

Summary of the 49th Session of the Intergovernmental Panel on Climate Change (IPCC-49): 8-12 May 2019

On Sunday evening, 12 May 2019, the 49th session of the Intergovernmental Panel on Climate Change (IPCC-49) adopted the Overview Chapter of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2019 Refinement) and accepted the underlying report. A small number of delegates registered their objection to what they considered inconsistent treatment in the report of fugitive emissions from oil and gas exploration on the one hand and coal exploration on the other. Following lengthy discussions on how to reflect the lack of consensus in the decision text, the Panel agreed to refer to Principle 10(b), which sets out the procedure when there are differing views and consensus cannot be reached, and to include the text of the principle in a footnote.

IPCC-49 also adopted decisions on:

- the terms of reference of the Task Group on Gender Policy and Gender Implementation Plan;
- guidance to the Board of Trustees on the use of the IPCC Scholarship Programme Fund;
- beginning preparatory work during the sixth assessment cycle for a methodological report on short-lived climate forcers to be completed during the seventh assessment cycle; and
- the Trust Fund Programme and Budget.

During IPCC-49, the Panel also took note of reports on, *inter alia*, progress made by the Task Group on the Organization of the Future Work of the IPCC in Light of the Global Stocktake and progress by the Task Force on National Greenhouse Gas Inventories and the three IPCC Working Groups.

IPCC-49 convened from 8-12 May 2019, in Kyoto, Japan, and brought together more than 380 participants from over 125 countries.

A Brief History of the IPCC

The IPCC was established in 1988 by the World Meteorological Organization (WMO) and the UN 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; instead, it conducts assessments of the state of climate change knowledge on the basis of published and peer-reviewed scientific and technical

literature. IPCC reports are intended to be policy relevant, but not policy prescriptive.

The IPCC has three Working Groups (WGs):

- Working Group I (WG I) addresses the physical science basis of climate change.
- Working Group II (WG II) addresses climate change impacts, adaptation, and vulnerability.
- Working Group III (WG III) 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 WG II, which has eight Vice-Chairs. The Co-Chairs guide the WGs in fulfilling the mandates given to them by the Panel with the assistance of Technical Support Units (TSUs).

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The IPCC also has a Task Force on National Greenhouse Gas Inventories (TFI) with two Co-Chairs to oversee the IPCC National GHG Inventories Programme, which is also supported by a TSU. The Programme aims to develop and refine an internationally-agreed methodology and software for calculating and reporting national GHG emissions and removals, and encourage its use by parties to the United Nations Framework Convention on Climate Change (UNFCCC).

The Panel elects its Bureau for the duration of a full assessment cycle, which includes preparation of an IPCC assessment report. The Bureau plans, coordinates, and monitors the IPCC's work, and is composed of climate change experts representing all regions. Currently, the Bureau comprises 34 members, and includes the IPCC Chair and Vice-Chairs, WG Co-Chairs and Vice-Chairs, and TFI Co-Chairs. In 2011, the IPCC established an Executive Committee (ExCom) to assist with intersessional work and coordination among the WGs. The IPCC has a permanent Secretariat, which is based in Geneva, Switzerland, and hosted by the WMO.

IPCC Products: Since its inception, the IPCC has prepared a series of comprehensive assessment reports, special reports (SRs) and technical papers that provide scientific information on climate change to the international community.

The IPCC has produced five assessment reports, which were completed in 1990, 1995, 2001, 2007, and 2014. The Sixth Assessment Report (AR6) is expected to be completed in 2022. The assessment reports are structured in three parts, one for each WG. Each WG's contribution comprises a Summary for Policymakers (SPM), a Technical Summary and the full underlying assessment report. Each report undergoes an exhaustive and intensive review process by experts and governments, involving three stages: 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. A Synthesis Report (SYR) is produced for the assessment report as a whole and integrates the most relevant aspects of the three WG reports and SRs of that specific cycle. The Panel then undertakes a line-by-line approval of the SPM of the SYR.

The IPCC produced a range of SRs and technical papers on climate change-related issues through the fifth assessment cycle, including:

- Land Use, Land-Use Change and Forestry (2000);
- Carbon Dioxide Capture and Storage (2005);
- Climate Change and Water (2008);
- Renewable Energy Sources and Climate Change Mitigation (2011); and
- Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (2011).

