

Summary of the 58th Session of the Intergovernmental Panel on Climate Change: 13-19 March 2023

“Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850-1900 in 2011-2020. Global greenhouse gas emissions have continued to increase, with unequal historical and ongoing contributions arising from unsustainable energy use, land use and land-use change, lifestyles and patterns of consumption and production across regions, between and within countries, and among individuals.”

So begins the Summary for Policymakers (SPM) of the synthesis of the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) that was adopted on Sunday, 19 March 2023. The Synthesis Report summarizes the state of knowledge of climate change, its widespread impacts and risks, and climate change mitigation and adaptation. As described by IPCC Chair Hoesung Lee in his opening remarks, it is “a fundamental policy document for shaping climate action...a much-needed textbook” for policymakers of today and tomorrow.

The draft SPM was prepared by authors prior to the meeting. While the text was taken, often verbatim, from the various reports produced during the IPCC’s sixth assessment cycle, delegates still had to reach an agreement on which elements of these reports represented the most critical messages for policymakers. Given the significant role of this report in shaping global climate action, delegates undertook a meticulous line-by-line review of the SPM.

As in past approval sessions, this painstaking work took substantial time. Delegates began meeting in evening plenary sessions on Tuesday, worked until 2:00 am on Thursday, and continued to labor around the clock on Friday until concluding on Sunday evening. Despite the exhortations of IPCC Chair Lee and many delegates to accelerate deliberations, participants delved deep into details, evaluating the clarity and relevance of the SPM’s paragraphs, figures, captions, and footnotes. The pace of the process was a source of frustration for many, as the long hours taxed everyone and were particularly challenging for small delegations.

By Saturday night, many delegates who were unable to change their travel plans had departed, including many from developing countries. Concerns about representation increased as participant numbers dwindled through the weekend. Late on Saturday, one delegate fought back tears as she declared “The inclusive process is not happening. The ones struggling the most are the ones that are leaving...it is our lives that we are here fighting for!” Ultimately the

IPCC finished its work on Sunday evening, two full days after the scheduled closure of the meeting.

The approval of the Synthesis Report and its SPM marked the culmination of sixth assessment cycle and the conclusion of the responsibilities of hundreds of authors from around the world who contributed to the IPCC’s assessments and special reports over the last eight years. The Sixth Assessment Report will inform global policymaking and action on climate change, and will feed into the first Global Stocktake, which will assess the world’s collective process in meeting the goals of the Paris Agreement on climate change.

IPCC-58 convened in Interlaken, Switzerland, from 13-19 March 2023. Over 650 people from 135 countries and 121 observer organizations registered for the meeting.

A Brief History of the IPCC

The IPCC was established in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) to assess, in a comprehensive, objective, open, and transparent manner, the scientific, technical, and socio-economic information relevant to understanding human-induced climate change, its potential impacts, and adaptation and mitigation options. The IPCC is an intergovernmental and scientific body with 195 member countries. It does not undertake new research or monitor climate-related data; rather, it conducts assessments of the state

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of climate change knowledge based on published, peer reviewed scientific and technical literature. IPCC reports are intended to be policy relevant but not policy prescriptive, and they provide key input into international climate change negotiations.

The IPCC has three Working Groups (WGs):

- WGI addresses the physical science basis of climate change;
- WGII addresses climate change impacts, adaptation, and vulnerability; and
- WGIII addresses options for reducing greenhouse gas (GHG) emissions and mitigating climate change.

Each WG has two Co-Chairs and seven Vice-Chairs, with the exception of WGII, which has eight Vice-Chairs. The Co-Chairs guide the WGs in fulfilling their mandates with the assistance of Technical Support Units (TSUs). In addition, the IPCC also has a Task Force on National Greenhouse Gas Inventories (TFI), which is also supported by a TSU, to oversee the IPCC National GHG Inventories Programme. The Programme's aims are to develop and refine an internationally agreed methodology and software for calculating and reporting national GHG emissions and removals and to encourage its use by parties to the United Nations Framework Convention on Climate Change (UNFCCC).

The IPCC elects its Bureau for the duration of a full assessment cycle, which includes preparation of an assessment report that typically takes five to seven years and any other special reports or technical papers published during that cycle. The Bureau is composed of climate change experts representing all regions and includes the IPCC Chair and Vice-Chairs, WG Co-Chairs and Vice-Chairs, and TFI Co-Chairs. The IPCC has a permanent Secretariat based in Geneva, Switzerland, and hosted by the WMO.

IPCC Products

Since its inception, the Panel has prepared a series of comprehensive assessment reports and special reports that provide scientific information on climate change to the international community.

The IPCC has produced six assessment reports, which were completed in 1990, 1995, 2001, 2007, 2014, and 2023. The Sixth Assessment Report (AR6) is complete as of the end of IPCC-58. The assessment reports are structured in three parts, matching the purviews of the WGs. Each WG's contribution comprises a comprehensive assessment report (the "underlying report"), a Technical Summary (TS), and a Summary for Policymakers (SPM). Each of these reports undergoes an exhaustive, three-stage review process by experts and governments, including: a first review by experts, a second review by experts and governments, and a third review by governments. Each SPM is then approved line-by-line by the respective WG and then adopted by the Panel.

A synthesis report is then produced for the assessment report as a whole, integrating the most relevant aspects of the three WG reports and the special reports from that assessment cycle. The Panel then undertakes a line-by-line approval of the SPM of the synthesis report.

The IPCC has produced a range of special reports on climate change-related issues. The AR6 cycle includes three special reports:

- Global Warming of 1.5°C (SR1.5), which was approved by IPCC-48 in October 2018;
- Climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (SRCCL), which was approved by IPCC-50 in August 2019; and

- Ocean and Cryosphere in a Changing Climate (SROCC), which was approved by IPCC-51 in September 2019.

The also IPCC produces methodology reports, which provide guidelines to help countries report on GHG emissions. Good Practice Guidance reports were approved in 2000 and 2003, while the IPCC Guidelines on National GHG Inventories were approved in 2006. A Refinement to the 2006 Guidelines on National GHG Inventories (2019 Refinement) was adopted at IPCC-49 in May 2019.

In 2007, the Nobel Peace Prize was jointly awarded to the IPCC and former US Vice-President Al Gore for their work and efforts "to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations needed to counteract such change."

Sixth Assessment Cycle

IPCC-41 to IPCC-43: IPCC-41 (24-27 February 2015, Nairobi, Kenya) adopted decisions relevant to the AR6 cycle. IPCC-42 (5-8 October 2015, Dubrovnik, Croatia) elected Bureau members for the AR6 cycle. IPCC-43 (11-13 April 2016, Nairobi, Kenya) agreed to undertake three special reports (SRCCL, SROCC, and, in response to an invitation from the 21st session of the Conference of the Parties to the UNFCCC (COP 21), SR1.5) and the 2019 Refinement during AR6. The Panel also agreed that a special report on cities would be prepared as part of the seventh assessment cycle.

IPCC-44: During this session (17-21 October 2016, Bangkok, Thailand), the Panel adopted outlines for SR1.5 and the 2019 Refinement, as well as decisions on a meeting on climate change and cities, among others.

IPCC Cities and Climate Change Science Conference: This meeting (5-7 March 2018, Edmonton, Canada) produced a research agenda to better understand climate change impacts on cities and the critical role local authorities can play in addressing climate change.

IPCC-45 to IPCC-47: IPCC-45 (28-31 March 2017, Guadalajara, Mexico) approved the SRCCL and SROCC outlines, and discussed: the strategic planning schedule for the AR6 cycle; a proposal to consider short-lived climate forcers (SLCFs); and resourcing options for the IPCC. IPCC-46 (6-10 September 2017, Montreal, Canada) approved the chapter outlines for the three WG contributions to AR6. During IPCC-47 (13-16 March 2018, Paris, France) the Panel agreed to establish a Task Group on Gender and draft terms of reference for a task group on the organization of future work of the IPCC in light of the Global Stocktake under the Paris Agreement.

IPCC-48: During this session (1-6 October 2018, Incheon, Republic of Korea), the IPCC accepted SR1.5 and its TS and approved its SPM, which concludes that limiting global average temperature rise to 1.5°C is still possible but will require "unprecedented" transitions in all aspects of society.

IPCC-49: During this session (8-12 May 2019, Kyoto, Japan), the IPCC adopted the Overview Chapter of the 2019 Refinement and accepted the underlying report. IPCC-49 also adopted decisions on the terms of reference for the Task Group on Gender and on a methodological report on SLCFs to be completed during the Seventh Assessment Report (AR7) cycle.

IPCC-50: During this session (2-7 August 2019, Geneva, Switzerland), the IPCC accepted the SRCCL and its TS and approved its SPM. A Joint Session of the three WGs, in cooperation with the TFI, considered the SPM line-by-line to reach agreement.

IPCC-51: This session (20-24 September 2019, Monaco) accepted the SROCC and its TS, and approved its SPM, following line-by-line approval by a Joint Session of WGs I and II.

IPCC-52: During this session (24-28 February 2020, Paris, France), the IPCC adopted the outline for the AR6 synthesis report, containing a stage-setting introduction and three sections: current status and trends; long-term climate and development futures; and near-term responses in a changing climate. The Panel also adopted the IPCC Gender Policy and Implementation Plan, which, among other things, established a Gender Action Team.

IPCC-53: This session (7-11 December 2020), which took place virtually due to the COVID-19 pandemic, addressed the IPCC Trust Fund Programme and Budget. The Panel approved the revised budget for 2020 and revised proposed budget for 2021.

IPCC-53 bis: In light of the COVID-19 pandemic, during this virtual session (22-26 March 2021) the IPCC adjusted the strategic planning schedule for the AR6 cycle with regard to modalities for the approval plenary of the WGI report and preparations for the election of Bureau members for the AR7 cycle.

IPCC-54: This session (26 July – 6 August 2021) took place virtually due to the COVID-19 pandemic and included the 14th session of WGI. The IPCC approved the SPM and accepted the WGI contribution to AR6, entitled “Climate Change 2021: The Physical Science Basis.” The report was finalized and officially published on 6 August 2021.

IPCC-55: This session (14-27 February 2022) took place virtually due to the COVID-19 pandemic and included the 12th session of WGII. The IPCC approved the SPM and accepted the WGII contribution to AR6, entitled “Climate Change 2022: Impacts, Adaptation and Vulnerability.”

IPCC-56: This session (21 March – 4 April 2022), which took place virtually due to the COVID-19 pandemic, included the 14th Session of WGIII. The IPCC approved the SPM and accepted the WGIII contribution to AR6, entitled “Climate Change 2022: Mitigation of Climate Change.”

IPCC-57: Following a delay to approval of the Synthesis Report due to staffing issues in the IPCC’s Technical Support Unit, this session (27-30 September 2022, Geneva, Switzerland) focused on business matters. Delegates addressed issues including: outreach and communications efforts; actions to strengthen gender equality and equity in internal operations; collaboration with other international bodies; and the size, structure and composition of the IPCC Bureau and any Task Force Bureau for the seventh assessment cycle.

IPCC-58 Report

On Monday, 13 March, IPCC Chair Hoesung Lee welcomed delegates to IPCC-58. In opening remarks, Albert Rösti, Federal Counsellor and Head of the Federal Department of the Environment, Transport, Energy and Communications of Switzerland, said hydropower is the “backbone of Switzerland’s energy supply,” but thawing permafrost renders the country vulnerable. He attributed the success of adaptation measures in the Alpine region to knowledge produced by the IPCC and people-centered decision-making procedures.

Several dignitaries addressed delegates via pre-recorded video message. UN Secretary-General António Guterres underscored that “we are at the tip of the tipping point” and yet, as shown by the IPCC, it is not too late to limit warming to 1.5°C. He called for the IPCC to assist delegates to the 28th meeting of the UNFCCC

Conference of the Parties (COP 28) in their first Global Stocktake by “pointing to solutions.”

WMO Secretary-General Petteri Taalas said key messages from the IPCC’s Sixth Assessment Report should be further communicated to UNFCCC COP 28 delegates. He pointed to three WMO initiatives focused on: early warning systems; methods to monitor greenhouse gas emissions budgets; and more precise modeling procedures. He called for an IPCC report on geoengineering, saying its risks must be assessed by the scientific community.

UNEP Executive Director Inger Andersen pointed to the important findings produced by the three Working Groups, highlighting their influence on international and national decision-making. She noted that input from the IPCC to the UNFCCC Global Stocktake “will set the tone for action in the second half of this critical decade.”

UNFCCC Executive Secretary Simon Stiell underscored his ambition to establish a closer, more productive relationship between the UNFCCC and IPCC. Highlighting that IPCC reports constitute a key input to the Global Stocktake, he urged delegates to work together constructively and focus on the main message of the report.

Chair Lee welcomed participants and encouraged them in their endeavor to “cross the finish line of this assessment cycle.” He highlighted improved cross-working-group coordination and solution orientation of the IPCC outputs during the sixth assessment cycle. He urged delegates to maintain a respectful and positive spirit during the session, noting that “when we work together, we deliver.”

Delegates then approved the provisional agenda ([IPCC-LVIII/Doc.1](#)). Delegates also approved the draft report of the fifty-seventh session of the IPCC ([IPCC-LVIII/Doc.2](#)).

Sixth Assessment Report of the IPCC: Approval of its Draft Summary for Policymakers of the Draft Synthesis Report

The IPCC initiated consideration of the draft [SPM](#) of the AR6 Synthesis Report (SYR) on Monday, reviewing and approving the SPM line-by-line. The SPM was provisionally approved in plenary on Sunday, 19 March, at 9:30 am. Formal discussions and approval took place in plenary sessions throughout the week. Delegates also met in contact groups and huddles for informal consideration of proposed text. This report summarizes the deliberations that took place in plenary sessions.

A: Current Status and Trends

A.1: Observed Warming and its Causes: The headline statement, which indicates that human activities have unequivocally caused global warming, was approved.

A.1.1: Delegates disagreed on how much information to include from the WGI report in this sub-paragraph on **global surface temperature increases**. LUXEMBOURG, supported by IRELAND, TIMOR-LESTE, and CHINA, requested a reference to the 20-year increase between 2001-2020 as cited in the WGI report. Authors proposed adding a sentence from the WGI report that does so, a move that was supported by SAINT KITTS AND NEVIS. INDIA and NORWAY warned that the additional sentence overloaded the sub-paragraph with numbers and diluted the message. INDIA recommended deleting the original sentence but retaining references to differences in warming over land and oceans.

NORWAY suggested rounding global surface temperatures in the SPM and including more numbers in the longer synthesis report (SYR). CHILE asked authors to clarify whether the data needed

to shift timeframes to two decades across the entire report was available.

TANZANIA requested clarification on the data used to demonstrate the 1.09□ average increase over 2011-2020 compared to 1850-1900. An author said the numbers came from the WGI report and explained that four datasets were used for spatiotemporal completeness, with the numbers for land and oceans coming from different datasets. SOUTH AFRICA said including too many numbers on surface temperature increase since before the Industrial Revolution will “only confuse policymakers.” Chair Lee said that separate figures on land and ocean changes had been added upon the request of many governments.

INDIA, SAUDI ARABIA, and INDONESIA said it was unnecessary to reference both the rounded 1.1□ figure and the more precise 1.09□ average increase. The US, supported by the NETHERLANDS, noted the IPCC has communicated an observed global warming of 1.1°C, and said that removing “around 1.1°C” could cause confusion. Delegates agreed to retain approved text from WGI and delete the rounded 1.1□ figure.

