

The Global Stocktake Under the Paris Agreement

Opportunities and challenges

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EXECUTIVE SUMMARY

The global stocktake, established in Article 14 of the Paris Agreement, is a central component of the set of provisions in the Paris Outcome that are intended to raise ambition of Parties over time. It interacts with other provisions in various ways. For example, it aligns with the cyclic nature of the agreement; it relies on the outcomes of the transparency regime; it considers as input Nationally Determined Contributions (NDCs) and other undertakings, whilst also informing their formulation and updating; it also links the commitments to the purpose and goals of the Agreement. While Parties agreed in Paris on the general scope, objective and purpose of the stocktake, specific modalities will have to be developed before the first stocktake can take place in 2023.

To conceptualise the stocktake, we introduce three central, basic structural concepts: the ‘pillars’ of the climate regime; four tracks; and three elements (benchmark-state-gap).

The stocktake is stipulated to be comprehensive and to cover all pillars of the climate regime. Mitigation, adaptation, and means of implementation (MOI, including finance, technology transfer and capacity building) are explicitly mentioned, but the general language of the stocktake suggests that the scope can be wider and also cover, for example, loss and damage (L&D), cooperative approaches, climate change education, etc.

Further, the stocktake has both backward-looking and forward-looking components. The text refers to “*implementation*”, indicating the backward-looking aspect, while the purpose of the stocktake is to assist Parties in increasing their ambition in the future, indicating the forward-looking aspect. Furthermore, the stocktake considers both ‘reported’ and ‘communicated’ information.

We define four separate ‘tracks’ for the stocktake, each associated with a different five-year implementation period:

1. the **period that has ended** before the stocktake (for example, the pre-2020 period in the case of the 2023 stocktake)
2. the **current period** (in the example, the 2021-2025 period);
3. the **next upcoming period** (2026-2030); and
4. the **one after** that.

Considering the pillars and tracks together results in a typology for the stocktake that we believe can be very useful for Parties as they consider and decide the stocktake’s modalities. For each track, and for each of the pillars within each track, the types of inputs that are available for the stocktake, the outcomes that are desirable or useful, as well as the processes that constitute the actual stocktake are different.

One way to conceptualise this typology is to think about the global stocktake as a set of individual stocktakes for the various track-pillar combinations. For example, the inputs considered, actions taken and outcomes produced in track 3 will be different for mitigation compared to, say, technology. For mitigation, emissions pathways and the mitigation components of NDCs can be used as inputs, while the outcomes could be recommendations for strengthening NDCs. For technology, however, no undertakings are expected to cover technology contributions, but needs might have been articulated in recipient countries’ NDCs.

Within each of these tracks and pillars, the central stocktake exercise has three basic elements: benchmark, state and gap. The ‘benchmark’ is the level of action within each track and pillar that should ideally be achieved, according to science and other relevant information sources – for example relevant emissions levels in a

1.5°C-compliant pathway. The ‘state’ is the level of action that actually has occurred in track 1 stocktakes; level of action currently being undertaken in track 2; and the level of action that is pledged or anticipated in track 3 and 4, respectively. Finally, the ‘gap’ is the shortfall of the state relative to the benchmark.

In designing the stocktake, Parties must identify suitable inputs for identifying benchmark and state, processes how to practically assess them, suitable outputs to describe state and gap, and guidance for actions to be taken by Parties to close the gap. Again, all of these would likely differ between each track-pillar combination.

As overarching design principles, the stocktake is stipulated to take place “*in light of equity in the best available science*”. This points to the role of the scientific community in generating and providing relevant knowledge (and closing pertinent knowledge gaps) as inputs to the stocktake. The equity stipulation will have to be further considered by Parties, but in our view can take three (not mutually exclusive) broad forms: differentiation in conducting the stocktake; group-based assessment; and making equity itself a topical focus of the stocktake. The differentiation aspect is well established within the provisions of Paris Agreement that are related to the stocktake: the rules for reporting, for example, have flexibility for developing countries, least developed countries (LDCs) and small island developing States (SIDS); there is differentiation with regards to the provision of finance; and there is self-differentiation with regards to type of mitigation commitment, to name but a few.

While the Paris Agreement stipulates that the collective progress is the focus of the stocktake, therefore hinting to an aggregate assessment, the outcomes of the stocktake must be relevant for application by individual Parties (to enhance their ambition) and the stocktake will consider input based on information from individual Parties. Hence, it will have disaggregated components as well. In general, the stocktake deliberations made clear that, as a group, Parties did not want the assessment itself to be conducted on an individual level. However, a globally-aggregated assessment cannot meet the “*in light of equity*” criterion.

We suggest that this conundrum can be solved by embracing group-based assessments, where groups are defined along yet-to-be-agreed criteria; perhaps even different criteria for different stocktake tracks and/or pillars. Groupings could, for example, be done by level of development, which in turn could be defined either through a dynamic, indicator-based approach, or through the developed-developing-LDCs/SIDS trichotomy used elsewhere in the Paris Agreement. Another option for grouping, at least in mitigation, could be by type of commitment. Other approaches can be envisioned as well. However, the overall result should be that there is a certain degree of relevant homogeneity within the group, and that the outcomes of the group-based assessments can be usefully employed by Parties in their unilateral application of the outcomes of the multilateral process.

Finally, equity can be considered as a stocktake topic in its own right – for example, when the distributional justice implications of mitigation policies are assessed, or when adaptation response is examined to determine whether it is reducing the risks of the most vulnerable populations.

I. INTRODUCTION

With the Paris outcome (which includes the Paris Agreement itself and decision 1/CP.21), many aspects of the international community's collective response to the global threat of climate change are now clear. For example, the bottom-up nature of this response is predominant, with countries nationally determining their contributions and other undertakings communicated to the UN Framework Convention on Climate Change (UNFCCC). Further, the Paris Agreement sets its purpose, and establishes global goals and objectives for each pillar of the climate regime.¹ This goal-setting, in combination with the transparency and accountability provisions of the Agreement, provides a top-down perspective of what the sum of unilateral efforts should deliver.²

Parties generally recognise³ that the collective ambition represented by their NDCs may not plausibly be compatible with these global goals and overall objectives. The various assessment and review mechanisms in the Paris outcome have an important role of contributing to bridging this gap. The global stocktake (Article 14 of the Paris Agreement) is particularly crucial in this regard: it is the most comprehensive collective review exercise within the Paris outcome, and is explicitly intended to connect the level of effort in Parties' undertakings to the global goals and objectives across the pillars of the climate regime.

It therefore provides Parties with a collective opportunity to progress to the higher overall ambition needed to meet collective goals and objectives. Further, the stocktake combines both backward and forward-looking elements, with the former reviewing implementation, whilst the latter informs the enhancement/update of undertakings being or yet to be implemented. The forward-looking element is particularly relevant to bridging the ambition gap across all pillars. Finally, since the stocktake will be conducted "*in the light of equity and best available science*",⁴ it provides an opportunity to advance the equity debates within the UNFCCC, as well as finding operational expression of the temperature goal across mitigation, adaptation and support.

BOX: Key terms used in this paper

Pillars: We use the term 'pillars' to refer to the main elements of the response to climate change: mitigation, adaptation, finance, technology transfer, capacity building, loss and damage etc.

Undertaking: We use this term to mean any action that a Party has indicated it would undertake. Undertakings is therefore a collective term that covers all of a Party's indicated actions, across mitigation, adaptation, finance etc., as well as across time, such as past commitments, commitments currently being implemented and commitments indicated for future periods. For example, Parties' Nationally Determined Contributions are undertakings for mitigation and, where applicable, adaptation. Announced or pledged amounts of climate finance or other support, are also undertakings. As such, undertakings differ from each other by the pillar they apply to, their temporal scale (in terms of the time period they refer to, the distance to that period and its length), their legal nature, as well as their firmness.

This paper intends to contribute to the discussion of the operationalization of the global stocktake, hereinafter referred to as 'the stocktake'. We begin by describing the provisions of the stocktake in the Paris outcome and its relationship to other relevant provisions, and then situate this outcome within the context of the pre-Paris discussions. For the remainder, and most substantial part of the paper, we provide a more detailed discussion of the elements and process, with questions and possible options that Parties will have to consider in operationalising the stocktake. The paper focusses on mitigation, adaptation and finance, as these elements have the most well-articulated forward-looking provisions and undertakings. However, we also briefly touch upon the role of other components (technology, capacity building, L&D, cooperative initiatives etc.) in the stocktake, where appropriate.

