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SIXTH ASSESSMENT REPORT (AR6) PRODUCTS

Outline of the Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty

Information note on the organization of the scoping meeting

(Submitted by the Secretary of the IPCC)

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(Prepared by Ms Thelma Krug, Chair of the Scientific Steering Committee)

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1. INTRODUCTION

In paragraph 21 of its Decision 1/CP/21, the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) invited the Intergovernmental Panel on Climate Change (IPCC) "to provide a special report in 2018 on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways".

In paragraph 2 of its Decision IPCC/XLIII-6 on the Sixth Assessment Report (AR6) – Special Reports - the IPCC decides "In the context of the Paris Agreement, to accept the invitation from the UNFCCC to provide a special report in 2018 on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, and decides to prepare a Special report on this topic in the context of strengthening the global response to the threat of climate change, sustainable development and efforts to eradicate poverty".

In paragraph 1 of its Decision IPCC/XLIII-7 on the Sixth Assessment Report (AR6) Products – Strategic Planning, the IPCC decides "to consider the outline of the Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways at the 44th Session of the IPCC in October 2016. The Draft Special Report on this topic will be considered by the Panel for approval at its Plenary session in September 2018".

Thereafter, the Chair of the IPCC established a Steering Committee, chaired by Ms. Thelma Krug, IPCC Vice-Chair, to undertake the scoping of the Special Report under the joint scientific leadership of Working Groups I, II and III with support from Working Group I (WGI) Technical Support Unit (TSU).

The Terms of Reference of the Scientific Steering Committee, including its membership, is provided in Annex 1.

2. CALL FOR NOMINATIONS

A call for nominations was issued to IPCC Member States and Observer Organizations on 22 April 2016 by the IPCC Secretariat. Expertise was sought in the following areas:

- Analysis of observed climate system changes related to degree of warming since pre-industrial levels and associated implications
- Climate modeling and projections
- Climate drivers, emission pathways, forcing scenarios, and relationship with the transparency framework
- Climate processes, non-linearities, sensitivity and feedbacks
- Observed and projected extreme events and impacts
- Short and long term impacts of different stabilization levels, including notion of irreversibility
- Detection of impacts and attribution to climate change
- Impact projections by modeling and shared socio-economic pathways
- Human vulnerability and adaptation, including infrastructure, cities and other human settlements
- Risk assessments, reasons for concern
- Risk perception, psychosocial, sociological, economic and anthropological underpinnings of human responses to climate change
- Adaptation/mitigation costs, trade-offs and co-benefits; adverse impacts of human response measures; including emission feedbacks

- Vulnerability and adaptation of natural systems and managed systems (Agriculture, Forestry and other Land Use (AFOLU)) and their services: oceans, coasts, freshwater, land, cryosphere
- Integrated assessment modeling and interpretation including global, regional and national perspectives
- Transformation pathways including emission trends and drivers, transparency in reporting, timing, technology transitions and societal aspects
- Mitigation of energy supply and demand, including cities and other human settlements
- Mitigation in agriculture, food systems, forestry and land use
- Negative emission technologies, including carbon capture, utilization and storage Climate change mitigation and sustainable development including co-benefits and risks, equity, poverty eradication and food security
- Policy instruments and international cooperation including technology and finance
- Interdisciplinary and other perspectives providing a holistic view of impacts and mitigation pathways, also considering geoengineering
- Ethics and equity

610 nominations were received, corresponding to a total of 589 experts (19 were nominated by more than one organization). Citizens coming from developing countries represented 45% of the total applications received while women represented 27%. Eighty six (86) National Focal Points participated in the nomination process, indicating 439 experts from 87 citizenships. Observer Organizations nominated 171 experts from 24 different citizenships. Nominations were also received from Bureau Members.

3. PARTICIPANT SELECTION

A selection process, based on IPCC procedures was agreed upon by WGI, WGII, WGIII, and (Task Force Bureau (TFB) Co-Chairs. The process is documented in Annex 2, with a summary and statistics of each stage of the process, until the final list of participants was agreed by the Scientific Steering Committee (SSC) on June 30th 2016. The entire process was facilitated by the Scientific Steering Committee of the scoping meeting and implemented by the WGI TSU. Since the scientific oversight of the Special Report will be provided by WGI, WGII and WGIII, the selection process was undertaken by Bureau Members of WGI, WGII and WGIII and the SSC. Members of the IPCC Bureau were invited to participate in the scoping meeting taking advantage of the 52nd Session of the Bureau being held back to back to the scoping meeting.

4. LIST OF PARTICIPANTS

The final list of selected participants consisted of 86 experts. The percentage of women selected to participate in the scoping meeting is higher than the total percentage of women nominated by the Focal Points, Observer Organizations and Bureau members, resulting in a more balanced gender participation. The percentage of experts from developing countries selected represent 51% of the total number of participants at the scoping meeting. The distribution of areas of expertise is consistent with the distribution of experts in the list of nominations. Experts selected originated from the academic/research sector, the Government sector, Non-Governmental Organizations (NGOs) and from the Private sector and Industry.

An analysis of the composition of the list of participants is provided in Annex 2. The list of participants, together with the Bureau Members, IPCC Secretariat and TSU staff and others present at the meeting, is provided in Annex 3.

5. BACKGROUND DOCUMENT

The SSC produced a background document ahead of the Scoping Meeting to stimulated discussions among the participants during the scoping meeting. The document is available on the Special Report webpage:
http://www.ipcc.ch/report/sr15/pdf/sr15_scoping_background_doc.pdf.

The document presented the expected outcomes of the scoping meeting (i.e. title and chapter structure for the special report, together with an indication of the relative size of the various chapters, and an annotated list of suggested topics that could be addressed in each chapter; provided context to the invitation for the Special Report, including issues related to meeting the needs of the UNFCCC and other stakeholders; framed the societal challenges; set out a suite of themes and scientific questions for consideration by the scoping meeting participants; and raised some methodological challenges faced by the Special Report.

The background document identified a number of scientific challenges related to the Special Report that were grouped in broad themes, within which multiple scientific questions were posed. The purpose of the themes and the questions was to stir up discussion at the scoping meeting and to stimulate an exchange regarding the scientific advances since the Fifth Assessment Report (AR5). The background document also stressed the role of the scoping meeting in the identification of elements that could be better addressed in the Special Report rather than the full Sixth IPCC Assessment Report.

The background document covered a number of themes, including:

- Changes in the climate system and response to perturbations of the Earth's energy balance
- Mitigation pathways
- Impacts on ecosystems and human systems
- Risks and adaptation
- Mitigation options and their wider impacts
- The interaction of climate risks, adaptation and mitigation
- Adaptation and mitigation in relation to sustainable development, poverty eradication and food security

6. PRE-SCOPING QUESTIONNAIRE

Ahead of the scoping meeting for the Special Report, the IPCC Secretariat invited interested parties to complete a questionnaire prepared by the SSC on recommendations for the structure, format and contents of the Special Report. The questionnaire was sent to all IPCC National Focal Points and Observer Organizations and was made publicly available on the IPCC website for wider participation. The questionnaire consisted of 12 questions combining multiple-choices, scaled and open-ended questions soliciting the respondents to address a broad range of issues.

A total number of 226 responses were received. A summary of the analysis of the questionnaire responses is provided in Annex 4.

Responses predominantly originated from experts in the areas of physical science, natural resources, energy, water management, social sciences, agriculture and food security, and economics. Suggested key topics to address included differential impacts, emission and mitigation pathways, improved knowledge and understanding, regional aspects, adaptation, cost-benefit analysis, climate extremes and feasibility of 1.5°C global warming above pre-industrial levels. By and large, the respondents favoured a small sized report of 5-6 chapters, 200-300 pages.

7. SCOPING MEETING

The scoping meeting for the Special Report was held in Geneva, Switzerland, from 15-18 August 2016. The presentations and meeting documentation are available on the scoping meeting webpage (http://www.ipcc.ch/report/sr15/). The agenda is provided in Annex 5.

Participants were invited to discuss all aspects of the scope, outline, and contents of the report. A pre-defined structure for the report was purposely not provided to the participants and the SSC encouraged participants to think beyond the contents of the background document, to think "outside of the box". The proposed outline for the Special Report was developed in an iterative process over the course of the scoping meeting.

The SSC identified three tracks, inspired by the text describing the IPCC decision to develop the Special Report topic: "on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty". The themes from the background document were integrated within these three tracks, recognizing the unavoidable overlaps. These three tracks provided a starting point from which to initiate the flow of the meeting and facilitated inclusive, integrative, cross-WG discussions amongst participants within small groups.

The tracks were the following:

Track 1: Global greenhouse gas emission pathways and impacts of global warming of 1.5°C above pre-industrial levels

- Changes in the Earth system and response to perturbations of the Earth's energy balance
- Mitigation pathways
- Impacts on ecosystems and human systems: attributing risks, avoided risks

Track 2: Global warming of 1.5°C above pre-industrial levels in the context of strengthening the global response to the threat of climate change

- Adaptation and mitigation pathways
- Socio-technical transitions associated with the integration of adaptation and mitigation

Track 3: Impacts of global warming of 1.5°C above pre-industrial levels in the context of sustainable development, and efforts to eradicate poverty

- Adaptation and mitigation in relation to sustainable development, poverty eradication and food security
- Integrative framework for implementation pathways

7.1 SCENE SETTING PRESENTATIONS

Scene-setting presentations were requested within each track to stimulate exchange amongst the meeting participants. The SSC invited keynote speakers to consider, where appropriate, the following guidelines in the preparation of their presentations:

- Highlighting relevant findings in the AR5 and identifying the key new scientific, technical and policy knowledge that has emerged since.
- A discussion of the robustness of the findings in AR5 where there is high confidence, and the implications for achieving 1.5^{o}C and the impacts of a 1.5^{o}C warming.

- Recommendations on what should be addressed in the Special Report with respect to what could best be treated in the main AR6.
- Identifying gaps in knowledge and presenting a vision for how these gaps can be addressed.
- A comparative discussion of different stabilization targets, including or not overshoots (e.g. pathways, impacts, policy implications, costs/benefits).
- Addressing regional aspects.
- A discussion of what is meant by 'transformations'.
- A discussion of sensitivity and implications of underlying assumptions, e.g. model, adaptation and mitigation options.