INDIA, supported by BRAZIL and SOUTH AFRICA, urged including language on equity and climate justice backed by efficient means of implementation, including finance, under the principle of common but differentiated responsibilities, and taking into account national circumstances.

UKRAINE noted the war in her country illuminates global interconnections, with everyone “in the same boat, heading for the waterfall.” She said the IPCC’s work shows the path to the climate-resilient “branch of the river where more people have the chance to survive.” On A.1.1, she requested adding a reference to “intensifying warming” to underscore the need for emergency measures.

INDIA and CHINA expressed concern about a sentence on rapid changes in global surface temperatures in the last 50 years, stating that it was taken out of context. An author noted that, due to the concise nature of the SPM, difficult decisions were made on what to include and exclude. After ECUADOR questioned the “high confidence” qualifier for this sentence and INDIA requested its deletion, Chair Lee reminded the Panel that deciding on qualifiers was the authors’ responsibility and the authors had said this was the most policy-relevant subset of the WGI findings. SAUDI ARABIA suggested replacing “global warming” with “global surface temperature,” as in the WGI report. With this amendment, the text was approved.

On Sunday, CHINA queried the difference in numbers related to global surface temperature in this section versus the headline statement. The authors explained that the observed warming assessment is given in A.1, while the attributable warming estimate is given in A.2, and that the difference is due to a one-year difference in dates for the two assessments.

A.1.2: On the opening sentence quantifying **the total human-caused global surface temperature increase**, a discussion arose on labelling a “best estimate” number in combination with stating the likely range of increase. SAUDI ARABIA, supported by INDIA, called for defining “best estimate.” An author clarified that “best estimate” relates to different contexts and therefore cannot be defined consistently throughout the SPM. Chair Lee reminded delegates that “best estimate” is approved WGI terminology. The US, supported by NORWAY, opposed defining “best estimate,” saying the draft SPM contains too many terms that would require definition if such a precedent were to be set.

On human drivers that contribute to cooling effects, TANZANIA queried a parenthetical reference to aerosols, noting policymakers might consider aerosols a solution to global warming. INDIA called for deleting it.

IRAN suggested including text on natural drivers that contribute to climate warming, as noted by WGI. An author objected, stressing the minimal contribution of natural drivers.

INDIA, CHINA, BRAZIL, IRAN, and SAUDI ARABIA called for deleting a parenthetical reference to carbon dioxide (CO₂) and methane in a statement on GHGs’ contribution to global warming. Chair Lee cautioned against revisiting approved text. The US preferred maintaining the text as presented. NEW ZEALAND suggested replacing “and” with “followed by.” This was supported by SOUTH AFRICA and accepted by authors but opposed by SAUDI ARABIA and CHINA, who noted differences between the two GHGs’ long-term and short-term contributions. TOGO and NIGER noted that “followed by” would help countries with limited resources prioritize actions. Noting this sentence speaks about the past, not the future, BELGIUM, supported by LUXEMBOURG, proposed starting the sentence with “Over this period.” INDIA urged grouping methane and aerosols together. To clarify the role of various GHGs in warming, the NETHERLANDS proposed including Figure SPM.2 of the WGI SPM. After further discussion, Chair Lee called for a huddle on this issue, to be facilitated by IPCC Vice-Chair Ko Barrett and WGI Vice-Chair Jan Fuglestedt. A proposal to address remaining issues with Figure SPM.2 in the huddle was opposed by SAUDI ARABIA and INDIA.

On Tuesday afternoon, Vice-Chair Barrett reported that huddle participants had agreed to delete the original parentheses, consolidate the rest of the sub-paragraph to reflect the language in the SYR related to solar and volcanic drivers, and capture in a new footnote the exact contributions from emissions of each of the gases mentioned.

On the footnote, AUSTRALIA requested adding the word “forcing” to “radiating studies.” INDIA asked for the lifetime of each gas to be added. An author said this would not be possible as there is no scientific consensus on CO₂’s lifetime and “fluorinated gases” captures multiple gases with different lifetimes.

A.1.3: On **historical cumulative net CO₂ emissions**, INDIA, supported by SAUDI ARABIA, CHINA, SOUTH AFRICA, BRAZIL, and MEXICO, suggested retaining language from the WGIII SPM that addresses historical emissions from 1850-1989 (58%) and 1990-2019 (42%), as opposed to focusing on emissions from 1990-2019. NEW ZEALAND, the US, and AUSTRALIA emphasized that emissions had accelerated during the period 1990-2019, underscoring the policy relevance of this message. The authors confirmed that including both numbers would be scientifically accurate but would lengthen the text. The Panel agreed to include both numbers.

INDIA requested deletion of a sentence indicating that in 2019 atmospheric concentrations of CO₂ were higher than any time in at least 2 million years and concentrations of nitrous oxide and methane were higher than at any time in at least 800,000 years, saying it did not offer an actionable policy message. AUSTRALIA, LUXEMBOURG, IRELAND, the US, GERMANY, SWEDEN, SWITZERLAND, the UK, FRANCE, UKRAINE, MEXICO, DENMARK, ZAMBIA, FINLAND, GUINEA, NIGER, TUNISIA, SUDAN, INDONESIA, the FRIENDS WORLD COMMITTEE FOR CONSULTATION (FWCC), and the ENVIRONMENTAL DEFENSE FUND objected, with many saying the information

conveys the gravity of the situation. INDIA suggested including a reference to decreasing carbon budgets and historically cumulative net emissions. Chair Lee said a separate section was dedicated to these topics.

TANZANIA, supported by ZAMBIA, GUINEA, SOUTH AFRICA, NIGER, and GHANA, asked for units of concentration of the three gases in the sentence to be harmonized to improve readability. The authors responded that while the ratio was different, the units were the same, internationally recognized, and reflected the WGI text. BOLIVIA, SOUTH AFRICA, and the INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN) asked for the sentence to reflect 2021 figures. GERMANY highlighted a footnote referencing 2021 numbers in the longer report. Chair Lee cautioned that the sentence's focus was 2019. The sentence was approved without amendment.

CANADA, GERMANY, ITALY, LUXEMBOURG, IRELAND, NORWAY, JAPAN, TOGO, the US, DENMARK, SWEDEN, SWITZERLAND, BELGIUM, TUNISIA, and FINLAND supported a proposal by FRANCE to add a figure illustrating the causal chain from emissions to warming of the climate system. Many argued that inclusion of the figure would provide a clear and necessary narrative about the causes of warming. SWEDEN highlighted the figure's value in synthesizing findings, as it incorporates information from several statements in section A.1.

SAUDI ARABIA, INDIA, and CHINA opposed inclusion of the figure. As a way forward, INDIA suggested adding a figure on historical and regional emissions, saying this would provide a full picture to policymakers. Chair Lee proposed a huddle on possible inclusion of those figures in the SPM, to be facilitated by IPCC Vice-Chair Krug.

On Sunday, FRANCE, supported by CANADA, noted that on the first day of the meeting it requested the elevation of Figure 2.1 to the SPM, and expressed concern that there had been almost no discussion of this, and requested that it be added to this section. SAUDI ARABIA opposed, saying a huddle had been unable to reach consensus. CANADA and LUXEMBOURG registered disappointment that the meeting had not included time to discuss this and other figures.

WGIII Co-Chair Jim Skea said many authors shared this disappointment but respected the results of the huddle.

A.1.4: On the scale of annual GHG emissions during 2010-2019, CHINA suggested replacing "higher than in any previous decade" with "since 1850." Following a lengthy editorial discussion, delegates agreed to state that average annual GHG emissions from 2010-2019 were higher than in any previous decade "on record."

The EU, supported by TANZANIA, suggested rearranging a sentence on CO₂ emissions from fossil fuels combustion and industrial processes to better reflect that emissions reductions through efficiency gains are displaced by increased emissions from rising global activity. SAUDI ARABIA preferred to retain the sentence as presented in the WGIII report.

FWCC noted the underreporting of military emissions and called for citing this issue in a footnote.

On a sentence on GHG emissions being higher in 2010 than in 1990, CANADA, supported by FRANCE, asked why the SYR SPM states GHG emissions "have been estimated to be" instead of "were" higher, as in the WGIII text. An author explained that literature emerging since the WGIII report has increased uncertainty, and the modified language will prevent it from looking dated.

SAUDI ARABIA called for inserting WGIII text indicating that the "highest growth" occurred in fluorinated gases. After some discussion, the authors suggested adding "whereas the highest relative growth occurred in fluorinated gases (F-gases), starting from low levels in 1990" at the end of the sentence. With this, the sentence was approved, although GERMANY noted that fluorinated gases are still of very low relevance.

The Centre for International Environmental Law (CIEL) called for: quantified information on fossil fuel emissions from WGIII; gross as well as net figures on GHG emissions, including for forestry and land use where emissions are growing; and information on military emissions. UKRAINE suggested putting that information in a footnote. Chair Lee explained that military emissions were not considered in the SYR as it can only synthesize information included in the WG reports.

CHINA requested insertion of WGIII text indicating the changing rate of growth in emissions. After discussion, the authors proposed adding: "Average annual GHG emissions during 2010-2019 were higher than in any previous decade, but the rate of growth between 2010 and 2019 (1.3% year-1) was lower than that between 2000 and 2009 (2.1% year-1)." This was accepted and the sentence was approved.

A.1.5: Delegates discussed a sub-paragraph on historical contributions of CO₂. Sentences stating that historical CO₂ emissions vary substantially and distinguishing between high- and low-emitting countries were approved without comment.

On a sentence on low per capita emissions in least developed countries (LDCs) and small island developing states (SIDS), INDIA, with SAINT KITTS AND NEVIS, SENEGAL, the BAHAMAS, AUSTRALIA, and ANTIGUA AND BARBUDA, called for including information about developed countries' emissions from the WGIII report. The US opposed this request. ECUADOR, supported by INDIA, called for specifying other regions' emissions or deleting mentions of any region.

Chair Lee noted Section C contains specific bullets addressing inequity, inclusiveness, injustice, and uneven distribution of consumption. Others added that this sentence is only a starting point for text on unequal distribution.

INDIA agreed to accept the sentence if inequalities of consumption for the countries "where the bottom 50% live" were addressed in the next sentence. The sentence was approved.

On percentages of global consumption-based household GHG emissions contributed by the 10% of households with the highest per capita emissions and the 50% with the lowest, INDIA, supported by MEXICO, NIGER, BOLIVIA, TÜRKIYE, BRAZIL, and VENEZUELA, called for inserting text from the WGIII assessment on where the top third of emissions producers live and all the regions where the bottom half live. The authors noted this information appears in Fig.2.2 in the SYR. INDIA reiterated his request, noting he had previously called for elevating Fig.2.2 to the SPM. SAVE THE CHILDREN INTERNATIONAL (SCI) and CLIMATE ACTION NETWORK-INTERNATIONAL (CAN-I) supported INDIA's proposed language, noting that it is essential to differentiate between emitters within countries and globally.

KENYA called for reinserting wording specifying that individuals with the highest economic status contribute disproportionately, saying this addresses the importance of production, consumption, and lifestyles. The US objected, noting the presented text repeated wording previously agreed after extensive discussions on the WGIII SPM. The authors said this issue is referenced in a subsequent

section on near-term future action. FWCC suggested using wording from the WGIII Technical Summary to accommodate countries' concerns.

Chair Lee called for a huddle, facilitated by IPCC Vice-Chair Krug, to address this sentence and consider the elevation of Figures 2.1 and 2.2. He instructed the huddle not to edit the figures.

GERMANY suggested that the authors propose text modifications based on plenary comments for the huddle to consider.

A.2: Observed Changes and Impacts: The headline statement, which states that widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred, was approved.

A.2.1: This sub-paragraph addresses **human influence on warming the atmosphere, ocean and land**. In a sentence on rising sea levels, AUSTRIA requested the addition of "because of loss of ice masses." INDIA responded that other causes of rising sea levels were specified in the SYR. The authors concurred with India. ANTIGUA AND BARBUDA, supported by the BAHAMAS and GRENADA, requested replacing references to "increasing" rates of sea level rise with "accelerating" to better capture urgency. INDIA, DENMARK, and NIGER questioned the choices of rates of increase and time periods. In response to several requests for clarification on inclusion of a reference date of 1971, authors noted this was the starting point of attribution studies. The authors agreed to replace this reference with the original text from the SYR, which includes a wider range of time periods. After further discussion, the sentence was approved with this change.

On evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, INDIA highlighted that such extremes do not affect all regions and said the media could misunderstand this sentence. Chair Lee pointed to A.2.2, which deals with regional variations. The BAHAMAS proposed emphasizing increased intensity in tropical cyclones. The sentence was approved without amendment.

A.2.2: In a sub-paragraph indicating that **3.3-3.6 billion people live in contexts that are highly vulnerable to climate change**, TANZANIA, supported by TIMOR-LESTE, asked that LDCs be added to a list of impacted communities.

BOLIVIA, AUSTRALIA, CANADA, and BELGIUM called for adding "Indigenous Peoples," emphasizing that Indigenous Peoples are vulnerable to food insecurity and reductions in water security. The authors said Indigenous Peoples are mentioned in several parts of the longer report and the SPM, and preferred retaining the sentence as written. The US noted that in the WGII assessment report, Indigenous Peoples are cited immediately after this sentence. The INUIT CIRCUMPOLAR COUNCIL expressed concern about removal of language related to small-scale food producers and Indigenous Peoples. The authors proposed adding references to LDCs, Indigenous Peoples, small-scale food producers, and low-income households. These amendments were approved.

A.2.3: On a sentence on substantial and increasingly **irreversible impacts on ecosystems**, GERMANY, supported by NORWAY, asked why climate change was no longer referred to as "human-caused."

BRAZIL requested the addition of "with impacts to the provision of ecosystem services." FWCC requested addition of "and human communities." An author explained that the sentence was approved language from WGII. A footnote was deleted after GERMANY said those simply pointing to the glossary should be removed, although SAUDI ARABIA warned this could lead to definitional misunderstandings for policymakers.

A.2.4: This sub-paragraph addresses **climate change impacts on food and water security**. On food security, an observer from the INUIT CIRCUMPOLAR COUNCIL, supported by CANADA, requested explicit mention of Indigenous Peoples in the Arctic, whose food security is already being negatively affected by climate change. An author noted that this issue is addressed in another bullet. The sentence and all other sentences in the sub-paragraph were approved without amendment.

A.2.5: On a sentence on **extreme heat events and human mortality**, SWEDEN, supported by CANADA, requested clarification of the link to climate change. Authors suggested amending the sentence, which was approved. On regions disproportionately affected by climate-induced displacement, KENYA, TANZANIA, TIMOR-LESTE, DENMARK, and SENEGAL requested highlighting Africa and LDCs in addition to SIDS. An author noted this sentence was approved text from the WG II SPM. SENEGAL recalled that several African delegations had experienced connectivity problems during the online approval session of the SPM WGII, which severely limited their ability to participate.

Many delegates requested the floor, and Chair Lee proposed sending the text to a contact group for further deliberations. This sub-paragraph was approved on Saturday without further discussion in plenary.

A.2.6: In a sub-paragraph on **widespread adverse impacts and related losses and damages**, GRENADA, supported by SENEGAL, ANTIGUA AND BARBUDA, TIMOR-LESTE, KENYA, and TANZANIA, called for explicitly referencing vulnerable developing countries in the first sentence and defining in the footnote the differences between "loss and damage" and "losses and damages." She underscored that the distinction is often confusing to people outside of the IPCC. CANADA called for adding a reference to both economic and non-economic losses and damages. The US supported putting a definition in the footnote.