The sixth assessment cycle includes three Special Reports:

- Global Warming of 1.5°C (SR15), which was approved by IPCC-48 in October 2018;
- Climate Change and Land (SRCCL), which is expected to be approved by IPCC-50 in August 2019; and
- Ocean and Cryosphere in a Changing Climate (SROCC), which is expected to be approved by IPCC-51 in September 2019.

In addition, the IPCC produces methodology reports, which provide guidelines to assist countries in reporting on GHGs. Good Practice Guidance reports were approved by the Panel in 2000 and 2003. The latest version of the IPCC Guidelines on National GHG Inventories was approved in 2006. Additionally, in 2013, the IPCC adopted a Supplement to the 2006 IPCC Guidelines: Wetlands (Wetlands Supplement), and the Revised Supplementary

Methods and Good Practice Guidance Arising from the Kyoto Protocol (KP Supplement). A Refinement to the 2006 Guidelines was to be adopted at IPCC-49 in Kyoto.

In 2007, the IPCC was awarded the Nobel Peace Prize, jointly with former US Vice President Al Gore, for its work and efforts "to build up and disseminate greater knowledge about manmade 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) addressed future IPCC work; took a decision on the size, structure, and composition of the IPCC and TFI Bureaux; and adopted decisions relevant to the sixth assessment cycle. IPCC-42 (5-8 October 2015, Dubrovnik, Croatia) elected Bureau members for the sixth assessment cycle. IPCC-43 (11-13 April 2016, Nairobi, Kenya) agreed to undertake two SRs (SRCCL and SROCC) and the 2019 Refinement to the 2006 Guidelines for GHG Inventories during the sixth assessment cycle. In addition, in response to an invitation from the 21st session of the Conference of the Parties to the UNFCCC (COP 21), asking the IPCC to provide an SR in 2018 on the impacts of global warming of 1.5°C above pre-industrial levels, IPCC-43 agreed to prepare SR15.

The Panel also agreed at that time that an SR 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 of SR15 and the 2019 Refinement. The IPCC also adopted decisions on, *inter alia*: an Expert Meeting on Mitigation, Sustainability, and Climate Stabilization Scenarios; communications and the AR6 scoping process; and a meeting on climate change and cities.

IPCC-45: This meeting (28-31 March 2017, Guadalajara, Mexico) approved the SRCCL and SROCC outlines, and discussed, *inter alia*: the strategic planning schedule for the sixth assessment cycle; a proposal to consider short-lived climate forcers (SLCFs); and options for resourcing the IPCC, which led to the decision to establish the *Ad Hoc* Task Group on the Financial Stability of the IPCC (ATG-Finance).

IPCC-46: During this session (6-10 September 2017, Montreal, Canada), the Panel, *inter alia*, approved the chapter outlines for the three WG report contributions to the AR6.

IPCC Cities and Climate Change Science Conference: This meeting (5-7 March 2018, Edmonton, Canada) brought together participants from the science, policy, and practice communities to discuss current and future sources of emissions, and identify pathways for cities to pursue emission reductions and resilience strategies. The meeting produced a research agenda to better understand climate change, its impacts on cities and the critical role local authorities can play in addressing the climate challenge.

IPCC-47: During this session (13-16 March 2018, Paris, France), the Panel agreed to, *inter alia*:

- establish a task group on gender;
- draft terms of reference for a task group on the organization of the future work of the IPCC in light of the Global Stocktake (GST) under the Paris Agreement;
- expand the IPCC Scholarship Programme to include funding for chapter scientists; and
- enhance developing country participation in IPCC activities.

The Panel also heard presentations by WG Co-Chairs on the reports from the WG Bureaux. The meeting was preceded by a 30th anniversary celebration of the IPCC, hosted by the Government of France.

IPCC-48: During this session (1-6 October 2018, Incheon, Republic of Korea), the IPCC approved the SR15 and its Technical Summary and adopted the SPM. A Joint Session of the WGs considered the SPM line-by-line to reach agreement, representing the first time the three WGs had collaborated together, in an interdisciplinary fashion, on an IPCC SR. The SPM consists of four sections:

- Understanding global warming of 1.5°C;
- Projected climate change, potential impacts, and associated risks;
- Emission pathways and system transitions consistent with 1.5°C global warming; and
- Strengthening the global response in the context of sustainable development and efforts to eradicate poverty.