The scene setting keynote presentations and the presenters consisted of the following:

Track 1: Global greenhouse gas emission pathways and impacts of global warming of 1.5°C above pre-industrial levels

- Changes in the Earth system and response to perturbations of the Earth's energy balance - Dahe Qin
- Changes in the Earth system and response to perturbations of the Earth's energy balance - Sonia Seneviratne
- Impacts of 1.5°C warming - Carl-Friedrich Schleussner
- Contributing on ecosystems and human systems: Attributing risks, avoided risks - Opha Pauline Dube

Track 2: Global warming of 1.5°C above pre-industrial levels in the context of strengthening the global response to the threat of climate change

- Adaptation and mitigation pathways - Nebojsa Nakicenovic
- Transformative adaptation pathways - Aromar Revi
- Socio-technical transitions and system innovation: Insights from sociology of innovation and evolutionary economics - Frank Geels
- Socio-technical transitions associated with the integration of adaptation and mitigation (insights from multiple branches of social science) - Joyashree Roy

Track 3: Impacts of global warming of 1.5°C above pre-industrial levels in the context of sustainable development, and efforts to eradicate poverty

- Sustainable development, poverty eradication and food security: Impacts, adaptation and losses - Petra Tschakert
- Adaptation and mitigation in relation to sustainable development, poverty eradication and food security - Maria-Virgina Vilariño
- Integrated framework for implementing pathways - Ioan Fazey
- Integrative Framework for Implementation Pathways - Cosmas Ochieng

The charge and objectives of the meeting were presented to participants by Thelma Krug, Chair of the SSC, in the subsequent plenary session, together with an explanation of how the break out-groups and plenary sessions would flow over the course of the meeting. Wilfran Moufouma-Okia (WGI TSU) presented a summary of the pre-scoping exercise (see Annex 4) and Andreas Fischlin provided his vision on the scoping of the 1.5°C Special Report in the context of the full suite of AR6 reports.

7.2 BREAK OUT GROUPS AND PLENARY SESSIONS

Detailed discussions of possible options for the structure of the report took place during three successive break-out-group (BOG) sessions, each followed by a plenary session. BOG sessions were proposed in an iterative sequence, starting from a broad discussion around the topics that could be addressed in the Special Report, starting with the three tracks, towards identifying and refining chapters, titles and content. The whole group was reconvened in a plenary session after each BOG to take stock, synthesize the discussions across the whole group, identify key challenges, gaps and overlaps that will be addressed in the next BOGs and to co-design with all participants the next stage. The flow of the meeting is schematically described in Figure 1.

For the first BOG (BOG1) session, participants were invited to select which Track they wished to continue discussing in smaller groups. In the first phase of BOG1 (Day 1 afternoon), the three groups were each sub-divided into three smaller groups (e.g. BOG1-Track1a, BOG1-Track1b, BOG1-Track1c), each comprised of 10-15 people, chaired by a member of the SSC. The objective was to facilitate an ice breaking and active exchange amongst all participants. The sub-groups were re-joined in the second phase of BOG1 (Day 2 morning). The chairs of BOG1 SSC facilitated discussions from the broad exchange emerging from the scene-setting presentations and plenary discussion, and steered thoughts on the Special Report structure, title, etc., then reported back in plenary, where gaps and overlaps, any contentious issues were identified.

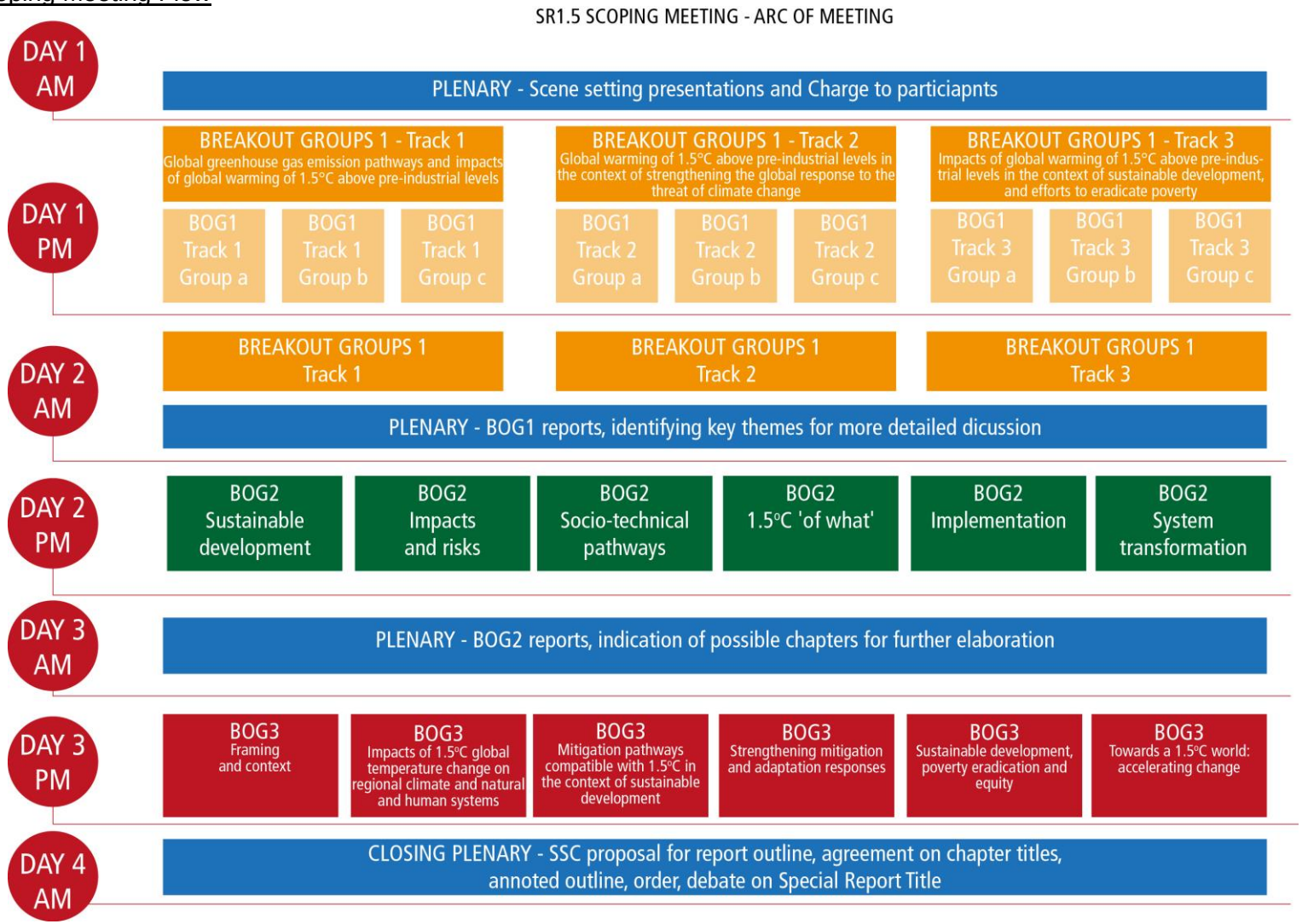
The topics for BOG2 were defined by the participants and SSC as the result of outcomes of BOG1 and plenary discussions and were chaired by meeting participants or Bureau Vice-Chairs.

On Day 2, BOG2 groups were formed on:

- Sustainable development
- Impacts and risks
- Socio-technical pathways
- 1.5^{o}C 'of what'
- Implementation
- System transformation

The outcomes of BOG2 were intensely discussed in the plenary session that followed on Day 3. Proposals for the Special Report outline were debated with multiple options presented.

Figure 1: Scoping Meeting Flow



Finally, the SSC proposed BOG3 groups around a set of potential chapters themes:

- Framing and context
- Impacts of 1.5°C global temperature change on regional climate and natural and human systems
- Mitigation pathways compatible with 1.5°C in the context of sustainable development
- Strengthening mitigation and adaptation responses
- Sustainable development, poverty eradication and equity
- Towards a 1.5°C world: accelerating change

The structure proposed within BOG3 was discussed in detail during the plenary session that followed, with minutes taken by TSU staff projected live on the overhead screen to ensure that participants' views were accurately noted.

Overnight, the SSC debated and integrated the breadth of views expressed by participants throughout the meeting, consulted with the BOG3 discussion leads, and converged around a proposed outline that was presented at the final day plenary. Intense discussion ensued until unanimous agreement of the participants was achieved for each chapter title, an annotated bullet text for each chapter, chapter order and, finally, an indicative number of pages for each section, as summarized in Box 1.

BOX 1: Special Report Outline

Front Matter (2 pages)
Summary for Policy Makers (15-20 pages)

Chapter 1: Framing and context (15 pages)
Chapter 2: Mitigation pathways compatible with 1.5°C in the context of sustainable development (40 pages)
Chapter 3: Impacts of 1.5°C global warming on natural and human systems (60 pages)
Chapter 4: Strengthening the global response to the threat of climate change (40 pages)
Chapter 5: Approaches to implementing a strengthened global response to the threat of climate change (20 pages)
Chapter 6: Sustainable development, poverty eradication and reducing inequalities (40 pages)

Up to 10 boxes on integrated case studies/regional and cross-cutting themes (20 pages)

Frequently Asked Questions (10 pages)

There was agreement that the title should capture the full Special Report mandate and be preceded by a shorter title to facilitate communication. The final plenary session did not converge on an agreed short title. Four short titles were proposed. The annotated report outline, the full title and the range of short titles from the scoping meeting are in Annex 6.

The 52nd Session of the IPCC Bureau approved the outcomes of the scoping meeting and recommended that the title of the Special Report be "Global warming of 1.5°C - The IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global

greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty".

8. ANNOTATED OUTLINE OF CHAPTERS FROM SCOPING MEETING

The following text provides additional information on the annotated Special Report outline and reflecting BOG3 and the final plenary discussions, as synthesized by the chairs of each BOG3 group.

CHAPTER 1: Framing and context

Summarized by Valérie Masson-Delmotte and Thelma Krug

- Understanding 1.5°C; reference levels, probability, transience, overshoot, stabilization
- 1.5°C in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, with consideration for ethics and equity
- Key concepts central to understanding the report
- Building on AR5: new information, integrative approaches, response options: opportunities and challenges
- Assessment and methodologies across spatial and time scales and treatment of uncertainty
- Storyline of the report

Chapter 1 will frame the Special Report and the challenges associated with global warming of 1.5°C and associated global emission pathways.

The first bullet is related to the concept of global warming of 1.5°C and its interpretation, in relationship to reference temperature levels (pre-industrial climate, observations and current state of the climate system and level of warming), considering climate variability/natural fluctuations, anthropogenic warming and uncertainties in relationship between pathways and climate responses. A discussion relative to higher stabilization levels enables the evaluation of "avoided impacts". The concept of “overshoot” and its implications will also be discussed (duration, amplitude etc.).

The second bullet introduces the multi-dimensional approach to this special report, in relationship to the responses to climate change, including the Sustainable Development Goals and considerations of ethics and equity.

Since the impacts of global warming of 1.5°C and GHG emission pathways need to be addressed in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, a broader range of literature than used before in IPCC assessments from the social sciences will be required, including in relation to the objectives of Sustainable Development.

The third bullet will introduce the key concepts required for the reader of the Special Report. These need careful cross-checked with the authors of other chapters, given the highly interdisciplinary nature of the report and to ensure that all key concepts are introduced upfront.