NORWAY asked if it would be possible to add a reference to children and youth. GERMANY suggested reinserting deleted language indicating that "reduced economic growth" from climate change had been detected.

Chair Lee said these comments would be addressed in a contact group. Following discussion in the contact group, revised text was approved on Saturday without further comment.

A.2.7: In a sub-paragraph on **adverse impacts of climate change on human health, livelihoods and key infrastructure**, the US suggested noting the influence of non-climatic factors and recognizing other drivers of impacts. TANZANIA noted that droughts are not mentioned in the footnote but are part of slow-onset events.

Figure SPM.1: On possible **adverse impacts on biodiversity attributed to climate change**, the NETHERLANDS sought clarification on the direction of impact. FRANCE questioned whether a global assessment of impact direction would be possible.

On water scarcity, LUXEMBOURG, supported by NORWAY, noted impacts occur regionally but the figure reflects climate impacts globally. NORWAY, SAUDI ARABIA, CANADA, and the US expressed confusion about the label "water scarcity," with NORWAY suggesting "water supply" as a way forward. CANADA, supported by the US, suggested including a caption with agreed text from WGII with further details.

On agriculture and crop production, FRANCE suggested changing the indicative color from red (adverse impacts) to both green and red (adverse and positive impacts), reasoning that some regions benefit from longer growing seasons. The authors replied that global assessments were carried out for water scarcity and agriculture in WGII.

In response to confusion over the potential positive and negative impacts of “water scarcity,” authors proposed to change the term to “physical water availability.”

On impacts of human-caused climate change, INDIA requested that mental health be removed. FINLAND opposed this request.

Several countries requested further information on the evidence required for a “global assessment.” TANZANIA and KENYA asked why animal and livestock health is referenced as being based on “regional” evidence. DENMARK, the NETHERLANDS, and IUCN warned against omitting impacts on biodiversity. SWITZERLAND requested the addition of an icon on cryospheric ecosystems. ECUADOR and INDIA requested inclusion of references to losses and damages across the figure. BOLIVIA, INDIA, and NICARAGUA requested referencing varying vulnerability to impacts.

On choices that will impact future scenarios, INDIA suggested the worst-case scenario be removed based on its unlikelihood. FRANCE and GERMANY requested further emphasis on the role of GHG emissions reduction.

Chair Lee said a contact group on Figure SPM.1, co-chaired by Tanzania and Denmark, would be established. On Wednesday, following deliberations in the contact group, delegates approved Figure SPM.1 and its caption.

On the figure’s title, “The growing intensity of adverse impacts underscores the urgency of climate action,” SAUDI ARABIA asked that “observed” and “projected” be added to “adverse impacts.” NORWAY requested adding “with every increment of global warming” at the end of the sentence. CHILE and MEXICO objected. The authors noted a reference to “with every increment of global warming” in the title of SPM.2. The title of Figure SPM.1 was then approved as presented.

A.3: Current Progress in Adaptation and Gaps and Challenges: On Thursday evening, Chair Lee collected comments on all paragraphs under A.3 for authors to consider. During a lengthy discussion, many delegates, including the EU, the US, BELGIUM, FRANCE, TÜRKIYE, SPAIN, SWEDEN, ITALY, and IUCN called for adding a reference to Nature-based Solutions (NbS). Many others, including INDIA, TIMOR-LESTE, BOLIVIA, ECUADOR, SOUTH AFRICA, BRAZIL, and VENEZUELA, opposed adding NbS, preferring to use only the term “ecosystem-based adaptation approaches.” Several countries, noting examples of adaptation were largely focused on agriculture, requested examples from other sectors.

Headline statement: Citing a need for consistency, LUXEMBOURG called for deleting a footnote that only referred to the glossary. BELIZE opposed deletion of the footnote, suggesting the glossary definition be added to the footnote. An author proposed not having footnotes in headline statements for “stylistic reasons.” Delegates agreed to delete the footnote and approved the text and title of the headline statement.

A.3.1: This sub-paragraph, which indicates that **progress in adaptation planning and implementation has been observed across all sectors and regions**, was approved.

A.3.2: This sub-paragraph addresses the **effectiveness of adaptation in reducing climate risks**. In a footnote on Ecosystem-based Adaptation (EbA), the EU called for adding a reference to NbS, saying this would not change the scientific assessment but would show an evolution in the political discussion. SOUTH AFRICA opposed. Chair Lee established a huddle facilitated by IPCC Vice-Chair Krug. On Saturday afternoon Krug reported the huddle had reached agreement on text explaining EbA and noting that NbS is defined in the glossary.

A.3.3: This sub-paragraph indicates that **most observed adaptation responses are fragmented, incremental, sector-specific and unequally distributed across regions**. It was approved.

A.3.4: In a sub-paragraph on **increased evidence of maladaptation in various sectors and regions**, INDIA, BOLIVIA, TANZANIA, and BRAZIL requested clarification on the rationale for the claim. BOLIVIA, supported by MEXICO, SAUDI ARABIA, the OFFICE OF THE UNITED NATIONS HIGH COMMISSIONER FOR HUMAN RIGHTS (OHCHR), and FWCC, called for language pointing to solutions to avoid maladaptation. The US expressed concern about putting maladaptation and limits to adaptation in a single bullet saying it seemed to conflate the two issues. INDIA, supported by BRAZIL, questioned the examples of maladaptation in a footnote. The text was referred to a contact group.

The sub-paragraph was approved on Saturday without further comment.

A.3.5: This sub-paragraph addresses **soft limits to adaptation experienced by small-scale farmers and households along some low-lying coastal areas**. It was approved.

A.3.6: On a sentence on **barriers to adaptation**, BELGIUM, supported by SWITZERLAND and GERMANY, asked why a reference to “political leadership” was removed. Several other barriers to adaptation were suggested. SAINT LUCIA and NORWAY asked for further references to vulnerability. The PHILIPINES suggested “limited availability of data and information” be added. CHILE and INDONESIA pointed to lack of technology, and FRANCE to lack of education. The US questioned whether “systematic barriers” was approved language and called for a broader list of constraints. GERMANY and JAPAN noted “developing countries” was not approved language and suggested “developing regions” instead. CARE INTERNATIONAL called for the inclusion of a sentence from the WGII SPM stating that “estimates of adaptation costs have increased since AR5.” Following discussion in a contact group, the text was approved on Saturday without further comment.

Box SPM.1: On a sentence on using **scenarios and pathways to examine possible long-term futures**, INDIA, supported by SAUDI ARABIA and CAN-I, called for moving a footnote stating that the scenarios and pathways make “no explicit assumptions about global equity, environmental justice, or intra-regional income distribution” to the main text. GERMANY opposed. A CAN-I compromise proposal to specify that scenarios and pathways are “based on various assumptions and projections” received some support. CHILE and the US noted assumptions were explained in the next sentence. Chair Lee, with the US, suggested deleting that sentence but keeping the footnote on assumptions.

NORWAY called for mentioning shorter-term as well as long-term futures. CIEL emphasized that policy-relevant information from the footnote would be useful in the main text.

Chair Lee established a contact group, co-chaired by Brazil and Norway, for further discussion. On Wednesday evening, NORWAY and BRAZIL reported agreement within the contact group on the entire box, including table, footnotes and captions. Box SPM.1 was then approved.

A.4: Current Mitigation Progress, Gaps and Challenges: In the headline statement on policies and laws addressing mitigation, GERMANY called for replacing “climate goals” with “long-term temperature goals.” SAUDI ARABIA and the authors said the definition of climate goals was broader and included elements such as financing. The headline was approved without amendment.

Chair Lee invited comments on this entire paragraph, saying they would be considered by the authors and then discussed in a contact group.

A.4.1: In a sub-paragraph on **regulatory and economic instruments** that have already been deployed successfully, the US suggested adding that they “have successfully reduced emissions.” FRANCE, supported by FINLAND and GERMANY, expressed surprise that all references to the Paris Agreement in the floor draft had disappeared. GERMANY requested a reference to nationally determined contributions (NDCs).

Delegates considered revised text, which included references to the UNFCCC, the Kyoto Protocol, and the Paris Agreement, drawn from the WGIII SPM. This was approved.

A.4.2: On the **cost effectiveness of several mitigation options**, DENMARK, supported by the UK, LUXEMBOURG, and SWEDEN, suggested specifying the cost reductions of solar, wind, and lithium-ion batteries over recent years, noting that their unit costs have decreased even more than anticipated. The BAHAMAS called for clarifying that these trends apply only to certain options and not, for example, to carbon capture and storage (CCS). SAUDI ARABIA suggested highlighting removal and other key technologies that are “in fact unavoidable.”

This sub-paragraph was discussed in a contact group on Saturday. On Saturday evening, DENMARK, supported by NORWAY and GERMANY, requested adding that “electricity from photovoltaics and wind is now cheaper than energy from fossil fuels in many regions.” GERMANY said the sentence was of “paramount” importance, underscoring that renewables are the “biggest solution” to the problems discussed during the week. FINLAND noted the root cause of climate change is the use of fossil fuels. SAUDI ARABIA strongly opposed inclusion of the sentence.

The authors proposed adding a sentence indicating that “maintaining emission-intensive systems may, in some regions and sectors, be more expensive than transitioning to low emission systems.” INDIA, supported by BRAZIL, said the sentence favored developed countries as it did not reference feasibility and challenges. FINLAND, supported by DENMARK, said it was essential to include the message that solar and wind power have now become less expensive and are widely available.

The sentence and sub-paragraph were approved.

A.4.3: On the “**emissions gap**” **associated with implementation of NDCs**, GERMANY, supported by DENMARK, SAINT KITTS AND NEVIS, the US, and AUSTRALIA, urged: mentioning the significance of the gap; referencing net-zero-pledges; and highlighting that limited policies are in place to deliver on these pledges. FRANCE suggested informing policymakers that submitted NDCs are projected to keep global warming just under 2.8°C.

DENMARK, supported by CHILE, proposed adding text specifying “when we need to peak,” with CHILE adding the text could clarify that “peak emissions must be before 2025.”

On a statement that many countries signaled their intention to reach net-zero emissions, INDIA, supported by MEXICO, noted no confidence level had been assigned to this statement and questioned its purpose. An author noted the sentence has been drafted in consistency with the IPCC guide to uncertainty. The sentence was approved.

A.4.4: On **policy coverage being uneven across sectors**, the EU noted that the estimated range for global warming under current policies was wide, with the best estimate much closer to the higher figure, and suggested displaying the uncertainty range including the best estimate figure.

Chair Lee proposed a contact group, co-facilitated by Australia and Timor-Leste. After consideration in the contact group, A.4.4 was approved on Saturday with the inclusion of the best estimate figure of 3.2°C and the uncertainty range following in brackets: [2.2–3.5°C].

A.4.5: In a sub-paragraph on **lags in the adoption of low-emission technologies** in most developing countries, INDIA, supported by SAUDI ARABIA and BRAZIL, requested reference to the 2020 goal to achieve USD 100 billion in finance for climate adaptation and mitigation, to highlight the finance gap in developing countries. BRAZIL emphasized that “we are now in the third year that this promise is not fulfilled.” Delegates approved an additional sentence indicating that in 2018 private climate finance flows from developed to developing countries were below the collective goal under the UNFCCC and the Paris Agreement.

B: Future Climate Change, Risks, and Long-Term Responses

B.1: Future Climate Change: In the headline statement on continued greenhouse gas emissions and related global warming, delegates discussed whether to replace a reference to reaching 1.5°C “in 2030–2035” with “in the near term.” CHINA suggested referring to “cumulative GHG emissions.” Authors opposed this suggestion, noting GHGs’ different lifetimes. SWITZERLAND’s proposal to change “strong” to “deep, rapid, and sustained” reductions in GHG emissions was accepted.

After discussions in a huddle chaired by WGI Co-Chair Fuglestedt, plenary approved a sentence indicating that reductions in GHG emissions would lead to a discernable slowdown in global warming and also to discernable changes in atmospheric composition. NORWAY, supported by SWEDEN, requested “atmospheric conditions” be changed to “air pollution.” INDIA opposed. Chair Lee noted the language had been agreed upon in the huddle, and the headline statement was approved without further amendment.

B.1.1: On a sub-paragraph indicating that **global warming will continue to increase in the near term mainly due to increased cumulative CO2 emissions**, numerous delegates queried a footnote indicating that global warming is reported “as running 20-year averages.” The authors proposed inserting that it is reported “here” as running 20-year averages. SAUDI ARABIA sought clarification on the use of “global surface temperature” (GST) in this footnote versus “global warming” in the main text. The authors explained that different working groups use different terms, and the footnote explains their relationship. The footnote was approved as amended.

On the main text, in response to SAUDI ARABIA and the US, authors explained that near-term increases are established as a

unique feature of CO₂, saying other GHGs cannot be assessed in the same way because they have different lifetimes.

On best estimates of reaching 1.5°C of global warming mostly lying between 2030-2035, BELIZE, supported by CANADA, GERMANY, LUXEMBOURG, TIMOR-LESTE, the UK, SWITZERLAND, KENYA, and the US, called for, *inter alia*, using language and differentiated scenarios from WGI, rather than only best estimates, and showing when 1.5°C would be reached under different scenarios. BELIZE also noted that the 230 WGIII pathways that show global warming declining to below 1.5°C by 2100 represent one-fifth of all pathways, while in many pathways it does not return to 1.5°C at all. CANADA called for stating that in very high emissions scenarios, 1.5°C is reached in the late 2020s. SWITZERLAND requested references to the peak of projected warming and GHG emissions, which had been expected between 2020-2025.

Numerous delegates commented on an associated footnote defining assessed timing for when a given global warming level is reached under a particular scenario. SAUDI ARABIA requested clarification of a definition that it “is the midpoint of the first 20-year period during which the assessed GST change, averaged over 20 years, exceeds the global warming level.” Discussion of these sentences and footnotes was deferred.

On Saturday morning, WGI Vice-Chair Greg Flato reported that a huddle on this sub-paragraph agreed on the main text, adding a sentence that “In all scenarios considered in WGI, by 2030, global surface temperature in any individual year could exceed 1.5°C relative to 1850-1900 with a probability between 50% and 60% across the five scenarios assessed in WGI (medium confidence),” and modified footnote text conveying the uncertainty associated with natural variability, which reads that “in all scenarios considered in WGI except the very high emissions scenario (SSP5-8.5), the midpoint of the first 20-year running average period during which the assessed average global surface temperature change reaches 1.5°C lies in the first half of the 2030s. In the very high GHG emissions scenario, the midpoint is in the late 2020s.”

B.1.2: This sub-paragraph addresses **discernible differences in trends of GST between contrasting GHG emissions scenarios**. On a sentence on non-global warming effects of air pollution controls combined with strong and sustained methane emissions reductions, TANZANIA asked whether “strong and sustained” means “deep,” as used elsewhere. CHINA questioned the logic of saying that “methane emissions reductions” will lead to “reductions...of methane.” The RUSSIAN FEDERATION asked whether “reductions of ozone” referred to surface ozone or the entire atmospheric column.

MEXICO and CHILE, opposed by SAUDI ARABIA, requested reference to mitigation of black carbon. The authors said there is no assessment of black carbon for future scenarios. After further discussion the sentence was parked.