2. THE GLOBAL STOCKTAKE IN THE PARIS OUTCOME

2.1 Objectives of the global stocktake

The stocktake is established in Article 14 of the Paris Agreement, with a number of other Articles⁵ providing some guidance on how the pillars of the climate regime will interface with the stocktake. The objective of the stocktake is clearly set out in Article 14.1: to “*periodically take stock of the implementation of this Agreement to assess the collective progress towards achieving the purpose of this Agreement and its long-term goals*” and, in doing so, cover all pillars of the climate regime “*in a comprehensive and facilitative manner, considering mitigation, adaptation and the means of implementation and support*”.⁶

Article 14.3 also stipulates the purpose of the stocktake: to “*inform Parties in updating and enhancing*” their various climate actions, as well as “*enhancing international cooperation for climate actions*”. As such, the stocktake is an integral component of the ambition provisions of the Paris Agreement. Taken together, paragraphs 1 and 3 of Article 14 make clear that the point of the stocktake is to identify how much Parties’ actions collectively contribute to the progress towards the realization of the goals of the Paris Agreement, as well as to identify the remaining gaps in order to inform adjustments to Parties’ actions and support accordingly.

At the same time, by explicitly referring to the “*implementation*” of the Agreement (Article 14.1), it appears that a review of the effectiveness of the Agreement itself is out of the scope of the stocktake. However, it also appears that the implementation of all provisions of the Agreement can be considered; not just those explicitly enumerated in Article 14.1.

2.2 Modalities of the global stocktake

One important element that Article 14 is unclear about is the temporal horizon that the stocktake is supposed to cover. The literature typically distinguishes between assessments and reviews in the context of forward-looking assessments, implementation reviews and backward-looking assessment, depending on whether the review or assessment is carried out before the commencement, during, or after the completion of the implementation of the actions in question, respectively.⁷ The Agreement suggests that the stocktake has both a backward-looking (“*take stock of the implementation*” in Article 14.1) and a forward-looking component (in the “*updating and enhancing*” provision in Article 14.3).

With respect to multilateral process and conduct of the stocktake, Article 14 does not provide guidance of ‘how’ the stocktake will be undertaken. However, elsewhere the Agreement seeks to build on existing arrangements, practices and processes in a number of areas, such as mechanisms for support, framework for adaptation, transparency arrangements and others. In our view, the 2013-2015 Review which consisted of expert (technical), scientific, and Party-driven (diplomatic) processes, can therefore serve as a precedent to guide the multilateral processes of the stocktake. It remains, however, a subject of negotiation what processes will be followed to achieve the purpose of the stocktake.

Furthermore, in defining the modalities of the stocktake, some architectural aspects require further elaboration as they are not currently set out in the text. In our view, this is partly due to the different levels of disaggregation that apply to different aspects of the stocktake: the input information is primarily from individual Parties, the assessment of progress is collective, and the triggered response is both individual (in updating actions and support) as well as collective (in enhancing international cooperation). This architecture of the stocktake presents opportunities for the design of modalities that leverage the strengths and mitigate the weaknesses of both a fully bottom-up or top-down architecture. Some of the questions that remain

include: what will be the process/guidance for Parties in updating their actions and support; and how will the stocktaking exercise consider equity and best available science? We will return to these question later.

2.3 Element-specific aspects

The stocktake provides for the assessment of implementation of provisions of the Agreement, and in our view, these provisions can be usefully classified along two dimensions. First, elements that are explicitly linked to the stocktake vs. those that are not, and, secondly, elements that have a provision for forward-looking undertakings elsewhere in the Agreement vs. those that have not.⁸ Thus, adaptation, finance and mitigation are explicitly linked and also have forward-looking provisions; technology and capacity building are explicitly linked but have no provision for communication of forward-looking undertakings; while L&D and cooperative approaches neither have an explicit link to the stocktake, nor provisions for forward-looking undertakings. However, in our view, they nonetheless constitute essential provisions of the Agreement and have important action and support dimensions. This classification is useful as each of the resulting classes represent certain opportunities and limits for the stocktake, for example with regards to the inputs available, applicable benchmarks, and desired outcomes.

On mitigation, Article 4.9 requires that when Parties communicate their NDCs – every five years – they take the outcomes of the stocktake into account. This in turn would require the design of the stocktake to result in outcomes that can usefully inform the formulation of NDCs. However, in addition to mitigation, Article 14.3 also provides for the stocktake to inform the enhancement of adaptation action as well as the provision of support.

The departure point for the link between adaptation and the stocktake is the assessment of adequacy of adaptation action and support,⁹ with a view of enhancement and update of the appropriate undertakings. In our view, this means that the enhancement and updating is therefore targeted at ‘a-NDCs’ (the adaptation components of NDCs),¹⁰ communicated every 5 years, from an adaptation action perspective, whereas for adaptation support, it would be based on obligations in Article 9.

The finance link to the stocktake is conceptually premised on the need to ensure finance flows that are consistent with the required emission reductions and climate resilience in Article 2 (as per Article 2.1.c), which in a fashion similar to mitigation and adaptation, is adequacy-driven. The outcomes of the stocktake could in this instance inform future finance announcements by developed countries and, in turn, the information in their Biennial Communications of Indicative Support (BCIS) envisaged in Article 9.5 of the Agreement.

Technology and capacity building, for which Parties are not expected to explicitly state their envisioned undertakings, also form an integral of the stocktake, and are explicitly mentioned in Article 14.1 under the term “*means of implementation and support*”. Again, details have not been decided yet, but it is our view that inputs could come from the transparency regime, particularly in respect of support provided for these elements,¹¹ and progress could be benchmarked against needs assessments by the relevant bodies under the UNFCCC. As such, the stocktake could focus on the ‘direction of travel’ in implementing the provisions, with the endeavour being on doing better than a previous period.

L&D and cooperative approaches are among the provisions that are not explicitly linked to the stocktake yet integral to action under the Agreement (as per Articles 6 and 8). In our view, L&D could be treated in a similar fashion as technology and capacity building in terms of being assessed of the basis of ‘direction of travel’ where the areas listed in Article 8.4 could serve as a basis of understanding action, whereas for cooperative approaches the focus could be on those initiatives that do not form part of any country’s undertaking but

contribute to increasing ambition. The challenge, however, pertains to how such voluntary initiatives can be reported, such that they can also inform the stocktake in assessing implementation.

2.4 Timeframes and the stocktake

As mentioned before, each stocktake has two principal temporal dimensions: backward and forward-looking. With regards to the forward-looking component, the stocktake has the potential to be relevant for two distinct processes and time periods. First, it can be used to assess Parties' communicated or indicated future contributions, with a view to inform Parties' "*updating and enhancing*" of these contributions. Secondly, it can be used by Parties in their domestic process of determining future, not-yet-communicated contributions, or in the confirmation of indicative nationally determined contributions previously communicated. The Paris Agreement leaves open the timeframes for NDCs, although it requires Parties to consider common timeframes,¹² as Parties communicated Intended Nationally determined Contributions (INDCs) with different (5 and 10 year) timeframes in 2015. The resolution of the timeframes discussion is crucial to the effectiveness of the stocktake (and failure to do so has potentially far-reaching consequences), but goes beyond the scope of this paper. Müller and Ngwadla (2016) explore various options elsewhere and highlight that the degree to which the stocktake will be able to inform Parties in this manner very much depends on further decisions on modalities regarding the timing of communicating NDCs.¹³

In this paper, meanwhile, we discuss the stocktake under the assumption that Parties will communicate an upcoming 5 year undertaking, as well as provide an indication of the subsequent 5 year undertaking. For example, by 2020, all Parties will confirm/update a 2025 NDC and indicate a 2030 undertaking. This would allow the 2023 stocktake to inform the finalisation of the 2030 NDC, leading Parties, by 2025, to confirm/update their 2030 undertaking, and communicate an indicative 2035 undertaking. This follows the approach that Müller (2016), in another ecbi brief,¹⁴ proposed as his option 2 ('a single-track ambition mechanism') to resolve the current common timeframe problem.

3. PROPOSALS THAT PRESENT A CONTEXT FOR THE GLOBAL STOCKTAKE

The stocktake outcome must be seen in the context of the rich pre-Paris discussions regarding a mechanism that would facilitate the increase of overall ambition with a clear consensus that a review or assessment mechanism was needed in this context. It is instructive to review Parties' and Observers' contributions to this discussion to situate the ongoing conversation about the stocktake.

First, on substance-related proposals, one question relates to whether reviews would consider the contributions of individual countries, or progress on an aggregate level. Further, the role of differentiation and equity was discussed, as well as the scope (mitigation-only vs. broader). The African Group, for example, suggested that a principle-based Equity Reference Framework could be utilised to establish "*a range of relative contributions by each Party towards the global effort*"¹⁵ for mitigation, adaptation and MOI, based on equity-related metrics, against which the adequacy of countries' nationally determined efforts would be assessed. This proposal would implement differentiation in a dynamic way, based on measures of capacity, responsibility and the development needs of each Party. By necessity, such an assessment would be on the level of individual countries. Other Parties suggested that assessments should occur on aggregate level only.¹⁶

In Brazil's "concentric differentiation" proposal,¹⁷ self-determined, uni-directional graduation of Parties between a number of groups would increase their mitigation and MOI obligations, respectively. Brazil's

proposal also combined an aggregate-level assessment with inputs and outputs on the individual country level, while its proposal limited the scope to mitigation and MOI.