The fourth bullet expresses the expectation to provide a brief summary on key related Fifth IPCC Assessment Report (AR5) findings and gaps, an update of "where we are now": an update on the current status of human influence on the climate system and status of the climate system. A general overview of the new information that has emerged from the literature since the AR5 is introduced. The framework of this special report is introduced that will be built across Working

Groups and scientific disciplines, providing integrative approaches and a balanced assessment of opportunities and challenges associated with the impacts and response options. The chapter will also include a discussion of outstanding challenges and the development of additional research to be assessed more comprehensively in the Sixth IPCC Assessment cycle.

The fifth bullet reflects the requirement to describe the adopted perspectives on spatial and temporal scales in the special report chapters, as well as the methodologies for assessing probabilities and uncertainties.

Finally, the sixth bullet introduces the narrative for the Special Report and will explain the logic of the proposed flow of chapters in this Special Report.

CHAPTER 2: Mitigation pathways compatible with 1.5°C in the context of sustainable development

Summarized by Jan Fuglestvedt and Fu Sha

- Methods of assessment and assumptions in the literature
- Constraints on and uncertainties in global greenhouse gas emissions and other climate drivers for limiting warming to 1.5°C
- Characteristics of mitigation and development pathways compatible with 1.5°C, compared to 2°C and higher as relevant, including short and long term, sectorial, regional, demand/supply-side; technological and socio-economic implications etc.
- Technological, environmental, institutional and socio-economic opportunities and challenges related to 1.5°C pathways

The first bullet serves to outline the framing of the chapter and how it approaches the topic of mitigation pathways and sustainable development. Breakout group and plenary discussions indicated that approaches to assessing mitigation pathways should be comprehensive, considering results from a broad set of models/model types and integration of top-down and national/sectoral bottom-up studies as well as case studies. The discussions also emphasized the need for clear communication of assumptions and choices, data, methods, model type, etc., that have been adopted by the assessed studies available in the peer-reviewed literature. Moreover, the framing of the chapter should introduce how the assessment is carried out with respect to selection and treatment of the available studies and scenarios. It should also explain the perspectives on spatial and temporal scales of the pathways and responses of the climate system, connected to the discussions of scales in Chapter 1.

The second bullet covers an update of relevant knowledge about the state and behavior of the climate system, and the resulting physical constraints on future pathways consistent with 1.5°C and 2°C. It implies a focus on climate sensitivity (Equilibrium Climate Sensitivity (ECS) and Transient Climate Sensitivity (TCR)) and the carbon cycle, sources, sinks, concentration levels and trends of gases and aerosols, carbon budgets, radiative forcing from CO_2 and non-CO_2 drivers (including short-lived climate forcers/aerosols, land use albedo), and the related uncertainties. In addition, potential responses of the Earth system to overshoot pathways should be assessed, including responses to net negative emissions. The discussions also pointed to the need for assessing how different definitions and interpretations of the 1.5°C and 2°C ambitions (in Chapter 1) will affect the mitigations pathways and their characteristics.

The next bullet addresses the need for assessing and explaining the broad set of characteristics of mitigation pathways, in the context of development pathways. The assessment can consider the level of collective mitigation ambition associated with climate stabilization to 1.5°C and 2°C as well as other pathways and reference levels of collective mitigation ambition when relevant, including incremental policy scenarios reflecting current levels of ambition. The chapter will need

to consider both overshoot and non-overshoot pathways as available in the literature. The importance of assessing the mitigation pathways on both global and regional scales was pointed out. The description of these pathways will need to cover energy use, land use, agriculture and food systems, different technologies and the various emissions by sector, and will assess the technological and socio-economic implications. The need for consideration of timescales of action, emissions levels and climate responses, timing of net zero emissions, including the interdependence between short- and long-term action and between extent of overshoot and end of century emissions levels, was emphasized. There is also a specific request from the UNFCCC to provide a 2030 emissions level for 1.5°C. The assessment should focus on sectors and across sectors and consider both demand- and supply-side. The discussion pointed to the importance of distinguishing the two concepts of "being consistent with 1.5°C" and "being required for 1.5°C" in the assessment of pathway characteristics.

The final bullet covers the aspects of mitigation pathways that go beyond the purely quantitative modeling approaches for which other types of studies are available in the peer-reviewed literature. This part of the chapter will also constitute a bridge to the assessments in the following chapters. It should consider the enabling conditions and constraining factors related to achieving 1.5°C and 2°C pathways, such as technical and political opportunities and challenges, as well as implementation requirements and costs, including distribution of costs. A balanced assessment is expected to address both opportunities and challenges in key dimensions. Those include issues around lock-in to particular technologies in the near term, socio-economic-environmental benefits and risks of rapid phase-out of fossil fuels, benefits and risks related to specific technologies (such as carbon dioxide removal technologies), and co-benefits and trade-offs with sustainable development goals, especially those related to equity, poverty, affordable energy and food security. Institutional /political risks and opportunities are key for a more insightful and comprehensive understanding of the mitigation options and will constitute a link to the following chapters.

In order to enable the required close collaboration between authors of this chapter and those from other chapters, one possibility could be introduction of a new type of "bridging authors", with specific responsibility for interaction and consistency with other chapters, either for specific cross-cutting issues, or related to the chapter as a whole.

CHAPTER 3: Impacts of 1.5°C global warming on natural and human systems

Summarized by Carolina Vera, Wolfgang Cramer and James Ford

- Methods of assessment.
- Observed and attributable global and regional climate changes and impacts and the adaptation experience.
- Key global and regional climate changes, vulnerabilities, impacts, and risks at 1.5°C, including adaptation potential and limits.
- Avoided impacts and reduced risks at 1.5°C compared to 2°C and higher as relevant.
- Timeframe, slow vs. fast onset, irreversibility and tipping points.
- Implications of different mitigation pathways for reaching 1.5°C, including potential overshoot for impacts, adaptation and vulnerability.

The main objective of the chapter is to provide a concise account of existing knowledge about impacts of 1.5°C of warming over preindustrial levels, and adaptive capacity to manage such change, covering all world regions and all sectors. Impacts may be associated with the impacts of environmental change associated with greenhouse gas emissions consistent with 1.5°C, or impacts of mitigation of higher levels of climate change. Besides evaluating the emerging literature on 1.5°C, the chapter will also infer impacts from a consideration of the "mid-point" between current warming and impacts expected for 2°C.

The first bullet introduces the structure of the chapter and how the key concepts (e.g., impact, risk, vulnerability, adaptation) will be addressed. The scoping discussion highlighted the relevance of including the description of the most relevant methods of assessment, like those related with confidence, likelihood, reference to present-day as well as to "2°C warming and higher", etc. The basis of the chapter assessment will be AR5 plus any updates in scientific knowledge available.

The second bullet includes an integrated assessment of the observed and attributable climate changes and impacts, and the adaptation experience at both global and regional scales. In particular, the discussion pointed out the importance of including explicitly the perspective of impacts caused by extreme events and adaptation options available to them.

The third bullet provides an integrated assessment of the key climate changes, vulnerabilities, impacts and risks at 1.5°C above preindustrial. The scoping discussion recommended addressing both global and regional scales. Also, as in the previous bullet it is suggested to explicitly assess the issue of extreme events. Key climate changes refer those of the physical climate, as well as of both natural and human systems and their interactions. The bullet includes the assessment of adaptive capacity and limits in natural and human systems.

Regarding the assessments recommended in both second and third bullets, the discussion concluded that providing them in such integrated framework will facilitate the communication and understanding. There was concern about the large amount of the physical, natural and human information that such assessments include and thus the challenge to prioritize the key aspects. In particular, the discussion suggested the use of case studies to facilitate and complement the assessment. Case studies can be selected according to either both ecological and geographical aspects.

The fourth bullet focuses on assessing the avoided impacts and reduced risks at 1.5°C compared to 2°C and higher as relevant. It will be necessary to consider the possible extent of these differences and whether the temporal and spatial scales of impacts at 1.5°C can reliably be distinguished from those at 2°C.

The fifth bullet relates to timeframe, slow versus rapid onset[1] of impacts of 1.5°C, their irreversibility and the potential of tipping points.

The sixth bullet addresses the implications of different mitigation pathways for reaching 1.5°C for impacts, vulnerability and adaptation. It includes also the consequences of potential overshoot.

CHAPTER 4: Strengthening the global response to the threat of climate change

Summarized by Aromar Revi and Frank Geels

- Assessing current and emerging adaptation and mitigation options and associated opportunities and challenges
- The pace of the development and deployment of mitigation and adaptation options compared to pathways consistent with sustainable development and 1.5°C

[1] Slow onset events include sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, loss of biodiversity and desertification (Decision 1/CP.16. paragraph 25, footnote 3). A rapid onset event may be a single, discrete event that occurs in a matter of days or even hours, as defined by UNFCCC (FCCC/TP/2012/7).

- The potential and capacity for development and deployment of adaptation and mitigation responses to accelerate transitions and strengthen the global response to the threat of climate change within and across relevant scales and systems
- Challenges to and opportunities from strengthened response options (e.g. current & future lock in, adaptive mitigation, consumption and production, negative emissions, food production, socio-economic); synergies and trade-offs among adaptation & mitigation options

This chapter is aimed at identifying high-priority opportunities and assessing the set of current and emerging options for limiting warming to 1.5^{o}C and adaptation options related to that level of warming. It will limit its assessment to opportunities in alignment with strengthening the global response to climate change consistent with 1.5^{o}C warming. In doing so, it provides a logical link between: an assessment of 1.5^{o}C compatible mitigation and sustainable development pathways (Ch.2); the potential and avoided impacts of 1.5^{o}C warming on human and natural systems (Ch.3); and options for implementation (Ch.5). It seeks to identify systemic processes and factors that can enable accelerated transitions to 'bend the curve' towards global and regional climate-resilient development pathways and their consequent synergy with poverty eradication, reducing inequality and sustainable development (Ch. 5).

Like other chapters, this chapter will build on and go beyond AR5, with an assessment of the pace of development and deployment of emerging and current supply-side (e.g. renewables and negative emissions) and demand-side (e.g. energy efficiency, behaviour change, demand modification) mitigation response options that are consistent with 1.5^{o}C warming and sustainable development pathways. It will do so within and across key systems (e.g. energy, urban and regional, transport); at global, regional and local levels; and across various stakeholders, agents and coalitions. This will enable the identification of technological, economic and financial, governance, institutional and policy, social and no-cost, and environmental barriers, challenges, opportunities and co-benefits with sustainable development to strengthen the global response to climate change. It will also attempt to address relevant lock-in, sustainable consumption and production and food production concerns.

The chapter will also assess the pace of development and deployment of regional and global adaptation options in the context of: the dynamics of 1.5^{o}C consistent mitigation pathways - their potential uncertainty, transience, overshoot and stabilisation; exposure and vulnerability and known adaptation potential and limits. It will do so across key systems, levels and stakeholders. This will enable the identification of technological, economic and financial, governance, institutional and policy, social and no-cost, and environmental barriers, challenges, opportunities and co-benefits with sustainable development - to accelerate transformative adaptation and adaptive mitigation.

