DECISION

CHAPTER OUTLINE OF THE WORKING GROUP I CONTRIBUTION TO THE IPCC SIXTH ASSESSMENT REPORT (AR6)

As Adopted by the Panel at the 46th Session of the IPCC

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CHAPTER OUTLINE OF THE WORKING GROUP I CONTRIBUTION TO THE IPCC SIXTH ASSESSMENT REPORT (AR6)

The Intergovernmental Panel on Climate Change decides:

(1) to agree to the outline of the Working Group I contribution to the IPCC Sixth Assessment Report as contained in Annex 1 to this document.

(2) that this report assesses relevant literature, especially since the Fifth Assessment Report (AR5), in a manner consistent with the IPCC guidance on the use of literature.

(3) that the bulleted text in Annex 1 to this Decision, that resulted from the scoping process and refined through comments by the Plenary, be considered by authors as indicative.

(4) to invite the Co-Chairs of Working Group I and the Co-Chairs of WGII and WGIII to develop appropriate mechanisms to ensure the effective co-ordination of Working Group contributions to the IPCC Sixth Assessment Report, to oversee the treatment of cross-cutting themes, and to prepare a Glossary common to Working Groups I, II and III.

(5) In order to achieve this, the timetable for the production of the IPCC Working Group I contribution to IPCC Sixth Assessment Report is as follows:

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Activity Description</th>
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<tbody>
<tr>
<td>15 September – 27 October 2017</td>
<td>Call for author nominations</td>
</tr>
<tr>
<td>29 January – 4 February 2018</td>
<td>Decision on Selection of authors</td>
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<tr>
<td>25 June – 1 July 2018</td>
<td>First Lead Author Meeting</td>
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<td>7 – 13 January 2019</td>
<td>Second Lead Author Meeting</td>
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<td>29 April – 23 June 2019</td>
<td>Expert Review of the First Order Draft</td>
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<tr>
<td>26 August – 1 September 2019</td>
<td>Third Lead Author Meeting</td>
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<td>1 – 7 June 2020</td>
<td>Fourth Lead Author Meeting</td>
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<tr>
<td>7 December 2020 – 31 January 2021</td>
<td>Final Government Distribution of the Final Draft and</td>
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<td>Final Government Review of the Summary for Policy Makers</td>
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<tr>
<td>12 – 18 April 2021</td>
<td>Submission to the WGI Session for approval of the Summary for</td>
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<td>Policymakers and acceptance of the underlying Report</td>
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</table>

(6) that the budget for the production of the Working Group contribution to the IPCC Sixth Assessment Report is as contained in Decision (IPCC/XLVI-1) on the IPCC Trust Fund Programme and Budget.
Chapter outline of the Working Group I contribution to the IPCC Sixth Assessment Report (AR6)

Summary for Policy Makers

Technical Summary

Chapter 1:
Framing, context, methods
Executive Summary
- Synthesis of key findings from AR5 and earlier assessment reports, and connections to AR6 Special Reports
- Framing of the physical science information relevant for mitigation, adaptation, and risk assessment in the context of the Global Stocktake
- Assessment approach
- Observational and reanalysis developments since the AR5
- Model and experimental design developments since the AR5
- Emissions and forcing scenarios
- Treatment and evaluation of uncertainty throughout the report

Frequently Asked Questions

Chapter 2:
Changing state of the climate system
Executive Summary
- Multi-millennial context, pre-industrial to present day
- Natural and anthropogenic forcings
- Radiative forcing
- Large-scale indicators of observed change in the atmosphere, ocean, cryosphere, land, and biosphere
- Modes of variability

Frequently Asked Questions

Chapter 3:
Human influence on the climate system
Executive Summary
- Overview of model performance and development since the AR5
- Simulated large-scale indicators of change in the atmosphere, ocean, cryosphere, land, and biosphere
- Simulated modes of variability
- Natural variability versus anthropogenically-forced change
- Attribution of large-scale observed changes

Frequently Asked Questions
Chapter 4:
Future global climate: scenario-based projections and near-term information

