

Summary report on the SBSTA–IPCC special event on advice on how the assessments of the IPCC can inform the global stocktake

Bonn, Germany, 18 May 2016

Note by the Chair of the SBSTA

18 August 2016

I. Introduction

A. Background

1. The Conference of the Parties (COP) requested the Subsidiary Body for Scientific and Technological Advice (SBSTA) to provide advice on how the assessments of the Intergovernmental Panel on Climate Change (IPCC) can inform the global stocktake of the implementation of the Paris Agreement and to report on this matter to the Ad Hoc Working Group on the Paris Agreement (APA) at its second session.¹ Consideration of this matter was initiated at SBSTA 44 in May 2016.

2. The COP also requested that the APA identify the sources of input for the global stocktake, to develop its modalities and to report to the COP with a view to the COP making a recommendation to the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) for consideration and adoption at its first session.² The latest reports of the IPCC have been identified as a source of input for the global stocktake.³ The work of the APA was initiated at APA 1 in May 2016.

B. General objective and approach for the meeting

3. The special event was organized by the Chair of the SBSTA with the objective of holding an open exchange of views between Parties and IPCC representatives on how the IPCC assessments can inform the global stocktake, in relation to the mandate mentioned in paragraph 1 above, without any prejudice towards the final result of discussions at SBSTA 44 on this matter.

4. It also aimed to generate a better understanding of the information needs of the global stocktake that are relevant for the IPCC. These information needs could then be addressed by the IPCC as it plans for new approaches and deliverables in its sixth assessment cycle. In addition to helping the SBSTA formulate the above-mentioned advice to the APA, the event also aimed to share information about forthcoming IPCC products, synchronize timeframes and inform the upcoming IPCC scoping meetings.

5. An information note was prepared by the SBSTA Chair to set the scene for the special event and frame questions to stimulate consideration of “what” will be provided, and “when”, by the IPCC in its sixth assessment cycle, beyond what was already provided in the fifth assessment cycle, as well as “how” this input could inform the global stocktake.⁴

II. Summary of the proceedings

6. The special event was held on 18 May 2016 (15:00–18:00 p.m.) at the World Conference Center Bonn, Germany and was chaired jointly by the SBSTA and IPCC chairs.⁵

7. The event started with presentations by the Vice-Chairs of the IPCC and the Co-Chairs of the three IPCC working groups and of the Task Force on National Greenhouse Gas Inventories (TFI). This was followed by a presentation by the United Nations Framework Convention on Climate Change (UNFCCC)

¹ Decision 1/CP.21, paragraph 100.

² Decision 1/CP.21, paragraphs 99 and 101.

³ Decision 1/CP.21, paragraphs 99(b).

⁴ Available at: <http://unfccc.int/files/adaptation/application/pdf/sbsta_chair_information_note_sbsta_ipcc_special_event_may_2016_rev.pdf>.

⁵ <<http://unfccc.int/9535.php>>.

secretariat. Thereafter, a general discussion was held. The general discussion was framed around four guiding questions which had been made available in advance:

- (a) What are the information needs of the global stocktake that the IPCC can address, beyond the Fifth Assessment Report (AR5)?
- (b) How can the IPCC products to be published during the sixth assessment cycle be tailored to better support the global stocktake?
- (c) How will the IPCC input and other input to the global stocktake be coordinated to ensure complementarity?
- (d) What modalities can we use to consider the IPCC input into the global stocktake? What experiences under the Convention can offer lessons in terms of modalities for considering the IPCC's input?

8. Mr. Carlos Fuller, the SBSTA Chair, welcomed all of the participants, and thanked Mr. Hoesung Lee, the IPCC Chair, for co-hosting the event. He reminded the participants that the SBSTA was launching work on the agenda item entitled “Advice on how the assessments of the IPCC can inform the global stocktake referred to in Article 14 of the Paris Agreement” and that it would report on this matter to the APA at its second session.⁶

9. Mr. Fuller added that, in parallel and also in response to a COP mandate, the APA will identify the sources of input for the global stocktake to develop its modalities. The latest reports of the IPCC were already identified as a source of input for the global stocktake at COP 21 in Paris. The advice that the SBSTA will provide to the APA about the IPCC input could further the APA's level of understanding about this particular input, for consideration under the global stocktake.

10. Mr. Fuller welcomed the IPCC's decision, in response to an invitation by the COP, to produce a special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related greenhouse gas (GHG) emissions pathways, to be prepared in the context of strengthening the global response to the threat of climate change, sustainable development and efforts to eradicate poverty. He noted that the discussions under the SBSTA, and in the special event, would take place at a time when the IPCC is scoping the sixth assessment cycle. As a result, the scoping may also be informed by the needs of the Convention and the Paris Agreement.

11. In closing, Mr. Fuller introduced the participants to the agenda and encouraged all, in the general discussion, to engage in an open dialogue with the IPCC. He encouraged Parties to make interventions during this session and to share their ideas on what modalities can be used to consider the IPCC input into the global stocktake. He also stressed that, although the global stocktake is broad and may eventually include numerous forms of input, the event should only focus on the IPCC input to the stocktake.

12. In his opening remarks, Mr. Hoesung Lee thanked the SBSTA Chair, IPCC Vice-Chairs and Co-Chairs, and the UNFCCC and IPCC Secretariats for contributing to the organization of the event. He noted that it would further enhance the close cooperation between the IPCC and UNFCCC which has been in place since the adoption of the Convention. He highlighted one particular output of that cooperation, the structured expert dialogue (SED) of the 2013–2015 review, which played a critical role in communicating scientific findings to climate negotiators, and helped to ensure that the Paris Agreement is based on science.

13. Mr. Lee mentioned some salient decisions that were taken by the IPCC at its 43rd Session. Amongst these are decisions to: complete the sixth assessment cycle in time for the first global stocktake in 2023 with the finalization of the Synthesis Report in 2022; prepare a proposal to align the work of the IPCC during the seventh assessment cycle with the needs of the global stocktake; update the current methodology report with a view to assisting Parties in reporting their GHG emissions and removals; accept the invitation by COP 21 to produce a special report on the impacts of global warming of 1.5°C above pre-industrial levels and the related emission pathways (this special report should be delivered by 2018 in time for the facilitative dialogue at COP 24); produce two other special reports; and to pay special attention in the sixth assessment cycle to the topic of climate change and cities, which presents particular challenges and opportunities for both adaptation and mitigation.

14. Mr. Lee concluded his remarks by expressing his expectation that the deliberations during the event would help the IPCC in planning the suite of reports to be prepared during the sixth assessment cycle, which should be a source of input into the global stocktake as decided at COP 21. He assured the participants that the IPCC is prepared to play a meaningful role in helping the Convention by providing comprehensive, robust, science-based information on where the global community *should be* in meeting the challenge of

⁶ Decision 1/CP.21, paragraph 100.

climate change, and comparing the latter with where the global community *could be* if all conditions are satisfied.

III. Summary of the discussion

A. Presentations by experts on possible IPCC inputs into the global stocktake – the sixth assessment cycle and beyond (the “what” and “when”)

1. The sixth assessment cycle of the IPCC: goals, approaches, products and timeframes

15. Ms. Thelma Krug and Mr. Youba Sokona, Vice Chairs of the IPCC, opened the session with a joint presentation on the sixth assessment cycle of the IPCC: goals, approaches, products and timeframes.

16. They noted the **opportune timing of the special event**, since the IPCC is in its early stages in terms of the development of the sixth assessment report (AR6), and since the event was taking place soon after the adoption of the Paris Agreement. They added that some of the provisions of the agreement will benefit from a timely discussion between the Parties and the IPCC, such as the enhanced transparency framework for action and the global stocktake.

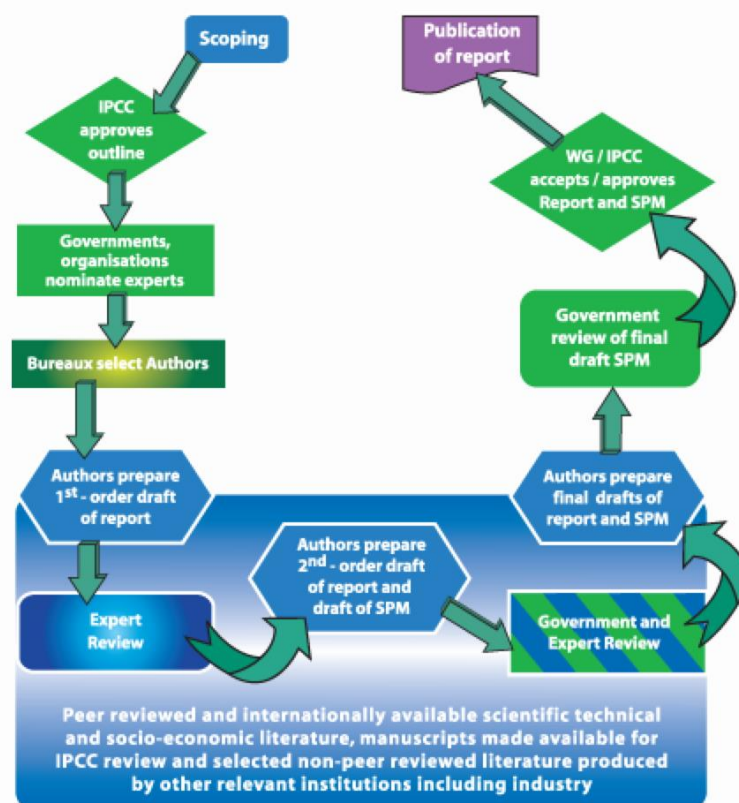
17. They discussed the **relevant mandates of the SBSTA and APA**, and emphasized that, in accordance with Article 14 of the Paris Agreement, the CMA shall undertake the global stocktake in the light of “the best available science.”⁷ They noted that the IPCC has taken into consideration, in its planning, that the first global stocktake will take place in 2023, and every 5 years thereafter, and that **the assessment cycles of the IPCC will be aligned with the cycles of the global stocktake**, with the goal of feeding effectively into the process. They also noted the **facilitative dialogue that will take place in 2018**. Noting that the special event was not part of the negotiations, they assured the Parties that IPCC representatives would listen very carefully to their views and will consider them in the preparations of the sixth assessment cycle products.