The SPM concludes, *inter alia*, 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 Report

On Wednesday morning, 8 May 2019, IPCC Chair Hoesung Lee opened the session, highlighting Japan’s leadership in hosting the TFI TSU at the Institute for Global Environmental Strategies. He also welcomed the expected approval of the 2019 Refinement to the 2006 Guidelines on National Greenhouse Gas Inventories, noting that this will ensure that the methodologies used to compile national inventories is based on the latest science.

Via video, Yoshiaki Harada, Japanese Minister of Environment, welcomed participants on behalf of the Government of Japan. He recalled the IPCC’s development of the scientific foundation leading to the UNFCCC, the Kyoto Protocol, the Paris Agreement and the 2018 Paris Rulebook. He noted Japan’s goal to create a model of a “virtuous cycle” for environment and growth, while ensuring quality of life and a sustainable society, and Japan’s current discussions on early achievement of a decarbonized society post-2050.

Jian Liu, Chief Scientist, UNEP, thanked Japan for its leadership on combating climate change, noting the importance of the City of Kyoto as the birthplace of the Kyoto Protocol, and expressing enthusiasm that it will now be the home of a new milestone in the form of the 2019 Refinement. He noted that greater ambition is needed to achieve the goals of the Paris Agreement and emphasized the importance of political and scientific leadership at this moment.

Florin Vladu, UNFCCC Secretariat, noted that 2019 presents a new opportunity to strengthen collaboration efforts and emphasized the importance of the 2019 Refinement to enhance transparency and trust in multilateralism. He expressed thanks for SR15 and anticipation for the IPCC’s other forthcoming work products that will together serve as vital inputs to reach the levels of ambition necessary to achieve the goals laid out in the Paris Agreement.

IPCC Chair Lee then presented the provisional agenda for adoption (IPCC-XLIX/Doc.1, Rev.1). Noting that the 7th session of the Plenary of the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES-7) had recently concluded with a call for a joint IPBES and IPCC technical report on biodiversity and climate change, France proposed inserting this into the IPCC-49 agenda under Other Business.

The provisional agenda was adopted with France’s amendment.

The draft report of IPCC-48 (IPCC-XLIX/Doc.4, Rev.1) was adopted with minor amendments.

Adoption and Acceptance of the 2019 Refinement of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2019 Refinement)

The Overview Chapter of the 2019 Refinement was addressed in TFI plenary sessions, contact groups, and informal consultations throughout the five-day meeting. On Wednesday, TFI Co-Chair Eduardo Calvo introduced the Overview Chapter and the underlying report and relevant documents (IPCC-XLIX/Doc.3a, Rev.1; IPCC-XLIX/Doc.3b, Rev.1; IPCC-XLIX/INF.1, Rev. 2). The Overview Chapter was considered section by section.

1. Introduction: On Wednesday, TFI Co-Chair Kiyoto Tanabe introduced this section, which states the aim and nature of the report. India expressed concern regarding the feasibility for developing countries to use the 2019 Refinement. Saudi Arabia, supported by Egypt, called for inserting reference to potential capacity-building and financial needs required for utilization of the 2019 Refinement. New Zealand, supported by the UK, the US, Norway, and Switzerland, objected, noting that: such a statement was beyond the scope of the Refinement; the Panel did not yet know whether such a statement would prove to be true; and the 2019 Refinement was meant for inventory compilers and not policymakers.

The UK said that others, including the UNFCCC, would decide on the implications of using the 2019 Refinement, while Norway stressed the need to protect the integrity of the IPCC by keeping the purview of the UNFCCC and the IPCC separate. As an alternative, TFI Co-Chair Calvo suggested inserting language stating that the implications using the 2019 Refinement were not assessed, but this proposal was not accepted either.

TFI Co-Chair Tanabe drew attention to language in Section 3 on key concepts, which states that the 2019 Refinement is intended for all countries and inventory compilers, including those with no prior experience. Switzerland suggested moving this language to the Introduction.

Following informal consultations this issue, TFI Co-Chair Calvo reported there was agreement to insert text in the report of the session, which was accepted. The text states that:

- a group of countries raised a concern that resource requirements for implementation of the 2019 Refinement were not assessed during its development process and that capacity-building support may be needed for some countries, in particular developing countries; and
- another group of countries noted that: resource requirement assessment was not included in the scope of the 2019 Refinement; assessment of such needs is not an appropriate task for authors of technical guidelines for GHG inventories; and discussions on resource requirements and capacity-building needs would be more appropriate in other multilateral bodies.

