex, decision 2/CMA.3 (<i>para. 23(f), annex, decision 2/CMA.3</i>) ^c	Yes		
Total quantitative corresponding adjustments used to calculate the emissions balance and/or annual adjusted indicator referred to in paragraph 23(k), annex, decision 2/CMA.3, in accordance with the Party’s method for applying corresponding adjustments consistent with chapter III.B, annex, decision 2/CMA.3 (Application of corresponding adjustments) (<i>para. 23(g), annex, decision 2/CMA.3</i>)	No		
The cumulative information in respect of the annual information referred to in paragraph 23(f), annex, decision 2/CMA.3, as applicable (<i>para. 23(h), annex, decision 2/CMA.3</i>)	No		
T CO ₂ eq or non-GHGs, an annual emissions balance consistent with chapter III.B, annex, decision 2/CMA.3 (Application of corresponding adjustments) (as part of the information referred to in para. 77(d)(ii) in the annex to decision 18/CMA.1) (<i>para. 23(k)(i), annex, decision 2/CMA.3</i>)	No		
Non-GHGs, for each non-GHG metric determined by participating Parties, annual adjustments resulting in an annual adjusted indicator, consistently with paragraph 9 in chapter III.B, annex, decision 2/CMA.3 (Application of corresponding adjustments) and future decisions of the CMA (as part of the information referred to in para. 77(d)(iii) in the annex to decision 18/CMA.1) (<i>para. 23(k)(ii), annex, decision 2/CMA.3</i>)	No		
In biennial transparency reports that contain information on the end year of the NDC implementation period, in the Party’s assessment of whether it has achieved the target(s) for its NDC pursuant to paragraphs 70 and 77 of decision 18/CMA.1, the application of the necessary corresponding adjustments consistently with chapter III, annex, decision 2/CMA.3 (Corresponding adjustments) and consistently with future decisions of the CMA (<i>para. 23(l), annex, decision 2/CMA.3</i>)	No		

^a Unit corresponds to the AEF metric.

^b For authorized entities see CTF for paragraph 23(j).

^c When the target is increasing, e.g. renewable energy target, the operation needs to be reversed, i.e. 23(e–c).

2. CTF for paragraph 23(j) in relation to paragraph 23(c) “Annual quantity of ITMOs first transferred”

Party	Party
Table	Actions
Reported year^a	Year

^a The annual period from 1 January to 31 December during which actions occurred.

Line no.	Reported year ^a	Cooperative approach ^b	Sector	First transfer destination			Annual quantity of ITMOs first transferred (t CO ₂ eq) ^g
				First transferring participating Party ^c	Acquiring participating Party of international transfer that is a “first transfer” as per paragraph 2(a) ^d	Participating Party in whose registry the “first transfer” is effected through use or cancellation as per paragraph 2(b) ^e	
		Cooperative approach	Energy				
		Article 6.4	IPPU				
			AFOLU				
			Waste				
			Energy				

^a The annual period in the two-year BTR period to which the entry relates.

^b Name/ID of the cooperative approach as per the initial report.

^c Sector where the mitigation outcome was generated as per the 2006 IPCC Guidelines.

^d Country of the Participating Party in which the mitigation outcome was generated (ISO 3166-1 alpha-2).

^e The Party acquiring ITMOs authorized to use towards NDCs that are being transferred internationally for the first time.

^f Host Party or other participating Party in whose registry the first transfer occurs.

^g Year in which the mitigation occurred.

3. CTF for paragraph 23(j) in relation to paragraph 23(d) “Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes and entities authorized to use such mitigation outcome, as appropriate”

<i>Line no.</i>	<i>Reported year^a</i>	<i>Cooperative approach^b</i>	<i>Sector^c</i>	<i>First transferring participating Party^d</i>	<i>OIMP^e</i>	<i>Authorized participating Parties or authorized entities^f</i>	<i>Vintage^g</i>	<i>Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes (t CO₂ eq)</i>
		Cooperative approach Article 6.4	Energy IPPU AFOLU Waste Energy					

^a The annual period in the two-year BTR period to which the entry relates.