On Saturday morning, delegates approved adding reference to discernible effects on global surface temperature within years for GHG emissions under contrasting scenarios, and sooner for air quality improvements,” along with a new sentence on targeted reductions of air pollutant emissions leading to more rapid improvements in air quality within years compared to reductions in GHG emissions only.

B.1.3: This sub-paragraph indicates that **continued emissions will further affect all major climate system components**. It was approved.

B.14: This sub-paragraph indicates that **with further warming, every region is projected to increasing experience concurrent and multiple changes in climatic impact-drivers**. It was approved.

B.1.5: This sub-paragraph indicates that **natural variability will continue to modulate human-caused climate changes**. It was approved.

B.2: Climate Change Impacts and Climate-Related Risks: In the headline statement on risks and projected adverse impacts from climate change, SENEGAL suggested referencing related losses and damages. LUXEMBOURG proposed stating “with every increment of global warming” instead of “with increasing global warming,” for consistency throughout the report. Plenary approved this text on Sunday morning.

B.2.1: On every region in the world projected to face further increases in climate hazards, INDIA requested clarification that confidence levels associated with a statement on mental health are in line with Figure SPM.1 and noted that the point only applies to assessed regions and should be qualified. The authors confirmed that the “very high confidence” level is from WGII and preferred not to add “all assessed regions,” saying this would make the sentence unnecessarily complex.

Noting that glaciers are receding, BHUTAN, supported by FRANCE, requested the authors to add high mountain areas to a list of areas subject to flooding. The authors said the sub-paragraph focuses on near-term risks and preferred to retain the text as-is. NIGER underscored that flooding does not only occur in coastal regions and low-lying cities, emphasizing it frequently occurs elsewhere after strong rains.

Emphasizing the importance of recognizing the impact of climate change on mental health, SCI suggested referencing the WGII assessment statement that children and young people, the elderly, and those with medical conditions will be more affected by mental stress. INDIA suggested adding a short footnote indicating that the information about mental health applies only to assessed regions.

DENMARK, supported by GERMANY, suggested including quantification of risk of extinction of species. GERMANY said this is policy relevant information and a global aspect of these ecosystem changes. BOLIVIA noted that loss of glaciers is important to many regions.

The sub-paragraph was parked.

On Saturday morning, delegates accepted authors’ suggestions to add a footnote after a reference to mental health challenges “in all assessed regions,” low-lying cities “and regions,” and two new sentences on the potential consequences of cryosphere-related changes in floods, landslides, and water availability. The sub-paragraph was approved.

B.2.2: In a sub-paragraph indicating that **risks and projected impacts from climate change will escalate**, SAINT LUCIA proposed to add “and losses and damages” to the first sentence. The BAHAMAS proposed to add “incremental” before global warming.

The authors proposed to amend the text to say: “risks and projected adverse impacts and related losses and damages from climate change will escalate with every increment of global warming.”

KENYA called for citing the current level of warming for context. GERMANY, supported by DENMARK, called for adding text including “in terrestrial ecosystems,” and FWCC appreciated the calls for more specific language about impacts.

The authors said the paragraph is on global aggregated risk and they preferred to keep it general, noting the related figures offer specific details. The sub-paragraph and its footnotes were approved.

B.2.3: This sub-paragraph indicates that with **further warming, climate change risks will become increasingly complex and difficult to manage**. It was approved.

B.2.4: This sub-paragraph addresses **level of risk for any given warming level**. On a sentence indicating that future exposure to climatic hazards is increasing globally due to socio-economic development, INDIA said that urbanization is not an unqualified cause of increasing exposure and proposed prefacing it with “unplanned.” GERMANY preferred “unsustainable” to “unplanned.” The authors noted the sentence was verbatim approved text.

BOLIVIA called for adding specific language from WGII, and authors agreed to add a sentence indicating, *inter alia*, that loss of ecosystems and their services has cascading and long-term impacts on people globally, especially for Indigenous Peoples and local communities.

The sub-paragraph was approved with this amendment.

Figure SPM.3: On this figure projecting **impacts of future climate change across natural and human systems**, INDIA sought clarification on whether adaptation measures were considered, noting its importance for food production and human health. UKRAINE and DENMARK queried a panel illustrating impacts on biodiversity. Several delegates questioned the color coding of the severity of impact, with SAUDI ARABIA referring to increased frequency of dust storms on the Arabian Peninsula and its impacts to human health, BRAZIL, to climate change impacts on maize yields in the northwestern area of its country, and AUSTRALIA, to wheat yields.

On Saturday, INDIA expressed opposition to Panel B of the figure, noting it was based on a single study and its data was dominated by inputs from temperate regions, and thus could not qualify as an assessment. An author suggested adding a footnote reflecting these conditions. The figure, including its caption, was then approved.

Figure SPM.4: On a figure showing **risks increasing with every increment of warming**, TÜRKIYE called for changing references from 1.09°C to 1.1°C, saying the former is correct but the latter is more easily understood.

ANTIGUA AND BARBUDA supported the figure, saying the information on sea level rise is a crucial visual representation, especially for SIDS, and, supported by the US, suggested changing a reference to “challenges” to “constraints.”

The US said the figure has become less transparent, encouraged the authors to add a sentence to the caption noting the methodology, and called for improvements in language. MEXICO called for clearer messaging and a different title to better convey urgency. The REPUBLIC OF KOREA cautioned that the meaning of the scenarios may be unclear.

Chair Lee proposed establishing a contact group to discuss the figure and caption.

On Thursday evening, co-facilitators CANADA and SOUTH AFRICA reported the contact group had reached an agreement. On Saturday morning the figure and its caption were approved with no further comment.

B.3: Likelihood and Risks of Unavoidable, Irreversible or Abrupt Changes: In the headline statement, on some future changes being unavoidable and/or irreversible, in a sentence on limiting these with mitigation action, LUXEMBOURG, supported

by NORWAY and DENMARK, asked for mitigation action to be “immediate and ambitious.” The RUSSIAN FEDERATION, supported by ECUADOR, VENEZUELA, INDIA, IRAN, SAUDI ARABIA, TÜRKIYE, and ECUADOR, suggested also referencing adaptation. The authors responded that B.3 does not refer to adaptation. They proposed replacing “unavoidable “and potentially” with “and/or” irreversible” and replacing “mitigation action” with “deep, rapid, and sustained GHG emissions reductions.” These proposals were approved, as was INDIA’s request to add “global” before “GHG emissions.”

B.3.1: This sub-paragraph indicates that **limiting global surface temperature does not prevent continued changes in climate system components that have multi-decadal or longer timescales of response**. It was approved.

B.3.2: On the **likelihood and impacts of abrupt and/or irreversible changes in the climate system**, CANADA suggested changing language from “when” to “if” tipping points are reached.” SAUDI ARABIA sought clarification on the sources of this high confidence statement, noting that the SYR does not mention a similar issue. An author explained the statement as an integration of high confidence statements from WGI and WGII reports.

On risks of species extinction or irreversible loss of biodiversity, DENMARK, supported by GERMANY and LUXEMBOURG, requested clarifying temperature ranges relating to impacts on biodiversity as provided in the SYR. An author referred to section B.2 and Figure SPM.4, both of which contain this information. CAN-I suggested rearranging the sentence, noting that every species extinction is irreversible and emphasizing specifically the threat to warm water coral reefs. The sentence was approved without amendment.

B.3.3: On the **probability of low-likelihood outcomes associated with potentially very large impacts**, the FWCC noted that a statement indicating medium confidence that the Atlantic Meridional Overturning Circulation (AMOC) will not collapse abruptly before 2100 does not sufficiently make policymakers aware that it is still on the path to collapse. She called for language that would recognize the enormity of what may be coming to allow countries to prepare.

TANZANIA asked if the message is that the AMOC will collapse, but not abruptly, before 2100. The US requested clarification as to whether there would be abrupt shifts if there were to be a collapse at any point.

The authors explained that: the sub-paragraph is about an abrupt change; the AMOC is projected to decline but not collapse; and the impacts from a collapse would occur at any time.

B.4. Adaptation Options and their Limits in a Warmer World: On the title of this paragraph, SAUDI ARABIA, supported by CHINA, asked for “and benefits” to be added to “adaptation options.” The authors proposed “Adaptation and its limits.” SAUDI ARABIA opposed this suggestion. CHINA suggested that “limits” to adaptation be deleted. This proposal was opposed by DENMARK, GERMANY, the UK, SAINT KITTS AND NEVIS, the NETHERLANDS, SWITZERLAND, MEXICO, and BELIZE, who noted the section mostly dealt with the limits of adaptation. Authors agreed and proposed returning to the original title, which was approved.

Headline statement: On adaptation options and increasing global warming, SAINT KITTS AND NEVIS, supported by TANZANIA and opposed by the US, requested the sentence be clarified to better reflect the correlation between losses and damages and

adaptation limits. An author explained the current wording aligned with the language in the SYR. GERMANY, opposed by IRAN and ECUADOR, requested “to explore synergies with mitigation” be added to a sentence on the long-term planning required to reduce maladaptation. OHCHR, supported by MEXICO, proposed long-term planning be qualified as “multisectoral and inclusive.” The authors noted synergies with mitigation were not included in B.4 bullets, and accommodated OHCHR’s request by replacing the sentence with the last sentence of B.4.3, which refers to multisectoral and inclusive adaptation. The headline statement was then approved.

B.4.1: This sub-paragraph indicates that the **effectiveness of adaptation, including ecosystem-based and most water-related options**, will decrease with increasing warming. It was approved.

B.4.2: This sub-paragraph addresses **limits to adaptation and losses and damages occurring with additional global warming**. On a sentence on long-term limits to adaptation, SAINT KITTS AND NEVIS, supported by ANTIGUA AND BARBUDA, requested these be described as “reached” rather than “emerging,” in order to recognize that soft limits to adaptation are already taking place and provoking losses and damages. To reflect this sentiment, authors reworded the sentence to add “and losses and damages” to “adaptation,” and “with additional global warming” instead of “at higher levels of global warming.” The sentence, and sub-paragraph, were agreed upon with these changes.

B.4.3: In this sub-paragraph on maladaptation, France noted that, in the WGIII SPM, maladaptation was described as being potentially “reduced,” not “avoided,” and requested reflecting this original language. The authors accepted this suggestion, and the sub-paragraph was approved.

B.5: Carbon Budgets and Net Zero Emissions: In the headline statement, on limiting human-caused global warming requiring net zero anthropogenic CO₂ emissions, INDIA noted cumulative emissions are the determining factor. On a sentence on projected CO₂ emissions from existing and planned fossil fuel infrastructure exceeding the remaining carbon budget for 1.5°C, SAUDI ARABIA proposed to specify “CO₂ emissions from existing infrastructure without additional abatement” would exceed the remaining carbon budget for 1.5°C. This was accepted.

The statement was parked for further consideration later in the meeting.

On Sunday morning, delegates considered a revised version of this headline statement. Key changes included: deletion of “anthropogenic” before CO₂ emissions; and the addition of “without additional abatement” after infrastructure; and deletion of a reference to the carbon budget for 2°C.

INDIA said that privileging net zero in the first sentence while not talking about cumulative emissions would not do justice to subsequent bullets. The authors said that a fundamental insight of AR6 is that, to hold warming at any level, net zero emissions are required at some point.

On a sentence on projected CO₂ emissions, LUXEMBOURG, supported by GERMANY, asked why the reference to 2°C was deleted and called for starting the sentence “without rapid, deep emissions.” CHINA opposed deletion of the reference to 2°C. GERMANY asked for clarification on the addition of “without abatement,” saying it seemed policy prescriptive. The authors said a comparison to 2°C would require an additional statement and said the current text is balanced.

The US and INDIA, supported by SAUDI ARABIA, called for moving forward. The headline statement was approved.

B.5.1: This sub-paragraph addresses **what is required to limit human-caused global warming to a specific level**. Following a query from NORWAY, a reference to “deep, rapid, and sustained” reductions was changed to “strong” GHG emissions reductions starting this decade. Several delegates questioned the reference to “this decade” given that peaking must happen before 2025. There were also calls for distinguishing the peaking of GHG emissions from that of CO₂ emissions.

SWITZERLAND requested specifying that carbon dioxide removal (CDR) may be required “for hard-to-reduce emissions.” This proposal was not accepted. INDIA said a statement on reductions necessary to limit warming to 1.5°C or below 2°C does not apply to all scenarios. GRENADA queried the lack of a reference to “pathways” for limiting warming to 1.5°C or below 2°C in the sub-paragraph.

On Sunday, GERMANY’s call to specify “from a physical science perspective” was agreed. A proposed sentence on CDR was discussed at length. CIEL, echoed by FRANCE, GERMANY, and DENMARK, cautioned that CDR deployment at scale is unproven and risky. SAUDI ARABIA and CHINA urged maintaining this sentence given its necessity for achieving net negative CO₂ emissions. NEW ZEALAND, with the NETHERLANDS, said deletion would be “policy prescriptive” because CDR must be “confronted, here or elsewhere.” Ultimately, plenary approved the statement that “CDR will be necessary to achieve net-negative CO₂ emissions,” with the addition of a suggested parenthetical reference to section B.6 from GERMANY and CANADA.

B.5.2: On global surface temperature rising by 0.45°C for every 1000 GtCO₂ emitted, the UK requested clarification on “stronger” reductions in non-CO₂ emissions implying “somewhat lower” temperatures. The EU, ITALY, and GERMANY requested recognizing in a footnote that the remaining carbon budget differs depending on whether national inventories or top-down global accounting models are used. INDIA, with the REPUBLIC OF KOREA and MEXICO, called for adding that four-fifths of the total carbon budget for the 1.5°C goal and two-thirds for 2°C is already exhausted. DENMARK asked about the timing for depletion of the carbon budget and for reaching particular temperature levels. After a contact group met on this sub-paragraph, it was approved in plenary on Sunday morning without further comment.

B.5.3: On cumulative emissions would almost exhaust the remaining carbon budget for 1.5°C, several delegates queried an “83%” probability that projected cumulative future CO₂ emissions over the lifetime of existing and planned fossil fuel infrastructure will equal the entire carbon budget for a 2°C global warming goal, with UKRAINE and the UK urging clarification for policymakers. DENMARK noted the WGIII language only refers to “existing” not “planned” infrastructure. SAUDI ARABIA said the phrase “without additional abatement” is only relevant for existing infrastructure and supported maintaining a footnote defining abatement.

INDIA, with SAUDI ARABIA, called for beginning the sub-paragraph with a reference to the exhaustion of the carbon budget from historical cumulative emissions. GRENADA called for quantification of how many fossil fuel emissions would exceed the carbon budget for the 1.5°C goal. GERMANY called for reference to “significantly” exceeding the carbon budget and for quantification of how much emissions abatement is necessary. Following further

discussion in a contact group, this sub-paragraph was approved on Sunday morning without further discussion.

Additionally, a new sub-paragraph, **B.5.4**, on **historical cumulative net CO₂ emissions between 1850 and 2019**, and associated footnote were added to the SPM and approved on Sunday morning.

B.6: Mitigation Pathways: The headline statement was opened for consideration on Sunday. On the first sentence, on global modelled pathways that limit warming to 1.5°C with no or limited overshoot, DENMARK requested the addition of peak years to align the headline statement and sub-paragraphs.

Noting that few delegates were still in the room at this point of the meeting, two days after the scheduled conclusion, the US and SAUDI ARABIA called for going with the text recommended by the authors. The authors preferred to retain the text as written. The statement was approved.