It will also examine the potential synergy and trade-off between 1.5^{o}C consistent mitigation and adaptation options and their potential to constrain or strengthen the global response to climate change. In summary, it provides the bridge between 1.5^{o}C impacts, emission and mitigation pathways and approaches to implementation and convergence with sustainable development.

CHAPTER 5: Approaches to implementing a strengthened global response to the threat of climate change

Summarized by Bronwyn Hayward and Joyashree Roy

The principal rationale for this chapter is to gather and assess the best available policy relevant knowledge from the available literature, including existing options and case studies, on what is known about the methods and approaches to implementation of possible mitigation and adaptation options, consistent with a strengthened global response to limit warming to 1.5^{o}C

above pre-industrial levels and related global greenhouse gas emission pathways, in the context of sustainable development and efforts to eradicate poverty. The chapter thus follows logically on an assessment of possible emissions pathways (Chapter 2), potential impacts of 1.5°C warming (Chapter 3), and the identification of priority mitigation and adaptation opportunities (Chapter 4) that could limit warming to 1.5°C. This chapter then would focus on existing mechanisms and on what is known about potential alternative implementation options and approaches through which the strengthened global response could be realized. To the extent the available literature allows, the chapter should assess how possible implementation approaches would impact the achievement of near-term (through 2030) sustainable development targets, and affect sustainable development pathways beyond 2030.

Drawing primarily on policy-related literature, the first bullet implies that this chapter examine the extent to which policy mechanisms, tools and approaches currently already deployed achieve emission reductions and meet adaptation needs consistent with warming kept to 1.5°C and assess current understanding of the opportunities and challenges associated with emerging and established adaptation and mitigation methods and approaches.

The second bullet is intended to go beyond already deployed, codified policy mechanisms, and look across relevant bodies of social science literature (e.g., policy sciences as well as behavioral, psychological, anthropological, economic, geographical, technology-focused disciplines and related fields) and published reports of practical experience to identify and critically assess the capacity, opportunity, costs and challenges associated with other ways to implement rapid and/or deep social changes consistent with the potential impacts of and emissions pathways to 1.5°C. The chapter should explore

- The role of various societal actors at different scales (individual, local, regional, national, global) and across levels of governance (incl. international cooperation)
- The opportunities and challenges with integration (e.g. private, government, civil society, partnerships, cross-sector)
- The range and design of possible tools, actions, processes, and programs available for implementing a strengthened global response
- The pace of the development and deployment of possible implementation mechanisms, including capacity needs, and the potential for acceleration and learning
- The possibilities of achieving far-reaching, equitable and sustained change through inclusive mobilization, social acceptance, and transparency
- The elements of a conducive enabling environment (e.g. social, educational, financial, institutional factors, the media); including synergies and trade-offs among adaptation & mitigation options

What is known about the opportunities for effective implementation of far-reaching and rapid change initiatives must be placed in the context of what is known about the potential implications of undertaking such initiatives, including the social, ecological, economic implications. The chapter should clearly articulate and assess the challenges involved in realizing a strengthened global response, including the challenges of reconciling near-term priorities and longer-term implications, as well as dealing with trade-offs.

The last bullet points to a critical need for this chapter: to illustrate with case examples from across the world, what policy-relevant (not policy-prescriptive) lessons have been learned about how to implement change initiatives and knowledge about whether these options can be implemented rapidly and how they have been brought to scale. While critically assessing what is possible, based on the available evidence, the chapter should respond to the communicative need for examples of successful implementation of change initiatives, providing evidence of context-sensitive, diverse approaches taken across different contexts. Discussants were of the

view that there is no “one size fits all” approach to implementing initiatives that – cumulatively – constitute the strengthened global response.

In order to contain this chapter, authors should focus on the options, challenges, trade-offs and potential synergies of implementing mitigation and adaptation options closely associated with the potential impacts of and mitigation pathways to 1.5°C and other sustainability goals.

CHAPTER 6: Sustainable development, poverty eradication and reducing inequalities

Summarized by Guy Midgley and Petra Tschakert

- Linkages between achieving SDGs and 1.5°C
- Equity and ethical dimensions
- Opportunities, challenges, risks, and trade-offs
- Positive and negative impacts of adaptation and mitigation measures including response measures and strategies, economic diversification, livelihoods, food security, cities, ecosystems, technologies
- Knowledge and experience from local to global, including case studies and integrated planning as relevant to aforementioned bullets
- Climate-resilient development pathways

The first bullet explores the multidimensional linkages between the 17 Sustainable Development Goals (SDGs) (169 targets, minus the ones specific to SDG 13) and keeping the global warming to 1.5°C, including both small and significant as well as positive and negative impacts on the SDGs. The group proposed guiding authors to develop a comprehensive table or matrix that could illustrate the synergies and trade-offs between the two goals (e.g. some SDGs would be enhanced while others are likely to become more difficult to achieve for pathways compatible with 1.5°C warming). This table could also encompass a regional approach. The group drew attention to the different timelines of the goals and proposed to consult the Zero Poverty – Zero Emissions report that attempted a similar comparison.

The second bullet draws attention to the ethical and equity dimensions of efforts to limit warming to 1.5°C. This includes the potential erosion of a country’s right to development, especially from the perspective of Least Developed Countries (LDCs). The group agreed that it would be essential to synthesize other emerging dimensions on ethics and equity from the preceding chapters of the Special Report (SR). The group underscored the importance of equity as a goal that indeed can be reached, in contrast to equality which is likely to remain elusive.

The third bullet examines opportunities, challenges, risks, and trade-offs between limiting global warming to 1.5°C on the one hand and pursuing sustainable development and efforts to eradicate poverty on the other hand, while also reducing inequalities. The group drew attention to the different development pathways that individual countries and regions were pursuing, including different starting points as well as going in different directions, at a different pace, with distinct modes of development as overarching guidelines.

The fourth bullet examines specifically positive and negative impacts of climate policies and other measures for mitigation and adaptation. The group discussed various areas of major importance and opted for those now listed under the proposed bullet point (with ‘response measures and strategies’ added in the plenary), although these are not meant to be exclusive. The proposed areas are most likely to have relevant literature.

The fifth bullet is to be seen as a methodological priority. Multiple types of knowledge and (lived) experiences across all scales will need to be taken into account to adequately address the two previous bullets. The type of evidence to be considered here includes ‘bottom-up knowledge’

(ways of knowing) but is not limited to it. Much evidence will be contained in case studies, from local to regional and global, as well as integrated planning efforts.

The last bullet closes the arc that the SR opens in Chapter 1 and lays out options and barriers for climate-resilient development pathways.

9. TIME SCHEDULE

A call for nominations of Coordinating Lead Authors, Lead Authors and Review Editors will be issued after the 44th Session of the IPCC in October 2016. Approval and acceptance of the Special Report is planned for the 48th Session of the IPCC in September 2018. In order to achieve this, the timetable for the Special Report is as follows:

31 October - 27 November 2016	Call for author nominations
29 January 2017	Selection of authors
6-12 March 2017	1st Lead Author Meeting
5-11 June 2017	2nd Lead Author Meeting
31 July - 24 September 2017	First Order Draft Expert Review
23-29 October 2017	3rd Lead Author Meeting
5 January - 25 February 2018	Second Order Draft Expert and Government Review
9-15 April 2018	4th Lead Author Meeting
4 June - 29 July 2018	Final Government Review of Summary for Policymakers (SPM)
24-30 September 2018	IPCC acceptance/adoption/approval

ANNEX 1

Steering Committee for the scoping of the Special Report on "The impacts of global warming of 1.5 ºC above pre-industrial levels and related global greenhouse gas emission pathways in the context of strengthening the global response to the threat of climate change, sustainable development and efforts to eradicate poverty" (SR 1.5)

Introduction

In Paragraph 2 of Decision IPCC/XLIII-6 on the Sixth Assessment Report (AR6) Products - Special Reports- the Panel decided that:

> "In the context of the Paris Agreement, to accept the invitation from the UNFCCC to provide a special report in 2018 on the impacts of global warming of 1.5 ºC above pre-industrial levels and related global greenhouse gas emission pathways, and decides to prepare a Special Report on this topic in the context of strengthening the global response to the threat of climate change, sustainable development and efforts to eradicate poverty"

The Special Report will be developed under the joint scientific leadership of Working Groups I, II and III with support from WGI TSU.

The Chair of the IPCC herein establishes a Steering Committee to undertake the scoping of the special report with the following composition and mandate:

Composition of the Steering Committee:

- Ms. Thelma Krug (Vice-Chair of IPCC)
- Ms. Valerie Masson-Delmotte (Co-chair of Working Group I)
- Mr. Panmao Zhai (Co-chair of Working Group I)
- Mr. Hans-Otto Portner (Co-chair of Working Group II)
- Ms. Debra Roberts (Co-chair of Working Group II)
- Mr. Jim Skea (Co-chair of Working Group III)
- Mr. Priyadarshi Shukla (Co-chair of Working Group III)
- Mr. Kiyoto Tanabe (Co-chair of TFB)
- Mr. Eduardo Calvo (Co-chair of TFB)

The Steering Committee may invite additional members after consultations with leading scientific bodies[2]

The Steering Committee will be chaired by Ms. Thelma Krug.

[2] Ms. Marie-Hélène Parizeau and Ms. Susanne Moser participated as additional members of the Steering Committee

Mandate

1. To propose by 24 June a list of experts to be invited to participate in the Scoping Meeting to be held on 15-18 August 2016 in Geneva to be submitted to the Bureau(x) for decision. This proposal should be prepared on the basis of nominations received from member States, observer organizations and members of the Bureau.

2. To prepare the draft agenda for the Scoping Meeting to be held on 15-18 August 2016.

3. To prepare the necessary documentation to inform the Scoping Meeting.

4. To prepare a document with the outcomes of the Scoping Meeting to be transmitted, through the Secretariat, to the 52nd Session of the Bureau and the 44th Session of the IPCC for their consideration.

*****

ANNEX 2

Report on scoping meeting participant selection process

Objective

The objective of the selection process was to select around 80 experts considering all criteria as stated in Appendix A of Principles Governing IPCC Work:

"In selecting scoping meeting participants, consideration should be given to the following criteria: scientific, technical and socio-economic expertise, including the range of views; geographical representation; a mixture of experts with and without previous experience in IPCC; gender balance; experts with a background from relevant stakeholder and user groups, including governments."