^b Name/ID of the cooperative approach as per the initial report.

^c Sector where the mitigation outcome was generated as per the 2006 IPCC Guidelines.

^d Country of the participating Party in which the mitigation outcome was generated (ISO 3166-1 alpha-2).

^e Specific OIMP towards which ITMOs can be/were used.

^f Authorized participating Parties and authorized entities to use MO for OIMP, including entity IDs.

^g Year in which the mitigation occurred.

4. CTF for paragraph 23(j) in relation to paragraph 23(e) “Annual quantity of TMOs used towards achievement of NDC”

<i>Line no.</i>	<i>Reported year^a</i>	<i>Cooperative approach^b</i>	<i>Sector^c</i>	<i>First transferring participating Party^d</i>	<i>Vintage^e</i>	<i>Annual quantity of ITMOs used towards achievement of NDC (t CO₂ eq)</i>
		Cooperative approach Article 6.4	Energy IPPU AFOLU Waste Energy			

^a The annual period in the two-year BTR period to which the entry relates.

^b Name/ID of the cooperative approach as per the initial report.

^c Sector where the mitigation outcome was generated as per the 2006 IPCC Guidelines.

^d Country of the participating Party in which the mitigation outcome was generated (ISO 3166-1 alpha-2).

^e Year in which the mitigation occurred.

5. Guidance on filling in CTFs for paragraph 23

2. CTF for paragraph 23:

(a) Include only data for the reported year;

(b) If first transfers affect preceding years owing to vintage-based accounting, submit an updated CTF for paragraph 23 for each affected preceding year;

(c) When the ITMOs are measured in non-GHG metrics, enter the GHG equivalence as per the AEF.

3. CTF for paragraph 23(j):

(a) Quantities to be aggregated to the extent possible for each table.

Annex V

Results of the Survey on Article 6, paragraph 2 of the Paris Agreement

I. Introduction

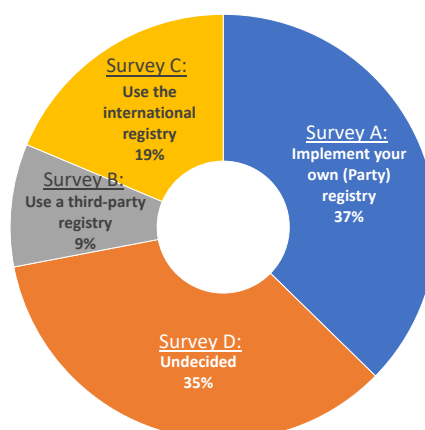
1. The survey was mandated at SBSTA 56.
2. The survey was sent to national focal points and was open from 15 July to 5 August 2022.
3. A total of 76 Parties participated in the survey, some providing more than one response through several representatives, with 70 Parties answering beyond the first question.

II. Summary of the results

4. Many respondents expect to have their own registry in place by the end of 2023.
5. Connectivity among national registries, the international registry and the Article 6.4 registry is essential for most of the respondents. Capacity-building and guidance in this area is also a priority for respondents.
6. An international registry with high levels of connectivity, standardization, automation and transparency is expected.
7. Capacity-building and assistance in relation to using and developing own registries is in a high priority for respondents.
8. Cancellation or recreation of ITMOs is an option being considered by some respondents.
9. Serialization of units as a method of tracking is the most commonly cited option among respondents.
10. Tracking of authorizations as part of the ITMO features or tracking of authorizations as evidence in the registry are widely accepted options among respondents.