B.6.1: On a sentence on **global modelled pathways that limit warming to 1.5°C**, TANZANIA, supported by CHINA, INDIA, and SAUDI ARABIA but opposed by LUXEMBOURG, NORWAY, the US, the UK, FINLAND, and AUSTRALIA, said the quantitative nature of this sentence was not appropriate for the SPM, and proposed moving numbers to a footnote. DENMARK, supported by CHILE, AUSTRALIA, and the NETHERLANDS, proposed moving ranges to the footnote and keeping the median in the text, while BELGIUM, supported by FINLAND and the US, proposed moving both ranges and medians to a new table.

GERMANY, GRENADA, FINLAND, and LUXEMBOURG called for CO₂ emissions numbers to be included in the pathway forecasts. DENMARK, supported by CHILE, GERMANY, SAINT LUCIA, LUXEMBOURG, CHILE, the NETHERLANDS, JAPAN, AUSTRALIA, SWITZERLAND, BELGIUM, and the US, and opposed by SAUDI ARABIA, called for language on emissions peaking before 2025 to be elevated to the main text from a footnote. CHINA and INDIA proposed adding language on equity and regional differentiation.

After IPCC Vice-Chair Barrett chaired a huddle on this sub-paragraph, SAUDI ARABIA called for adding a reference to “assumptions described in Box SPM.1” to the main text. A long discussion ensued on whether to keep a reference to projections for 2035 in a footnote. CHINA, opposed by NORWAY, the US, the UK, and FRANCE, proposed its deletion. After a huddle with WGI Vice-Chair Flato, CHINA proposed including all the numbers and timings from the original sub-paragraph in a table, to go immediately below B.6.1. The authors agreed. A completely rewritten B.6.1, with no footnotes but with the added table on GHG and CO₂ emission reductions from 2019, median, and 5-95 percentiles, was approved Sunday morning.

B.6.2: On Saturday, delegates opened this sub-paragraph on **reaching net zero CO₂ or GHG emissions** for consideration and parked the first sentence and its related footnote without discussion. CHINA called for parking the second sentence, on modelled pathways that limit warming to 1.5°C, for further consideration with B.6.1.

On a sentence on residual GHG emissions, GERMANY, supported by MEXICO and FRANCE, strongly suggested including a brief overview of the feasibility and current deployment of different CDR methods, saying it would be difficult to accept this sentence without this information. FRANCE said the IPCC must make policymakers aware of the challenges of CDR.

SAUDI ARABIA called on the authors to reconsider the language used in the sub-paragraph, saying it significantly weakens the language of the WG SPM, which states that deployment of CDR is unavoidable. She said that if barriers to CDR were introduced in this paragraph, her country would require similar balancing language on the feasibility of solar and renewables elsewhere in the report.

INDIA suggested framing B.6.1 and B.6.2 in the language of carbon budgets, which would allow the pathways to be framed simply and qualitatively, and stating that net negative emissions arise from different options, including CDR. The authors said carbon budgets are discussed in a previous sub-paragraph.

JAPAN, supported by NORWAY, suggested adding “hard-to-abate” in front of zero emissions. NORWAY said this addition clarifies why these emissions are residual. The authors agreed to revise the text to say “however, some hard-to-abate emissions...”

The NETHERLANDS, supported by JAPAN, said this paragraph was not the right place to incorporate risks to use of CDR technologies and called on delegates to start trusting the authors. The authors said adding limitations of CDR would duplicate text contained in B.6.4.

GERMANY called for adding the deployment rates of CDR and suggested adding language from the WGIII assessment.

SAUDI ARABIA called for maintaining the text as it was agreed in WGIII, where it says that CDR is unavoidable, and reiterated that further changes would result in reopening other sections of text and exploring the limitations of other technologies, such as renewables.

Chair Lee parked the sentence.

On Sunday morning, delegates agreed to add “hard-to-abate” before emissions and delete a footnote. The sub-paragraph was approved.

B.6.3: On **global modelled mitigation pathways reaching net-zero CO₂ and GHG emissions**, SAUDI ARABIA requested using agreed text from WGIII. GERMANY, supported by LUXEMBOURG and the EU, suggested referencing concrete options that enable a transition away from fossil fuels. LUXEMBOURG proposed a separate sentence stressing that CDR measures are limited in scale. NORWAY, with the EU and DENMARK, called for quantifying the scale of CDR required to reach net-zero.

The US and DENMARK called for specifying the need to reduce fossil fuel use and show reduction pathways for coal, oil, and gas. An author suggested adding “renewables or fossil fuels with CCS” to the sub-paragraph. GERMANY, supported by SAINT KITTS AND NEVIS, cautioned that CCS was overemphasized in this paragraph, noting that “substantial reduction in overall fossil fuel use” is also agreed language. On quantification of necessary CDR, an author said these numbers are not available, but the amount is substantial. NORWAY and the US, supported by LUXEMBOURG, noted reduction of fossil fuel use as the main strategy for reaching net-zero. Chair Lee parked the sentence.

On the role of the forestry sector for reaching net-zero CO₂ emissions, JAPAN, supported by UKRAINE and SWEDEN, suggested adding “afforestation” and “sustainable forest management” in parentheses. INDIA queried the amount of sequestration expected from the forest sector, noting the importance of “having some idea of scale.” The sentence was approved without amendment.

After GERMANY, supported by NORWAY, CIEL, and FWCC, said more information on the limits of CCS was needed in the sub-paragraph and proposed a footnote, authors proposed including one

sentence from WGIII SPM sub-paragraph C.4.6. SAUDI ARABIA said any additional context on CCS should include benefits and proposed adding the full sub-paragraph to the footnote. FRANCE noted this could be a compromise, and the authors ultimately agreed. The sub-paragraph was adopted with the new footnote.

B.6.4: On CDR methods, FRANCE, supported by GERMANY and NORWAY, asked for more detail on their limits and risks in the text or footnote. NORWAY, with LUXEMBOURG and FRANCE, proposed a reference to “sustainable” CDR. JAPAN, opposed by NORWAY, suggested “coastal” blue carbon management. Authors agreed to a new footnote detailing the variable “impacts, risks, and co-benefits of CDR deployment for ecosystems,” and referring to “coastal” blue carbon management. JAPAN, opposed by INDIA, proposed adding “when poorly implemented” to a sentence on the socio-economic and environmental impacts of afforestation and biomass crops. FRANCE, NORWAY, LUXEMBOURG, INDIA, and GERMANY said quantifying “large scale” in the context of these risks was important, with INDIA pointing to potential text from WGIII. An author responded the text from WGIII would not be an accurate reflection, and KENYA said that adding numbers would be policy prescriptive. The sentence was parked and subsequently approved with no further comments after revisions made by a contact group.

Figure SPM.5: In this figure on **global emissions pathways**, FRANCE called for adding information on recent GHG emissions up to at least 2019. INDIA called for removing information about GHG emissions by sector, emphasizing that sector-wide decline in emissions is a model.

Chair Lee established a contact group co-chaired by Switzerland and Mexico for further discussion. After an agreement was found in the contact group, FINLAND and CHILE requested small modifications to clarify the figure in plenary on Saturday night. This was opposed by SAUDI ARABIA and the UK, who warned against reopening agreed language. Figure SPM.5 was approved.

B.7: Overshoot: Exceeding a Warming Level and Returning: The headline statement addresses warming exceeding a specified level such as 1.5°C. On Sunday, the authors proposed to insert “global” before CO₂ emissions and delete “globally” at the end of the first sentence. Delegates approved the headline statement.

B.7.1: In a sub-paragraph indicating that only a **small number of the most ambitious global modelled pathways limit global warming to 1.5°C by 2100** without exceeding this level temporarily, the RUSSIAN FEDERATION proposed putting “global” behind “net negative CO₂ emissions” in the second sentence. The authors preferred to retain the sentence as written.

CIEL highlighted the need to clearly communicate the uncertainties and risks of CO₂ removal. FWCC queried the lack of a reference to the need for rapid reductions of CO₂ emissions. CARE INTERNATIONAL suggested adding “achieving and sustaining net negative CO₂ emissions globally, with deep and rapid reductions,” noting that without such a reference the paragraph implies that CDR is the main approach. The authors said the need for rapid emissions reductions is referenced elsewhere.

SAUDI ARABIA said the impacts of CDR have been discussed elsewhere and said the paragraph as written reflected important findings related to the need for removals.

BOLIVIA, supported by GERMANY, KENYA, FRANCE, and DENMARK, called for clear reflection on the problems and limitations of CDR and CCS.

The authors explained that the sub-paragraph focuses on how to reduce warming after reaching a particular temperature threshold and said CDR, its risks and impacts are addressed elsewhere. Saying the authors’ explanation of the narrative was compelling and clear, CANADA supported the text as written.

In a sentence on adverse impacts that occur during this period of overshoot, SWITZERLAND suggested referencing irreversibility and tipping points. GERMANY, supported by DENMARK and FWCC, called for introducing more policy-relevant examples. The US suggested tying the language more clearly to the overall narrative of 1.5°C of warming. The authors noted this sentence focuses on carbon sinks and irreversibility is addressed elsewhere.

The EU asked why only land sinks were cited, noting that similar weakening could happen to ocean carbon sinks. The authors said that while both land and ocean carbon sinks are affected by climate change, land is more affected.

Noting that the term “natural land carbon sinks” is not very illustrative, GERMANY suggested adding examples. The authors proposed to add “such as increased wildfires, mass mortality of trees, drying of peatlands, and permafrost thawing.”

SAUDI ARABIA, supported by JAPAN, proposed to insert language on the co-benefits of CDR. The authors said co-benefits are addressed elsewhere.

The sub-paragraph was approved as amended.

B.7.2: In a sub-paragraph on **impacts of overshooting 1.5°C**, several delegates proposed additional wording on increasing risks to ecosystems and societies from higher-magnitude and longer-duration overshoot to emphasize severe impacts. The authors did not accept these requests.

On irreversible adverse impacts from overshooting 1.5°C, in response to GERMANY, authors added a reference to coastal ecosystems “impacted by ice sheets, glacier melt, or accelerating and higher committed sea level rise.” The sub-paragraph was approved as amended.

B.7.3: On net negative CO₂ emissions needed to return to 1.5°C by 2100, several delegates questioned references to risks associated with CDR deployment at “very” large scales when WGIII specified “at large scale.” Others called for reference to “technical, economic, and institutional barriers related to CDR technologies” and to “GHG” emissions. This sentence was parked.

On Sunday, the authors presented a revised version of the final sentence that added a reference to sustainability concerns. The sub-paragraph was approved.

C: Responses in the Near Term

C.1: Urgency of Near-Term Integrated Climate Action:

In the headline statement, on climate resilient development, SAUDI ARABIA requested deleting “and is enabled by increased international cooperation.” Authors proposed amended text referencing “improved access to adequate financial resources,” which GERMANY deemed “too much focus on finance.” On choices and actions implemented in the near future, the EU, NORWAY, TÜRKIYE, SWEDEN, TANZANIA, GERMANY, and MEXICO proposed changing “next” decade to “this” decade with GERMANY noting, given that underlying literature is from the last decade, the meaning refers to this decade. The text was amended, and the headline statement and its title approved.

C.1.1: On a sub-paragraph on **climate resilient development**, INDIA called for clearly signaling that constraints of mitigation and adaptation are globally differentiated and a reference to global warming that has already occurred. The US noted that there are

many components of differentiation, which cannot be mentioned in every section. The authors said the issues of historical difference and regional inequities were addressed elsewhere in the summary.

ECUADOR, supported by BOLIVIA, called for referencing projected losses and damages. SAUDI ARABIA called for deleting “adverse” in a reference to observed adverse impacts. DENMARK and CHILE objected, noting “adverse” is approved language. The US suggested adding that “accelerated mitigation and adaptation will reduce the risks for humans.”

The authors preferred retaining “adverse” as it reflects WGII findings and supported adding references to losses and damages. The authors also suggested inserting a sentence stating that “Climate resilient development integrates adaptation and mitigation to advance sustainable development for all,” saying this is consistent with WGII definitions and WGII and WGIII SPMs.

INDIA underscored his “foremost concern” that near-term action is constrained by historic responsibility for global warming and asked for further emphasis on “past” emissions. Chair Lee said that measurements were addressed in Section A and the authors did not believe they needed to be repeated in Section C. IRELAND, AUSTRALIA, the UK, and the US called for greater trust in the authors’ judgment and speedier approval of the text. The first sentence was approved.

On a sentence on climate-resilient development, GERMANY asked that “greenhouse gas” be added before “mitigation” to be consistent with the glossary. This was accepted by the authors. INDIA asked to replace the sentence with a sentence from B.3.2 in the WGII SPM, which notes there is a difference in emphasis between adaptation and mitigation priorities for vulnerable communities. With the understanding this would be addressed in the following sentence, this sentence was approved.

SAUDI ARABIA, supported by INDIA, CHINA, BRAZIL, BOLIVIA, MEXICO, and VENEZUELA, called for including wording from WGIII on equity, climate justice, and varying circumstances and capabilities. CHINA also pointed to historical development emissions. INDIA added that focusing on the 1.5°C threshold gives the wrong impression of risk, given the scale of current warming and depletion of the global carbon budget.

The authors proposed adding words to the sentence that climate resilient development pathways “have been constrained by past development, emissions, and climate change.”

The US, supported by JAPAN and JAMAICA, preferred the original sentence, noting many additional past constraints to development are captured under “progressively constrained” and other sub-paragraphs address specific constraints. He stressed that C.1.1 is forward-looking.

After further discussion, delegates accepted the authors’ suggested addition and approved the entire paragraph.

C.1.2: On government action and pathways towards sustainability and climate resilient development. SWEDEN, supported by LUXEMBOURG, the UK, IRELAND, the US, NORWAY, UKRAINE, AUSTRALIA, FINLAND, FRANCE, SWITZERLAND, FWCC and SCI, requested retaining the opening sentence on the availability of urgent, feasible, and equitable near-term options to address climate change and improve human wellbeing and planetary health from an earlier draft of the SPM. Many countries highlighted the clarity and policy-relevance of this sentence. The UK called for highlighting that climate change is not an unsolvable problem and that there are possible solutions, suggesting that valuable support for this statement can be found in

section 4.5 of the SYR. Observers from FWCC and SCI stressed the need to state at the forefront of this section “that we can do something now,” emphasizing that hope is needed.

LUXEMBOURG suggested more precision on knowledge diversity as an enabling condition for climate-resilient development by specifying diverse knowledge partnerships, including with youth, Indigenous communities, and ethnic minorities. BOLIVIA, supported by FRANCE, highlighted the importance of including different knowledge forms. The value of Indigenous and local knowledge was emphasized by CANADA, AUSTRALIA, FINLAND, and ECUADOR. MEXICO and UKRAINE added the importance of including minority group knowledge and increasing participation of youth and women.

BOLIVIA, supported by CHILE, MEXICO, ECUADOR, and FWCC, requested that the principles of equity, social justice, and climate justice be included in this section. The OHCHR suggested including equity, justice, a rights-based approach, and just transitions as enabling conditions. The INUIT CIRCUMPOLAR COUNCIL supported a rights-based approach. On Friday night, the paragraph was approved.

Figure SPM.6: BOLIVIA urged that the figure reflect different valuations of nature. The PHILIPPINES suggested adding a legend that provides information on the different pathways and sought clarification on the graph’s color coding and shape.