Executive Summary

- Projections of global mean surface temperature and other key global indicators
- Evaluation of multi-model ensemble methods
- Large scale patterns of climate change
- Committed climate response, climate targets, overshoot, irreversibility, abrupt change
- Climate response to greenhouse gas removal scenarios
- Climate response to solar radiation management scenarios
- Interplay between internal variability and response to forcings, including short-lived forcers
- Variability and unexpected changes of global mean surface temperature
- Near-term predictability, sources and capabilities
- Synthesis of climate information in the near-term

Frequently Asked Questions

Chapter 5:
Global carbon and other biogeochemical cycles and feedbacks

Executive Summary

- Feedbacks between climate and biogeochemical cycles, including paleoclimate information
- Ocean acidification
- Historical trends and variability of CO₂, CH₄ and N₂O; sources and sinks
- Projections of global biogeochemical cycles from near-term to long-term
- Abrupt change, irreversibility
- Model evaluation, emergent constraints
- Transient climate response to cumulative emissions and remaining carbon budgets for climate targets
- Biogeochemical implications of land and coastal management mitigation options and greenhouse gas removal
- Biogeochemical implications of solar radiation management scenarios

Frequently Asked Questions

Chapter 6:
Short-lived climate forcers

Executive Summary

- Key emissions: global overview, natural, anthropogenic, historical and scenarios
- Observed and reconstructed concentrations and radiative forcing
- Direct and indirect-aerosol forcing
- Implications for greenhouse gas lifetimes
- Implications of different socio-economic and emission pathways, including urbanisation, for radiative forcing
- Connections to air quality and atmospheric composition

Frequently Asked Questions
Chapter 7:
The Earth’s energy budget, climate feedbacks, and climate sensitivity
Executive Summary
• Energy budget and its changes through time
• Radiative forcing: definitions, estimates, and its representation in models
• Climate feedbacks
• Sensitivity of the climate system: methods and uncertainty
• Empirical constraints on the sensitivity of the climate system, including paleoclimate
• Global warming potential, global temperature change potential, and other metrics
Frequently Asked Questions

Chapter 8:
Water cycle changes
Executive Summary
• Observations, models, methods and their reliability
• Past, present and projected changes, trends, variability and feedbacks in the physical components of the water cycle
• Circulation, processes and phenomena (e.g. monsoon systems) affecting moisture and precipitation patterns, including extremes
• Cloud-aerosol processes affecting the water cycle
• Changes in seasonality of natural storage and water availability
• Abrupt change
• Confidence in projections
Frequently Asked Questions

Chapter 9:
Ocean, cryosphere, and sea level change
Executive Summary
• Past and future changes in ocean circulation and properties (trends, variability and extremes)
• Past and future changes in marine and terrestrial cryosphere
• Evaluation of models and projection methods
• Detection and attribution
• Past global and regional sea level changes
• Projections of global and regional sea level change
• Abrupt change and long-term commitment
• Extreme water levels (tides, surge and ocean waves)
Frequently Asked Questions
Chapter 10: Linking global to regional climate change
Executive Summary
• Regional phenomena, drivers, feedbacks and teleconnections
• Regional scale observations and reanalyses
• Interplay between internal variability and forced change at the regional scale, including attribution
• Evaluation of model improvements, methods, including downscaling and bias adjustment and regional specificities
• Confidence in regional climate information, including quantification of uncertainties
• Scale specific methodologies e.g. urban, mountains, coastal, catchments, small islands
• Approaches to synthesizing information from multiple lines of evidence
Frequently Asked Questions

Chapter 11: Weather and climate extreme events in a changing climate
Executive Summary
• Extreme types, encompassing weather and climate timescales and compound events (including droughts, tropical cyclones)
• Observations for extremes and their limitations, including paleo
• Mechanisms, drivers and feedbacks leading to extremes
• Ability of models to simulate extremes and related processes
• Attribution of changes in extremes and extreme events
• Assessment of projected changes of extremes and potential surprises
• Case studies across timescales
Frequently Asked Questions

Chapter 12: Climate change information for regional impact and for risk assessment
Executive Summary
• Framing: physical climate system and hazards
• Region-specific integration of information, including confidence
• Information (quantitative and qualitative) on changing hazards: present day, near term and long term
• Region-specific methodologies
• Relationship between changing hazards, global mean temperature change, scenarios and emissions
Frequently Asked Questions