III. Structure

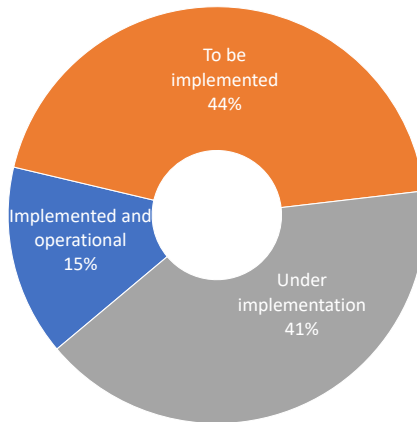
11. The first question determined the survey to be answered (A–D).
12. *Initial question: How do you intend to meet the requirements for tracking internationally transferred mitigation outcomes (ITMOs) as per paragraphs 4(d) and 29 in the annex to decision 2/CMA.3?*



1. Parties implementing their own registry (survey A)

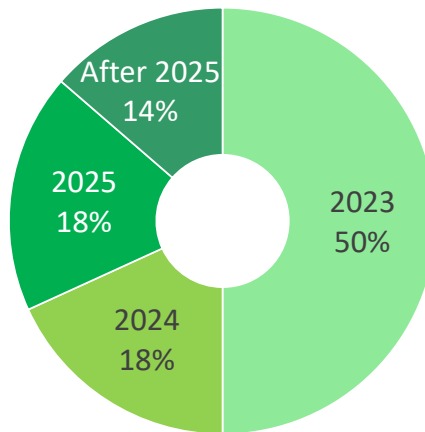
13. A total of 28 Parties (37 per cent) indicated that they will implement their own registry.

14. **Question A.1:** *What is the status of the registry?*

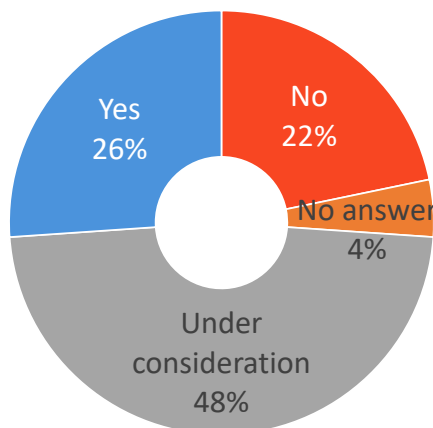


15. For those that responded “To be implemented” and “Under implementation”:

(a) **Question A.1.1:** *By when are you planning to finish implementing the registry?*



(b) **Question A.1.2:** *Do you plan to implement an interim solution before the registry?*



16. Parties that indicated that they plan to implement an interim solution were asked to provide further details, to which they responded:

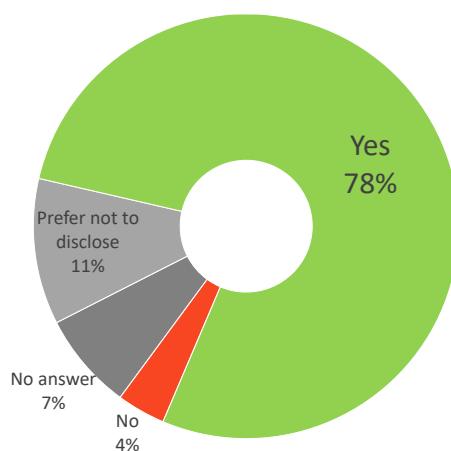
(a) **Question A.1.2.1:** *The interim solution will be:*

- (i) Excel;
- (ii) Current registries.

(b) **Question A.1.2.2:** *The interim solution will draw on existing systems that have similar functions to a registry, such as:*

- (i) CDM registry;
- (ii) World Bank Climate Warehouse;
- (iii) Coalition for Rainforest Nations Registry.