18. The presentation of Ms. Krug and Mr. Sokona elaborated the **process taken by the IPCC in the writing and review of IPCC reports**. They are undertaken in accordance with the “Procedures for the preparation, review, acceptance, adoption, approval and publication of IPCC Reports”⁸ as illustrated by figure 1 below. They explained the role of the scoping meeting and the review process, and invited Parties to make their views known at these meetings.

⁷ Article 14.1 of the Paris Agreement, available at: < http://unfccc.int/meetings/paris_nov_2015/items/9445.php>.

⁸ Contained in Appendix A of the Principles Governing IPCC Work, available at: <http://www.ipcc.ch/organization/organization_procedures.shtml>.

Figure 1
 The writing and review process for IPCC reports



Source: IPCC (<https://www.ipcc.ch/organization/organization_procedures.shtml>). The figure illustrates the three tiers review process, including, respectively: expert review; government and experts review; and government review of the final draft of the Summary for Policymakers. Note that the process for the Synthesis Report is slightly different. Each step in the review process takes an allocated amount of time and, for this reason, the timelines for producing a report are clearly defined.

19. Ms. Krug and Mr. Sokona complemented the information supplied earlier in the event by Mr. Lee about upcoming products, by providing further detail and timelines. They informed participants about the following products:⁹

- (a) In response to an invitation by the COP, a **special report on “the impacts of global warming of 1.5 °C above pre-industrial levels and related global GHG emission pathways”**.¹⁰ The outline of the special report will be considered at the 44th Session of the IPCC in October 2016. The final draft will be considered by the Panel for approval at its Plenary session in September 2018;
- (b) A **special report on climate change, desertification, land degradation, sustainable land management, food security and GHG fluxes in terrestrial ecosystems**. The scoping process for this special report may consider challenges and opportunities for both adaptation and mitigation. The outline will be considered at the 45th Session of the IPCC in the first half of 2017;
- (c) A **special report on climate change and oceans and the cryosphere, which** will be considered as early as possible during the sixth assessment cycle;
- (d) A **methodology report(s)** (refinement of the 2006 IPCC Guidelines). The outline will be considered at the 44th Session of the IPCC in October 2016, and the draft report(s) will be approved at the Panel Session of the IPCC in May 2019; and
- (e) The **AR6**, which consists of reports from the three IPCC working groups (WGs) (physical science, adaptation and mitigation) and a synthesis report. The AR6 outline will be considered at the Panel Session in October 2017. The synthesis report will be considered as early as possible in 2022;

20. They informed the participants that the IPCC received **31 proposals** for special reports. All of the topics included in the proposals would be under consideration in the AR6. Special reports normally take

⁹ IPCC 43, held in Nairobi from 10–14 April 2016. Decision IPCC/XLIII-6.

¹⁰ Decision 1/CP.21, paragraph 21.

about two and a half years to complete, and feed into the assessment reports, but include more specific details.

21. Ms. Krug and Mr. Sokona informed participants that the seventh assessment cycle will include a **special report on climate change and cities**, and that the IPCC is considering working with academia, urban practitioners, and relevant scientific bodies and agencies to organize an international scientific conference on climate change and cities early in the sixth assessment cycle. This would be undertaken in order to stimulate scientific reports and peer-reviewed publications on this subject. The IPCC will also consider modalities for addressing and enhancing the treatment of regional aspects in the scoping process for AR6.

22. Ms. Krug and Mr. Sokona assured the Parties that the IPCC plans to publish the AR6 **as early as possible in 2022, to allow time for it to be considered by the global stocktake**, which will conclude in 2023. While the decision on undertaking the seventh assessment cycle is still to be made by the IPCC after the completion of the sixth assessment cycle, they informed Parties that the IPCC understands that the needs of the global stocktake go beyond 2023 and that the IPCC is considering how to align its products with the second global stocktake and beyond.

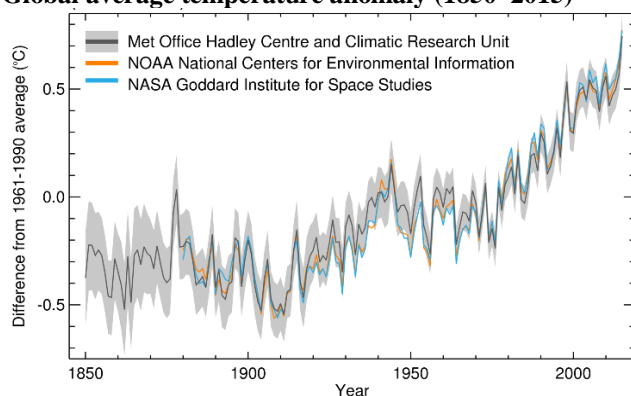
2. The Physical science basis and the global stocktake

23. Ms. Valérie Masson-Delmotte and Mr. Panmao Zhai, Co-Chairs of WGI, provided a joint presentation. Ms. Masson-Delmotte discussed the possible contributions of WGI to the global stocktake. She noted that the contributions were pending the formal scoping process, and would be based on the decisions of the authors, as well as the information available. She divided her presentation into three themes: the **current state** of the climate system (referred to as the “dashboard”); the **human influence** on the climate system (referred to as the “diagnosis”) and **pathways and climate projections** (referred to as the “prognosis”). She not only presented information from the AR5, but also recent updates from the peer-reviewed literature to illustrate new scientific information already available for the sixth assessment cycle.

24. When describing the current state of the climate system, she explained how the **long-term global goal is measured in global mean surface-temperature** (figure 2 below), however this is only a small-element of the increase in the energy content of the climate system, which should be **complemented by monitoring of ocean-heat content**, since it represents more than 90 per cent of the additional energy in the climate system.

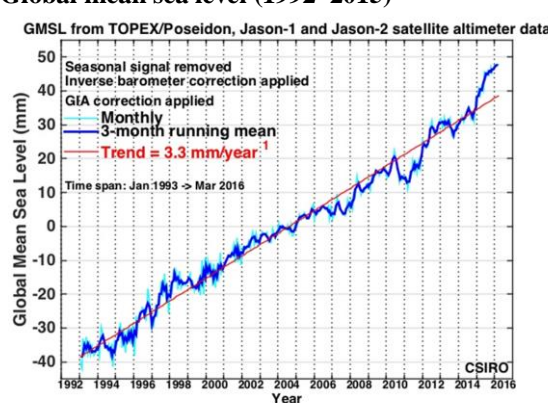
25. **Global mean sea-level**, she explained, is also an integrated indicator of the state of the climate system, and of the state of the cryosphere in particular (figure 3 below). **Arctic sea-ice content** is another relevant indicator of the climate system when looking at regional impacts, adaptation and vulnerability. She mentioned that the flow-rate of the ice-sheets has implications for the state of the climate system, and that these implications would be felt in the coming decades due to the slow-response time of the system.

Figure 2
Global average temperature anomaly (1850–2015)



Source: World Meteorological Organization (<http://public.wmo.int/en/media/press-release/2015-hottest-year-record>). The figure illustrates the significant increase of global average temperature in 2015 (an El Niño year).

Figure 3
Global mean sea level (1992–2015)



Source: The Commonwealth Scientific and Industrial Research Organisation.

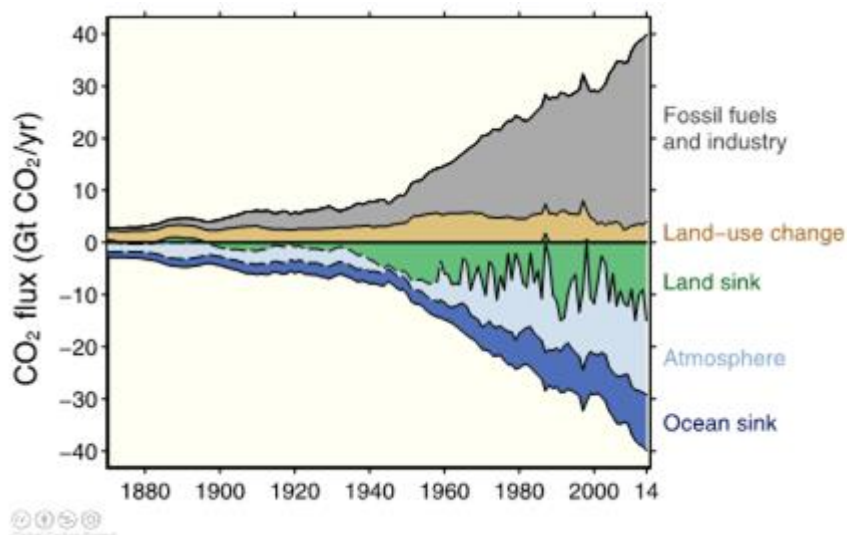
26. Ms. Masson-Delmotte asked about the information needs of the global stocktake with regard to the **reference period** (e.g. pre-industrial and the lack of data); the **water cycle** (e.g. for slow-onset events like desertification); and **impacts, vulnerability and adaptation** (e.g. mass loss from glaciers and ice sheets, regional climate and extreme events). She stressed the importance of **monitoring large-scale ocean dynamics** (a change in the Atlantic Meridional Overturning Circulation may decouple the local and regional impacts from global mean surface temperature) and **modes of variability** (El Niño and its influence on the year-to-year surface temperature variability).