Among Observers, Climate Action Network (CAN) proposed a ‘Paris Ambition Mechanism’ with both substance- and process-related aspects which also featured an Equity Reference Framework and review of individual countries, but also highlighted the need for a “matchbox” mechanism in which additional conditional mitigation contributions of developing countries would be matched with the provision of required MOI by developed countries.¹⁸

Table 1: Proponents of different Assessment and Review criteria at the beginning of 2015¹⁹

Transparency etc.	Aggregate ambition	Individual ambition	Equity/ Equitable	Fair(ness)
EU	African Group	AILAC	African Group	African Group
Singapore	AILAC	EIG	AILAC	AILAC
	Brazil	EU	Brazil	EIG
	EU	Marshall Islands	EIG	EU
	Korea	New Zealand	EU	Korea
	Marshall Islands	Norway	Norway	Marshall Islands
	Norway	South Africa	South Africa	South Africa
	Switzerland			US
	US			

Source: van Asselt, Pauw, Sælen 2015, p. 55²⁰

Second, process-related proposals considered the timing of the reviews, how they would fit into the broader cycles of the UNFCCC and Intergovernmental Panel on Climate Change (IPCC), how they would feedback into the process of determining contributions or increasing ambition, and the temporal directionality of the review (‘forward-looking’ vs. ‘backward-looking’ components). For example, Brazil’s Dynamic Contribution Cycle^{21,22} would establish a five-year contribution cycle in each of which an ‘Aggregate Consideration Process’ would consider Parties’ progress toward a mitigation and MOI goal. This Consideration Process would be based both on ex-post elements, e.g. inventories, and ex-ante elements, e.g. next-cycle NDCs, while having the clear forward-looking objective of Parties “making adjustments” to next-cycle NDCs.

Similarly, South Africa’s submission included a review of the implementation of commitments²³ as well as an ex-ante assessment of the adequacy of intended future contributions.²⁴ The submission also specified the processes that could be triggered by the assessment, namely, referral to a compliance mechanism for the implementation review and recommendations by the Conference of Parties (COP) for enhancement of next-cycle contributions in the ex-ante assessment.

Beyond this, the discourse was not very specific about how the outputs of the assessment would be used by Parties or which next steps would be triggered. Finally, some Parties indicated that the assessment could take different shapes for different elements; for example, in the case of provision of finance and other support to developing countries, the South African submission included the additional step of verification in the assessment.

Despite the predominant focus on mitigation by most proposals, and on adaptation by some, very few elaborated the finance aspects in the cyclical processes. Among them, the ecbi discussion note on the Paris Replenishment Cycle focussed on the public sources of finance, which tend to be more predictable across all funds of the financial mechanism, and proposed to address programming scenarios for joint replenishment, agreement on a joint replenishment envelope under the aegis of the Standing Committee on Finance, and the

determination of replenishment contribution in a hybrid burden-sharing and bottom-up model.²⁵ Likewise, an ACT 2015 working paper also describes an ambition cycle for support.²⁶

Some of the crunch issues of discussion before and during the Paris conference have now been resolved – or at least, the number of plausible options has decreased. On the scope of the assessment, the stocktake is explicitly scoped to be comprehensive and include mitigation, adaptation and MOI. The timing is fixed to a five-year cycle and the role of science in providing benchmarks for the stocktake has been clearly established.²⁷ Parties have also agreed that there will be a backward-looking component (“*take stock of the implementation*”) while the outcome has a forward-looking purpose (“*inform Parties in updating and enhancing*”), which also suggests a forward-looking assessment component.

Further, while the stocktake text mandates an assessment of the “*collective effort*”, this does not necessarily rule out assessments of collective efforts of groups of countries (e.g. grouped by level of development, type of commitment etc.); or, indeed, assessment of contributions from individual countries. Since the stocktake is mandated to be conducted “*in the light of equity*” it may include assessments on whether contributions are equitable and fair, which, in turn, is impossible on a globally-aggregated level. “*In light of equity*” further suggests a direct role for equity and differentiation in the stocktake, but leaves open whether this merely applies to process-related aspects (e.g. different roles for LDCs and SIDS) or to the substance as well (e.g. assessment of the fairness of individual or group-aggregated contributions). Finally, neither the Agreement nor the decision text specifies the modalities, outputs, or inputs (except for a non-exhaustive list of inputs in decision 1/CP.21), or the specific ways in which the outputs are going to be used by Parties in their “*updating and enhancing*” of action and support.

4. OPERATIONALISING THE GLOBAL STOCKTAKE

In the following section we discuss some of the areas which will require further discussion, elaboration and, ultimately, decisions by Parties in order to operationalise the stocktake in the Paris Agreement. The discussion in this section is firmly grounded in our understanding of the pre-Paris conversation around the ambition mechanisms and around assessment and review, as well as the relevant textual provisions of the Paris Outcome. However, different interpretations are possible, and therefore we want to reiterate here that the following discussion represents our view of the possibilities, limits and options available for operationalising the stocktake.

4.1 Terminology

We define three main structural concepts in our discussion of the stocktake:

- ‘**pillars**’ describe the elements of the scope of the stocktake, e.g. mitigation, adaptation, finance, technology transfer, capacity building, L&D, cooperative approaches and so on;
- the five-year ‘**implementation periods**’ (IP) are the periods in which the activities communicated in a given undertaking are actually carried out. For example, the implementation period for an NDC with a 2025 end date would be the period from 2020 to 2025. It is important to note, though, that currently IPs are not necessarily aligned with the five-year NDC communication and stocktake cycle as established by Articles 4.9 and 14 – many current NDCs refer to implementation periods that are 10 years long. A treatment of this misalignment is beyond the scope of this paper²⁸ but should be addressed by Parties. In any case, the views expressed and issues raised here can be easily applied *mutatis mutandis* if stocktakes have to continue considering ten-year implementation periods alongside five-year ones.
- we identify four possible ‘**tracks**’ for the global stocktake that refer to these IPs. The first track is

concerned with the implementation period that has concluded prior to the date of the stocktake in question (IP-1); track 2 is concerned with the then-current implementation period (IP 0); track 3 with undertakings for the upcoming implementation period (IP+1) which, following the timeframe assumption made in Section 2.4, have already been communicated or indicated by the time of the stocktake; and track 4, with the undertakings for the implementation period after that (IP+2), for which undertakings likely have not been communicated yet.

BOX 2: Implementation Period (IP) and Review and Communication Period (RCP)

This paper and the ecbi's Ambition Mechanism brief (Müller 2016) complement each other in many ways. The Ambition Mechanism brief focuses on the mechanics of the "contribution cycle" (when and how undertakings are communicated), while this paper focusses on the global stocktake as the central component of the "review cycle" (when and how undertakings and actions are reviewed and assessed).

The Ambition Mechanism brief highlights Review and Communication Periods (RCPs) as the central structural concept of the Ambition Mechanism, while this paper instead features Implementation Periods as the more relevant concept for assessment and review. RCPs are fundamentally about what type of communication and review activities are to be undertaken in each five-year RCP period, and how their elements relate to each other.

For example, the '2025 RCP' (2021-2025) would feature data collection (e.g. synthesis reports) on undertakings for upcoming periods, the global stocktake itself, the national determination, national review, and communication of undertakings for future periods (e.g. NDCs for the periods up to 2030 and 2035), and multilateral processes to clarify those communications.

Implementation periods (IP), as used in this paper, however, refer specifically to the periods in which implementation of undertakings (past, present, and future) takes place. As such, the '2025 IP' would be the period in which the mitigation and adaptation action envisioned for the 2021-2025 period would be undertaken, the finance pledged for these years disbursed, and so on.

RCPs and IPs are related to each other insofar as we assume a five-year cyclicity for both, and RCPs detail when the undertakings for future IPs are communicated, or, since the RCP also contains the stocktake itself, assessed.