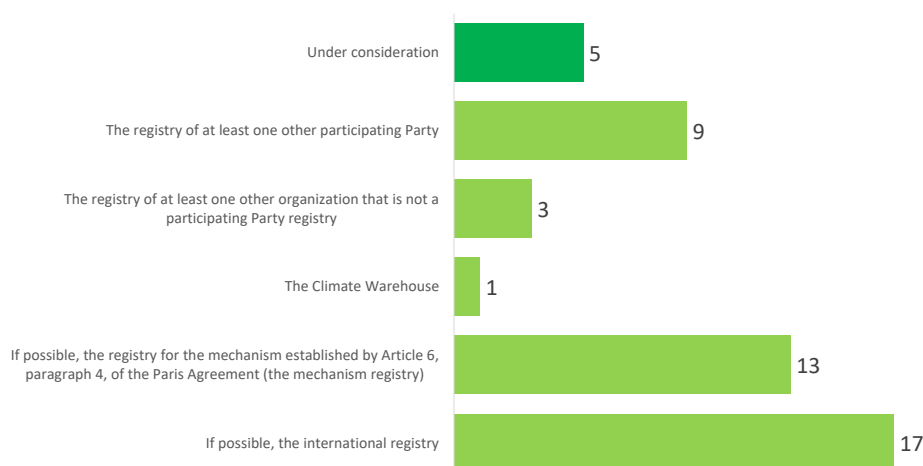
17. **Question A.2:** *Do you foresee the possibility of connecting to any other registry/registries in the future?*



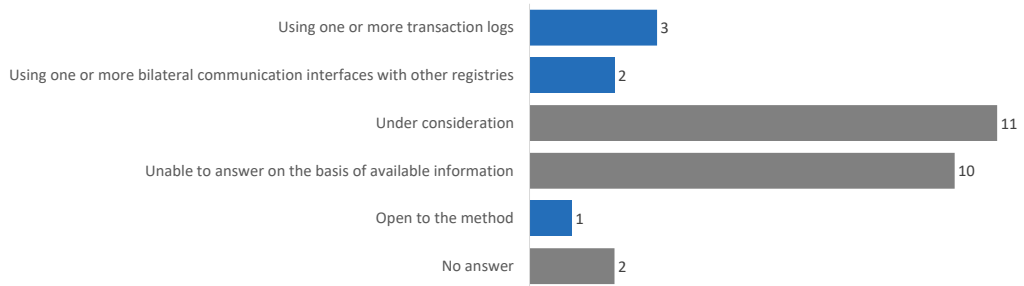
18. Parties that indicated that they do foresee the possibility of connecting to another registry or registries in the future were asked to elaborate further:

(a) 63 per cent of respondents would like to connect to the international registry and 48 per cent to the A6.4 registry;

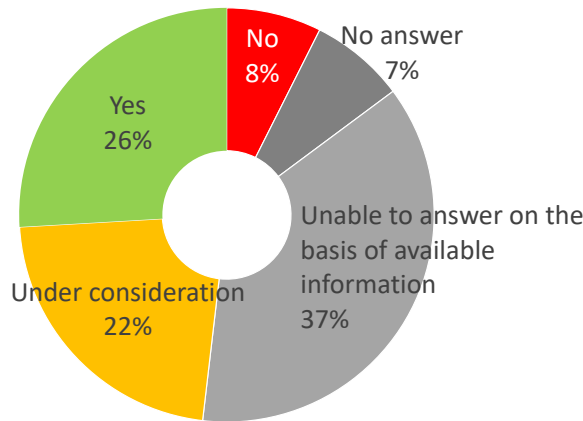
(b) Over 40 per cent would like to connect to both.



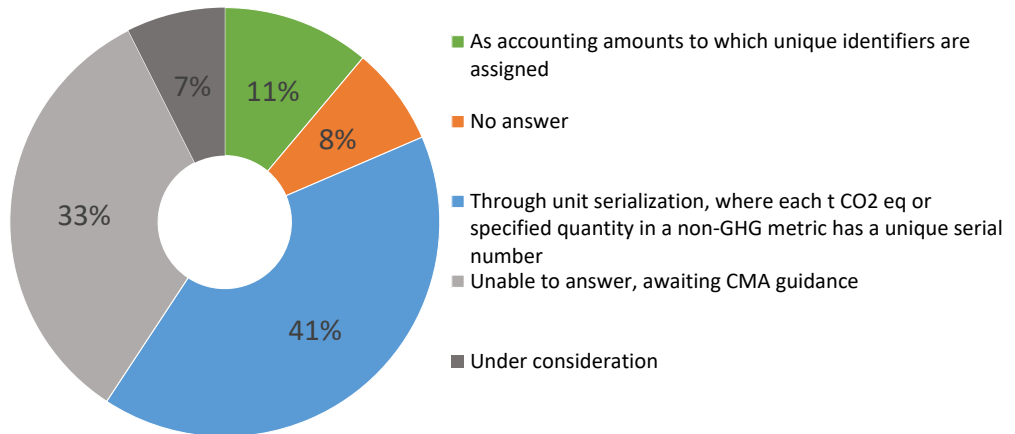
19. **Question A.3:** *If you plan to connect the registry to any other registry/registries, do you have any preference(s) for the method of connecting?*