Timeline

The following timeline was implemented for the selection process:

All times are in Central European Time. SOB - Start of Business = 08hr, COB - Close of Business = 19hr

Deadline	Task	Responsible
Friday 20 May (left open over weekend)	Nomination submissions	Secretariat
COB Monday 23 May	Nominations compiled and sent to WGI TSU	Secretariat
Tuesday 24 May	Formatted xls sheet sent to WG Bureau Members with instructions	WG1 TSU
COB Friday 3 June	First Round Rankings (1,2) due back to WGI TSU (including any additional nomination xls form and CVs from WG Bureau Members)	WG Bureau Members
COB Tuesday 7 June	'Long List' generated based on the rankings and sent out to WG Bureau Members for second round ranking	WGI TSU
20:00 CET Sunday 12 June	Second Round Rankings on the 'Long List' due back to WGI TSU	WG Bureau Members
COB Wednesday 15 June	Revised 'Long List' generated based on the narrowed rankings with info on gaps/overlaps to SSC	WGI TSU
Thursday 16 June	WebEx Telecon for SSC to discuss specific gaps, overlaps and pre-selection	SSC, WGI TSU
Friday 17 June	Short List sent to WG Bureau Members	WGI TSU
SOB Wednesday 22 June	Feedback on Short List due to WGI TSU	WG Bureau Members
Friday 23 June	SSC WebEx Telecon / In-person meeting to finalize selection	SSC, WGI TSU
COB Friday 24 June	Final List sent to WG Bureau for final review	WGI TSU
SOB Monday 27 June	Comments (if any) due to WGI TSU	WG Bureau Members

Monday 27 June	Final adjustments if needed	WG Co-Chairs
SOB Tuesday 28 June	Final List sent to SSC	WGI TSU
Thursday 30 June	Invitations sent to selected participants	Secretariat

Nominations

610 nominations were received (19 were nominated by more than one organization), corresponding to a total of 589 experts. Citizens coming from developing countries represented 45% of applications; women represented 27% of applications. 86 National Focal Points participated to the nomination process, nominating 439 experts from 87 citizenships; 171 experts from 24 different citizenships were nominated by 39 Observer Organizations.

Figure 1 illustrates the geographical distribution of nominations and Figure 2 illustrates the sectorial distribution of nominators.

Figure 1 - geographical distribution of nominations

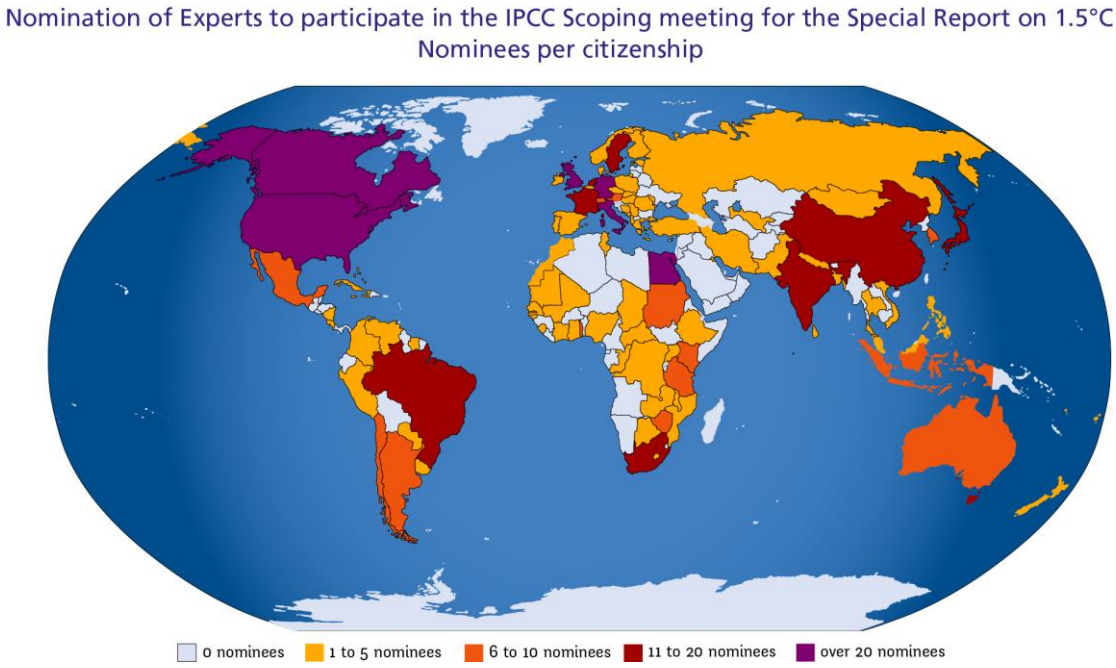
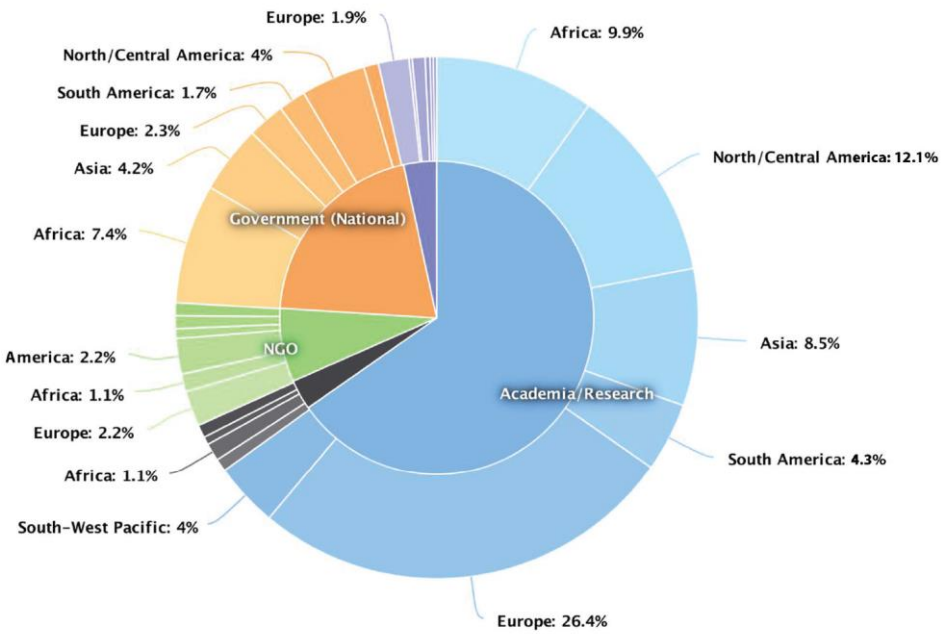


Figure 2 - sectorial distribution of nominators



Selection Process - Part 1

- Each WG Bureau Member was asked to provide a 'ranking' with particular attention to nominations from their region, considering all criteria as stated in Appendix A of Principles Governing IPCC Work:

  "In selecting scoping meeting participants, consideration should be given to the following criteria: scientific, technical and socio-economic expertise, including the range of views; geographical representation; a mixture of experts with and without previous experience in IPCC; gender balance; experts with a background from relevant stakeholder and user groups, including governments."

- It was noted that the ranking undertaken by each WG Bureau Member was not restricted to their own WG topics or areas of direct expertise. The need to seek 'big thinkers' that could cut across the WGs, bringing inter-disciplinarily and vision was very much emphasized;
- Each WG Bureau Member was asked to consider the nominations carefully and to provide up a maximum of 30 selections. Using a rank of '1' to indicate a 'high priority', and a rank of '2' to indicate a 'secondary priority'. There was purposely no '3' or 'low priority' as the intention was not to produce a 'hierarchical ranking'.
  The 'ranking' was intended as a way to identify overlaps and agreement across the selections undertaken by all the WG Bureau Members;
- Each Member could also provide optional 'Comments' to make note of additional details not captured in the nomination that would be useful for others to consider;
- WG Bureau Members could suggest nominations at this stage in case key gaps were identified.

Construction of the Long List

- All the input (rankings and comments) received from the WG Bureau members was entered in the Excel sheet (anonymity was preserved);
- A score was calculated for each nomination based on the following calculation: a rank of "1" was equivalent to 3 points and a rank of "2" was equivalent to 1 point;
- All the candidates that obtained at least 1 point were part of the long list;
- Two additional nominations, submitted by WG Bureau Members during the ranking process, were added;
- For easier readability, a column "areas of expertise" was added with key words summarized the areas of expertise that each candidate had ticked;
- The original full suite of nominations as well as a statistical analysis showing the balance of the various criteria were supplied for reference;

Two analyses were provided - one of the Long List of 378 nominees, the second of the 82 top scoring nominees (score of 7 or above). The latter was a glance of what the list of participants could be if selected purely based on the ranking score (82 to include all those with a score of 7).

Overall there was good balance, particularly in terms of gender and between developed and developing country nominees. Some imbalance that could be addressed in this second phase of selection were:

- Oversubscribed areas of expertise: adaptation/mitigation costs and mitigation;
- Need to improve gender balance;
- Need to improve geographical imbalance (noting that the balance degraded for Asia and Africa when looking at the top 82 scoring nominees;

Selection Process - Part 2

The objective of this stage was to refine and optimize the Long List to aid the pre-selection of the Short List by the SSC for consideration by the WG Bureau Members in the next stage of the selection process. The WG Bureau Members were asked to assign five ranks of '1' indicating a high priority, and five ranks of '2' indicating secondary priority and to carefully consider their ranking allocations towards achieving balance across all selection criteria.

WG Bureau Members were asked to include where appropriate clear comments articulating their choices and views as this would help the Scientific Steering Committee pre-select the Short List (examples: wish to highlight a nominee that was less well known among Bureau Members, who had a lower score, but could be a key participant for the scoping meeting, any reservations on nominees with higher scores, wish to highlight the need to consider a nominee who was not in the Long List, looking back at the Full List of nominations).

Construction of the Revised Long List

- All the input (rankings and comments) received from the Bureau members was assembled into an updated nominations spreadsheet. All comments received since the beginning of the selection were grouped in one column;
- The original full suite of nominations as well as the previous Long List were provided for reference as separate tabs;
- A score was calculated for each ranking: a rank of "1" (high priority) was equivalent to a score of 3 and a rank of "2" (secondary priority) was equivalent to a score of 1;

- All the candidates that obtained at least 1 point during this second round were part of the Revised Long List bringing the list to 149 names;
- Candidates who had received a score above 4 (56 names) were highlighted in colour;
- All the candidates that did not score during this second round were not included in the Revised Long List but nonetheless were retained in the lower part of the table for reference;
- Cases where the geographical balance was altered if considering the nominee's "citizenship" or "country of residence" were highlighted for reference (for twenty experts, the nominee's "citizenship" was different from his "country of residence" and, in seven cases, this difference had an impact on geographical balance).

Selection Process - Part 3

The Revised Long List was sent to the SSC members with a statistical analysis showing the balance of the various criteria. The SSC Members considered all those on the Revised Long List of equal priority for WG Bureau Members, not just focusing on those with highest scores. To facilitate the selection of 80 or so nominees, SSC members were asked to identify priority candidates. The aim was to achieve a balance within and across WGs and the SSC as a whole in expertise and across all other selection criteria.

SSC members were requested to provide comments detailing their selections. If necessary, nominees from the Total List could be re-proposed.