Chair Lee called for a contact group, chaired by the UK and Belize with WGII Vice-Chair Joy Pereira, to address delegates’ comments on C.1.2 text and Figure SPM.6. On Friday night, the figure and its caption were approved.

C.1.3: In a sub-paragraph on **irreversible changes**, NORWAY, supported by GERMANY, BELGIUM, and the NETHERLANDS, asked for the reinsertion of a sentence on the availability of “collective knowledge” to undertake mitigation and adaptation actions, which they said offers a positive message. Authors responded that this message was relayed in C.1.2.

In a sentence on the consequences of “continued emissions,” GERMANY and the NETHERLANDS asked to replace “continued emissions” with “any further emissions.” INDIA said “further affect” should be replaced by “further compound,” to better reflect the existing presence of climate emissions. Authors said the sentiment behind both requests was already reflected in the wording.

In a sentence on the impact of mitigation and adaptation actions, BRAZIL suggested impacts be described as potentially “minimized” to avoid implying these could be avoided entirely. The authors said this was already clear in the wording. A suggestion by KENYA to add a reference to “livelihoods” was accepted by the authors.

SCI underscored the importance of this paragraph as it is the only one in the SPM to explicitly recognize threats to young and future generations. This sub-paragraph was approved.

C.2: The Benefits of Near-Term Action: Chair Lee opened discussion on the headline statement early on Sunday morning. GERMANY suggested adding “deep and sustained mitigation and accelerated implementation” to the first sentence. LUXEMBOURG suggested adding “rapid” before deep. The authors agreed.

GERMANY suggested referring to adaptation actions in this decade instead of in the near term. The authors agreed.

Chair Lee parked the text for further consideration.

Noting that at this point of the meeting delegates had been working for “72 hours straight,” INDIA, supported by CHINA, called for a break. Noting that many delegates had left, he underscored his concern about lack of inclusivity, said that the

process was “compromised,” and asked if there was a need to complete the work virtually. CHINA called for thinking seriously about how to adopt the report on behalf of all members, not only those who could stay until the end.

Noting the panel had “never finished an approval” on schedule, Chair Lee said by the time previous SPMs had been approved, the distribution of participants was not what the IPCC “rules, procedures, and spirits” demand. He said the panel had collectively made every effort to expedite the process, and he was in the Panel’s hands.

IPCC Secretary Abdalah Mokssit explained that the Secretariat had offered to rearrange travel plans for “all developing countries” with flights on Saturday, noting that some authors and Bureau members from developing countries had accepted this offer. He underscored the need to find a new approach to speed the “approval process itself.”

WGI Co-Chair Valérie Masson-Delmotte emphasized that the slow process has been “torturous” for the authors, who are unpaid, and said not being able to see the process to its conclusion is an offense to their work.

Underscoring that many authors were unwell, their numbers were dwindling, and the Panel had not yet begun consideration of the SYR, IPCC Vice-Chair Barrett called for delegates to consider a “humane” path forward.

SAUDI ARABIA recognized the extraordinary work done by the authors, Bureau and Panel, called on delegates to show flexibility and move forward constructively, and underscored that the panel members who are most vulnerable no longer had a voice in the room.

Chair Lee called on the Panel to complete its work.

Noting that “most of our friends and colleagues are not in the room,” the US questioned whether the Panel was achieving “the right balance” in the text. Emphasizing that the authors had read all of the government comments, he urged the Panel to stick to the text “as it is” to complete the approval process, and then think about next steps. The UK supported this approach.

IPCC Vice-Chair Diana Ürge-Vorsatz asked Chair Lee to clarify his plan after approval of the SPM, describing the task ahead as “simply impossible.” Speaking on behalf of the authors, Vice-Chair Barrett called on the Panel to finish the SPM in plenary, underscoring there were not enough countries left to have contact groups.

Chair Lee called on the Panel to leave questions about editorial issues, scientific content, and structure to the authors, saying the process could be expedited if “we just keep that line between the policymakers and scientists.”

Several delegations thanked the authors, called for the Panel to move swiftly ahead on the SPM and then consider next steps. The Panel resumed its review of the SPM.

Later in the day, the Panel approved a revised version of the C.2 headline statement with the addition of “deep, rapid and sustained” before a reference to mitigation and “accelerated” implementation “in this decade.”

C.2.1: On accelerated mitigation and implementation of adaptation actions, authors agreed with GERMANY and TANZANIA to replace “accelerated” with “deep, rapid, and sustained” mitigation for consistency and with those two and others on replacing “in the near term” with “this decade” in a sentence that mitigating and adapting to climate change impacts is critical to sustainable development. A new sentence proposed by CHINA,

supported by SAUDI ARABIA, on delayed adaptation resulting in higher overall costs was parked. Following the work of a contact group, this sub-paragraph was approved with no further comments on Saturday night.

C.2.2: On delayed mitigation action further increasing global warming, several countries called for wording on the effects of delaying mitigation and adaptation. IRAN, INDIA, SAUDI ARABIA, CHINA, MEXICO, BRAZIL, and CHILE called for including developing countries and/or other regions with vulnerable populations in a list of those who will be disproportionately affected by losses and damages.

GERMANY, DENMARK, and TANZANIA called for replacing “strong” with “immediate, rapid, and sustained” mitigation. The US asked the authors to clarify the meaning of “poverty traps.” FWCC noted “societal instability” is also linked to delayed action.

MEXICO, supported by CHILE, requested adding Latin America to the developing country regions particularly vulnerable to losses and damages. The authors proposed replacing the list referring to “Africa, LDCs, and SIDS” with “especially in developing and least developed countries.” NORWAY, supported by SWITZERLAND, AUSTRALIA, the UK, the US, the NETHERLANDS, GERMANY, EGYPT, and IPCC Vice-Chair Barrett, opposed this suggestion, on the grounds that deleting the mention of SIDS when many delegates from SIDS were no longer present in plenary would not be acceptable.

SWITZERLAND, supported by the US and MEXICO, proposed to instead refer to countries “most vulnerable” to climate change. When authors proposed to return to the original list but to preface it with “including” rather than “in particular” to be more inclusive, INDIA asked why Asia was not included in the list. MEXICO and BRAZIL said the list should be longer and include Asia and Latin America. The sentence was then parked.

On Sunday, the authors presented amended text listing “Africa, LDCs, Central and South America, and Asia” as disproportionately affected by losses and damages. MEXICO insisted on referring to “Latin America” instead of “Central and South America,” noting the importance of this term for including her country in this list. The US proposed adding the Arctic to the list of regions with particularly high vulnerability. The authors agreed to add “Arctic” but preferred not to accept Mexico’s request, saying it was not supported by the literature. MEXICO said she was not in a position to accept the language as presented and suggested adding a footnote stating Mexico is considered within Central and South America. Chair Lee proposed parking the sentence once again.

Following a huddle, delegates considered revised text with the addition of “Without rapid, deep and sustained mitigation and accelerated adaptation actions” losses and damages will continue to increase. Delegates approved the sentence, as well as a footnote stating, *inter alia*, that the southern part of Mexico is included in the climatic subregion South Central America for WGI.

C.2.3: In a sub-paragraph on the co-benefits of accelerated climate action, FINLAND requested the authors to reformulate “healthy diets” to one of several alternatives reflecting planetary health. NORWAY proposed adding “sustainable” before healthy diets. FWCC suggested “balanced, sustainable, and healthy.”

CHINA, supported by MEXICO, called for replacing a reference to methane with “non-CO₂.”

The sub-paragraph was referred to a contact group and was subsequently approved without further discussion.

C.2.4: On limits of cost-benefit analysis to represent all avoided damages from climate change, FRANCE queried a sentence on emissions peaking “earlier,” with INDIA calling for quantification. INDIA also urged ensuring that global cost-benefit analysis does not mean restricting energy use and access or giving a free ride to the historical emitters.

SWITZERLAND sought clarification on health benefits compared to mitigation costs, non-monetized costs such as loss of human life and, with LUXEMBOURG, economic benefits “exceeding the costs of mitigation.” This sub-paragraph was approved in plenary without further discussion on Saturday night.

C.2.5: In a sub-paragraph indicating that **ambitious mitigation actions imply disruptive changes in existing economic structures,** LUXEMBOURG, supported by ITALY, said the first sentence was very negative and should be rewritten to imply that disruptive changes are “actually wanted.” ITALY called for adding “large and sometimes” before disruptive.

INDIA, supported by SOUTH AFRICA, said that some interventions could be particularly disruptive to lower-income groups and economies, and said the language could be simplified to say “with negative consequences.” Noting that the need to address distributional consequences is a key message of the SYR, MEXICO asked the authors to reflect on broader consequences of disruptive changes. This sub-paragraph was approved without further discussion in plenary early Sunday morning.

Figure SPM.7: On this figure illustrating **mitigation and adaptation options for scaling up climate action,** FRANCE suggested capturing in the legend that mitigation options presented in Panel B are not sufficient to get temperature increase back down to 2°C without being complemented by other measures. INDIA noted adaptation options are being considered only in combination with mitigation, without being systematically discussed on their own. BRAZIL pointed to regional variation regarding feasibility of adaptation options. MEXICO sought clarification on color coding related to the costs of each option. Secretary Mokssit announced Japan and Saint Kitts and Nevis would co-facilitate a contact group on the figure.

On Saturday, two authors reported on changes made in the contact group, including updating the title of Panel A to include the “feasibility” of climate responses and the “potential” of mitigation options. Further, in mitigation options, “forest management” was replaced with “improved sustainable forest management,” “hydropower” was added to “geothermal,” and “transport” to “biofuels.” In Panel B, a sentence specifying “the range of the GHG emission reductions” was added, as well as a sentence detailing examples of forest-based adaptation and another explaining that WASH refers to “water, sanitation, and hygiene.” BRAZIL noted that, as discussed in the contact group, “energy” as a section title was too vague. The authors updated it to “energy supply.” The figure and its caption were approved without further comments.

C.3: Mitigation and Adaptation Options across Systems: In a sentence in the headline statement on deep and far-reaching emissions reductions, LUXEMBOURG suggested “sustained,” and NORWAY “just” as qualifiers. Authors agreed to add the former.

In a sentence on the availability and effectiveness of low-cost options, INDIA, supported by CHINA and SAUDI ARABIA, requested the addition of “but vary across sectors and regions.” Authors proposed “with differences across systems and regions.” The headline statement was approved.

C.3.1: On a list of **systems transitions,** CHILE, supported by GERMANY and UKRAINE, noted an absence of “energy systems.” DENMARK, GERMANY and the NETHERLANDS suggested replacing “low-emission technologies” with “zero-emission technologies.” SAUDI ARABIA opposed. The authors proposed amending text to “low- or zero-emission technologies.” The sentence was parked.

On the availability and feasibility of mitigation and adaptation options, the UK, supported by NORWAY, called for stating that “many options exist.” An author proposed adding that “feasible, effective, and low-cost options for mitigation and adaptation are already available,” which was approved.

SAUDI ARABIA requested mentioning “just transition principles” in the context of system transitions, noting that system transitions need to “fit within different national circumstances.” Noting lack of consensus, Chair Lee parked the sentence. After the authors proposed new language, including on adding “climate services” to a list of system transition examples, the sub-paragraph was approved.

C.3.2: On what net-zero CO2 energy systems entail, GERMANY, supported by DENMARK, NORWAY, the NETHERLANDS, and FINLAND, but opposed by the US, said a key WGIII message was the importance of renewable energy for the energy transition and called for specifying that “especially wind and solar” energy was needed. DENMARK, supported by NORWAY, BELGIUM, the NETHERLANDS, ITALY, FINLAND, MEXICO, SWEDEN, and SPAIN, but opposed by SOUTH AFRICA and SAUDI ARABIA, requested the addition of WGIII wording on the affordability and availability of renewable energy. The authors agreed.

IRAN said that Fig.SPM.7 allows for nuclear energy. Authors declined to take up this or a suggestion by SAUDI ARABIA for WGIII wording on CDR and national circumstances.

After the addition of wording on the large contribution to emission reductions coming from solar and wind energy, the sub-paragraph was approved.

C.3.3: On reducing industry and transport GHG emissions, GERMANY proposed including text on the potential of electric vehicles. SWEDEN, supported by FINLAND, suggested expanding the sub-paragraph to cover overall land-based transport, including light duty passenger vehicles. An author proposed text on the decarbonization potential of electric vehicles. SAUDI ARABIA requested that it be revised and simplified, expressing concern at no mention of critical minerals needed for battery production. Chair Lee noted diverging views on the sentence and parked it.

On Saturday, the authors presented modifications to the text in response to comments from the floor, including on the potential of electric vehicles to reduce GHG emissions from land-based transport. BRAZIL said the paragraph should recognize the experiences of countries where biofuels are the most viable alternative. He asked for the new sentences to be deleted or for a new sentence on biofuels to be added. Chair Lee pleaded for the approval of the sentence as it was, noting that, according to the Principles Governing IPCC Work Section 10b, Brazil’s comment would be recorded in the minutes of the meeting. After BRAZIL underscored this proposal was insufficient, authors proposed adding a sentence from the WGIII SPM, which notes that “sustainable biofuels can offer additional mitigation benefits in land-based transports in the short and medium term.” The sub-paragraph was approved.

C.3.4: This sub-paragraph indicates that **urban systems are critical for achieving deep emissions reductions and advancing climate resilient development**. It was approved.

C.3.5: This sub-paragraph addresses how **agriculture, forestry, and other land use options provide adaptation and mitigation benefits**. In response to comments from delegates, authors proposed a variety of changes, including adding a sentence on potential trade-offs resulting from ecosystem restoration, reforestation, and afforestation. GERMANY expressed concern the added sentence is “too negative,” with its focus on trade-offs neglecting the positive potential of ecosystem restoration. The paragraph was approved with minor amendments.

C.3.6: This sub-paragraph addresses **ways to maintain the resilience of biodiversity and ecosystem services**. The text was approved.

C.3.7: This sub-paragraph addresses **mitigation and adaptation options that mainstream health into food, infrastructure, social protection and water policies**. The text was approved.

C.3.8: This sub-paragraph addresses **factors that can reduce vulnerability and exposure of human systems**. The text was approved.

C.4: Synergies and Trade-Offs with Sustainable Development: This headline statement, which indicates that accelerated and equitable action in mitigating and adapting to climate change impacts is critical to sustainable development, was approved.

C.4.1: This sub-paragraph addressed the different **starting points and conditions of countries**. On a sentence on mitigation efforts within the wider development context, INDIA, with BOLIVIA and CHINA, called for adding a reference from the WGIII report indicating that the pace, depth, and breadth of emission reductions are contingent on the availability of means of implementation, technology transfer, capacity, and the remaining carbon budget and equity in access to it. The US opposed this suggestion. The authors said INDIA’s suggestion related to actions to be taken, which are addressed in other paragraphs, and the purpose of C.4.1 is to assess links between sustainable development and mitigation and adaptation actions.

INDIA queried whether a sentence on countries seeking to improve the well-being of people really referred to sustainable development, as it did not mention equity, climate justice, or enabling conditions. An author explained that “sustainable development” is the overarching framework in which WGII and WGIII formulated their texts, but agreed context also needs consideration. She proposed stating that development priorities reflect different starting points and “contexts” rather than “priorities.” With this change, the sentence was approved.