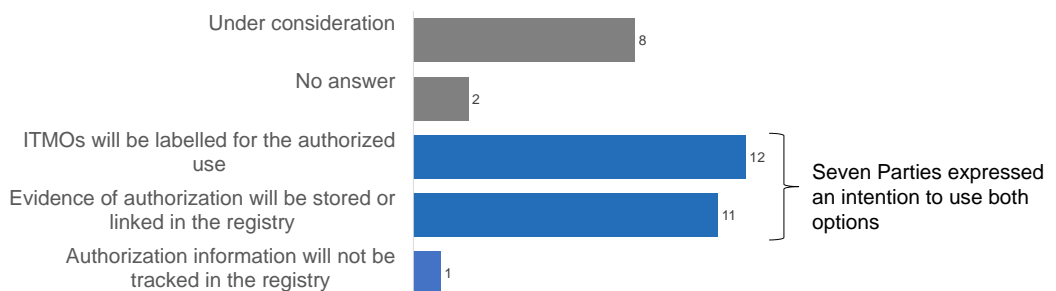
20. **Question A.4:** *Do you plan to process external transfers of ITMOs, without connecting to any other registry, using the cancellation and recreation method (cancelling ITMOs in one registry and recreating ITMOs in another registry)?*



21. **Question A.5:** *How do you plan to record and track ITMOs?*



22. **Question A.6:** *How do you plan to track authorizations in the registry?*

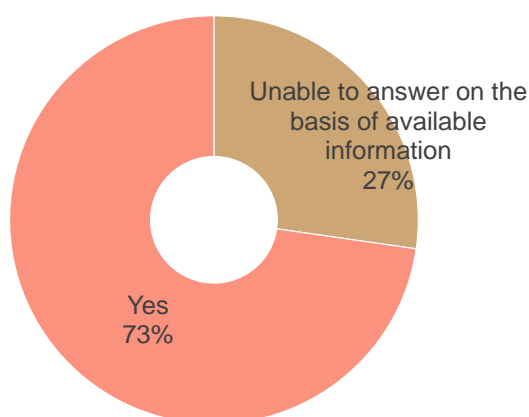


2. Parties using a third-party registry (survey B)

23. Seven Parties (9 per cent) indicated that they will use the international registry.
24. Parties that indicated their intention to use a third-party registry were asked the following questions:
- (a) **Question B.1:** *What type of third-party registry do you intend to use?*
- (b) **Question B.2:** *Have you initiated the process of obtaining access to a third-party registry?*
- (c) **Question B.3:** *Do you foresee the possibility of changing your arrangements in order to use the international registry?*
25. Their answers can be summarized as:
- (a) An independent commercially operated registry and a registry from another participant were mentioned as possible options;
- (b) Only one Party has already initiated the process of obtaining access to a third-party registry;
- (c) One Party indicated an interest in changing arrangements in order to use the international registry.