Construction of the Preliminary Short List

- All the input (selection, discussions and comments) received from the SSC were assembled in the updated spreadsheet and a discussion was facilitated on balance in areas of expertise, including attention on the impact to the overall balance when further modifications to the list were suggested;
- The Preliminary Short List consisted 67 names (62 coming from the Revised Long List and five re-selected from previous selection iterations);
- The preliminary Short List was not based on the number of ranks received by nominees in the Revised Long List, rather on the collective expert judgment of the SSC to achieve balance across the selection criteria (expertise, gender, geography, institutional) and to address issues of overlap or gaps.
- Areas discussed by the SSC as needing particular attention included the need to address gaps in expertise (e.g. oceanography and modes of climate variability), addressing the recommendation by the IPCC to enhance the integration of urban issues, achieving a balance in participants with high IPCC experience with those bringing renewal, avoiding multiple representatives of the same institution, and the inclusion of stakeholders. The SSC also considered the expertise and institutional memory that will be provided by the Bureau itself and members of the ExCom that will be present at the meeting.
- The original full suite of nominations as well as all the previous Lists were provided for reference as separate tabs;

Selection Process - Part 4

The Preliminary Short List was sent to the all WG Bureau Members for the final phase of the selection of participants. The priority was to fine tune the selection where needed to address any remaining critical issues of overlap or gaps and imbalance in selection criteria. They were requested, to the extent that this was possible, to propose any further changes to the list as substitutions.

Gender balance decreased in this stage of the selection process. WG Bureau Members were requested to give particular attention to this criterion in the final stage of selection. The analysis showed an increase in the proportion of participants with previous IPCC experience. The balance across regions remained steady and reflected the original distribution in nominations.

Construction of the Revised Short List

- WG Bureau Members provided feedback and the SSC worked to address all the concerns and suggestions, to integrate these into a Revised Short List, all the while having to ensure balance across the list as a whole, the areas of expertise, and balance of all selection criteria;
- All gaps, overlaps and criteria were discussed and addressed to the extent possible;
- An additional nomination was proposed by the SSC Chair to address a gap in expertise;

Selection Process - Part 5

The Revised Short List was sent to all WG Bureau Members asking them to raise any final critical issues, considering the need to avoid changing the overall balance of the list at this late stage. Any proposed changes were asked to be suggested as substitutions with a clear motivation.

Short List

The Short List (78 names) was agreed on 29 June 2016 and invitations sent on 30 June 2016 by the Secretariat. A reserve list was maintained in case invitations were declined.

The Executive Committee discussed how to improve the balance among experts to be invited to the scoping meeting regarding scientific, technical and socio-economic expertise; geographical representation; a mixture of experts with and without previous experience in IPCC; gender balance; and experts with a background from various stakeholder and user groups. The Executive Committee also discussed how to enhance the participation of experts from developing countries, mindful that the IPCC budget would allow providing travelling support to up to 50 experts from developing countries and countries with economies in transition.

The Executive Committee agreed that the Steering Committee should make recommendations to the WG Bureaus in these regards. The SSC and WG Bureau Members agreed to include in the List of Participants eight additional nominees that had been on the reserve list. Three invited participants declined the invitation and were replaced according to the expertise gap that resulted. The Participant List (86 names) was finalized on 20 July 2016.

Five invited experts (2 from developing countries / 3 from developed countries - 1 female / 4 males) did not attend the scoping meeting. They could not be replaced because of their late cancellation (4 persons) and no show (1 person).

Analysis of the Participant List

86 participants were selected for the Final List taking into account expertise and all criteria as stated in Appendix A of Principles Governing IPCC Work.

- 33% of the selected experts are women, an increased balance relative to the full Nominations List.
- Experts coming from developing countries represented 51% of the total selected participants, whereas they represented 45% of the full Nomination List.

- All regions are covered in proportions consistent with the full Nomination List.
- 46 nationalities (citizenship) were represented. The Nomination List included 99 citizenships, though with over 71% of the nominations coming from 25 countries.
- All areas of expertise are represented. The areas of expertise with the least number of experts are “Climate Processes, Non-linearities, Sensitivity And Feedbacks” and “Short And Long Term Impacts Of Different Stabilization Levels, Including Notion Of Irreversibility”. The area of expertise with the most number of representatives is “Climate Change Mitigation And Sustainable Development Including Co-benefits And Risks, Equity, Poverty Eradication And Food Security”. This distribution is consistent with the distribution of experts in the full Nominations List.
- Over 70% of experts come from the academic/research sector, which was also the most represented sector in the Nomination List (over 65%). 17.6% come from the “Government” sector (24% of the Nomination List), 6,6% from NGO’s (they represented 7.6% of the Nomination List) and 3.3% from the Private sector and Industry (they represented 3.1% of the Nomination List).

The evolution of the balance of all criteria throughout the selection process has been monitored throughout, as shown in Figures 3-6. Finally, Table 1 provides the list of break down by country of the nominations, list of participants, and overall list of attendees of the scoping meeting, including Bureau Members and SSC.

Figure 3 - Gender Balance throughout the selection process

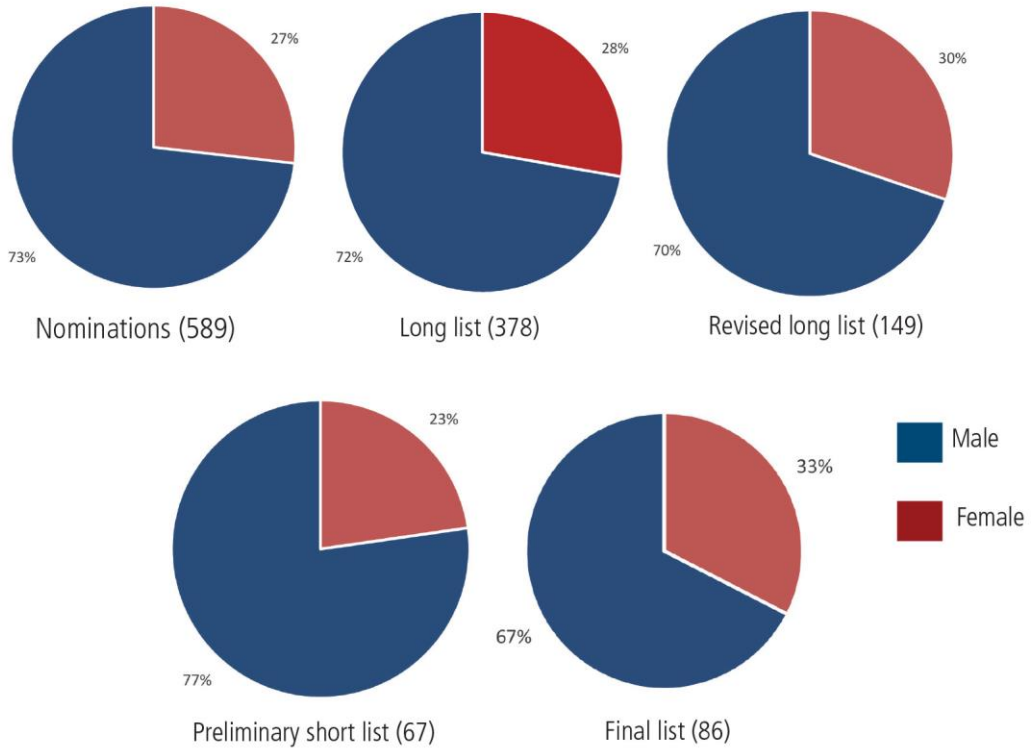


Figure 4 - Balance in nominees from developed and developing countries (and economies in transition)

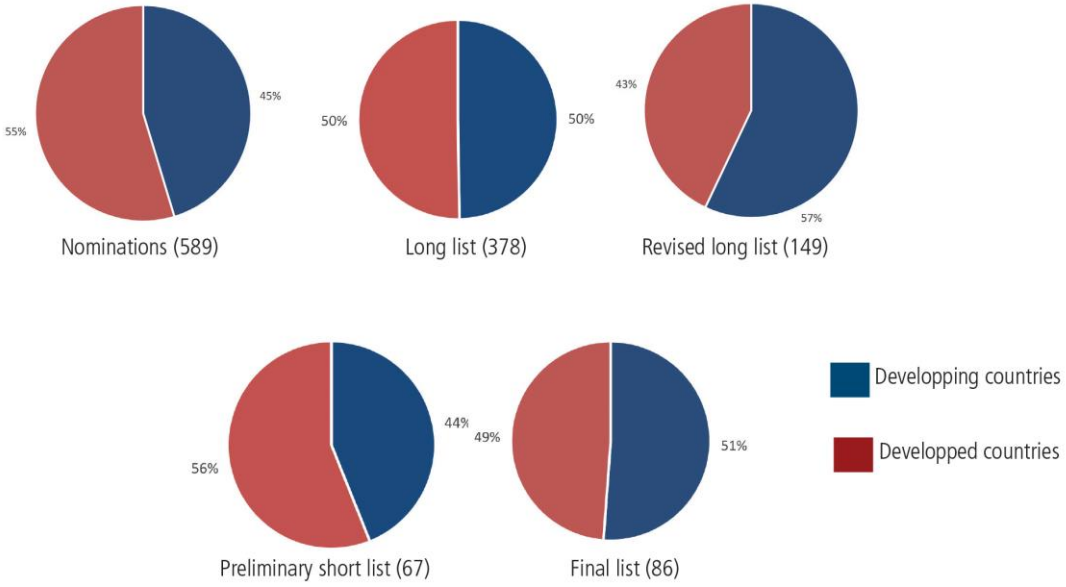


Figure 5 - Distribution of nominees across regions (based on citizenship)