2. Background: This section was addressed on Wednesday. Tanzania suggested removing the qualifying term “abundant” to describe new scientific and empirical knowledge, stating that the term is subjective. With this deletion, this section was approved.

3. Key Concepts Unchanged from the 2006 IPCC Guidelines: This session was addressed on Wednesday. Saudi Arabia requested insertion of a caveat regarding the financial and capacity-building implications of implementing the updated guidelines, or, alternatively, a caveat stating that the 2019 Refinement did not assess such implications. The US opposed language regarding financial or capacity-building implications. Multiple textual changes were suggested for the sake of clarity.

The TFI Co-Chairs requested that interested delegates work to resolve this in informal consultations. (See Section 1, on Introduction, for resolution of this issue.)

4. Coverage of the 2019 Refinement: This section was addressed on Wednesday afternoon and was adopted as presented.

5. Relationship with the 2006 IPCC Guidelines: This section was addressed on Wednesday. India questioned inclusion of a paragraph noting that the Guidelines can also be relevant at the subnational, entity, or project level, pointing out that the mandate is for Guidelines for national GHG inventories. Following deletion of this paragraph, the section was agreed.

6. Specific Developments in the 2019 Refinement: Volume 1 (General Guidance and Reporting): Participants discussed a paragraph on **comparing GHG emission estimates with atmospheric measurements** on Wednesday and Thursday. Following comments from the US, Germany, France, and the UK, text was modified to reflect that the guidance highlights key components and steps to be used when atmospheric measurements and inverse models are used as inputs to, or for comparison with, the inventory emissions estimates.

Regarding a paragraph on **indirect GHG emissions**, TFI Co-Chair Calvo requested the authors to formulate language in response to a call by Canada to omit reference to carbon dioxide (CO₂) when addressing CO₂ precursors such as methane. Following the introduction of new language explaining that indirect GHG emissions can come from emissions of carbon-containing compounds that are not already accounted for in GHG emissions, participants agreed to Germany's request to change "accounted for" to "reported in" GHG inventories. A footnote was also added to explain that these compounds contain unoxidized carbon emitted from anthropogenic activities, and that CO₂ is not released directly from these activities but forms at a later time in the atmosphere. This text was then accepted.

Germany asserted that plant biomass CO₂ is unlike other CO₂ and, supported by Finland, called for reflecting Chapter 8 of the underlying report, on reporting guidance and tables, in the Overview Chapter. The Coordinating Lead Authors (CLAs) agreed to prepare a new paragraph, which was presented on Thursday. The proposed paragraph, on **national GHG inventory coverage**, addresses how to deal with CO₂ capture in terms of reporting, and emissions from biochar production and from flooded lands. The new paragraph was accepted.

Volume 2 (Energy): This text was first addressed on Wednesday. On **fugitive emissions from fuel transformation**, Germany, supported by France and the US, called for reporting all non-CO₂ emissions from non-combustion in the energy sector. The CLAs on energy and agriculture, forestry, and other land use (AFOLU) responded that because biochar is not from a fuel transformation process it will not be known to energy compilers, so the principle is to report emissions where they occur, for consistency with the 2006 Guidelines. Delegates discussed whether biochar should be covered in this volume or in Volume 4 (AFOLU), given its different purposes. France and Germany favored its inclusion in AFOLU when used as a fertilizer for agriculture. This was considered a cross-cutting issue and deferred for further consultations among the authors. Following informal discussions, biochar was added to a list of sources of fugitive emissions from fuel transformation under this sector. To address a concern of the Russian Federation, a cross-reference to discussions of methodology on fugitive emissions in Volumes 3 (Industrial processes and product use) and 4 (AFOLU) was added at the end of the paragraph.

In response to questions from Saudi Arabia on emission factors derived from only one source or data from one country, the CLA replied that the mandate was to develop technology or practice-specific emission factors for Tier 1. Tier 1 is the least complex of the IPCC classification of methodological approaches, according to quantity of information required and degree of analytical complexity, with Tier 3 being the most complex.

On another question posed by Saudi Arabia on new guidance for fugitive emissions from exploration activities, the CLA clarified that this provides more reporting options but not an added reporting burden, as the scope is not widened.

On Saturday afternoon, after the section had been considered in its entirety, Saudi Arabia, supported by Iran and Algeria, objected to inconsistency in the treatment of oil and gas exploration and coal exploration in Volume 2, saying coal emits much more than oil and gas.