27. She described the content of GHGs in the atmosphere, noting **the rise in CO₂, methane and other well mixed global GHGs**. She stressed that the rise in CO₂ in the ocean, leading to an increase in acidity, has a significant impact on marine ecosystems.

28. The **global carbon cycle**, illustrated by figure 4 below, indicates anthropogenic emissions and the natural sinks that absorb them. Ms. Masson-Delmotte noted the relevance of the global carbon cycle for the **long-term mitigation goal of reaching an equilibrium between anthropogenic emissions and natural sinks**, whereby emissions are expected to be in-line with natural sinks. She asked whether the global stocktake will need information on regional land-surface aspects.

Figure 4

Annual anthropogenic CO₂ emission and their partitioning among atmosphere, land and ocean from 1750 to 2014

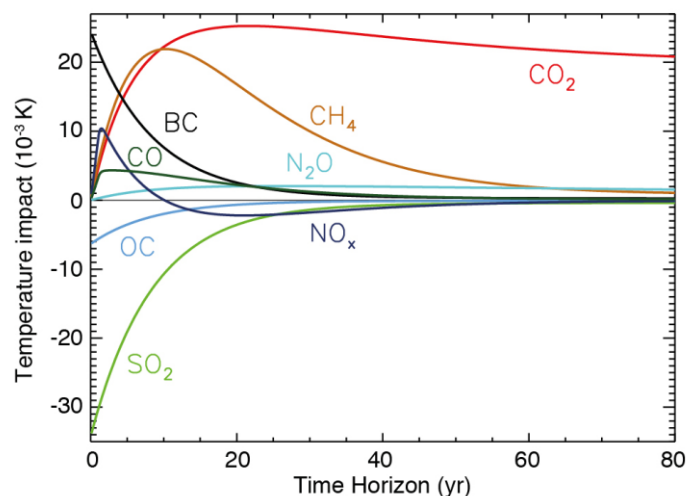


Source: Global Carbon Project. CDIAC/NOAA-ESRL/GCP/Joos et al. 2013/Khatriwala et al. 2013 (<http://folk.uio.no/roberan/img/GCP2015/PNG/s14_Global_Sources_and_Sinks.png>).

29. She went on to discuss **pathways and climate projections**, as well as predictions that can provide information over a five-year period, relevant to the global stocktake. In terms of “diagnosis”, she explained that the human influence on the climate system is best measured through **radiative forcing** (the impact on radiative fluxes), and by taking into account the **different drivers of climate change** including the short-lived compounds (not only cumulative compounds like CO₂). **The time response** of the climate system differs for each compound, as illustrated by figure 5 below. She added that it is important to take into account the albedo effect of land-use change, particularly in terms of regional impacts (e.g. afforestation will enhance the sinks but at the same time will affect the albedo effect of land-use change) and **asked if the global stocktake will include the attribution of observed changes** (e.g. temperature and sea-level rise) to anthropogenic drivers (e.g., GHG emissions, aerosols, land-use).

Figure 5

Temperature response by component for total anthropogenic emissions for a 1-year pulse



Source: Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, chapter 8, figure 8.33. Emission data for 2008 are taken from the EDGAR database and for back carbon (BC) and organic carbon (OC) for 2005 from Shindell et al. (2012a). There are large uncertainties related to the absolute global temperature change potential (AGTP) values and consequentially also to the calculated temperature responses.

30. With regard to the “prognosis” and the relevant elements for the global stocktake, Ms. Masson-Delmotte again noted the need for assessing emissions and radiative impacts of each driver (not only CO₂) and stressed that there are new developments with regard to research on **climate sensitivity**, which are important for assessing the global climate response to a given pathway; and with regard to **ocean and land carbon sinks**, including natural systems and managed land surfaces, which is important as studies **show a potential reversal in the fluxes in the long-term for low carbon emissions scenarios**.

31. In relation to the **carbon budget**, new research is being undertaken on a “**threshold-avoidance budget**”. The latter budget refers to a 66 per cent chance of staying below 2 °C, with a corresponding carbon budget accounting for the other GHGs (besides CO₂), and corresponds to 15-30 years of emissions at 2015 levels from fossil fuels and industry.

32. Ms. Masson-Delmotte discussed how the research community, which will present **eight shared socio-economic pathways (SSPs) for the CMIP6 (Coupled Model Intercomparison Project) of the WCRP (World Climate Research Programme)**, goes beyond the AR5 that was based on four representative concentration pathways (RCPs). Figure 6 below illustrates the two sets of pathways. The SSPs will be a new framework to facilitate the integrated analysis of future climate change impacts, vulnerability, adaptation and mitigation. SSP2 will represent a very low-emissions pathway, and SSP4 will represent an overshoot effect, which may be very relevant given the current emissions trends. Results from all CMIP6 simulations will be available after 2018 for assessment.

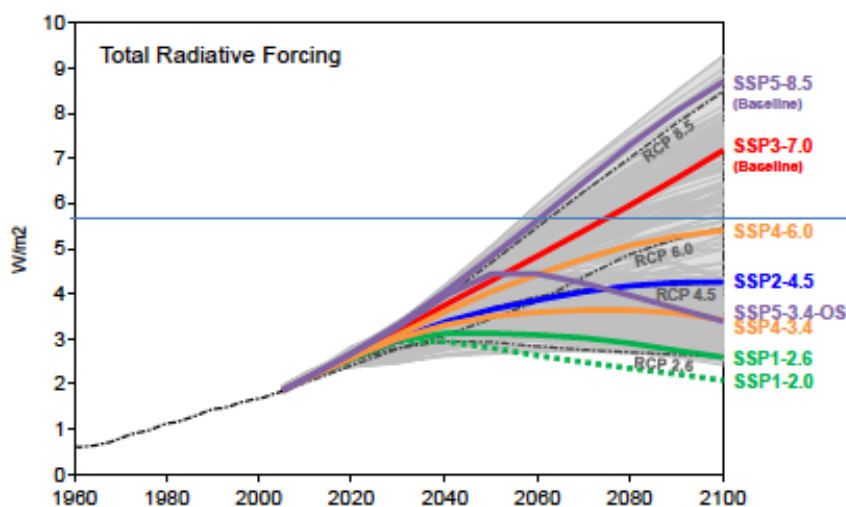
33. She mentioned the need for **coordination** between the IPCC and the Global Climate Observing System, WCRP, Future Earth, the Global Carbon Project, the UNFCCC, United Nations Environment Programme, and climate statistics for Sustainable Development Goal (SDG) number 13.

34. She informed participants that the three special reports planned to be published in the sixth assessment cycle are **pending scoping by the IPCC and new peer-reviewed information**. The special report on 1.5 °C, mentioned in paragraphs 13 and 19(a) above, will likely include an **update of the “dashboard”, new analyses of existing CMIP5 simulations, as well as new simulations**, including HappiMIP (“Half a degree Additional warming, Projections, Prognosis and Impacts” Model Intercomparison Project).¹¹ The other two special reports, mentioned in paragraphs 13 and 19(b and c), may contain information related to carbon fluxes.

¹¹ <<http://www.happimip.org/about/>>.

Figure 6

The Shared Socioeconomic Pathways in the Coupled Model Intercomparison Project 6



Source: Preliminary ScenarioMIP SSP for the Coupled Model Intercomparison Project 6, O’Neil et al, GMD Discussion 2016, from Riahi, K., van Vuuren, D.P., Kriegler, E., Edmonds, J., O’Neill, B.C., et al.: The Shared Socioeconomic Pathways: An Overview, Global Environmental Change (submitted), 2016, available at: <<http://www.geosci-model-dev-discuss.net/gmd-2016-84/>>. This figure illustrates the eight new Shared Socioeconomic Pathways (labelled on the right of the graph) and also shows the four Representative Concentration Pathways that were presented in the Fifth Assessment Report (labelled inside the graph) in terms of total radiative forcing.

35. The main assessment report of WGI (which will be published at the end of 2020 or beginning of 2021) will include an **update of the dashboard as well as the diagnosis, new CMIP6 simulations and the new scenarios, and an emphasis on regional aspects**. Based on IPCC strategic planning,¹² the WGI report will be adopted in April 2021 and will therefore be available for consideration by the global stocktake after this approval.