On the embeddedness of mitigation efforts within the wider development context, several delegates commented on a list specifying “different contexts.” TANZANIA and INDIA sought clarification of “political conditions.” INDIA suggested adding “equitable access to the carbon budget” to the list. ECUADOR and BOLIVIA supported replacing “historical conditions” with “access to the carbon budget.”

SWITZERLAND sought clarification on “international environment” and, supported by the US, cautioned against including a list since it would “never be complete.” He suggested subsuming all elements under the overarching concept of sustainable development. CHILE proposed changing the sentence from a list into a message by adding, “Regional mitigation strategies depend

on...” An author explained that the list specifying “different contexts” originated in the WGIII SPM.

The text was parked pending further discussion.

When this sentence was reopened, INDIA reiterated its request to refer to the “equitable access to the global carbon budget” and to “provision of the means of implementation including finance, technology, and capacity transfer” in the text. Similarly, CHINA and BOLIVIA noted “history” is too vague and should be replaced with “historical responsibilities.” Authors said “history” was approved language in the WGIII SPM and that the terminology sought by INDIA was in C.4.2.

The REPUBLIC OF KOREA proposed “history” be replaced by “historical divergence.” TANZANIA requested confirmation that “political conditions” was not policy-prescriptive, after which authors replaced it with “political circumstances.” After the sentence was once again parked, AUSTRALIA, ESTONIA, GERMANY, the US, and FRANCE, expressed frustration with difficulties in getting text approved, with GERMANY noting that “parking approved language is really worrying.”

On policies for regions with high dependency on fossil fuels for revenue and employment generation, ESTONIA, supported by FINLAND, suggested adding “principles” after “just transition.” The authors agreed to amend the text accordingly.

On just transitions in regions with high dependency on fossil fuels for revenue and employment generation, INDIA insisted on referencing regions depending on fossil fuels for industrial growth. An author noted there is no mention of industrial growth in the glossary term on just transition. INDIA requested removal of “for revenue and employment generation,” to go beyond the “sole focus” on revenue. Chair Lee noted no changes can be made to this sentence from a scientific point of view and called for a huddle given diverging views.

Following discussion in the huddle, the sub-paragraph was approved on Saturday.

C.4.2: On synergies of mitigation and adaptation actions with the Sustainable Development Goals (SDGs), JAPAN, SAUDI ARABIA, and INDIA sought clarification on evidence from underlying reports. BOLIVIA, supported by INDIA, stressed the dependence of synergies and tradeoffs on development contexts. SWITZERLAND, supported by the US and DENMARK, suggested reflecting that synergies are exceeding tradeoffs, with CHILE adding “substantially” exceed tradeoffs.

MEXICO and CHILE called for including climate justice along with the SDGs. FRANCE, supported by CARE INTERNATIONAL, proposed inclusion of SYR Figure 4.5 illustrating the potential for synergies. The OHCHR and FWCC suggested adding WGII text on the role of integrated and inclusive system-oriented solutions for climate resilient development.

C.4.3: In a sub-paragraph on **implementing mitigation and adaptation actions**, INDIA stressed the need for industrial growth and development and provision of energy as required. He suggested including “shifting toward clean energy,” and “taking into account trade-offs” under mitigation actions.

After authors explained that the second sentence shows synergies are maximized for human well-being if mitigation and adaptation are combined, the sub-paragraph was approved.

C.5: Equity and Inclusion: In the headline statement on prioritizing equity, climate justice, social justice, inclusion and just transition processes, BOLIVIA requested adding “climate justice” as a factor enabling mitigation. OHCHR suggested adding “and rights-

based approaches.” Authors agreed with BOLIVIA’s suggestion and accommodated it, further adding “adaptation and” to the reference to “ambitious mitigation.”

C.5.1: Following a contact group on C.4., C.5, and C.6, co-chaired by Chile and Germany, a new sub-paragraph on **equity remaining “a central element in the UN climate regime”** was added to this section on Friday. It was approved without further comments in plenary.

C.5.2: In a paragraph on **adaptation and mitigation actions that prioritize equity, social justice, and inclusivity**, BOLIVIA, supported by MEXICO, NICARAGUA, CANADA, SAUDI ARABIA, the FWCC, and CAN-I, urged including “climate justice” and “rights-based approaches.” Several delegates called for referencing Indigenous Peoples. BENIN, INDIA, and TÜRKIYE stressed climate justice, with the FWCC noting this concept is mentioned five times in the SYR but nowhere in the SYR SPM. The US cautioned that the specific contexts in which terms are used in the WG reports must be captured in the SPM.

INDIA cautioned that language on “social justice” and “social trust” seemed policy prescriptive.

The authors agreed to refer to “climate and” social justice and “rights-based approaches,” but noted evidence that transformative changes happen much faster where there is social trust.

Chair Lee parked this sub-paragraph for consideration by a contact group. When the sub-paragraph came back to plenary on Friday, it was approved without further comment.

C.5.3: This sub-paragraph addresses the **high vulnerability of regions and people with considerable development constraints to climactic hazards**. On a sentence on factors exacerbating vulnerability, FRANCE proposed stating that the list is not exhaustive.

TIMOR-LESTE suggested adding a reference to SIDS and LDCs. OHCHR called for further mention of the way forward, including a reference to rights-based approaches. In a sentence on adaptation outcomes being enhanced by “targeting” equity and inclusivity, INDIA proposed replacing the word “targeting” with “through approaches focusing on” and qualifying a reference to well-being in urban areas as “environmental.” BOLIVIA asked that the differing worldviews of marginalized communities be recognized in the sub-paragraph.

The sub-paragraph was then sent to a contact group. When the issue returned to plenary on Friday, it was approved without further comments.

C.5.4: This sub-paragraph addresses how **the design of instruments and consumption-based approaches can advance equity**. SAUDI ARABIA requested adding regulatory instruments to a reference to the design of economic instruments. TIMOR-LESTE, supported by INDONESIA, AUSTRALIA, CHILE, NORWAY, and the US, requested adding “capacity-building” to “technology transfer” and “finance” as tools that can assist developing countries in transitioning to low-emissions transport systems.

SWITZERLAND, supported by NORWAY, asked for “investments” to be added. On the same sentence, GERMANY, supported by LUXEMBOURG and the US, proposed “developing regions” instead of “developing countries” as the latter was not defined in the glossary. MEXICO responded that efforts to move towards low-emissions transport was done at the national, not regional, level.

The sub-paragraph was then sent to a contact group. When this issue returned to plenary on Friday, delegates continued

deliberations. Following a suggestion by SAUDI ARABIA, supported by CHINA, a reference to “regulatory instruments” was added to the mention of the role of “economic instruments” in the advancement of equity.

CHINA, supported by SAUDI ARABIA, EGYPT, and IRAN, called for either the examples of “taxes, subsidies, and prices on consumption” to be deleted, or a mention of “national circumstances” to be included. This proposal was opposed by NORWAY, the US, IRELAND, GERMANY, FINLAND, PERU, MEXICO, and NEW ZEALAND, as well as by the authors, who noted the policy relevance of providing examples. The authors also highlighted the implicit reference to national circumstances, as these policies are carried out at the national level. The sentence was sent to a huddle chaired by IPCC Vice-Chair Barrett. On Saturday morning, the text was approved with no further comments.

C.6: Governance and Policies: In the headline statement on elements that enable effective climate action, SWITZERLAND requested a reference to “improved” rather than “enhanced” finance. The authors agreed. INDIA objected. The text was approved with no change.

C.6.1: In a paragraph indicating that **effective climate governance enables mitigation and adaptation**, SWITZERLAND stressed the importance of inclusive and transparent decision-making. NORWAY noted that cooperation between different levels of governance could be highlighted.

The sub-paragraph was then sent to a contact group. It was approved without further discussion in the early hours of Sunday morning.

C.6.2: On **effective local, municipal, national and subnational institutions**, CIEL pointed out that businesses should not be included in a category of “civil society.” The sub-paragraph was approved without change.

C.6.3: Chair Lee opened this sub-paragraph on **effective multilevel governance for mitigation, adaptation, risk management, and climate resilient development**, and immediately sent it to a contact group for further discussion. It was approved without comment early Sunday morning.

C.6.4: On **regulatory and economic instruments supporting deep emissions reductions if scaled up and applied more widely**, BELIZE, supported by NEW ZEALAND, GERMANY, the UK, LUXEMBOURG, and the EU, called for elaborating on the benefits of removing fossil fuel subsidies, noting relevant language was approved in the WGIII SPM. GERMANY suggested adding “immediate and deep” to the reference to rapid emissions reductions.

INDIA, supported by SAUDI ARABIA and CHINA, said the section on fossil fuel subsidies must take note of widely varying circumstances around the world, as this is “a matter of survival and basic essential services.” Chair Lee said this sub-paragraph would be discussed in a contact group. When it returned to plenary on Sunday morning, it was approved without further discussion.

C.6.5: On **diverse knowledges**, NORWAY called for including youth and women, as mentioned in the longer report. Chair Lee sent this sub-paragraph to a contact group. When it returned to plenary on Sunday morning, it was approved without further discussion.

C.7: Finance, Technology and International Cooperation: The headline statement indicates that finance, technology, and international cooperation are critical enablers for accelerated climate action. SAUDI ARABIA said that a sentence on global capital was too long for a box and suggested deleting “including institutional, regulatory, and market access.” INDIA noted that this sentence

is missing context indicating there is sufficient global capital but barriers to access for climate finance.

SWITZERLAND emphasized that regional mismatch is central to this issue and should be captured in the headline statement. The authors proposed to state, “There is sufficient global capital to close the global investment gaps, but there are barriers to redirect capital to climate action.”

The proposed text was approved.

C.7.1: In a sub-paragraph indicating that improved **availability and access to finance** would enable accelerated climate action, TANZANIA called for adding “adaptation and” before a reference to mitigation. JAPAN called for adding a reference to “more effective use of existing financial arrangements.” The US proposed to delete “equitable” before access to domestic and international finance, noting that equitable typically refers to each country getting the same share, and this does not necessarily catalyze finance. On Sunday morning, plenary approved the sub-paragraph with no further discussion.

C.7.2: In a sub-paragraph indicating that **increased access to finance can build capacity, address soft limits to adaptation and avert rising risks**, SWITZERLAND emphasized that all finance—not just public finance—is an important enabler of adaptation and mitigation.

CHINA, supported by BRAZIL and IRAN, called for adding a reference to “developing countries” in text citing vulnerable groups, regions and sectors. The sub-paragraph was approved with this change on Sunday morning.

C.7.3: In a sub-paragraph on **barriers to redirecting capital to climate action**, SAUDI ARABIA requested clarification on the source of language on reducing barriers and scaling up financial flows. BOLIVIA called for referencing “enhanced access to finance.” This sub-paragraph was approved on Sunday with no further discussion.

C.7.4: This sub-paragraph indicates that **tracked financial flows fall short of the levels needed** for adaptation and to achieve mitigation goals across all sectors and regions. MEXICO underscored the importance of including references to climate-related risks. SWITZERLAND, supported by the US, called for deleting the first sentence, on climate finance gaps and opportunities in developing countries, saying there is no common definition of climate finance, the terms “gaps” and “opportunities” are unclear, and there is no common IPCC definition of developing countries. SAUDI ARABIA said the first sentence is a statement of fact and opposed deletion. Many countries called for adding references to adaptation and developing countries.

Chair Lee said these comments would be considered in a contact group. When this issue returned to plenary on Sunday, CHINA asked why a reference to options for scaling up mitigation for developing “countries” had been changed to “regions.” An author responded that authors were “as depleted as delegates” and could not remember why that change was made. They changed the text back to “countries.”

Delegates deferred discussion of a reference to Figure 4.6 in the longer SYR until discussion of the SYR itself. With that one reference left pending, the sub-paragraph was approved.

C.7.5: On **enhancing technology innovation systems**, GERMANY, supported by SWITZERLAND and the US but opposed by SAUDI ARABIA, cautioned that a sentence on technological innovation having trade-offs conveys a negative message and called for replacing “requiring” with “that can be

managed by” effective governance. Authors rejected this change. sentence was approved as presented.

On low-emission technologies lagging in most developing countries, UKRAINE requested clarification of “capacity” limitations. TIMOR-LESTE suggested changing this to “capacity-building.” The authors agreed and the sentence was approved.

C.7.6: This sub-paragraph addresses **international cooperation**. In a sentence indicating that climate resilient development is enabled by increased international cooperation, including mobilizing and enhancing access to finance, GERMANY, supported by LUXEMBOURG, called for mentioning technology and capacity building as enabling factors. FRANCE suggested adding “among others” to indicate that increased international cooperation is not the only enabler of climate resilient development. The authors noted enabling conditions are discussed elsewhere in the SPM.

GERMANY, supported by the US, NORWAY, AUSTRALIA, LUXEMBOURG, JAPAN, and SWITZERLAND, suggested adding a reference to “aligning finance flows with ambitious climate action.” INDIA said “enabled by increased international cooperation, including finance” would be sufficient. The authors proposed “aligning finance flows for climate action to be consistent with ambition levels,” saying this text is policy relevant but not policy prescriptive. SAUDI ARABIA suggested “aligning financial flows with funding needs” rather than ambition. The authors said their proposed wording was the most accurate reflection of the synthesis. Noting her delegation was unable to find specific references to the proposed wording, SAUDI ARABIA, supported by SOUTH AFRICA, DJIBOUTI, INDIA, and CHINA, suggested “aligning financial flows to be consistent with ambition levels of funding needs.” The authors proposed to add “and funding needs” to the end of the sentence.

GERMANY, supported by SWITZERLAND, opposed this suggestion, saying this language duplicated the first part of the sentence. Noting that the sentence was becoming harder to understand, the US, supported by AUSTRALIA, suggested reverting to the original.

Chair Lee proposed a huddle to resolve this issue. The US said it could, in the spirit of compromise and to avoid another huddle, accept the revised text. The sentence was approved.

On a sentence on enhancing collaboration in finance, technology and capacity building, TÜRKIYE, supported by TANZANIA and SAUDI ARABIA, suggested adding a reference to adaptation. SWITZERLAND and SAUDI ARABIA proposed replacing “collaboration” with “cooperation.” The authors accepted these suggestions.

CHINA proposed adding text indicating that current international cooperation for technology transfer for developing countries is insufficient due to political and legal barriers with developed countries. The authors said this point was addressed in C.7.5.

When agreement could not be reached, the text was parked.

In the final sentence of the SPM, TÜRKIYE, supported by TANZANIA, the UK, IRAN, and SAUDI ARABIA, called for adding a reference to adaptation actions. TANZANIA, the UK, and UKRAINE asked for clarification of a reference to “uncertainties.” UKRAINE, supported by NEW ZEALAND, suggested finishing the SPM with a positive message, focusing on possibilities rather than uncertainties.

Chair Lee suggested that the sentence be parked.

On Sunday morning, on international cooperation, CHINA suggested clarifying that “current international cooperation for

technology transfer to developing countries is insufficient due to political and legal barriers,” with the US opposing this suggestion noting insufficient line of sight. SAUDI ARABIA requested removing “international cooperation” from the beginning of the last sentence noting the subject of it no longer is “transnational partnerships.” FWCC, supported by GERMANY, reminded delegates of Ukraine’s call for ending the SPM on a “more positive note” and proposed concluding with “emissions reductions.”

The authors proposed amended text considering delegates’ comments, which was followed by lengthy discussions on grammar, “flow” of the sentence, and the right position of the term “international cooperation” within the sentence. The NETHERLANDS sought clarification about the further process for the SPM approval, noting being “lost in night and day.” Chair Lee called for a huddle on the sentence.