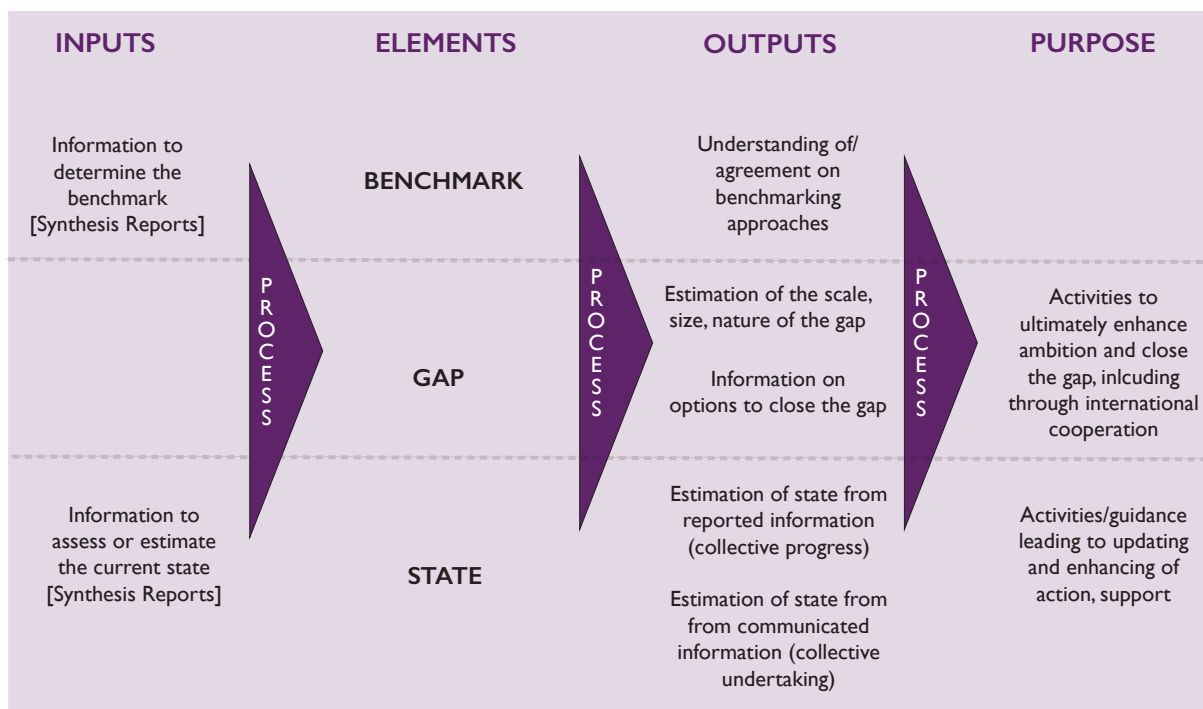
4.2 General structure of the stocktake

At the most basic level, it seems obvious that a stocktake has to consider three elements: a benchmark; the current state; and the gap between the two. Crucially, each of these three elements have different requirements for each of the four tracks defined above, and within each track for each of the pillars.

As such, in designing the stocktake, Parties will, for each of these cases, need to define inputs that allow setting the relevant benchmark as well as determining the relevant current state, a process which would consider these inputs in order to determine the gap, and relevant outputs that could contribute to understanding and, ultimately, closing the gap. Lastly, additional processes are needed to ensure that the outputs actually contribute to achieving the purpose of the stocktake, namely the updating and enhancing of action and support, as well as the enhancement of international cooperation, with a view of increasing ambition and closing the gaps (see Figure 1).

As mentioned, the structure of the stocktake requires four tracks, each of which relate to a different implementation period. The first track would review the collective progress already actually made, on the ground, towards achieving the purpose and long term goals of the agreement. Inputs for this track would therefore be the outputs of the transparency arrangements for the previous implementation period (IP-1) to identify 'the state' of the implementation. This would require the synthesising the individual information from individual Parties, noting that Biennial Reports (BRs) and Biennial Update Reports (BURs) do not cover comprehensive implementation information for non-mitigation elements such as adaptation. For identifying the 'benchmark' (i.e. information against which implementation will be assessed), inputs could consist of the undertakings made for the previous implementation period.

Figure I: The Basic Structure of the stocktake, with examples (non-exhaustive)



As such, for the first track in the 2023 stocktake (IP-1), the benchmark would be Cancun Pledges in the case of mitigation, and National Adaptation Plans of Action (NAPAs) and National Adaptation Plans (NAPs) in the case of adaptation. In 2028, it would be the NDCs for the 2021-2025 period for both adaptation and mitigation. Alternative benchmarks could be the level of mitigation, adaptation, finance etc. that should ideally have been implemented or provided during the previous period, regardless of the undertakings that were communicated. The outcome of this track would therefore be an understanding of the mitigation, adaptation and finance gaps at the end of the previous implementation period.

The second track addresses progress in implementing undertakings for the implementation period within which the stocktake is being undertaken (IP 0). This track would focus on progress toward implementation of the undertakings for the current implementation period and what additional measures could be put in place to reach or exceed them. Therefore, this track can only be light-touch and focus on sharing experiences made in implementing the current undertaking. In this track, prognosis on whether the policy impacts are likely to yield the envisioned result (e.g. the level of ambition communicated in NDCs) would form part of the considerations. The idea behind such a track is not to ‘re-open’ the pledges currently being implemented, but rather to encourage and identify opportunities for achieving/exceeding the undertaking, or alternatively, already identify likely implementation shortfalls, to inform the stocktake in subsequent tracks.

The third track of the stocktake focusses on the indicative undertakings for the upcoming five-year implementation period (IP+1). As such the inputs for this track would be the undertakings communicated for that implementation period: mitigation NDC (m-NDC), a-NDC, and the BCIS could form the source information for this forward-looking track. This is possible as the timing of the stocktake is such that Parties would have already communicated their undertakings for the upcoming implementation period. Another set of inputs would be benchmarking information – in this instance the temperature goal, both "well below 2°C" and 1.5°C – against which the progress implied by the communicated undertakings can be assessed for mitigation, adaptation and finance as envisaged in Article 2. The outcome of this exercise would be an understanding of the plausible gap in an upcoming period, despite the pledges already made for that period, which could inform Parties in enhancing their ambition or identify collective actions that could contribute to closing the gap.

Finally, the fourth track is concerned with the undertakings in the five-year implementation period following the one under consideration in the third track (IP+2). This track is substantially different from the first three in the sense that it is based on undertakings that are more indicative in nature, (e.g. in the case of mitigation it could be Low Emission Development Strategy envisaged in Article 4.19). It largely depends on how the common timeframes conundrum is resolved. However, global benchmarks for at least some elements (e.g. mitigation, adaptation) could likely be identified. Importantly, the undertakings for this IP can be understood as a target for the outcomes of the stocktake, where Parties would utilise these outcomes to inform their domestic processes for determining these undertakings. In this respect, Articles 4.19 and 7.9 provide a basis for the long-term low greenhouse gas emission and adaptation planning processes to provide indicative pathways.

4.3 Process-related aspects (what happens, how, for which implementation period)

Timelines

In unpacking the modalities of the stocktake, the first aspect that requires clarity and further elaboration is, what happens when? Figure 2 presents a generic timeline (using mitigation in the 2023 stocktake as an example) with inputs, processes and outputs, all with a varying level of granularity in the Paris Agreement. The Agreement entrenches five-year cycles for the communication of NDCs, as well as for carrying out the stocktake. As such the first stocktake will be in 2023, and the next NDCs will have been communicated by 2020.

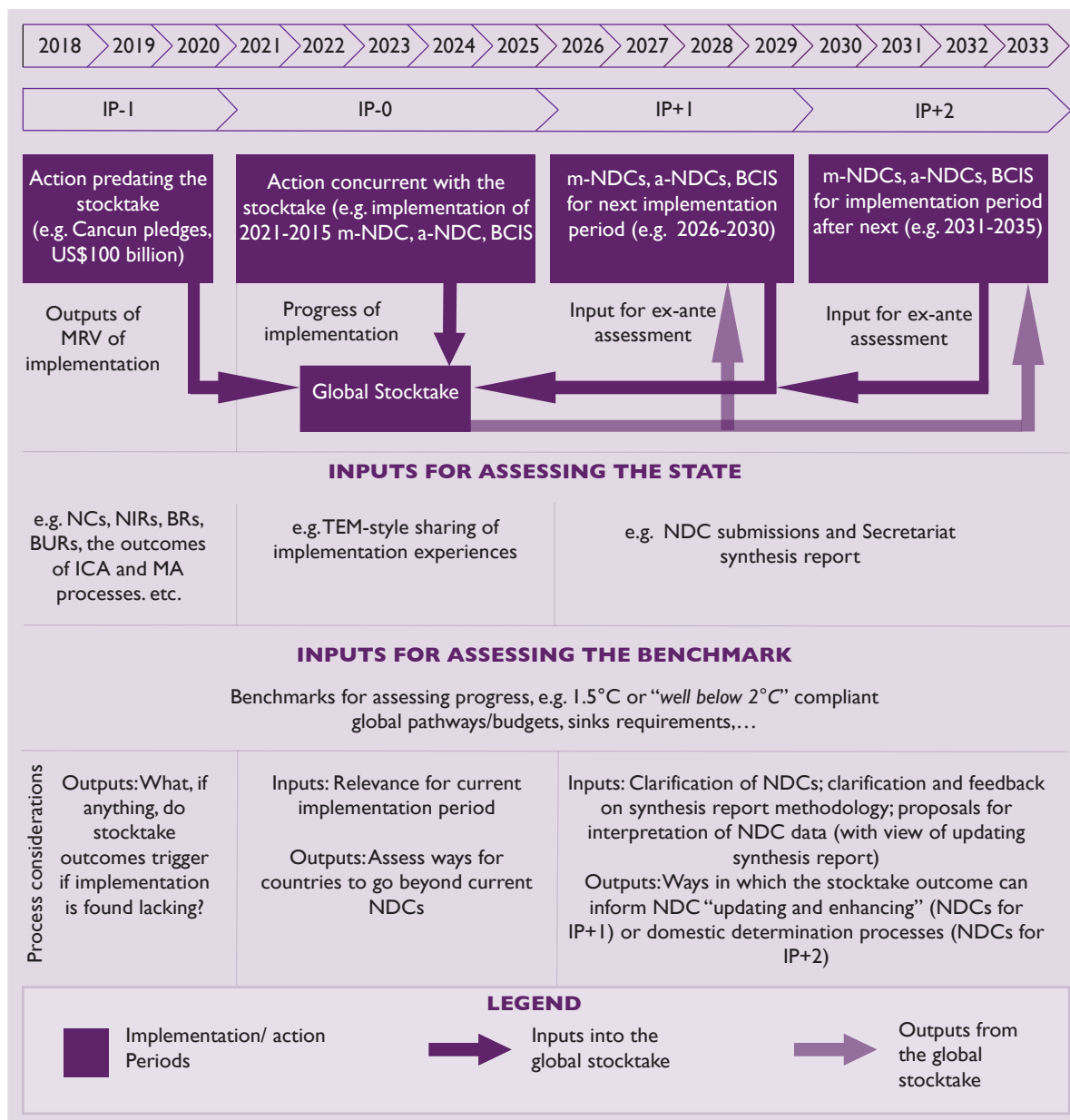
In our view, the processing of the inputs and publication of synthesis reports could therefore be pegged at two years after the communication of NDCs, with the first synthesis reports for all tracks released in 2022.²⁹ In the year of the stocktake, Parties and Observers can be invited to make submissions, online questions and answers on methodologies, approaches and assumptions used in the synthesis reports, with a view of holding in-session workshops and engagement with the Secretariat during the May/June Subsidiary Body (SB) sessions. This would afford sufficient time for an update of the synthesis reports for consideration during the stocktake at the appropriate session of the Conference of Parties serving as the meeting of the Parties to the Paris Agreement (CMA) session. The CMA would then provide some guidance on actions Parties should consider in updating their NDCs.