3. Impacts, adaptation and vulnerability: possible new elements in support of the global stocktake

36. Mr. Hans-Otto Pörtner, Co-Chair of WGII, started the presentation by explaining the **climate risk concept** of WG II, as developed and presented in the AR5: risk resulting from the overlapping of climate hazards, exposure and vulnerability, leading to impacts that provide feedback to socioeconomic processes and the climate system. The IPCC assessed the potential for reducing the risks of both adaptation and mitigation. In relation to the **risks associated with 1.5 °C**, he illustrated how there are still open questions for AR6, as those particular risks were not fully covered and compared in the fifth assessment cycle. He added that the climate risks of the near-term (2030–2040) identified in AR5 have been used as a proxy for a 1.5 °C risk-level but it is unclear how these risks compare to a long-term (2080–2100) 1.5 °C increase in temperature.

37. The AR5 explained that a 1.5 °C warming presented a higher level of risk than the current warming in most areas, and a lower level of risk than in a 2 °C warming scenario, particularly in terms of the distribution of impacts. He linked the aggregated climate risks from this diagramme to the objective of avoiding dangerous anthropogenic interference with the climate system, allowing ecosystems to adapt naturally, ensuring that food production is not threatened and enabling sustainable economic development (as per Article 2 of the UNFCCC). Furthermore, Mr. Pörtner pointed out that in the **SED, towards the end of the AR5 cycle, some discussions were held on comparing 1.5 °C and 2 °C, and associated risks and avoided impacts**.¹³

38. He went on to describe figure 7 below, taken from a new study that will be assessed in the sixth assessment cycle, which found **significant differences between impacts under 1.5 °C and 2 °C scenarios at the global and regional levels**, mostly determined on an RCP 8.5 trajectory.¹⁴ It found that “the

¹² <<http://www.ipcc.ch/activities/activities.shtml>>.

¹³ Report on the structured expert dialogue on the 2013–2015 review. Note by the co-facilitators of the structured expert dialogue. See paragraphs 106-115 (<<http://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf>>).

¹⁴ Rising radiative forcing pathway leading to 8.5 W/m² in 2100.

additional 0.5 °C increase in global mean temperature marks the difference between events at the upper limit of present-day natural variability and a new climate regime, particularly in tropical regions”.

39. Mr. Pörtner also emphasized the importance of looking at climate risk by taking into account the **combined impacts of climate drivers**. One example he gave was related to the impacts of ocean warming and acidification. He pointed out that if ocean acidification is taken into account alone, the risk appears less than if it is combined with another driver, that of warming. In a 1.5 °C warmer world, the risk-level increases when analyzing impacts caused by combined drivers, but still remains in the “moderate” category. In a 2 °C warmer world, the combined drivers lead to a significantly higher risk level than if the drivers were considered alone. He added that these risk transitions between the 1.5 °C and 2 °C scenarios are relevant for the global stocktake.

Figure 7

Summary of key differences in climate impacts between a warming of 1.5 °C and 2 °C above pre-industrial and stylized 1.5 °C and 2 °C scenarios over the 21st century. Square brackets give the likely (66%) range

		1.5°C	2°C	
Heat wave (warm spell) duration [month]				
Global		1.1 [1;1.3]	1.6 [1.4;1.8]	Tropical regions up to 2 months at 1.5°C or up to 3 months at 2°C
Reduction in annual water availability [%]				
Mediterranean		9 [5;16]	17 [8;28]	Other dry subtropical regions like Central America and South Africa also at risk
Increase in heavy precipitation intensity [%]				
Global		5 [4;6]	7 [5;7]	Global increase in intensity due to warming; high latitudes (>45°N) and monsoon regions affected most.
South Asia		7 [4;8]	10 [7;14]	
Global sea-level rise				
in 2100 [cm]		40 [30;55]	50 [35;65]	1.5°C end-of-century rate about 30% lower than for 2°C reducing long-term SLR commitment.
2081-2100 rate [mm/yr]		4 [3;5.5]	5.5 [4;8]	
Fraction of coral reef cells at risk of long-term degradation [Constant case, %]				
2050		90 [50;99]	98 [86;100]	Only limiting warming to 1.5°C may leave window open for some ecosystem adaptation.
2100		70 [14;98]	99 [85;100]	
Changes in local crop yields over global and tropical present day agricultural areas including the effects of CO₂-fertilization [%]				
Wheat	Global	2 [-6;17]	0 [-8;21]	Projected yield reductions are largest for tropical regions, while high-latitude regions may see an increase. Projections not including highly uncertain positive effects of CO ₂ -fertilization project reductions for all crop types of about 10% globally already at 1.5°C and further reductions at 2°C.
	Tropics	-9 [-25;12]	-16 [-42;14]	
Maize	Global	-1 [-26;8]	-6 [-38;2]	
	Tropics	-3 [-16;2]	-6 [-19;2]	
Soy	Global	7 [-3;28]	1 [-12;34]	
	Tropics	6 [-3;23]	7 [-5;27]	
Rice	Global	7 [-17;24]	7 [-14;27]	
	Tropics	6 [0;20]	6 [0;24]	

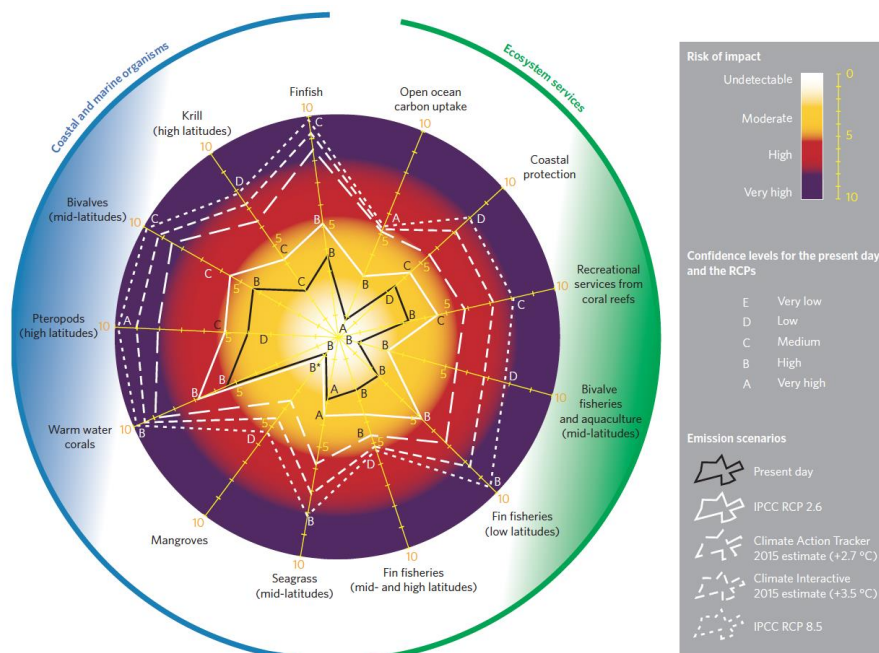
Source: Carl-Friedrich Schleussner et al, Earth System Dynamics (2016), (<<http://www.earth-syst-dynam.net/7/327/2016/esd-7-327-2016-corrigendum.pdf>>).

40. Mr. Pörtner also highlighted a new study focussed **on ocean risks**, which will be assessed in the sixth assessment cycle, illustrated in figure 8 below. The figure demonstrates that the present day risk-level (represented by black lines in the centre) for the oceans is mostly moderate (except for mangroves, open ocean carbon uptake, and bivalve fisheries and aquaculture, for which the risk level is undetectable) and that although the risk level does increase, the oceans remain in this moderate category with 1.5 °C of warming for the most part (except for warm water coral reefs, which will be at a high-level of risk). The figure also demonstrates that the two estimated pathways presented in the current Intended Nationally Determined Contributions (INDCs) would lead to high and very high levels of risk for almost all of the ocean organisms and services, and this should motivate higher ambition in climate mitigation.

41. In terms of **adaptation to climate change**, he noted that although the potential for adaptation is limited in terms of protecting natural systems, adaptation can still be effective. Adaptation actions being

undertaken include defending oyster cultures against the in-flow of acidified water, enhancing the resilience of coral reefs and fish stocks through the creation of marine protected areas, and restoring mangrove forests.

Figure 8
Linking ocean risks to Intended Nationally Determined Contributions and the global stocktake, to be assessed in the sixth assessment cycle



Source: Magnan et al. 2016. Nature Climate Change. This figure looks at different warming scenarios, including the estimated projected global surface temperature warming of the current Intended Nationally Determined Contributions, estimated at 2.7 °C and 3.5 °C by different organizations (Climate Action Tracker and Climate Interactive, respectively), and assesses the risk to the oceans in terms of ocean organisms/biota (e.g. bivalves, warm water corals, mangroves etc.) in blue and ecosystem services (coastal protection, open ocean carbon uptake, fisheries etc.) in green.