On Sunday morning, delegates considered revised text based on discussions in the huddle. WGIII Chair Skea explained that the authors had combined two paragraphs from WGIII into one sentence, and the authors proposed to break them into two sentences for clarity. The text was approved.

Consideration of the Adoption of the Draft Synthesis Report

Following the provisional approval of the SPM on Sunday morning, delegates reconvened in plenary in the early afternoon for what was expected to be a three-hour plenary session to adopt the draft synthesis report and conclude the meeting.

The start time was delayed by over three hours, during which time Chair Lee allowed delegates who were departing to take the floor to give their closing statements. He declared that this was not a formal plenary session.

BRAZIL and MEXICO, supported by CHINA, GERMANY, and the NETHERLANDS, underscored their concerns about the lack of inclusivity of the process, particularly for developing country delegations, most of which were no longer in the room. They proposed the IPCC plan for longer meetings or fund the participation of a second delegate from developing countries.

Many others raised questions about the procedure for the remainder of the meeting, underscoring their concerns about the lack of inclusivity and exhaustion after working around the clock for two days, in addition to the very late nights earlier in the meeting. The US invited delegates to join him in a huddle.

Plenary resumed at 4:20 pm. Chair Lee initiated the process of adopting the SYR page-by-page.

SAUDI ARABIA requested deletion of a sentence in the SYR that has been deleted from the SPM. Andreas Fischlin, WGII Vice-Chair, requested clarification on whether, when a sentence was deleted from the SPM, it should also be deleted from the longer report. FRANCE responded this depended on whether the sentence was deleted due to lack of consensus, or whether it had been deemed unsuitable for the SPM. SWITZERLAND noted the relationship between the SPM and SYR was about directionality, saying that while the SPM must be grounded in the longer report, the SYR does not have to be traceable to the SPM. In response to SAUDI ARABIA, an author said that, while the sentence was deleted in the SPM for the sake of concision, the sentence complemented another in the SYR. CANADA called for trusting the authors on the traceability of the SYR to underlying reports.

The authors took note of several comments from delegates. GERMANY flagged several inconsistencies in wording, including on the addition of “deep, rapid and sustained” mitigation in the

SPM, which had not been reflected in the SYR. SAUDI ARABIA said a reference to “equity and meaningful participation” had not trickled back to the text. BELGIUM noted a mention of sufficiency measures, made in the SPM, which needed to be more thoroughly reflected in the SYR. The US said a sentence on heavy-duty trucks had not been added. SAUDI ARABIA noted that text stating “all of which depends on national circumstances” needed to be added. CANADA, supported by GERMANY, said “Indigenous Peoples” should not be listed as civil society. FWCC, supported by CIEL, added that businesses are also not part of civil society.

Delegates debated the inclusion of Figure 4.6, entitled “Higher mitigation investment flows required for all sectors and regions to limit global warming.” CHINA and MEXICO stressed that many developing countries supported retaining the figure. The NETHERLANDS, SWITZERLAND, CANADA, and the US requested removal of this figure for consistency with deliberations from WGIII, in which the figure was not approved. Chair Lee asked delegates not to spend more time discussing the merits of this figure. The page, including the figure, was approved. The US stated its opposition to the inclusion of the figure for the record.

Delegates formally adopted the SYR and approved the Summary for Policymakers (Decision IPCC-LVIII-3).

Closing Plenary

In closing statements on Sunday, INDIA, CANADA, BELGIUM, TÜRKIYE, SAUDI ARABIA, and MEXICO highlighted the need to improve the inclusivity of the process, as most developing countries were unable to participate in the unscheduled extra days of IPCC-58.

INDIA welcomed the adoption of the report, expressed regret that many delegates had already left, and stressed that “we need to look at our procedure” to avoid that “we don’t end up sacrificing inclusivity in the pursuit of accuracy.” He called for a stronger focus on solutions for the seventh assessment cycle and strengthening the focus on evidence instead of narrative.

DENMARK thanked the author team for its extraordinary effort and “patiently” addressing all the delegates’ comments.

CANADA, supported by AUSTRALIA, highlighted the importance of Indigenous Peoples, who are seeing first-hand changes in their environment, and called for bringing in Indigenous knowledge from the start of AR7.

FRANCE noted that the SYR has a unique value as climate change threatens an increasing number of countries and regions and called for learning lessons to improve the workload in future meetings.

CUBA underscored AR6’s broader inclusivity, noting that more authors from developing countries had been included than in past cycles and questions relating to gender and Indigenous peoples had featured more heavily. NORWAY welcomed the increased inclusivity of countries and disciplines at the IPCC over time and said the difficulty in reaching approval on the SYR demonstrated the relevance of the IPCC as a powerful institution in the science-policy interface, both nationally and internationally. He added that, therefore, it was important to prevent the politicization of the IPCC. BELGIUM said the IPCC needed to reflect on its mode of work so inclusivity is maximized throughout the conference.

The REPUBLIC OF KOREA said the SYR would inform its efforts to achieve carbon neutrality by 2050. LUXEMBOURG said they looked forward to using AR6 to enhance climate action. MEXICO said the SYR would be useful in the upcoming Global Stocktake.

SWEDEN highlighted the “immense” scientific basis of AR6, noting it includes over 86,000 citations. SAUDI ARABIA expressed appreciation for the “balance” in the SYR as well as its “consistent messaging, especially when it comes to the technologies of the future to address climate change.”

CHINA, along with multiple delegates, thanked the host country of SWITZERLAND.

SWITZERLAND expressed his gratitude to the authors for their work “as pen-holders of our reports,” calling for enhanced trust. He emphasized the relevance of the SYR for the UNFCCC, highlighting information provided on synergies between mitigation and adaptation.

The US underscored his trust in the IPCC as the best source of information to combat the climate crisis.

CIEL noted transformative rights-based solutions exist and welcomed human rights language in the SYR.

FWCC, speaking on behalf of the ICC, emphasized the higher rate of climate change in the Arctic and its impacts on health. She encouraged increased inclusion of Indigenous knowledge and said the ICC looks forward to working with the IPCC to “protect this beautiful planet and all species.”

The ORGANIZATION OF THE PETROLEUM EXPORTING COUNTRIES welcomed any scientific contribution needed in the upcoming assessment cycle.

IPCC Secretary Mokssit invited participants of IPCC-58 to observe a minute of silence for Patricia Annie Courtin, a former IPCC colleague. He noted the number of delegates from developing countries is “a sign of trust” and called for further increasing developing countries’ participation.

Underscoring that “we have delivered what we have promised,” Chair Lee reminded delegates of the magnitude of the week’s work, during which a record number of delegates had participated in over 40 plenary sessions. He gavelled IPCC-58 to a close at 7:35 pm.

A Brief Analysis of IPCC-58

With the release of the Sixth Assessment Report (AR6), the Intergovernmental Panel on Climate Change (IPCC) has issued a clarion call to the world: the time for serious action on climate change is now. As greenhouse gas emissions continue to increase, climate change is already affecting every region in the world. The impacts, including irreversible losses to ecosystems, acute food insecurity, reduced water security, disease, and climate-driven displacement, will continue to intensify. The horror of climate change is spelled out clearly and unequivocally in the Synthesis Report (SYR) and its shorter Summary for Policymakers (SPM). These reports systematically set out the state of scientific knowledge on climate change, providing evidence to inform policymakers as they grapple with the immediate and growing impacts.

The 58th session of the IPCC was the culmination of an eight-year cycle of work, during which the IPCC produced three Working Group assessments and three special reports. Building on the work of hundreds of authors from around the world with expertise in natural and social science related to climate change, during this meeting the Panel was tasked with determining which messages from this rich cycle were most critical for policymakers. Delegates also conducted a line-by-line review and approval of the SPM of the SYR, a monumental task that dominated the week.

This brief analysis examines the process and outcomes of IPCC-58 and the challenges for the IPCC as it looks toward the future.

Working at the Interface of Science and Policy

The IPCC works at the nexus of science and policy, bringing together governments and report authors to finalize draft reports that policymakers can rely on to provide detailed technical information. Delegates to IPCC-58 were tasked with wrapping up the work of the sixth assessment cycle by approving the SYR, which draws together the major findings not only of the three Working Group’s assessments, but also three Special Reports, and the 2019 Refinement of the IPCC’s Greenhouse Gas Inventories Guidelines. The SPM captures the most essential insights of the SYR and is expected to be the most widely read of the IPCC’s outputs.

Given the high profile of the SPM and its potential impact, the key challenge for IPCC-58 was reaching consensus on its content. In this process the authors “hold the pen”; government representatives could not change the authors’ findings, but they could refer to the wording of the SYR or published reports from this cycle to draw out particular messages. This process illuminates the interests of different countries, their priorities and challenges, and the ways in which they are being affected by climate change. Delegates repeatedly pressed their case for inclusion of specific themes by highlighting the need for “balance” in the final product; for example, by talking about both the potential of carbon removal technologies and their risks and limitations.

The strict adherence to previously reviewed and approved outputs also prevented the inclusion of new findings; at most, the authors could strengthen or weaken the confidence statements that supported claims in the SYR. As such, the scientific findings of the reports are at least a few years old and may not reflect new concerns. For example, a request to add “black carbon” to a list of emissions was rejected due to a lack of evidence of its impacts. Furthermore, the reports cannot reflect concerns arising from geopolitical changes, including, for example, the impact of military emissions on the environment. These constraints reflect the meticulous nature of the IPCC’s review procedures, as well as its core purpose: to produce trusted, reliable, rigorous reports that can provide the basis for robust action.

The seriousness of this process is reflected in the time it takes to complete an approval session. IPCC Secretary Abdallah Mokssit noted that approval sessions always run over their scheduled time, and IPCC-58 was no exception. The working hours expanded each day, as delegates sought to make the most of their time, completing their work without unduly rushing their review. By Friday delegates were working around the clock. The meeting concluded on Sunday evening, 49 hours past its scheduled end.

Delegates were exhausted. Many, and particularly those from developing countries, were forced to leave by Saturday night. While the Secretariat offered to make arrangements for developing countries to stay longer, almost none were able to remain in Interlaken until the meeting’s conclusion on Sunday.

Time for Change?

The departure of most developing country delegates on Saturday left a striking imbalance in the negotiating room. On Sunday, the delegate from Brazil informed plenary that he had to leave, and with his departure, there would be no countries from South America left. Nor were any delegates from Africa still in the room. Many delegates lamented the lack of inclusivity that was created by the unscheduled extension of the meeting and underscored the need to proceed carefully with the review, bearing in mind that the countries that are being hit hardest by climate change no longer had a voice

in the room. By the final day of negotiations, delegates reached an informal agreement to avoid changing text unless absolutely necessary, with many saying that adding or removing critical information would not be fair to those who were not present.

This situation raises significant questions about how the IPCC should proceed as it moves into its seventh assessment cycle. Lack of inclusivity has been a recurring theme in the work of the IPCC, from concerns about gender and geographic representation among the authors to claims of a hostile work environment within the Technical Support Unit. Recent analyses by think tanks have demonstrated that the bulk of scientific evidence used in IPCC assessments comes from the Global North. There is much work to be done to address these critical issues, and calls for reform are growing louder. While many of these issues are structural challenges that may take time to analyze and solve, others—such as planning in advance for longer approval sessions to ensure that all delegates are able to participate—seem more straightforward. As one participant said early on Sunday morning, “The approvals run over every single time; the simplest solution would be to allow delegates the days that are needed to do the job.”

Explanations for the problems at IPCC-58 were abundant, and perhaps overly simplified. Many delegates implored their colleagues to “speed up” and demonstrate flexibility. Others expressed frustration with the lack of transparency in the process, including the persistent lack of information about which issues were going to be discussed when. In a discussion about how to work more efficiently, Chair Lee said that he was in delegates’ hands, and delegates, in turn, said they were in his hands.

Notably, IPCC-58 reflected many different voices; no single delegation dominated discussions, and the issues raised reflected an array of considerations. While the authors “hold the pen” and are responsible for ensuring the science is accurately represented in these reports, deciding which points are most policy relevant is also a significant responsibility. As one veteran participant said, “Perhaps this meeting takes a long time not because people are too slow, but because it is rigorous.” After all, the IPCC is responsible for deciding “how climate science should be presented to support the global community. The responsibility is huge.”

Looking Forward

The impact of IPCC-58’s work is already being felt, as the release of the SYR and SPM the day after the meeting garnered global media coverage. Despite the dire warnings contained in these outputs, the IPCC itself sought to emphasize that all is not lost, including through a press release headlined “Urgent climate action can secure a liveable future for all.” The IPCC’s outputs outline a wide range of specific actions that can be taken now to prevent catastrophic warming, as well as to support adaptation to those changes that are unavoidable. These outputs will inform work under the UN Framework Convention on Climate Change (UNFCCC). All of the outputs from the sixth assessment cycle will also feed into the Global Stocktake (GST), mandated to take place every five years under the Paris Agreement.

The timing of the GST raises key questions for the Panel to consider as it moves into its seventh cycle. The second GST is scheduled for 2028, and it is probable that the only IPCC outputs that would be available by that date would be special reports (including a special report on cities that has already been mandated). Moreover, by the time of the third GST in 2033, IPCC’s AR7 reports could be too out of sync with the GST to be relevant.

It was clear that everyone at IPCC-58 wanted to get information about—or shine the IPCC global spotlight on—issues that most affect them. The IPCC’s work is a valuable tool for policymakers. Nevertheless, the challenges of IPCC-58 underscore long-standing questions about inclusivity. If the difficulties and frustrations of IPCC-58 provide any reason for hope, it is that they may spur new willingness to find ways to do the job better. It remains to be seen how the IPCC addresses these challenges and moves forward with the next assessment cycle. But one thing is clear: the impacts of climate change will not wait.

Upcoming Meetings

UNFCCC SB 58: Delegates to the 58th sessions of the UNFCCC Subsidiary Body for Implementation (SBI) and Subsidiary Body for Scientific and Technological Advice (SBSTA) will convene to prepare for the COP 28. **dates:** 5-15 June 2023 **location:** Bonn, Germany **www:** unfccc.int/sb58

64th meeting of the Global Environmental Facility (GEF) Council: The 64th GEF Council meeting will review and approve the work program. **dates:** 26-30 June 2023 **location:** Brasilia, Brazil **www:** thegef.org/events/64th-gef-council-meeting

IPCC-59: The 59th session of the IPCC will mark the final session of the sixth assessment cycle. Delegates are expected to hold elections for the IPCC Bureau and Task Force Bureau. **dates:** 23-27 July 2023 (TBC) **location:** Nairobi, Kenya (TBC) **www:** ipcc.ch

For additional upcoming events, see sdg.iisd.org

Glossary

AR6	Sixth Assessment Report
AR7	Seventh Assessment Report
CAN-I	Climate Action Network-International
CCS	Carbon capture and storage
CDR	Carbon dioxide removal
CIEL	Center for International Environmental Law
COP	Conference of the Parties
CO2	Carbon dioxide
FWCC	Friends World Committee for Consultation
GHG	Greenhouse gas
GST	Global surface temperature
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
LDCs	Least developed countries
OHCHR	Office of the United Nations High Commissioner for Human Rights
SCI	Save the Children International
SIDS	Small island developing states
SPM	Summary for Policymakers
SYR	Synthesis Report
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WG	Working Group
WMO	World Meteorological Organization