Inputs

In terms of what happens, under Track 1, which is backward-looking, the stocktake process would need to collect inputs, process them, and produce results/outcomes, which may include guidance on how Parties could use those outcomes and trigger follow-on processes. For mitigation, the backward-looking inputs would be from BRs, BURs, National Inventory Reports (NIRs), National Communications (NatComms), and/or Measurement Reporting Verification (MRV) processes envisaged in Articles 13.5, 13.6 and 13.7.

For adaptation, the inputs would include NatComms, BURs, BRs, NAPs, and MRV processes envisaged in Article 13.5, 13.6 and 13.8. For finance, the backward-looking inputs would be from BRs, BURs and processes envisaged in Articles 13.6, 13.7 and 13.9 covering support provided and received, including the Biennial Assessments of the Standing Committee on Finance (SCF). The benchmark inputs will be the pledges from the previous implementation period, which in the case of the 2023 stocktake will be the Cancun pledges, Nationally Appropriate Mitigation Actions, and the US\$ 100 billion commitment.

Figure 2: Example of inputs, processes and outputs related to mitigation in the 2023 Stocktake³⁰



For the light-touch Track 2, the inputs could be in the form of reports from the Technical Expert Meetings (TEM) and the Technical Examination Process for Adaptation (TEP-A) as well as selected presentations by Parties on the implementation of good practices and lessons learnt, as well as barriers faced during the current implementation period.

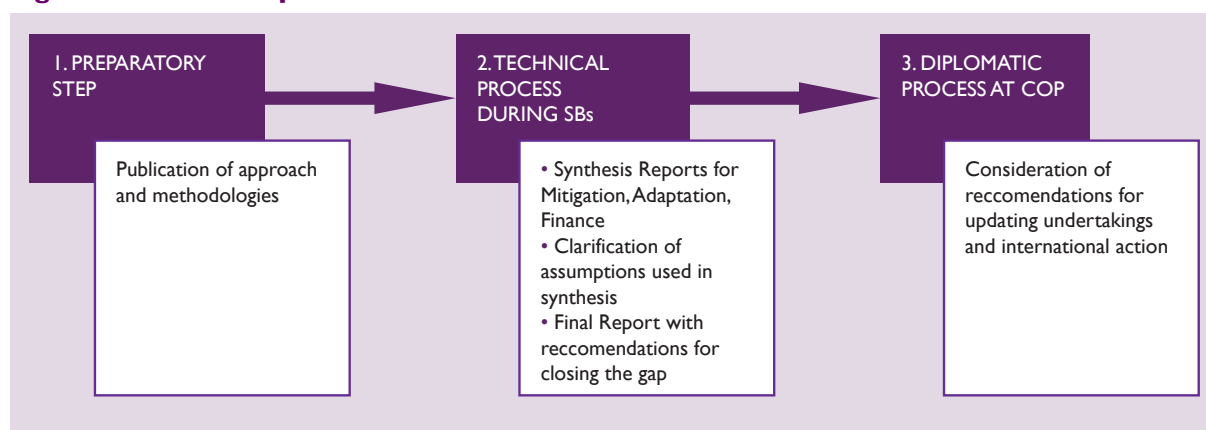
On Track 3, m-NDCs, a-NDCs and the BCIS provide a basis for the forward-looking component. The benchmarking information would primarily come from the IPCC Assessment Reports, with the sixth Report due in 2020/21, as well as its Special Reports such as the 2018 Special Report on 1.5°C, including reports generated by other bodies of climate finance, such as the World Bank, OECD, and various think tanks and organisations. The SCF could play a role in synthesising these different sources, including the requirements presented by Parties in their communications and reports to the UNFCCC. These benchmarks could also apply to Track 4.

The other source of inputs for Track 4 would be indicative longer term targets communicated by Parties in their NDCs and BCIS should Parties opt for such a representation, as well as the long-term plans for low carbon development and adaptation.

Process

The processing of inputs could follow a technical process as proposed above, which starts with the compilation of synthesis reports by the Secretariat under the guidance of a Technical Panel, constituted of Party and Observer representatives. Synthesis methodologies, approach and presentation of outcomes would have to be published by the Secretariat for comment and enhancement. The synthesis reports would separately present the backward-looking performance, good practices and experiences in implementation, and forward-looking picture, clearly showing the gap in terms of emissions, adaptation and finance in relation the required action consistent with 1.5°C and "well below 2°C", and performance against pledges for the former. The synthesis would therefore comprise of a process of aggregating inputs, followed by the assessment of the level of performance against the benchmark performance, as such presenting the gaps in relation to the goals in Article 2.

Figure 3. Stocktake process



The 2015 synthesis report by the Secretariat (and its 2016 update)³¹ exposed some gaps, particularly in the aggregation process for the mitigation component of INDCs and more so for the adaptation component. It is from that premise that the process of undertaking the stocktake should include a step where there is an opportunity for Parties and Observers to engage with the assumptions made in the aggregation with a view of clarifying, interpreting, and where appropriate, correcting and improving of assumptions made in the analysis, especially of the forward-looking aspects as it does not have the verification benefit of implementation information. This can be facilitated through prior online submission of questions and answers to/by Parties and Observers, including suggestions of how to interpret certain data building from the Multilateral Assessment experience.

The in-session workshops at the May/June SB sessions would be open to participation of, and inputs from, Observers and would give further guidance to the Secretariat in making adjustments to assumptions and methodologies, to update the synthesis reports prior to the CMA stocktake discussions. In the stocktaking discussions, the co-chairs of the Technical Panel for the Global Stocktake can present recommendations to the CMA for adoption in a 'diplomatic process', outlining options how Parties could use the outcomes from the stocktake to enhance their ambition, as well as the role of Technical Examination Processes for mitigation and adaptation in stimulating cooperative actions, and the activities that Mechanisms serving the Agreement can undertake to facilitate such increased action and support. As we will discuss later, the results of the technical process should not be aggregated to the global level only, but provide group-based aggregation to be relevant

in informing further action on mitigation, adaptation, and finance. The role of the diplomatic process would therefore be to consider Technical Panel recommendations, and propose a decision/s to the CMA for adoption.

Outcomes

The process above describes how to achieve the first objective of the stocktake, which is to assess progress towards the purpose of the agreement as well as its goals. As such the outcomes are an expression of the gaps, as well as options for increasing ambition. However, for the second aspect, on how such outcomes can inform the updating and enhancing of NDCs for the upcoming two implementation periods, the question remains on how a meaningful connection can be made between the expression of a *collective* gap and actions by *individual* Parties. Again, it is our view that an important part of the answer lies in conducting the stocktake in a manner that assesses the collective progress of groups of countries, rather than at the globally-aggregated level, which we will discuss in more details below.