42. Ms. Debra Roberts, Co-Chair of WGII, noted there is a strong call in the Paris Agreement for non-Party stakeholders to scale-up their mitigation and adaptation efforts. **Cities**, she added, **are often “ahead of the curve”** and many have already started acting through the Compact of Mayors.¹⁵

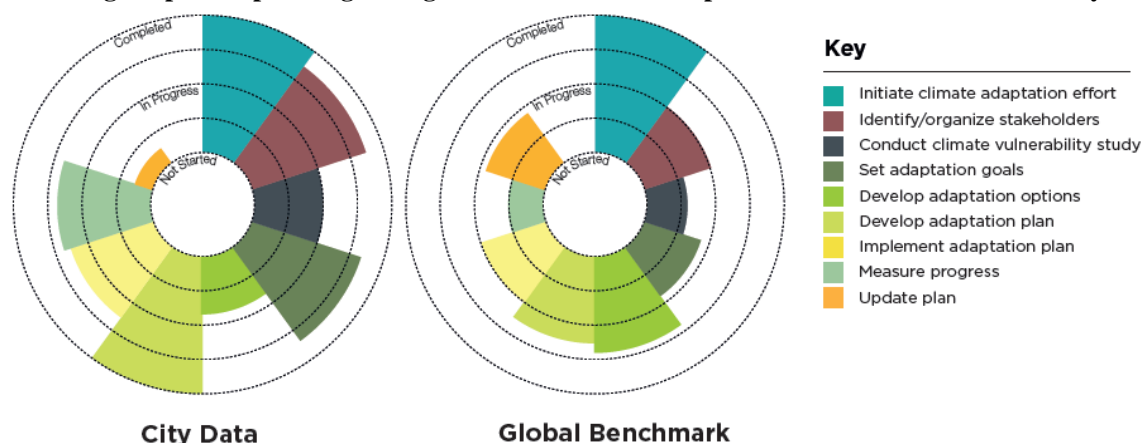
43. She went on to explain efforts by the Compact of Mayors to **quantify the scope and limits to adaptation in cities**. She referred to the **Climate Risk Adaptation Framework and Taxonomy (CRAFT)** which aims to establish a standard for measuring and reporting climate risk and vulnerability in cities, and establish a common framework for adaptation planning structured in three parts: identifying the profile of the city; understanding the problems (vulnerability, hazards, exposure and impacts); and planning, responding and monitoring.

44. The CRAFT also facilitates data collection and analysis allowing for the benchmarking of adaptation planning by comparing city data with global benchmarks (see figure 9 below), and by identifying cities with shared climate risks (see figure 10 below).

¹⁵ More information on the Compact of Mayors is available here: < <http://www.compactofmayors.org/history/>>.

Figure 9

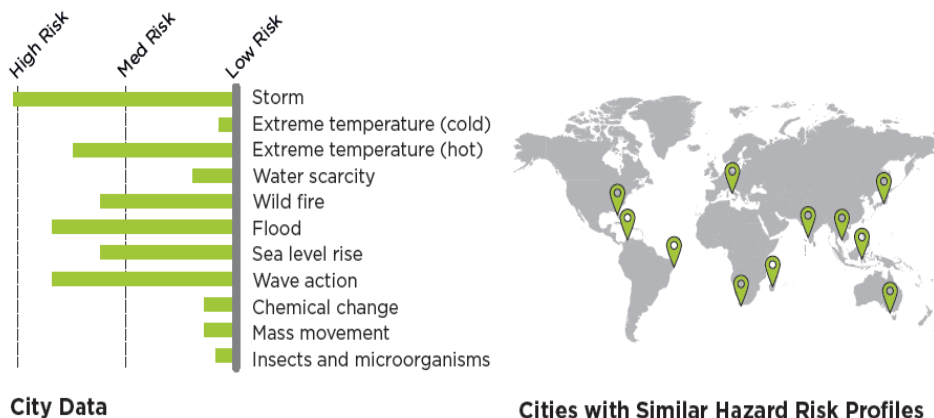
Benchmarking adaptation planning through the Climate Risk Adaptation Framework and Taxonomy



Source: Compact of Mayors, 2016 (<http://www.compactofmayors.org/content/uploads/sites/14/2015/06/C40-CRAFT_comms-brochure-final.pdf>). In this figure, an example is given of a city compared with the global benchmark, highlighting different aspects of adaptation.

Figure 10

Identifying cities with shared climate risks through the Climate Risk Adaptation Framework and Taxonomy



Source: Compact of Mayors, 2016 (<http://www.compactofmayors.org/content/uploads/sites/14/2015/06/C40-CRAFT_comms-brochure-final.pdf>). The figure illustrates how different cities in different regions can have shared climate risks.

45. Ms. Roberts identified that, during the scoping processes of the sixth assessment cycle, there will be a **stronger integration of the assessment on the impacts of climate change on cities and their unique adaptation and mitigation opportunities**, including through the enhanced engagement of urban practitioners.

46. Ms. Roberts informed the participants that the IPCC will work with academia, urban practitioners, and relevant scientific bodies and agencies, to organize an **international scientific conference on climate change and cities** early in the sixth assessment cycle (as mentioned in paragraphs 13 and 21 above), in order to stimulate scientific reports and peer-reviewed publications on this subject.

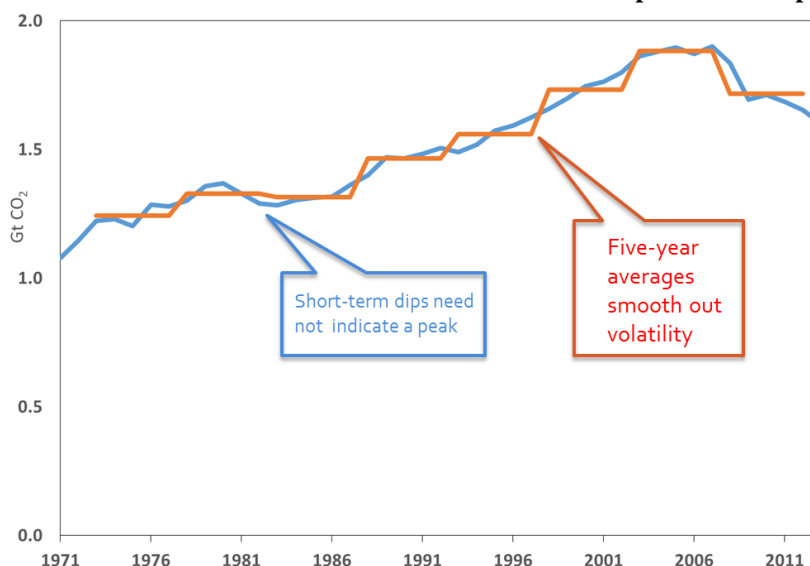
4. Climate change mitigation and the global stocktake

47. Mr. Jim Skea and Mr. PR Shukla, Co-Chairs of WGIII, provided a joint presentation on mitigation, based on the following mitigation-relevant elements relevant for the global stocktake: **peaking, balancing sources and sinks, the aggregation of efforts and indicators**.

48. In relation to how to determine if and when global emissions peaked, Mr. Skea talked about what can be learned from aggregate emissions from 12 Annex I countries which had emissions peaking between 2001 and 2010. In this context, it was found **that annual emissions data does not give a good indication of when peaking occurs. Five-year averages, on the other hand, smooth out the volatility of emission fluxes and present a clearer picture**. This is illustrated in figure 11 below. Mr. Skea added that countries

tend to peak in clusters simultaneously, and usually for the same reasons, such as a change in policy (e.g. the Kyoto Protocol) or economic changes.

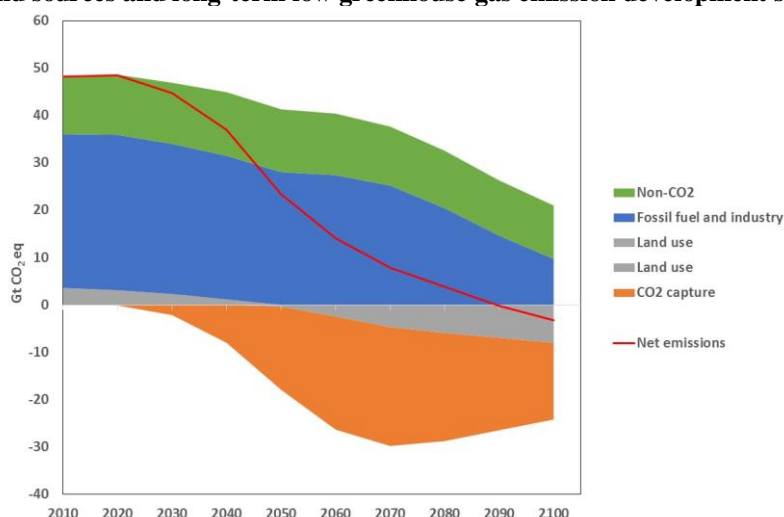
Figure 11
Aggregate fossil fuel CO₂ emissions of twelve countries whose emissions peaked in the period 2001-2010



Source: International Energy Agency data. The figure illustrates that averaging aggregate emissions over five year periods helps to smooth out volatility. The blue line depicts annual emissions, showing variability due to climate and fluctuations in economic activities. The red line refers to five-year averages.

49. In relation to **balancing sinks and sources**, Mr. Skea presented figure 12 below, which looks in detail at one scenario from AR5 (from the 450 ppm set, roughly in the middle of the range of scenarios presented in AR5). The scenario assumes that land-use will change from a source of emissions to a sink around the year 2050, and that a large amount of CO₂ will be captured and sequestered. This example shows that, although the present day is dominated by emissions that are mainly from fossil fuels, **a balance of emissions and sinks in the second half of the century will not be possible by only reducing CO₂ emissions. It will require the consideration of non-CO₂ emissions, carbon capture and land-use issues.**

Figure 12
Balancing sinks and sources and long-term low greenhouse gas emission development strategies¹⁶



Source: Derived from the Fifth Assessment Report database. The figure illustrates how the net-emissions are associated with the balance (or lack thereof) between emissions (fossil fuels and industry, land use and non-carbon dioxide emissions) above the zero line, and sinks (carbon dioxide capture and land use) below the zero line.