3. Parties using the international registry (survey C)

26. A total of 14 Parties (19 per cent) indicated that they will use the international registry.
27. **Question C.1:** *Would you like the international registry to offer the possibility of connection to registries other than the registry for the mechanism established by Article 6, paragraph 4, of the Paris Agreement (the mechanism registry)?*

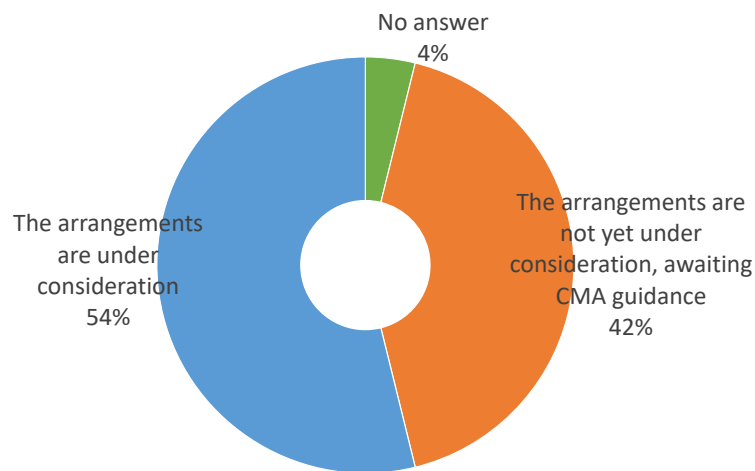


28. **Question C.2:** *In addition to the minimum functionalities (as per paras. 29–30 of the annex to decision 2/CMA.3), which other functionalities would you like the international registry to have?*
29. The responses to question C.2 could be grouped as follows:
- (a) Transparency:
- (i) Enhanced transparency at the national and entity level by cooperative approach;
- (ii) Monetary value and pricing for ITMO transfers in order to assist with climate finance tracking;
- (iii) Type of GHG transactions to be provided (avoidance or reduction);
- (b) Usability:
- (i) User-friendly system with guidance;

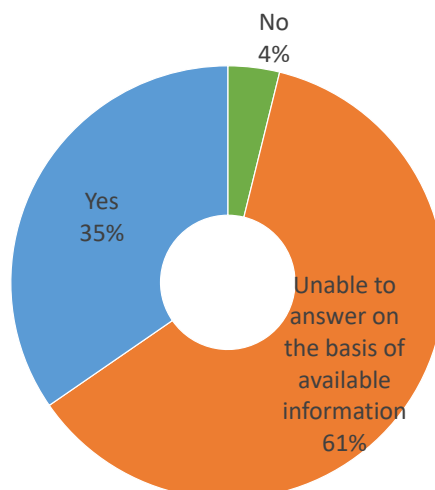
- (ii) Similar environments, wording and formats between the international registry and the mechanism registry;
- (iii) Format of tables and outlines aligned with country-specific needs.
- (c) Functionalities:
 - (i) No limit on transfers;
 - (ii) Centralized international registry to ensure proper accounting;
 - (iii) Accurate accounting and verification of transactions;
- (d) Connectivity:
 - (i) Electronic connection to eliminate human error in data exchange;
 - (ii) Interoperability between national registries and the international registry;
 - (iii) Interoperability between national registries and the international registries, if MRV methodologies are aligned;
 - (iv) Enhanced communication or links between the international registry, national registries, the CARP, the database, the registry for Article 6.4 and existing infrastructures for other international mitigation purposes.

4. Undecided Parties (survey D)

- 30. A total of 26 Parties (35 per cent) indicated that they are undecided about the type of registry.
- 31. **Question D.1:** *If the arrangements for tracking ITMOs have not yet been decided, which of the following is most applicable?*



32. **Question D.2:** Do you foresee the possibility of using the international registry?



33. **Question D.2.1:** If the answer is “Yes”, in addition of the minimum functionalities (as per paras. 29–30 in the annex to decision 2/CMA.3), which other functionalities would you like the international registry to have?

- (a) Statistical information on holdings and movements;
- (b) Progress indicators;
- (c) Tools for submission analysis;
- (d) Guidance and examples;
- (e) Voluntary information on social and environmental safeguards;
- (f) Tracking information on prices for ITMOs, where applicable;
- (g) Information on the NDCs and sectors included by the Party;
- (h) Information and analysis of international platforms and arrangements.