Clarity of inputs and outputs

The success of the stocktake largely hinges on clear, transparent, understandable information being provided, both in terms of counting and accounting practices for backward-looking information, and minimum information for mitigation, adaptation and finance undertakings contained in NDCs or BCIS. For adaptation, minimum information on the aspects of the a-NDC need to be agreed by Parties, including vulnerability and priorities (risks for sectors and the economy), plans and actions (planning objectives and adaptation options and programmes), implementation and support needs (required investment for implementing the programmes), recognition of adaptation efforts (investments made on adaptation), and indicative adaptation support provided by developed countries (per sector, region, and channel of delivery).

The same applies for the definition of minimum information with respect to the indicative support in the biennial communications by developed countries. In order to leverage existing templates, decision 9/CP.21 presents methodologies for the reporting of public financial information by Parties included in Annex I to the Convention in a tabular format, which provides a sound starting point.

With respect to forward-looking information on mitigation, the minimum information should build from paragraph 14 of 1/CP.20, the discussions under this topic since Lima as well as the experiences with the INDCs, with further guidance particularly with regards to accounting rules used in the determination of an undertaking. However, this requires further definitions in light of the different formulations of presenting an undertaking, such as economy-wide absolute emission reduction targets, deviation from BAU, emissions intensity, sectoral targets, or policies in order to ensure that the information can be understood and aggregated. In this context, it could be useful to review the specific experiences with the quantification of the m-INDCs, for example while preparing the Secretariat's 2015 and 2016 synthesis reports, to identify types of information that were systematically missing but that would have benefitted from a more accurate estimation.

The clarity of information is a major activity that Parties need to undertake in preparing for entry into force of the Paris Agreement with respect to the stocktake. Further technical work is required in order to develop the equity indicators that Parties can self-apply in updating and enhancing their NDCs as well as elaborating why they consider it to be fair and ambitious. Such an indicator framework would also have to address and recognise the contributions developing countries make to the global effort through their investments in adaptation.

Other considerations

Parties established a Review in paragraph 138 of 1/CP.16, with the objective of assessing the adequacy of the temperature goal with a view of strengthening it, as well as assess the overall progress towards achieving

the ultimate objective of the UNFCCC. Due to the overlap in the mandates and objectives, it is pragmatic to consider the Review forming part of the stocktake, whilst avoiding duplication.

Article 7.3 of the Paris Agreement mandates the CMA to develop modalities for the recognition of adaptation efforts, with such recognition undertaken as part of the stocktake. The concept of ‘recognition of adaptation efforts by developing countries’ can be understood in the context of the goals, particularly on adaptation and finance. As such, in the equity assessment, adaptation efforts of developing countries should form part of understanding ambition in developing countries. In operationalising the stocktake, significant effort is required on defining the type of information that will be generated by that process and how it will interface with science and equity aspects, as well as how it will inform the update/enhancement of contributions.

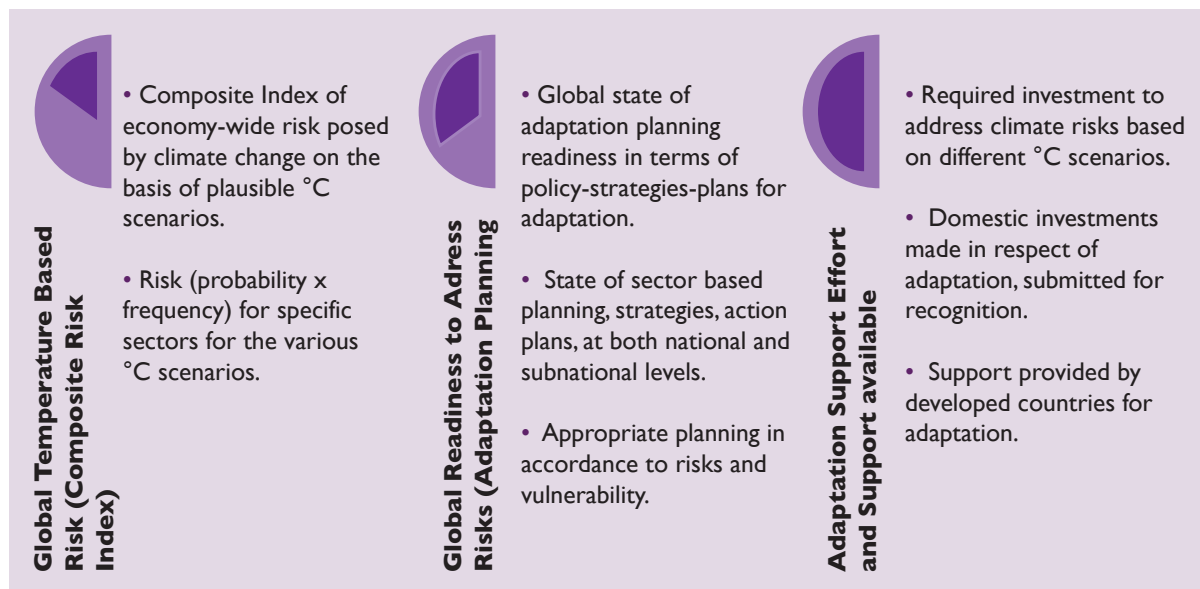
4.4 Substance-related aspects of operationalization of the stocktake

In addition to, and overlapping with, the process-related aspects discussed above, a number of substance-related issues will have to be resolved in the context of operationalizing the stocktake. As we have mentioned before, many of the aspects of the stocktake have to be differentiated across mitigation, adaptation and finance, as well as across the four tracks introduced above.

As we highlighted above, two of the three basic elements (and functions) of the stocktake refer to the establishment of benchmarks and the state. In our view, for the stocktake to function it is clear from the explicit link of the stocktake text to Article 2 that each of the three components of Article 2 (mitigation, adaptation, finance) will require a benchmark against which to assess the state. For mitigation, the basis for benchmarking is well established with a large community of climate scientists producing emissions trajectories and budgets, with their work regularly synthesised in the Assessment Reports of the IPCC. Nonetheless, the complexity of the methodological choices and assumptions made in this work, suggests that perhaps a technical process of the stocktake is required to turn the inputs from climate science into useful benchmarks for the stocktake. We suggest above that this could be part of the technical process undertaken in conjunction with SB sessions, including through prior submission of questions and suggestions online.

For adaptation, benchmarks for the global goal in relation to temperature are less developed. More research and building on existing experience is needed to support such benchmarking and operationalising the adaptation aspects of the stocktake. Parties may wish to explore ways in which such research could be stimulated to generate, by 2023, more outputs that could be useful in benchmarking. Risk-based metrics such as the percentage of population vulnerable to floods, droughts, etc.; percentage of the economy vulnerable, percentage loss from a sector, etc.; percentage vulnerable to disease, etc. provide a starting point through which progress towards reducing vulnerability can be assessed. The IPCC and Parties could be a potential source for such metrics, based on methodologies developed by the IPCC. Other agencies might also be relevant, and further work on global risk, global readiness and required investments, based on different temperature scenarios as shown in *Figure 4* could also contribute to this effort.

Figure 4. A framework for metrics to track implementation of the global goal on adaptation



Source: Ngwadla, El-Bakri. 2016, forthcoming³²

For finance, the availability of input information for establishing the benchmark is quite scant, as such more work is needed, including on identifying the most plausible sources of information. Some aspects are covered by recent IPCC Assessment Reports, and other periodic or one-off publications such as the Stern Report or outputs of World Bank, OECD or McKinsey offer additional insights. However, a periodic and focussed synthesis of this information by the SCF, building on their Biennial Assessments, would prove invaluable. A complexity for finance benchmarking is that its level will depend on estimates of mitigation and adaptation finance needs (for example as communicated by countries), which, in turn, are a function of the current state of progress on mitigation and adaptation action (and, consequently the size and nature of the adaptation and mitigation gap).

The second basic element of the stocktake is the assessment of the state of collective progress. Here, substance-related questions largely relate to the treatment of individual inputs and the nature of the aggregation process. Most of the inputs (see above) that are relevant and available for assessing the state across all tracks and across mitigation, adaptation and finance, are available in their raw form as Party-level data (e.g. individual NDCs, individual Parties' provision of finance). Hence, in the interest of transparency and clarity, the processes of the stocktake must be clear and open about the methodologies and approaches used to derive estimates of the collective progress from that data.

For example, in the case of the 2015 and 2016 synthesis reports on the INDCs by the UNFCCC Secretariat,³³ in addition to the aggregate level assessment, methodological and data supplements could have been provided that elaborated the assumptions underlying the report's interpretation of the INDCs as well as the resulting emissions estimate data on individual country level.

Other substance-related questions should be asked, as has been hinted above, with respect to what Parties could do to initiate or intensify relevant research programmes to strengthen the knowledge base in the case of some benchmark-type inputs where substantial knowledge gaps currently exist, with the objective of substantially improving the situation in time for the first stocktake in 2023.