The CLA responded that only energy sources that have publicly available data across a range of production types become the subject of instructions in the main text of the Guidelines. Where emissions and/or removals are poorly understood and insufficient information exists, the 2019 Refinement follows the 2006 Guidelines' practice of putting information on that source into an appendix. Another CLA noted that differences in the depth at which coal, oil, and gas are found means that coal has no gas blowouts that can be used to measure fugitive emissions.

Saudi Arabia asserted that the confidence levels contained in the scientific references for oil and gas were low, and said the Refinement's new sections for oil and gas should be put into an appendix.

Norway, supported by the US, the UK, China, Ireland, Luxembourg, Switzerland, and Canada, urged delegates to respect the authors' judgment on the levels of scientific understanding of these energy types, but Saudi Arabia noted that respect for the authors had not prevented delegates from making changes to the authors' expressed opinions in other sections of the Refinement. He suggested that a special report could address guidelines for coal.

TFI Co-Chair Calvo asked interested countries and authors to further discuss this issue informally.

Following informal consultations on Saturday afternoon and Sunday morning, TFI Co-Chair Calvo reopened the discussion on Sunday afternoon, noting that some relevant information on coal exploration had been moved from the appendix to the main text of the underlying report, but that the authors felt there was no need for changes to the text on oil and gas.

In response to continued objections from Saudi Arabia, TFI Co-Chair Calvo noted that IPCC Principles and Procedures allow for two options in the case of failure to reach consensus: representing differing views on scientific, technical or socio-economic matters in the document concerned; or recording differences of views on matters of policy or procedure in the report of the session. He invited delegates to submit in writing any different views.

Saudi Arabia, supported by Iraq, Algeria, Syria, Egypt, Iran and Iraq, strongly objected to applying the IPCC Principles and Procedures, noting their objection was scientific in nature and bemoaned the bias they perceived. TFI Co-Chair Calvo stressed that the dispute concerned the underlying report, over which the authors have final say.

Tanzania, supported by Togo and South Africa, called for more time to try to reach a compromise.

A CLA confirmed that text and an equation on calculating fugitive emissions from coal exploration had been added to the main body of the text, but noted that so little literature exists on fugitive emissions from coal exploration that emissions factors are only a matter of expert opinion.

The TFI Co-Chairs called for more informal consultations and an extension of the session to accommodate this, although New Zealand cautioned that taking final decisions late in the evening might risk a lack of a quorum.

Additional informal consultations brought no agreement on moving, totally or partially, the section on oil and gas fugitive emissions to an appendix, with the CLAs reiterating that the science on oil and gas was robust enough for the main text. TFI Co-Chair Calvo reminded participants that the underlying report cannot be negotiated, and that the science must be respected.

Canada noted the existence of an official error protocol by which an IPCC member state finding a gap or mistake can submit a correction for evaluation.

Norway, supported by France, the UK, Canada, Switzerland, and China, urged delegates to protect the integrity of the IPCC and use its Principles and Procedures covering a situation of no consensus. TFI Co-Chair Calvo reiterated that any countries with a differing view can submit it in writing, to be recorded as per Principle 10(b). Saudi Arabia agreed to proceed if his objection was recorded. On that condition, the section was agreed.

Volume 3 (Industrial Processes and Product Use): India requested guidance on reporting emissions from iron and steel production when the default Tier 1 methodologies are not suitable and Tier 3 is not yet feasible. The CLA agreed that Tier 1 provides information on general average worldwide conditions but is not the most precise option, and, with TFI Co-Chair Calvo, pointed to the Emission Factor Database where countries can find values that better fit their conditions and apply them to Tier 2. This section was agreed with no change.

Volume 4 (Agriculture, Forestry and Other Land Use): Discussions on this volume began in Plenary on Thursday and continued in contact groups and informal consultations throughout the week.

On **interannual variability (IAV)**, the Russian Federation expressed concern with a new approach suggested for disaggregating emissions and removals from natural disturbances, noting that differentiating between natural and anthropogenic emissions and removals is extremely complicated, if not impossible, and could lead to false conclusions. Given these limits, she said, it was preferable to maintain the current use of background levels for natural disturbances and the managed land proxy for estimating anthropogenic emissions and removals, which, if not perfect, at least enables transparency.

Finland supported this proposal, adding that factoring out natural effects for some land uses and not others is unbalanced. Likewise, the US questioned the value added of the approach, and cautioned against country-specific definitions, which would pose challenges for comparability and possibly introduce inconsistencies and loopholes. She underscored the need to maintain reporting on national totals.