50. Mr. Skea also discussed the matter of **aggregating Nationally Determined Contributions (NDCs)**, highlighting **some issues that could present a challenge to the aggregation effort**. He noted the **conditionality of some of the INDCs**, since they are dependent on actions by others, and that some of the

¹⁶ Note: one illustrative scenario with a 65 per cent probability of going below 2 °C warming.

targets are relative to business-as-usual scenarios or to Gross Domestic Product. Furthermore, he added that there is uncertainty and variety in auxiliary assumptions regarding, for example, the business-as-usual estimates and the forecasts of economic growth. There is also the risk of under- and over-achievement, depending on the underlying philosophy of the INDCs, underpinned by the transparency framework established in Article 13 of the Paris Agreement.

51. He stated that there needs to be consideration of **how compatible the NDCs are with the agreed goal in the Paris Agreement related to the goal in Article 2.1(a),¹⁷ or, in other words, what temperature pathway the NDCs entail.** He discussed this topic in terms of the findings of the updated synthesis report on the aggregate effect of INDCs¹⁸, which benchmarked the INDCs against “least-cost mitigation pathways” derived from the AR5 database.

52. Given the above-mentioned benchmarking, it becomes important to understand what “least cost” implies, and what assumptions underlie those pathways. In this regard, he stressed the following:

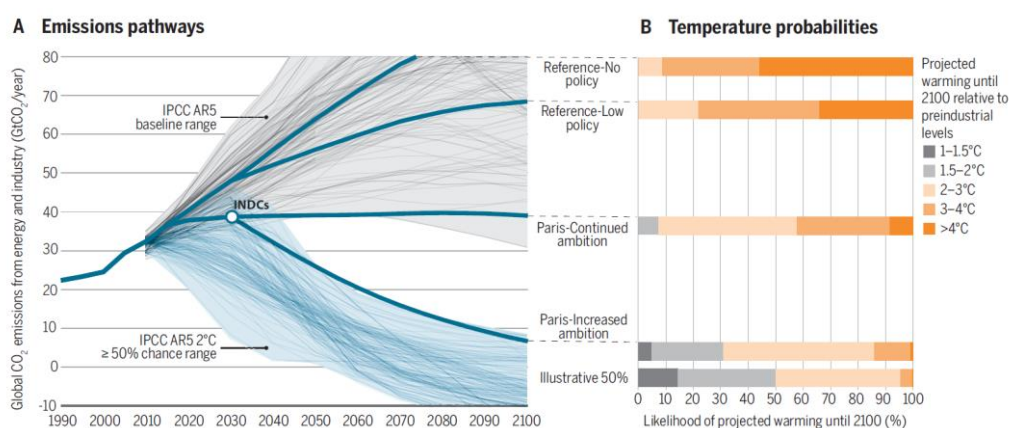
(a) If all Parties were to take the least-cost pathway today, it would mean being more ambitious than what is currently put forward by the INDCs. Therefore, **with the current INDCs**, emissions would need to fall more quickly in the second half of the century, and **the probability of reaching the global goal would be reduced;**

(b) An analysis of an AR5 single scenario with a 65 per cent probability to stay below 2 °C and a 20 per cent probability to stay below 1.5 °C, by 2100, shows that the **mix of mitigation measures beyond 2030 to 2100** (dominated by moving away from fossil fuels and the use of carbon capture, towards zero carbon) **will be very different from those prior to 2030, that are included in the INDCs** (dominated by incremental measures, energy efficiency and fossil fuel switching);

(c) A **least-cost pathway implies an acceleration of effort throughout the 21st century.** For illustration purposes, **he explained that the implicit carbon price** associated with these scenarios could be explained as going from USD 30-40 per ton in the early part of the century to levels that are in several hundreds of dollars in the later part of the century.

53. With regards to the path that the NDCs lead to, Mr. Skea presented a recent study on the **aspects of socio-economic development and ambition that may persist beyond 2030** (figure 13 below). In a scenario where emissions stabilise at the level of INDCs (equal to 2 per cent per year decoupling of CO₂ emissions and economic activity) the probability of staying under 2 °C would be less than 10 per cent. By comparison, in a scenario with increased ambition, where emissions fall in line with the most ambitious INDCs (equal to a five per cent decoupling of CO₂ emissions and economic activity) there would be a 30 per cent probability of staying under 2 °C and a five per cent probability of staying under 1.5 °C (this illustrates the need to go beyond the level of ambition of even the most ambitious of INDCs).

Figure 13
Emissions pathways and temperature probabilities



Source: Fawcett et al. 2015, Science. The figure illustrates a scenario whereby the level of ambition of the Intended Nationally Determined Contributions submitted by COP 21 in Paris is constant until the end of the century. On the left hand side the emissions pathways are illustrated, and on the right hand side the temperature probabilities are given for the different pathways.

¹⁷ Article 2.1(a) of the Paris Agreement. “Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change”

¹⁸ The synthesis report is available here: <<http://unfccc.int/9240>>.

54. Mr. Skea provided conclusions from a recent workshop, held at the University of Maryland, on **indicators which might be extracted from studying the INDCs that could be compared with indicators extracted from the integrated assessment models**, noting that some of these indicators are implicit in mitigation pathways and scenarios. It was found that **headline emission indicators are not sufficient to determine whether the world is on the right track**. Indicators that should be used include **macro-indicators**, such as sectoral emissions, energy/GDP ratios; the contribution of non-fossil energy; and the decomposition and attribution of mitigation effort.

55. He identified that many of the technologies needed in the second half of the century are not available yet, and as such, the relevant **technology indicators** could include the deployment of key technologies, investment in research and development, and demonstration activities. **Financial flows and policy formation and implementation** are also useful indicators.

5. Methodological work in support of the Paris Agreement

56. Mr. Eduardo Calvo Buendia and Mr. Kiyoto Tanabe, Co-Chairs of the TFI, provided a joint presentation on the methodological work of the task force in support of the Paris Agreement. Mr. Calvo Buendia explained that the **core objectives** of the TFI are to develop and refine an internationally-agreed methodology and software for the calculation and reporting of national GHG emissions and removals; and to encourage the widespread use of this methodology by countries participating in the IPCC and by Parties to the UNFCCC.

57. Mr. Calvo Buendia added that the TFI **assists countries in estimating and reporting their GHG emissions and removals** through methodology reports which include inventory guidelines, and through supporting materials like the Emission Factor Database (EFDB) and IPCC Inventory Software. These supporting materials are continuously improved and updated. He noted that the methodologies developed by the TFI are used for national GHG inventories (Biennial Reports, Biennial Update Reports, National Communications), for the Clean Development Mechanism and for REDD-Plus.

58. He informed participants that the COP requested the APA to **elaborate guidance for accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC for consideration by CMA 1**¹⁹ and that Article 13.7 of the Paris Agreement commits each Party to **regularly provide a national inventory report** of anthropogenic emissions by sources and removals by sinks of GHGs, prepared using good practice methodologies accepted by the IPCC and agreed upon by CMA 1. Mr. Calvo Buendia also referred to the enhanced transparency framework established by the Paris Agreement, mentioning that good quality and credible GHG inventory estimates are essential given that this is an input into the global stocktake.

59. He updated the participants on the outcomes of the IPCC's forty-third session in relation to the TFI, and noted that, in relation to the methodology report(s) mentioned in paragraphs 13 and 19(d) above, the **refinement of the current available guidance** is necessary in order to provide an **updated and sound scientific basis for future international climate actions, particularly those under the Paris Agreement**. He added that the refinement work will not revise the 2006 IPCC Guidelines, but will provide an update, supplement and/or elaboration of the 2006 IPCC Guidelines. It will also provide supplementary methodologies for sources or sinks of GHGs only where necessary; provide updated default values of emission factors and other parameters based on the latest available science only where significant differences from current default values are identified; and provide additional or alternative up-to-date information and guidance, where possible, as a clarification or elaboration of existing guidance in the 2006 IPCC Guidelines.

60. To conclude, he discussed how some **possible topics in the special report on 1.5 °C may be related to the work of the TFI**. These include climate drivers, emission pathways, forcing scenarios, the transparency framework; adaptation/mitigation costs, trade-offs and co-benefits; adverse impacts of human response measures; transformation pathways including emission trends and drivers, transparency in reporting, timing, technology transitions and societal aspects; and negative emission technologies, including carbon capture, utilisation and storage.