Finally, there are a number of questions that cut across the temporal tracks of the stocktake, or go across the pillars of mitigation, adaptation and finance. For example, there are relationships between mitigation and adaptation (less mitigation requires more adaptation, and without an increase in adaptation action, low mitigation ambition widens not only the mitigation gap but also the adaptation gap); or between finance and mitigation (if mitigation finance is not provided at the required level, it appears likely that the level of mitigation action will be lower – hence a wider finance gap also possibly triggers a wider mitigation gap); and especially with the “*in the light of equity*” stipulation in mind, this raises the question of hierarchy of pillars (for instance, if both mitigation and finance gaps are identified, will addressing the finance gap have a higher priority (thus narrowing the mitigation gap), or vice versa?).

4.5 Equity and tiers of assessment

Given that the stocktake is mandated to be “*in the light of equity*”, the question arises on what sort of inputs, processes, and outputs should the stocktake consider, undertake, and produce to fulfil that mandate? Likewise, how will the stocktake reconcile this equity mandate with the stipulation that it is to consider ‘collective’ progress?

For the second question, and as we hinted above, we believe the answer lies in establishing multiple tiers of collective assessment. For the overall assessment against a global benchmark, a globally aggregated assessment is sensible. However, globally-aggregated inputs do not allow for consideration of equity – a lower level of aggregation is needed for that. While, in our view, the stocktake text does not preclude individual country assessment, the pre-Paris discussions made clear that, collectively, Parties are not interested in a stocktake that assesses them individually.

A compromise between individual (for which there is no appetite) and globally-aggregated review (which contradicts the “*in the light of equity*” language) would be an assessment at the level of group aggregates. The specific definition and membership of such groups would remain open for discussion and could plausibly be different for different stocktake tracks and pillars,³⁴ but the overriding design principle should be that there is a certain degree of relevant homogeneity within the group and that the outcomes of the group-based assessment can be usefully employed by Parties in their unilateral application of the outcomes of the multilateral process.

Groups could, for example, be set along the differentiation used elsewhere in the Paris Agreement, i.e. developing countries, developed countries, LDCs and SIDS. Group-based assessments could also be undertaken by type of contribution (e.g. countries with absolute economy-wide targets, those with intensity targets, those with peak-plateau-decline goals, etc.), which would make comparison with other countries within the same group more straightforward, but might present issues for group-level benchmark-setting.

Grouping could also occur, and perhaps this is most pertinent in the context of assessments “*in light of equity*”, based on comparable levels of development – for example as defined by self-application of applicable quantitative indicators.³⁵ Group-based aggregation would then allow a determination of the gaps between the benchmarks and the current state on a group-by-group basis, which would enable the stocktake to take equity into account, as mandated, and would allow for the outputs of the stocktake to provide more meaningful insights to Parties – for example, when they unilaterally utilise the outcomes of the multilateral stocktake in their domestic processes of determining future undertakings.

As for the question, “what sort of inputs, processes and outputs” to implement “*in the light of equity*” – a part of the answer could be to make process-related equity components one subject of the stocktake. For example, the stocktake could consider how Parties implemented, in their INDCs/NDCs, the invitation of the Lima

call to specify “*how the Party considers that its [...] contribution is fair and ambitious*”.³⁶ The outcome of such an examination could then be further guidance from the CMA on how Parties could improve their current and future NDCs in that regard, for example by providing a range of options on how Parties could implement this, perhaps via self-selection of suites of indicators from a list (as suggested by the EU),³⁷ or along the lines of an Equity Reference Framework.³⁸

The stocktake could also develop guidance or suggestions on how Parties could take equity into account when interpreting the applicability of the group-based outcomes of the stocktake in their domestic updating and enhancing of actions and support, including how to assess any gaps in their own undertakings by themselves. A precedence for such self-applied guidance has been set, for example, by paragraph 2b of 1/CP.19 which provided guidance on the preparation of INDCs by identifying the importance of national consultations. Such equity metrics guidance need not be prescriptive, but rather a suite that Parties can choose from, even though their application and reporting on in subsequent NDCs could be prescribed.

It is also our view that consideration of equity can perhaps more usefully, flexibly, and comprehensively be explored in stocktake-like activities and studies outside of the formal multilateral process – for example within academia or larger civil society. The formal stocktake could encourage and draw upon such informal activities by making avenues available for lessons-learned and results to inform the formal stocktake.

Finally, the stocktake could consider equity concerns more holistically, by making equity itself a topic across all pillars and assessing how Parties may have been addressing equity concerns in implementing their past undertakings or proposing to implement future ones. For example, the impacts on distributional impacts of mitigation measures across socioeconomic, or regional, strata of countries, including auxiliary measures to address any associated injustices, could be in focus. Similarly, the risk reduction impacts of adaptation actions might unequally apply to different socio-economic groups, for example indigenous and traditional peoples, refugees, women, or children, and an equity-focussed stocktake on adaptation could foreground such issues.

5. CONCLUSIONS

The questions of ambition review as well as science and equity have always been fraught with highly emotive, complex and difficult negotiations, despite the creative proposals that have been presented over the years. In the pre-Paris deliberations, a number of concepts were tabled, both by Parties (e.g. African Group and Brazil) as well as civil society, notably CAN. Despite being a contentious issue, the Paris negotiations of the stocktake remained cordial, perhaps because Parties were acutely aware of the need to build an ambition mechanism into the agreement, were clear of each other’s pressure points, and the Agreement provided various ‘hooks’ for the elements of the stocktake.

In assessing the opportunities and challenges posed by the operationalization of the stocktake, this paper identifies some basic elements of a successful stocktake:

- a benchmarking exercise (linked to the Article 2 goals and representing the required effort);
- an assessment of the current and anticipated state (informed by planned and implemented undertakings, or efforts, by Parties); and
- an assessment of the gap between the two, with a view of informing future efforts by Parties.

The paper also identifies four tracks along which such basic elements need to be considered:

- backward-looking implemented actions;

- ongoing implementation of current undertakings;
- undertakings for the upcoming implementation period; and
- indicative undertakings for the second implementation period after the current.

Each track has unique needs and opportunities in terms of inputs, outcomes, processes and purpose, and within each track, the stocktake will take different shape (again, in terms of inputs, outcomes, purpose and processes) for each of the pillars under assessment.

Considering the comprehensive scope of the stocktake, the paper identifies the need for clarity, consistency, and ability to aggregate information in mitigation, adaptation as well as finance as crucial to an effective stocktake. The paper also highlights some of the challenges, options and further work required on the character of m-NDCs, a-NDCs and BCIS, as well as benchmark information from organisations such as the IPCC that interpret the goals.

The paper discusses remaining unresolved questions, and proposes options. One such question concerns the level of granularity of the assessment, i.e. at individual or some aggregated level. The Paris Agreement excludes no options, but identifies aspects that are collective (progress against the purpose and goals of the agreement), whilst also having a clear individual component with the enhancement and updating of actions and support, as well as by referencing equity. The paper posits a solution through multilaterally developing guidance to categories of Parties that Parties would then self-apply.

Another set of key questions relate to timing: cyclicity, length of implementation period, timing of the stocktake relative to communication of undertakings by Parties, and the relationship of the outcomes of the stocktake with what is inscribed by the Party. The Paris Agreement prescribes five-year cycles for communication of NDCs and for the stocktake, whilst providing for negotiations of common implementation timeframes. We think the stocktake is best served by five-year implementation periods, and that the obligatory long term-plans for mitigation and adaptation provide an opportunity for the stocktake and Parties to take a longer view beyond enhancing their undertakings for the upcoming implementation period.

Finally, on modalities of the stocktake, the paper proposes a technical expert process followed by a diplomatic process. The former is concerned with the processing and synthesis of the inputs, providing opportunities for comments and questions to Parties and Observers on assumptions and methodologies used. The latter would focus on developing recommendations of how Parties can enhance ambition individually and collectively, captured in a CMA decision that would guide countries in their national processes.

Endnotes and References

1. For example, mitigation goals in Art 2.1.a and Art 4.1, adaptation goals in Art 2.1.b and Art 7.1, and finance goal in Art 2.1.c and Art 9. Furthermore, the stipulation of Article 14 for the global stocktake to be “*comprehensive*” suggests that capacity building (Article 11), technology transfer (Article 10), but also loss and damage (Article 8), education (Article 12) etc. are within the scope of the stocktake. However, in this paper, we limit our considerations to the three elements explicitly mentioned in Article 2.1, namely mitigation, adaptation and finance.

2. “Assessment and review (A&R) processes [...] embody the ‘top-down’ part in a hybrid ‘bottom-up’/‘top-down’ model of international climate policy [...] and are essential to ensure that internationally agreed objectives and principles do not fall through the cracks in a system of nationally determined offers”, van Asselt, H., Pauw, P. & Sælen, H. (2015). *Assessment and Review Under a 2015 Climate Change Agreement*. Nordic Council of Ministers, p. 20. 23 March. <http://norden.diva-portal.org/smash/get/diva2:797336/FULLTEXT01.pdf>.