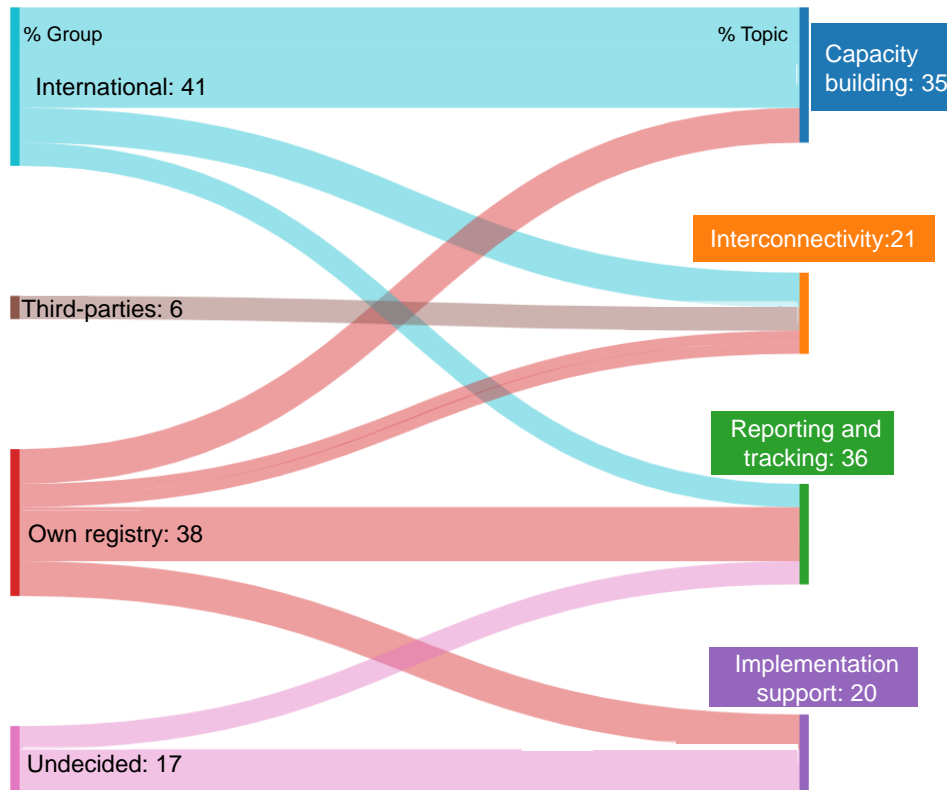
5. Proposal and requests

34. Parties were invited at the end of the survey to make suggestions and leave comments. Below is a summary of comments/themes of interest grouped per topics.

- (a) Capacity-building in relation to:
 - (i) Registry procedures and registry types;
 - (ii) Infrastructure, including software solutions and registries;
 - (iii) Operationalization of the guidance;
 - (iv) Markets and regulations;
 - (v) Regional consultations and cooperation on implementation aspects;
 - (vi) Building on the CDM;
 - (vii) Leveraging on links and similarities between Article 6.2 and Article 6.4;
- (b) Interconnectivity is of interest:
 - (i) Among national registries;
 - (ii) Between national registries and the international registry;
 - (iii) Data shareability between national registries and the international registry;
 - (iv) Between national registries and other UNFCCC systems;

- (v) Between national registries and current/available systems;
- (vi) Between the Article 6.2 and 6.4 systems;
- (c) Reporting and tracking in relation to:
 - (i) Using standards and promoting compatibility between systems;
 - (ii) Real-time reporting and tracking;
 - (iii) Reporting on avoidance measures;
 - (iv) Open access to non-confidential data;
 - (v) A clear ITMO coding definition;
 - (vi) Public accountability for ITMO transactions;
- (d) Implementation support:
 - (i) Support on registry procedures, costs and capabilities;
 - (ii) Assistance in relation to the development of national registries.