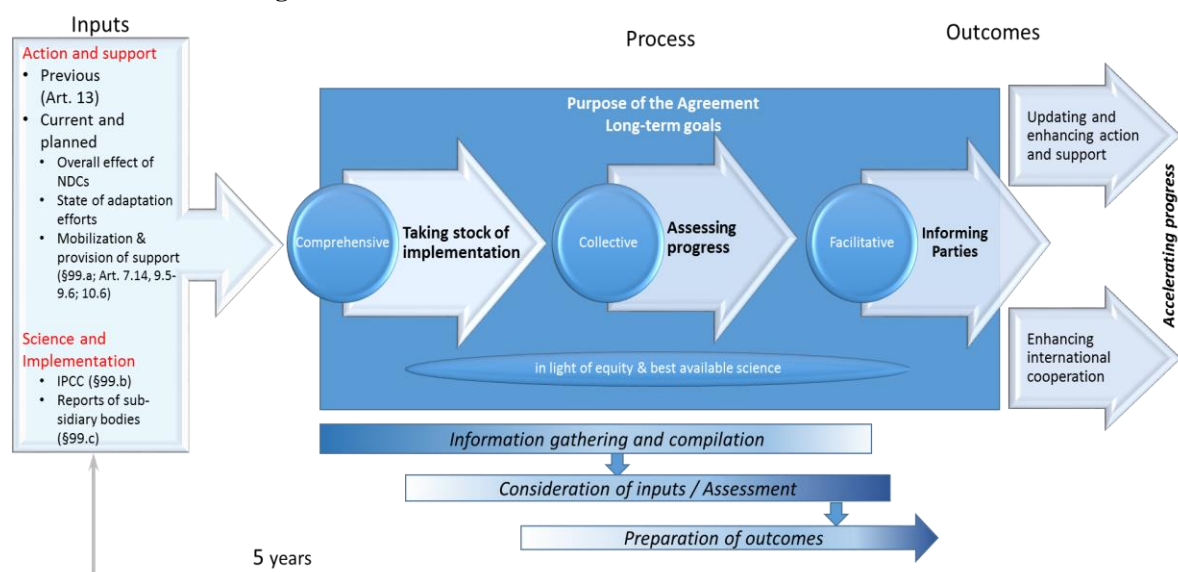
¹⁹ Decision 1/CP.21, paragraph 31(a).

B. Presentation by the UNFCCC secretariat on setting the scene: possible options for modalities for using the IPCC’s latest reports to inform the global stocktake (the “how”)

61. Mr. Halldor Thorgeirsson, UNFCCC secretariat, congratulated the **IPCC on its state of preparedness for the global stocktake**, noting that the IPCC is very focused on serving the Parties on this important component of the efforts for controlling climate change.

62. He explained figure 14 below, which was included in the annex of the information note prepared by the SBSTA Chair, and which **connects the global stocktake process to its inputs**. He emphasised the comprehensive, collective and facilitative nature of the global stocktake.

Figure 14
Schematic overview on the global stocktake



Source: United Nations Framework Convention on Climate Change secretariat, 2016, Bonn, Germany. This figure illustrates the inputs to the global stocktake (on the left), as well as the process and outcomes (middle and right), over a five-year period.

63. Mr. Thorgeirsson stressed that the global stocktake will be a **comprehensive** review, since it will consider mitigation, adaptation and the means of implementation. It is a **collective** effort, which entails a global effort to take stock of collective progress. It is also going to be **facilitative**, as it aims to bring the world closer to the purpose of the Paris Agreement.

64. The global stocktake will inform national governments’ preparations and updating of their **NDCs**. Once information is collected and compiled, it will be considered and assessed.

65. Mr. Thorgeirsson stressed that information gathering and consideration of inputs will be an important part of the global stocktake and referred to a **modality that served well in the 2013–2015 review, the SED**, noting that the dialogue took place through a number of meetings. He mentioned that a similar dialogue could be a possible component of the global stocktake. This could be a necessary component, but would not be a sufficient component, in terms of making the global stocktake as impactful as it needs to be.

66. He highlighted four interrelated aspects of the global stocktake that he considers important in terms of making it impactful. Firstly, the global stocktake will need to **simplify** the complex picture of the status of implementation of the Agreement, and help to make it **relevant**.²⁰ To pull out the relevant information will be a collective effort, and an iterative dialogue similar to this special event might be needed to be able to do this.

67. The second aspect is that there is a need for broad **ownership** and **inclusiveness** of the global stocktake, given that it is one of the most consequential stocktakes that humankind will undertake. It needs to be broadly owned by policymakers, as well as civil society and all of those affected.

²⁰ For example, see the questions asked above in the presentation of WGI on the information needed for the global stocktake.

68. It should **inspire** and accelerate action, and **motivate** change. It should not only tell governments where they should be, but also where they could be, if all policies were aligned. This is an important role for science.

69. He added that the stocktake is the top-down component of the Paris Agreement, connecting the contributions by countries to the long-term goals, thus the **impact** of the global stocktake to a large extent determines the lasting impact of the Paris Agreement.

70. In terms of **the timing of the global stocktake**, Mr. Thorgeirsson noted that the global stocktake will conclude in 2023, but it cannot start in 2023. He noted that the time frame in terms of the scientific input is clear, because the IPCC has supplied the dates, but the timeline for the other input is still under discussion by the APA.

C. Summary of the general discussion and interventions from Parties

71. During the special event, a lot of time was dedicated to the general discussion, and questions and comments were raised by a large number of Parties (the African Group of Negotiators, the Alliance of Small Island States, the European Union, Belize, Brazil, Canada, China, Colombia, Guatemala, Japan, New Zealand, Norway, the Philippines, the Solomon Islands, South Africa, Switzerland and Uruguay).

72. Parties expressed their gratitude to the IPCC for the participation of IPCC experts and the excellent presentations made, and noted that the IPCC's plans for the sixth assessment cycle are relevant for the global stocktake. Furthermore, Parties welcomed the opportunity to discuss with the IPCC its possible contribution to the global stocktake and possible modalities for considering this contribution.

6. The information needs of the global stocktake that the IPCC can address, beyond the Fifth Assessment Report

73. In general, Parties felt that: the IPCC should be the main source of scientific information for the global stocktake; and that the IPCC is already taking into account the needs of the stocktake and of the Parties and the planned products demonstrate this well. With regard to the first question (see paragraph 7(a)), a number of suggestions were raised in terms of the information needs of the global stocktake.

74. Parties made reference to the specific **information needs related to the newly adopted global goals**. They noted that the Paris Agreement, in its Article 2, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and to eradicate poverty, including by holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.

75. Several Parties stressed that the global stocktake should address collective progress towards achieving Article 2 of the Paris Agreement and should be conducted in a comprehensive manner. A Group of Parties mentioned that they would like to know how the IPCC could provide **information on the global goals and progress towards them**, and how it could **contribute to the analysis of NDCs**. Parties also referred to the need for more **information on the peaking of global emissions** and the need to understand not only the current status, but also the required status in terms of progress towards the global goals. A Party noted that the analysis of progress should go beyond identifying the gap in emissions and provide options for bridging this gap. In this context, the IPCC should provide information on the effectiveness of policies, identify best practices and technology needs, and provide options for scaling-up ambition.

76. In relation to holding the increase in the global average temperature to well below 2 °C above pre-industrial levels, a number of Parties suggested that information from the IPCC on low-emissions scenarios would be useful for the global stocktake, with a Party mentioning the need for information about how the world's chance of staying below 2 °C changes over time and successive cycles.

77. In terms of the goal to pursue **efforts to limit the temperature increase to 1.5 °C above pre-industrial levels**, Parties voiced their approval that the IPCC has agreed to prepare the special report on the impacts of global warming of 1.5 °C mentioned in paragraphs 13 and 19(a) above. A group of Parties added that the IPCC should assess the feasibility, risks and barriers of such mitigation pathways and that they look forward to seeing how the topic of 1.5 °C will be further elaborated in the AR6.

78. Numerous Parties highlighted that there are **information and research gaps in terms of the science on 1.5°C**. A group of Parties highlighted the COP decision on the 2013–2015 review,²¹ which “[e]ncourages the scientific community to address information and research gaps identified during the structured expert dialogue, including scenarios that limit warming to below 1.5 °C relative to pre-industrial levels by 2100 and the range of impacts at the regional and local scales associated with those scenarios”. The same group of Parties called for the 1.5 °C scenarios to be given highest priority and included, by the WCRP, in Tier 1 for CMIP6. These Parties were also of the view that the SBSTA should renew its call to the WCRP and World Meteorological Organization to ensure that the best possible scenarios and related impacts are used for AR6 and that 1.5 °C is included in the Tier 1 scenarios.

79. An IPCC expert responded that **new research is being undertaken** in relation to 1.5 °C. The low-emission SSP is currently under development by the research community, after which the modelling groups will perform the relevant simulations. In addition, other relevant, new research is being undertaken, particularly in relation to 1.5 °C, to produce new results on time for the special report by the IPCC. Another expert reiterated that the **scientific community has understood the need** for information in this area and has already started responding to this need. Additionally, workshops on how to address this need have been held by the scientific community on several continents. The group of Parties welcomed these developments. It also pointed out that the HappiMIP project mentioned in paragraph 34 above is limited to the analysis of extreme events.

80. Some Parties also noted the value of information from the IPCC on **policy-options related to the low-emissions scenarios** and the **options for negative emissions** that are associated with them, for meeting the goals agreed upon in the Paris Agreement. A Party mentioned the link between those goals and the **SDGs**. Parties saw value in: information about the different emission-reduction options and corresponding policy measures; information on progress towards meeting the Paris Agreement goals; and information on the effectiveness and efficiency of adaptation, mitigation and finance measures. A Party, noting the limitations of **least-cost mitigation scenarios**, such as the use of a single carbon price for the world and the assumption that technologies are available everywhere, called for the IPCC to consider scenarios that are taking national circumstances into account to a greater extent. An expert added that there was an important theme emerging of connecting top-down scenarios with the real-world concerns of policymakers and WGIII is considering how to address this.