3. UNFCCC (2016). *Report of the Conference of the Parties on Its Twenty-First Session, Held in Paris from 30 November to 13 December 2015. Part Two: Action Taken by the Conference of the Parties at Its Twenty-First Session*. United Nations Office,

- Geneva. <http://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf>, Decision 1/CP.21, paragraph 17.
4. UNFCCC (2015). *Paris Agreement*. United Nations Office, Geneva. http://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf, Article 14.1.
5. *Ibid.*, Articles 4.9, 7.14, 9.6, 10.6, and 13.5 and 13.6.
6. *Ibid.*, Article 14.1.
7. For example, see van Asselt, Pauw & Sælen, *Assessment and Review Under a 2015 Climate Change Agreement*; van Asselt, H., Sælen, H. & Pauw, P. (2014). *From Lima to Paris, and Beyond: Options for Ex Ante Assessment of Intended Nationally Determined Contributions Under the UNFCCC*. Nordic Council of Ministers, Copenhagen. <http://norden.diva-portal.org/smash/get/diva2:767276/FULLTEXT02.pdf> <http://dx.doi.org/10.6027/NA2014-928>.
8. This typology results in four classes: 1. Explicit linkage with stocktake and provisions for forward-looking undertakings, 2. Explicit linkage with stocktake but no provisions for forward-looking undertakings, 3. No explicit linkage but provisions for undertakings, 4. No explicit linkage and no provisions for undertakings.
9. *Ibid.* Articles 2, 7.1 and 7.14 (c) and (d).
10. We use the terms “a-NDC” and “m-NDC” to refer to the adaptation and mitigation components of an NDC, respectively, in contexts where such distinction is relevant. Otherwise, we use the overarching “NDC”, which includes and m-NDC and might include an a-NDC.
11. UNFCCC (2016). *Paris Agreement*. Article 13.6.
12. *Ibid.* Article 4.10.
13. Müller, B. & Ngwadla, X. (2016). *The Paris Ambition Mechanism: Review and Contribution Cycles*. Options Note. European Capacity Building Initiative, Oxford.
14. Müller, B. (2016). *A Dynamic Ambition Mechanism for the Paris Agreement*. Discussion Note. Oxford Climate Policy; European Capacity Building Initiative, Oxford. March. http://www.eurocapacity.org/downloads/Dynamic_Ambition_Mechanism_for_Paris.pdf.
15. African Group (2013). *Submission by Swaziland on Behalf of the African Group Under Workstream I of the ADP*. Government of Swaziland, p. 3. 8 October. https://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp_african_group_workstream_1_20131008.pdf.
16. c.f. van Asselt, Pauw & Sælen, *Assessment and Review Under a 2015 Climate Change Agreement*, 55, for a detailed overview.
17. Brazil (2014). *Views of Brazil on the Elements of the New Agreement Under the Convention Applicable to All Parties*. Government of Brazil, Brasília. 6 November. http://www4.unfccc.int/submissions/Lists/OSPSubmissionUpload/73_99_130602104651393682-BRAZIL%20ADP%20Elements.pdf.
18. CAN (2015). *The Paris Package: A Springboard for Sustained, Transformative Change*. Climate Action Network Annual Policy Document 2015. CAN International, Beirut. November. https://unfccc.int/files/documentation/submissions_from_non-party_stakeholders/application/pdf/548.pdf.
19. It is important to note that this table represents the status of deliberations in early 2015, shortly after the COP 20 in Lima, as such, the landscape has changed somewhat with some parties shifting their positions and some elements now decided (hence, agreed to by all Parties), for example that the global stocktake is to be conducted “*in the light of equity*”.
20. van Asselt, Pauw & Sælen, *Assessment and Review Under a 2015 Climate Change Agreement*.
21. Brazil, *Views of Brazil on the Elements of the New Agreement Under the Convention Applicable to All Parties*.
22. Similar views are also expressed in: Müller, B., Ngwadla, X. & Miguez, J. D. G. (2014). *A Dynamic Contribution Cycle: Sequencing Contributions in the 2015 Paris Agreement*. Concept Note. European Capacity Building Initiative. October. http://www.eurocapacity.org/downloads/Dynamic_Contribution_Cycle_Concept_Note.pdf.
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Climate Policy; European Capacity Building Initiative, Oxford. November. http://www.oxfordclimatepolicy.org/publications/documents/Paris_Replenishment_Cycle_Procedures3.pdf.

26. Oberthür, S., La Viña, A. G. M. & Morgan, J. (2015). *Getting Specific on the 2015 Climate Change Agreement: Suggestions for the Legal Text with an Explanatory Memorandum*. ACT 2015. May. http://www.wri.org/sites/default/files/uploads/ACT2015_LegalSuggestions.pdf.

27. See Article 4.1 of the Paris Agreement, and paragraphs 100.b and 101 of decision 1/CP.21 with respect to the role of science in the stocktake.

28. For discussions on the implications of this misalignment as well as proposals to address it, see Müller & Ngwadla, *The Paris Ambition Mechanism: Review and Contribution Cycles*. Options Note; Müller, *From Contribution Framework to Ambition Mechanism: How to Enhance Mitigation Ambition Under the Paris Agreement*; Müller, *A Dynamic Ambition Mechanism for the Paris Agreement*. Discussion Note.

29. In the preceding year, the Secretariat should publish the approach, methodology and presentation of outcomes of the stocktake, with a view of Parties and Observers making how inputs in that regard.

30. m-NDC is the mitigation component of an NDC; a-NDC is the adaptation component of NDC; BCIS is the Biennial Communication of Indicative Support; GST is the Global Stocktake.

31. UNFCCC (2015). *Synthesis Report on the Aggregate Effect of the Intended Nationally Determined Contributions*. UNFCCC, Bonn. 30 October. <http://unfccc.int/resource/docs/2015/cop21/eng/07.pdf>. UNFCCC (2016). *Aggregate Effect of the Intended Nationally Determined Contributions: An Update. Synthesis Report by the Secretariat*. UNFCCC, Bonn. 2 May. <http://unfccc.int/resource/docs/2016/cop22/eng/02.pdf>.

32. Ngwadla, X. & El-Bakri, S. (2016). *Operationalisation of the Global Goal for Adaptation Under the Paris Agreement*. Climate Development Knowledge Network (CDKN), Cape Town. Forthcoming.

33. UNFCCC, *Synthesis Report on the Aggregate Effect of the Intended Nationally Determined Contributions; UNFCCC, Aggregate Effect of the Intended Nationally Determined Contributions: An Update. Synthesis Report by the Secretariat*.

34. For example, if the 2023 stocktake on finance were to assess the finance contributions of the pre-2020 period (track 1), it would be appropriate to group those countries that are finance contributors according to the Copenhagen and Cancun agreements, while a track 3 (undertakings for the next implementation period) assessment would include additional contributors. Likewise, if grouping in mitigation assessments were to be done by type of commitment, those groupings would likely be different across the tracks (with countries moving to different types of commitments, e.g. economy-wide, absolute targets, over time) and it would likely be different from the groupings used for, say, the finance assessments for the same track.

35. In the EU's submission to the Ad-hoc Group on the Durban Platform, the use of quantitative indicators to justify fairness and ambition of contributions was suggested. Importantly, Parties would themselves select which indicators to utilise in such a justification. In the same way, Parties could select their own indicators to justify that they belong to a certain grouping for the purpose of group-based aggregation in the global stocktake. See: European Commission (2013). *Submission by Lithuania and the European Commission on Behalf of the European Union and Its Member States: Further Elaboration of Elements of a Step Wise Process for Ambitious Mitigation Commitments in the 2015 Agreement*. European Commission. 16 September. http://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp_eu_workstream_1_mitigation_20130916.pdf.

36. UNFCCC (2015). *Report of the Conference of the Parties on Its Twentieth Session, Held in Lima from 1 to 14 December 2014. Addendum. Part Two: Action Taken by the Conference of the Parties at Its Twentieth Session*. United Nations Office, Geneva. 2 February. <http://unfccc.int/resource/docs/2014/cop20/eng/10a01.pdf>, Decision 1/CP.20, paragraph 14.

37. European Commission, *Submission by Lithuania and the European Commission on Behalf of the European Union and Its Member States: Further Elaboration of Elements of a Step Wise Process for Ambitious Mitigation Commitments in the 2015 Agreement*.

38. African Group, *Submission by Swaziland on Behalf of the African Group Under Workstream I of the ADP*; Ngwadla, X. & Rajamani, L. (2014). *Operationalising an Equity Reference Framework (ERF) in the Climate Change Regime: Legal and Technical Perspectives*. MAPS: Mitigation Action Plans & Scenarios, Cape Town. 30 June. http://www.mapsprogramme.org/wp-content/uploads/Paper_Operationalising-ERF.pdf.