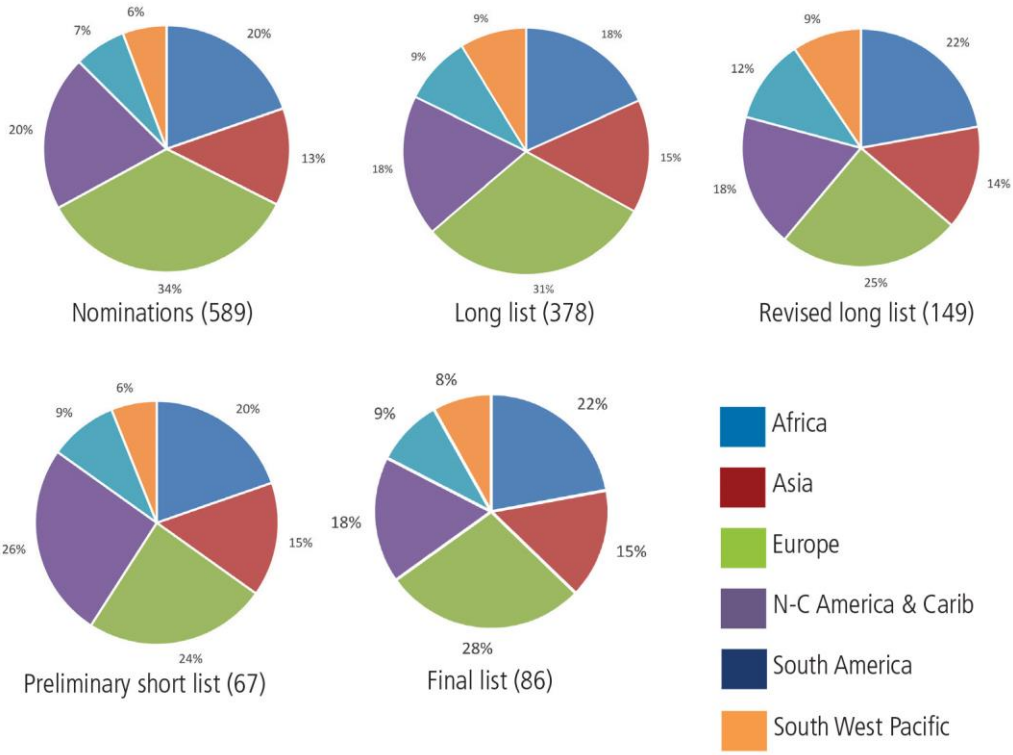


Figure 6 - Previous IPCC experience of nominees

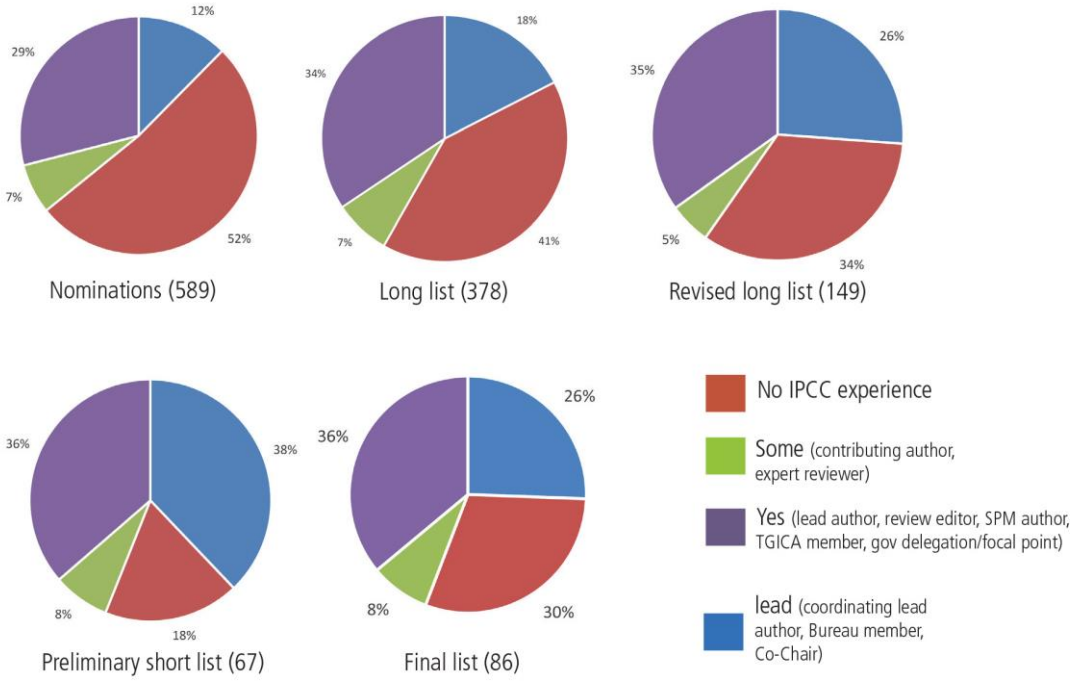


Table 1 - Country distribution of nominees and scoping meeting participants

	NOMINATIONS		FINAL LIST		BUREAU/SSC	TOTAL PARTICIPANTS
	QTY Citizenship	% of total nominations	QTY Citizenship	% of total nominations	QTY Citizenship	Final list + Bureau / SSC members
Algeria					1	1
Botswana	2		1			1
Central African Republic	1					0
Chad	2					0
Congo	3					0
Cote d'Ivoire	1					0
Democratic Republic of the Congo	2					0
Egypt	22		2			2
Ethiopia	3		1		1	2
Gambia	1		1			1
Ghana	5		1			1
Guinea Bissau	1					0
Kenya	6		1			1
Lesotho	1					0
Malawi	5					0
Mali	1				1	1
Mauritius	1					0
Morocco	4		1		1	2
Mozambique	2					0
Nigeria	5		1			1
Senegal	4		1			1
Sierra Leone	1					0
South Africa	12		4		1	5
Sudan	5		2		1	3
Togo	7					0
Tunisia	3					0
Uganda	2		1			1
United Republic of Tanzania	5				1	1
Zambia	2					0
Zimbabwe	7		2			2
AFRICA	**116**	**20%**	**19**	**22%**	**7**	**26**
Bangladesh	1		1			1
China	11		3		1	4
India	11		2		1	3
Iran	5					0
Japan	17		3		1	4
Kuwait	2					0
Maldives	1		1		1	2
Mongolia	1					0
Nepal	4					0
Pakistan	4		1		1	2
Republic of Korea	10		1		1	2
Saudia Arabia					1	1
Sri Lanka	1		1			1
Thailand	1					0
Turkey	4					0
Uzbekistan	1					0
Vietnam	1					0
ASIA	**75**	**13%**	**13**	**15%**	**7**	**20**
Albania	2					0
Austria	6		2			2
Belgium	2		1			1
Bosnia and Herzegovina	2					0
Czech Republic	1					0

	NOMINATIONS		FINAL LIST		BUREAU/SSC	TOTAL PARTICIPANTS
	QTY Citizenship	% of total nominations	QTY Citizenship	% of total nominations	QTY Citizenship	Final list + Bureau / SSC members
Denmark	3		1			1
Estonia	4					0
Finland	4					0
France	18		3		1	4
Germany	50		6		1	7
Greece	4					0
Hungary	2				1	1
Ireland	2					0
Italy	24		1		1	2
Montenegro	1					0
Netherlands	11		1			1
Norway	3		1		1	2
Poland	2					0
Portugal	1					0
Republic of Moldova	1					0
Romania	2		1			1
Russian Federation	2		1		1	2
Serbia	1					0
Slovakia	1					0
Spain	4					0
Sweden	11					0
Switzerland	9		1		1	2
United Kingdom	31		5		1	6
EUROPE	**204**	**35%**	**24**	**28%**	**8**	**32**
Bahamas	1		1			1
Canada	22		3		2	5
Costa Rica	3					0
Cuba	2				1	1
Haiti	2					0
Jamaica	2					0
Mexico	6				1	1
Nicaragua	1					0
United States of America	81		11		2	13
NORTH AMERICA - CENTRAL AND CARIB	**120**	**20%**	**15**	**17%**	**6**	**21**
Argentina	10		2		1	3
Brazil	11		2		1	3
Chile	8		2			2
Colombia	1					0
Paraguay	1					0
Peru	1		1		1	2
Suriname	4					0
Uruguay	2		1			1
Venezuela	2				1	1
SOUTH AMERICA	**40**	**7%**	**8**	**9%**	**4**	**12**
Australia	8		1		1	2
Fiji	1		1			1
Indonesia	9				1	1
Malaysia	4		1		1	2
New Zealand	3		2		1	3
Philippines	4		2			2
Singapore	4					0
Tonga	1					0
SOUTH WEST PACIFIC	**34**	**6%**	**7**	**8%**	**4**	**11**
Total général	**589**		**86**		**36**	**122**

ANNEX 3

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ANNEX 4

Summary of responses to the pre-scoping questionnaire

1. Analysis

- The analysis of responses received of the pre-scoping questionnaire was undertaken by triangulating the questionnaire responses through clustering areas of interest, identification of topics and common patterns, emerging trends, and measuring the frequency of requests.
- Topics of interest were catalogued and counted using a quasi-objective approach.
- The analysis of findings was conducted by splitting the global sample size population into six main categories including institutional responses, individual responses, focal points, observer organisations, developing countries, and developed countries.

2. Report Content

2.1. Question: "In your vision, which are the main, relevant elements that could be addressed in the Special Report?"

Globally, the responses were dominated by the following topics:

- differential impacts;
- emission and mitigation pathways;
- regional aspects;
- improved understanding and knowledge review;
- adaptation;
- cost-benefit analysis;
- climate extremes;
- feasibility of 1.5°C global warming above pre-industrial levels;
- sectorial impacts;
- sustainable development;
- avoided impacts

There was some agreement between developing and developed countries that a priority issue is to assess differential impacts across different levels of warming. Developing countries prioritised regional aspects, mitigation and sectorial impacts, while, developed countries identified in particular interest in emission pathways and avoided impacts.

Some contributions from national governments, academia and institutions stress the need to discuss options for geoengineering, especially BECCS (Bioenergy with Carbon Capture and Storage) that would be affordable and estimate the feasibility and horizon for availability.

In addition, responses from the academic population identified the following issues:

- Assessing the timescales for dangerous climate change and accounting for areas of unharnessed mitigation potential for limiting global temperature warming to 1.5°C.
- Providing paleoclimate perspectives in assessing the avoided impact under different global temperature targets

2.2 Emerging scientific questions

Priority scientific questions raised by the respondents includes:

- What local-to-regional, sectorial and socio-economic impacts are avoided with limiting global temperature warming to 1.5^{o}C?
- What is the adequacy of research attempting to quantify the differential impacts of 1.5^{o}C, 2^{o}C and beyond global temperature targets, taking into account the

contribution of short-lived climate pollutants (black carbon, methane, hydrofluorocarbon, and ozone)?
- What development and emissions pathways (including with/without negative emissions and/or overshoots) are consistent with limiting the rise in global mean surface temperature to no more than 1.5^{o}C?
- Feasibility of the 1.5^{o}C temperature rise limit and implications for adaptation strategies, emission pathways, mitigation pathways and sustainable development goals (SDGs)?

2.3 Question: "In your view, which sectors would you deem relevant to be addressed in the report? Please prioritize your choices (maximum 300 characters)"

The sectorial interest varies across categories of the population, but a strong demand is directed toward the following sectors:

- Energy;
- Agriculture and food security;
- Water;
- Transport;
- Health.

While there was broad agreement across the different categories of the respondents' population, developed countries and academia also identified interest for the transport sector.

2.4 Question: "Which stakeholder challenges or decision contexts is this Special Report relevant for? Please rate (low, lower, medium, high priority) each of the following key words:

The decision-making context of those who responded to the questionnaire spans a wide range of issues. Priority areas are sustainable development, adaptation and mitigation, disasters and risks, and increasing resilience.