35. Relation between the groups (surveys A–D) to the topics of the comments.



Percentages are based on those who have responded

Annex VI

Guidelines for the reviews pursuant to the chapter V (Review) of the annex to decision 2/CMA.3

Possible structure of the guidelines for the Article 6 technical expert review (TER):

1. Scope and objectives of the review
2. Information to be reviewed
3. Article 6 TER format (centralized or desk review)
 - (a) Definitions
 - (b) Applicability
4. Procedures and timelines
 - (c) Proceedings
 - (d) Timelines
 - (e) Consistency check results
 - (f) Parties participating in the same cooperative approach(e)
5. Confidentiality
6. Role of the Party
7. Role of the secretariat
8. Role of the Article 6 TER team
9. Article 6 TER team institutional arrangements
 - (g) General
 - (h) Composition
 - (i) Lead reviewers
10. Article 6 TER report
11. Coordination with the Article 13 TER
 - (j) Planning and sequencing
 - (k) Interactions

Annex VII

Outline of the Article 6 technical expert review report, pursuant to the guidelines for the reviews contained in chapter V (Review) of the annex to decision 2/CMA.3

Abbreviations and acronyms

I. Introduction and summary

- A. Introduction
- B. Scope
- C. Summary
- D. Information provided by the Party with regard to decision 2/CMA.3, annex, chapter IV (Reporting)

II. Technical review of the information reported (paras. 18 to 23 of the annex to decision 2/CMA.3)

- A. A review of the consistency of the information submitted by the Party under Article 6, paragraph 2, of the Paris Agreement with the annex to decision 2/CMA.3 and future relevant decisions by the CMA (*reference paragraph from the review guidelines*)
- B. Identification of areas of improvement for the Party related to the implementation of Article 6, paragraph 2, and decision 2/CMA.3 (*reference paragraph from the review guidelines*)
- C. Linkages with information relating to information relating to Article 13 of the Paris Agreement

III. Conclusions and recommendations

- A. Conclusions and recommendations
- B. Recommendations identified by the technical expert review teams in previous reviews that the Party has not addressed
- C. Recommendations on capacity-building needs

Annexes

Documents and information used during the review

Any clarifications from the Party on how overall consistency of information on the cooperative approach(es) will be maintained between the participating Parties when the Party under review submits information in the course of the review in response to Article 6 technical expert review observations.

Annex VIII

Acronyms and abbreviations

A6.4ERs	Article 6, paragraph 4, emission reductions
AEF	Agreed electronic format
AFOLU	Agriculture, forestry and other land use
AF	Adaptation fund
API	Application programming interface
BHTA	Balance in a higher-tier account
BOAA	Balance-only accounting amount
BTR	Biennial transparency report
CARP	Centralized accounting and reporting platform
CDM	Clean development mechanism
CER	Certified emission reduction
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
CTF	Common tabular format
DES	Data exchange standards
DLT	Distributed ledger technology
ETF	Enhanced transparency framework
GHG	Greenhouse gas
GWP	Global warming potential
HTA	Higher-tier account
ID	Identifier
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial processes and product use
IR	Initial report
IT	Information technology
ITL	International transaction log
LDCs	Least developed countries
LT-LEDS	Long-term low-emission development strategy
MO	Mitigation outcome
MPGs	Modalities, procedures and guidelines
NA	Not applicable
NDC	Nationally determined contribution
OLA	Operational level agreement
OIMP	Other international mitigation purpose
OMGE	Overall mitigation in global emissions
RE	Renewable energy
RI	Regular information
RMP	Rules, modalities and procedures
RSA	Registry system administrators
SB	Supervisory Body of the Article 6.4 mechanism
SBSTA	Subsidiary Body for Scientific and Technological Advice
SEF	Standard electronic format
SIDS	Small Island Developing States
SOAP	Simple Object Access Protocol

TACCC	Transparency, accuracy, completeness, consistency and comparability
TER	Technical expert review
t CO ₂ eq	Tonne of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
UIAA	Uniquely identifiable accounting amount
UIR	Updated initial report
ZKP	Zero-knowledge proofs

Annex IX

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