81. The **global goal for adaptation** was mentioned by Parties. They also highlighted the need for more information on progress towards that goal from the IPCC. Parties felt that the IPCC should provide more information on adaptation measures and information on how to **assess the collective progress** in the global stocktake, including on the **global goal for adaptation**, and **effectiveness** of mitigation and adaptation action and finance measures. Several Parties also called for information from the IPCC on **methodologies related to adaptation needs in developing countries, and on adaptation indicators**. An expert responded that this is an important issue for WGII and that there is emerging literature on adaptation pathways and thresholds. The adaptation global goal is different from the mitigation global goal as it is more context-specific, and so case studies will be particularly useful.

82. The need for more **downscaled information** was also raised by a number of Parties. It was noted that there is a gap in scientific information and projections at the national and regional levels. A group of Parties requested the IPCC to provide **information on models that are downscaled to the local, national and regional levels**. Experts responded on this topic, mentioning that the IPCC works on the basis of peer-reviewed literature, but that it also relies on grey literature and that the process is well-outlined on the IPCC website.²² An expert also stressed that, in the sixth assessment cycle, there will be an emphasis on the regional perspective, which will be informed by national information. In addition, the scoping of the upcoming products will have broad participation and include a wide range of perspectives.

83. Several Parties mentioned the need for more information related to the **co-benefits of mitigation**, such as the link between mitigation and air-pollution, particularly in cities. Such information would contribute to increasing the ownership and inclusiveness of the global stocktake. A Party noted the **critical role of cities** and the need for information in that regard, particularly in terms of adaptation. Another Party stressed the importance of ocean acidification, which is mainly connected to CO₂ emissions and less to other GHGs.

84. The topic of **loss and damage** was also raised, with several Parties calling for more information from the IPCC on this topic in the sixth assessment cycle, and a Party requesting that the IPCC incorporate more research on loss and damage in the work of WGII. An expert responded that the Executive Committee

²¹ Decision 10/CP.21.

²² Available at: <https://www.ipcc.ch/organization/organization_procedures.shtml>.

of the Warsaw International Mechanism for Loss and Damage was looking into conceptualizing this topic including on how to bring this together with the risk assessment concept developed in AR5, and that the IPCC is open to future developments and advice on this topic.

85. A large number of Parties raised the need for more information on **means of support for mitigation and adaptation**, which was already identified in the 2013–2015 review. Some Parties called for information on finance and on costs and benefits, specifically the costs of mitigation and adaptation activities, and the costs of climate change impacts. Several Parties asked if WGII and WGIII could **translate the risks into financial data**, which would be relevant for policymakers and the private sector. A group of Parties responded that other organizations are already analysing and sharing information related to finance, technology transfer and capacity building and may be better placed to do so. Another Party, called for the identification and provision of information on options to scale up the financial flows and technology development.

86. Some Parties mentioned that the global stocktake should take into account information from the IPCC related to **attribution**, particularly in terms attributing observed climate change to drivers of climate change, and/or attributing climate change to mitigation measures.

87. A Party, noting that the IPCC already provided a series of questions that might be relevant for the global stocktake, was of the view that the SBSTA should identify **relevant policy questions** for the global stocktake that the IPCC should address. Such questions could then help the IPCC decide on the best way to tailor its sixth assessment cycle products to address them.

7. Tailoring the IPCC products to better support the global stocktake, and coordinating the input to ensure complementarity

88. There was a discussion on how the IPCC products, to be produced during the sixth assessment period, can be tailored to better support the global stocktake and, related to this, how the input can be coordinated to ensure complementarity. A Party pointed out that the SBSTA negotiations would discuss this matter and give guidance, while another Party mentioned that the **IPCC has its own procedures to plan its work**, and is taking complementarity into account. IPCC experts assured the Parties that it is responding to the COP invitations, aligning with the global stocktake, and taking the information needs of Parties to the UNFCCC into account.

89. A Party mentioned that there is a need for the IPCC to **communicate** its work **effectively**, particularly in relation to the SSPs. The participant added that it had been a challenge to understand the RCPs in the AR5, in particular on how they were linked to a different set of scenarios assessed by WGIII, and that a good understanding of the new SSPs was important.

90. There were many interventions on the topic of grey literature and the need for the IPCC to **include more information from the national level in the sixth assessment cycle** (e.g. national information submitted to the UNFCCC). A Party also mentioned the need to stimulate the production of science in certain regions, particularly from developing countries, since regional assessments are important for the global stocktake. The same Party, as well as an IPCC expert, emphasized the need for the strengthening of national statistical offices, which is particularly important in terms of inventories. IPCC experts and a Party reassured the participants that the IPCC has clear and effective procedures to integrate national-level information in place. An expert noted that the work of the TFI contributed significantly to the harmonization of the national information submitted to the UNFCCC and stressed the importance of increasing the capacity of developing countries to implement the IPCC guidelines for national GHG inventories.

91. The **timing of the IPCC products** and the global stocktake were discussed. The IPCC assessment cycles and the cycles of the global stocktake will be synchronized, with the IPCC planning its sixth and future cycles as five year periods. A number of Parties voiced their approval for the synchronization, noting that the last product in the cycle will be finalized in 2022, one year prior to the first global stocktake in 2023.

92. Others warned that the **condensed IPCC cycles** could pose a risk to ensuring scientific integrity by hindering the rigorous drafting and review process, could make it difficult for the IPCC to undertake special reports, and/or could pose logistical problems for the IPCC. Furthermore, they added that there might be only incremental advances in science, which may not justify a full assessment cycle every five years. Several Parties noted that an alternative would be to produce assessment report in a ten-year cycle with special reports in the middle of the cycle, but added that this would lead to financial problems due to the way the IPCC operates. Experts responded, pointing out that the IPCC is increasingly asked to produce special reports, and that the review processes within each assessment cycle require due time and diligence.

The timeline for the sixth assessment cycle was produced based on the need to have time for the relevant IPCC review procedures (see paragraph 19(a-e) above). Another expert was of the view that five-year cycles will generate a need to revise the IPCC procedures or to manage the demand.

93. Parties also discussed the timing of the publication of the **special report on the impacts of global warming of 1.5 °C**, with two Parties asking the IPCC if the publication date could be **moved earlier in 2018**, so that it could feed into the mid-year SBSTA negotiations and the facilitative dialogue of 2018.²³ An expert responded that the science needed for the report would not be available in time for an earlier publication date.²⁴ Another expert added that the integrated assessment modellers that are part of the WGIII community would struggle to get new literature produced in time for an earlier publication date, and so it would be almost impossible for the IPCC to produce the special report earlier than September 2018. Furthermore, the IPCC's procedures to ensure scientific integrity, including a three-tiered review, necessitate that the special report be finalized at the planned time of September 2018.

8. Modalities to consider the IPCC input into the global stocktake, and experiences under the Convention that can offer lessons in this regard

94. In relation to the modalities that can be used to consider the IPCC input into the global stocktake, Parties mentioned that experiences under the Convention can offer lessons. A large number of Parties referred to **the 2013–2015 review** and the SED as key examples of good practice. They acknowledged that the **SED** served as an interface between science and policy, and Parties mentioned that lessons can be learned from the open dialogue between experts and policymakers that took place over a number of meetings during the two-year period, at the heart of the UNFCCC process. A Party suggested that the **Co-Facilitators of the SED** could also be approached to **share the lessons** that they learned from the process. Another Party suggested that the IPCC should participate not only in the technical phase, but also in the political phase of the global stocktake.

95. Several Parties discussed how the **special event** that they were currently participating in was also a good modality, and they mentioned that they looked forward to **more such events** as the work on AR6 and the global stocktake unfolds. A Party emphasized that cooperation and dialogue between the IPCC and the UNFCCC is very important.

96. In relation to the modality of *when* the science should feed into the global stocktake, numerous Parties noted the adequacy of the IPCC's timeline for the sixth assessment cycle. It was emphasized that the timeline allows for the **science to be considered as it becomes available**, throughout the sixth IPCC assessment cycle.

D. Closing remarks

97. The IPCC Chair noted that the discussion and suggestions from Parties will help the IPCC to make its products more relevant to policymakers. He added that the IPCC sees the global stocktake consisting of three elements:

(d) **Aggregating the efforts** of Parties: This will be informed by the enhanced transparency framework for action and support under the Paris Agreement. The IPCC methodology report(s) will be very relevant in this regard.

(e) **Assessing the progress**: Scientific content will need to be enlarged in terms of, *inter alia*, an understanding and estimation of the carbon budget and indicators of early-warning anomalies in the emissions pathways, as well as in terms of investment patterns in infrastructure. Globally-agreed metrics for adaptation are needed and the scientific community can play a role in developing and advising on these metrics.

(f) **Accelerating the progress**: To make progress meaningful, the scientific community needs to deliver information on the decision-making framework and process, as well as on incentives for investment in low-carbon and low-emissions development. It should also provide information on private-sector decision-making and consumer behaviour. Furthermore, there is value in science-

²³ Decision 1/CP.21, paragraph 20.

²⁴ In terms of shared socio economic pathways scenarios for 1.5 °C as well as in terms of impacts of such scenarios (e.g. the project on Half degree of additional warming projections, prognosis and impacts model intercomparison).

based information on where the global community *should be* on the low carbon climate resilient pathway, and where the global community *could be* if all conditions were satisfied.

98. The SBSTA Chair thanked the participants and delegates, and notified Parties that he will produce an informal summary report of the event.