2.5 Question: "How do you expect this special report be used and what is its expected impact for your institution and/or field of expertise? (Maximum 600 characters)"

The special report is expected to provide the scientific foundation to:
- inform climate policies, programs, and services as well as adaptation & mitigation decision-making;
- raise awareness of impacts and ability to assess vulnerability of sectors, regions and populations;
- enhance adaptive capacity and resilience

3. Format of the special report

3.1. Question: "Please provide your suggestions for the format of the Special Report)?"

The majority of questionnaire responses underline the need for limiting the report size to 5 chapters and 200-300 pages. A few observer organisations and NGOs favour instead a report of larger size with 6 to 8 chapters.

3.2. Appendix and technical summary

For the appendix section, the dominant request is to include a description of methodologies and datasets, and a discussion of case studies. The technical summary should need to be small in size, written in technical but clear language, and highlight key findings.

The Summary for Policy-Makers and Frequently Asked Questions are perceived by the majority of respondents as critical components of the Special Report that should be concise and, for example, follow the format used in the IPCC Fifth Assessment Report.

ANNEX 5

Scoping Meeting Agenda

Day 0: Sunday 14 August

13:00 – 18:00 Registration *(Registration desk)*
15:00 – 17:00 SSC meeting *(Salle C2)*

Day 1: Monday 15 August

8:00 - onwards	Registration

09:00 - 10:00 Opening Session *(Salle Obasi)*
Chair: Youba Sokona
Rapporteur: Anna Pirani

09:00 - 09:10	Welcome Remarks	Hoesung Lee (Chair, IPCC)
09:10 - 09:20	Welcome Remarks	Elena Manaenkova (Deputy Secretary-General, WMO)
09:20 - 09:30	Role of IPCC	Abdalah Mokssit (Secretary, IPCC)
09:30 - 09:40	UNFCCC	Florin Vladu (UNFCCC)
09:40 - 09:50	Vision and Objectives	Thelma Krug (Chair Scientific Steering Committee - SSC)
09:50 - 10:00	Q&A	

10:00 - 10:30	Coffee Break - Photo

10:30 - 13:30 Plenary: Scene Setting Presentations *(Salle Obasi)*
Chair: Thelma Krug
Rapporteur: Renée van Diemen

Track 1: Global greenhouse gas emission pathways and impacts of global warming of 1.5°C above pre-industrial levels

Changes in the Earth system and response to perturbations of the Earth's energy balance

10:30 - 10:45 Dahe Qin (China)
10:45 - 11:00 Sonia Seneviratne (Switzerland)

Impacts on ecosystems and human systems: attributing risks, avoided risks

11:00 - 11:15 Carl-Friedrich Schleussner (Germany)
11:15 - 11:30 Pauline Dube (Botswana)

Track 2: Global warming of 1.5°C above pre-industrial levels in the context of strengthening the global response to the threat of climate change

Adaptation and Mitigation pathways

11:30 - 11:45 Nebojsa Nakicenovic (Austria)
11:45 - 12:00 Aromar Revi (India)

Socio-technical transitions associated with the integration of adaptation and mitigation:

12:00 - 12:15 Frank Geels (Netherlands)
12:15 - 12:30 Joyashree Roy (India)

13:00 - 14:30 Lunch

Track 3: Impacts of global warming of 1.5°C above pre-industrial levels in the context of sustainable development, and efforts to eradicate poverty

Adaptation and mitigation in relation to sustainable development, poverty eradication and food security

14:30 - 14:45 Petra Tschakert (Australia)
14:45 - 15:00 Maria-Virgina Vilariño (Argentina)

Integrative framework for implementation pathways

15:00 - 15:15 Ioan Fazey (UK)
15:15 - 15:30 Cosmas Ochieng (Kenya)

15:30 - 16:00 Scene Setting Plenary Discussion - Background Document and Pre-Scoping, charge to participants
(Salle Obasi)
Chair: Eduardo Calvo Buendía, Hans-Otto Pörtner
Rapporteur: Melinda Tignor

Vision Document	Thelma Krug (Brazil)
Pre-scoping Exercise	Wilfran Moufouma Okia (WGI TSU, Republic of the Congo)
1.5 within AR6 package of reports	Andreas Fischlin (Switzerland)

SSC Panel Discussion and Q&A: Meeting objectives, key themes

16:00 - 16:30 Coffee Break

16:30 - 18:30 Breakout groups (BOG) Session 1
Track Discussions: each BOG split into 2 or 3 smaller sub-groups, each facilitated by a Chair, a Vice Chair and TSU staff

BOG1a: Global greenhouse gas emission pathways and impacts of global warming of 1.5°C above pre-industrial levels *(Salle Obasi and Salle Obasi + Press room + Jura 5 for sub-groups)*

BOG1b:	Global warming of 1.5°C above pre-industrial levels in the context of strengthening the global response to the threat of climate change *(Salle C1 and Salle C1 + C2 + Jura 6 for sub-groups)*
BOG1c:	Impacts of global warming of 1.5°C above pre-industrial levels in the context of sustainable development, and efforts to eradicate poverty *(Salle B and Salle B +Jura 8 + Jura 7 for sub-groups)*

18:30	End of day 1
18:30	Dinner Reception, offered by the Swiss Government *(Attique Restaurant)*

Day 2: Tuesday 16 August

08:00 - 09:00	SSC Meeting *(Room 0L08)*
09:00 - 10:30	BOG Session 1, continued Track Group discussions, merge the sub-groups into three Track groups
10:30 - 11:00	Coffee Break
11:00 - 12:30	Plenary Discussion *(Salle Obasi)* Outcomes of BOG1 - report from each Track Discussion of emerging high level structure, identifying gaps, overlaps, challenges Setting charge to BOG2 *Chair: Jim Skea, Panmao Zhai* *Rapporteur: Jeff Hardy*
12:30 - 14:00	Lunch
14:00 - 15:30	BOG Session 2 Groups structured around high level structure proposal from Plenary, each facilitated by a Chair/champion (not necessarily SSC members).
15:30 - 16:00	Coffee Break
16:00 - 18:00	BOG Session 2, continued
18:00	End of day 2

Day 3: Wednesday 17 August

08:00 - 09:00	SSC Meeting *(Room 0L08)*
09:00 - 10:30	Plenary Discussion *(Salle Obasi)* Outcomes of BOG2, proposal for report structure and charge to BOG3 *Chair: Valérie Masson-Delmotte, Priyadarshi Shukla* *Rapporteur: Wilfran Moufouma-Okia*
10:30 - 11:00	Coffee Break
11:00 - 12:30	BOG Session 3 Groups formed around Chapters, drafting of chapter structure
12:30 - 14:00	Lunch
14:00 - 15:30	BOG Session 3, continued (Participants may change groups)
15:30 - 16:00	Coffee Break
16:00 - 17:00	BOG Session 3, continued (Participants may change groups)
17:00 - 19:00	Plenary *(Salle Obasi)* Outcomes of BOG3 and discussion/resolution of outstanding issues, change to BOG4 *Chair: Debra Roberts, Kiyoto Tanabe* *Rapporteur: Elvira Poloczanska*
19:00	End of day 3
19:00 - 22:00	SSC Meeting

Day 4: Thursday 18 August

08:00 - 09:00	SSC Meeting *(Room C2)*
09:00 - 10:30	Concluding Plenary *(Salle Obasi)* Report back from BOG4, agreement on title, structure and content Final SSC Panel Discussion *Chair: Ko Barrett, Youba Sokona* *Rapporteur: Anna Pirani*
10:30 - 11:00	Coffee Break
11:00 - 12:30	Concluding Plenary, continued *(Salle Obasi)*
12:30	Meeting adjourned

ANNEX 6

Special Report Title and Outline

Options for short title

Global warming of 1.5°C/
The 1.5°C challenge/
Toward a 1.5°C world/
Global warming of 1.5°C above pre-industrial levels

Option for a full title

The IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty

Front matter

- IPCC context
    - Building on AR5
    - Assessing literature since AR5
    - Reports to come in this cycle
- Context of UNFCCC invitation
- Specificity of this report within the cycle (integration, systems- and solutions-based approach, near-term)
- Laying the foundations for the Special Report in the context of strengthening the global response to climate change, sustainable development and poverty eradication

Chapter 1:
Framing and Context

- Understanding 1.5°C; reference levels, probability, transience, overshoot, stabilization
- 1.5°C in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, with consideration for ethics and equity
- Key concepts central to understanding the report
- Building on AR5: new information, integrative approaches, response options: opportunities and challenges
- Assessment and methodologies across spatial and time scales and treatment of uncertainty
- Storyline of the report

Chapter 2:
Mitigation pathways compatible with 1.5°C in the context of sustainable development

- Methods of assessment and assumptions in the literature
- Constraints on and uncertainties in global greenhouse gas emissions and other climate drivers for limiting warming to 1.5°C
- Characteristics of mitigation and development pathways compatible with 1.5°C, compared to 2°C and higher as relevant, including short and long term, sectorial, regional, demand/supply-side; technological and socio-economic implications etc.
- Technological, environmental, institutional and socio-economic opportunities and challenges related to 1.5°C pathways

Chapter 3:
Impacts of 1.5°C global warming on natural and human systems

- Methods of assessment
- Observed and attributable global and regional climate changes and impacts and the adaptation experience
- Key global and regional climate changes, vulnerabilities, impacts, and risks at 1.5°C, including adaptation potential and limits
- Avoided impacts and reduced risks at 1.5°C compared to 2°C and higher as relevant
- Timeframe, slow vs. fast onset, irreversibility and tipping points
- Implications of different mitigation pathways for reaching 1.5°C, including potential overshoot, for impacts, adaptation and vulnerability

Chapter 4:
Strengthening the global response to the threat of climate change

- Assessing current and emerging adaptation and mitigation options and associated opportunities and challenges
- The pace of the development and deployment of mitigation and adaptation options compared to pathways consistent with sustainable development and 1.5°C
- The potential and capacity for development and deployment of adaptation and mitigation responses to accelerate transitions and strengthen the global response to the threat of climate change within and across relevant scales and systems
- Challenges to and opportunities from strengthened response options (e.g. current & future lock in, adaptive mitigation, consumption and production, negative emissions, food production, socio-economic); synergies and trade-offs among adaptation & mitigation options

Chapter 5:
Approaches to implementing a strengthened global response to the threat of climate change

- Existing policies, institutions and actions
- Options for implementing far-reaching and rapid change; implications, challenges, enabling environment; levels; and integration of action
- Case studies for implementation at all scales and in different circumstances, and lessons learned

Chapter 6:
Sustainable development, poverty eradication, and reducing inequalities

- Linkages between achieving SDGs and 1.5°C
- Equity and ethical dimensions
- Opportunities, challenges, risks, and trade-offs
- Positive and negative impacts of adaptation and mitigation measures including response measures and strategies, economic diversification, livelihoods, food security, cities, ecosystems, technologies
- Knowledge and experience from local to global, including case studies and integrated planning as relevant to aforementioned bullets
- Climate-resilient development pathways