Italy stressed the importance of ensuring completeness and comparability, and said a clear definition of natural disturbances would be needed to allow inventory compilers to do their work.

In contrast, Canada and Australia said the guidance in the 2019 Refinement represents a significant improvement to the 2006 Guidelines and that, as a second order approximation, it enables countries with large natural disturbances to disaggregate and identify drivers of emissions and removals, thus helping policymakers make better decisions.

Recognizing the difficulty of clearly distinguishing between natural and anthropogenic effects, the CLA explained that the guidance on such disaggregation was proposed for voluntary use by countries as a second order approach, with the first order still being the managed land proxy. He reassured the US that national totals will still be reported, and that the guidance was for those wishing to go further in their reporting, adding that this is for estimation purposes and not for accounting, which would depend on decisions under the UNFCCC. The Russian Federation noted that reporting forms the basis for accounting, so their relationship cannot be ignored.

The US, the Russian Federation, and Finland proposed possibly moving the section on natural disturbances to an appendix, saying that it only applies to a few countries. The CLA agreed this could be considered.

Discussions continued in a contact group, which met numerous times throughout the session. On Saturday afternoon, Riitta Pipatti (Finland), contact group rapporteur, reported that the group had addressed the concerns expressed. She explained that the paragraph in the Overview Chapter was modified to clarify the need to report on national totals. She said the text also clarifies that a generic methodology is provided to report the disaggregated contribution of natural disturbances for those countries that have high IAV due to natural disturbances, not as a higher order approach but as an additional reporting option.

On **soil carbon**, Germany expressed concern about estimating the long-term stability of biochar using Tier 1 methodologies. The CLA responded that special instruments are not available in many countries to use Tier 2 methods, but that countries can use less precise temperature measurements at the Tier 1 level to get some information about biochar's long-term stability.

India noted that the effect of adding biochar to mineral soil remains uncertain and more progress must be made regarding the state of scientific knowledge.

The CLA explained that to qualify as biochar for use of Tier 1 methodologies, the substance must be produced through low-temperature pyrolysis (limited-oxygen heating). He rejected a suggestion to expand the biochar definition to include other production methods or to use Tier 1 methods on biochar in ecosystems other than cropland or grassland; however, he noted that Tier 2 or Tier 3 methods can be used to address the effects of biochar in other ecosystems.

Germany questioned the permanence of biochar, especially given the effects of variability in soil types to which biochar is applied, and called for periodic verifications to be included in the methodology to address the significant uncertainties about its long-term stability.

The CLA agreed that biochar produced at an uncontrolled or unspecified temperature would not be appropriate for Tier 1-level analysis. He agreed to remove lines in a table on default values for F_{perm} (the fraction of biochar carbon remaining after 100 years) in the underlying report that seemed to show biochar production at uncontrolled or unspecified pyrolysis temperatures.

Responding to concerns from Germany and France, the CLA noted that biochar was originally given its own subcategory and that Tier 1 methods are only appropriate for mineral soils, not for organic soils. He acknowledged priming effects when biochar is added to soils already containing carbon but said these effects can only be measured at higher Tier levels.

Following informal consultations, the CLA reported that information and guidance on Tier 1 methods for biochar in the underlying report would be moved to an appendix. TFI Co-Chair Tanabe noted that the changes in the underlying report would not affect the Overview Chapter.

Returning to this issue on Friday, reference to refinement of the “default” method for estimating the impact of biochar amendments on soil carbon stocks in mineral soils for cropland and grassland was changed to specify refinement of Tier 2 and 3 methods.

On **flooded lands**, the Russian Federation, the US, France, Italy, and Finland raised concern about a new approach related to “factoring-out emissions that would have occurred otherwise if the land remained unmanaged.” They noted that this is inconsistent with the Guidelines for other land uses and key IPCC concepts, and that introducing this would create serious problems, with the US saying that any consideration of what “would have occurred otherwise” is hypothetical in nature and should not be included in the reporting.

The Russian Federation emphasized the need to distinguish between anthropogenic and natural emissions and suggested that, if that is not possible, then continuing with the current approach as set forth in the Wetlands Supplement to the 2006 IPCC Guidelines is preferable.

The CLA explained that, while he understood the concerns expressed, the methodology had been developed in response to the mandate from IPCC-44, which called for “factoring out what would happen if the land had not been converted.” TFI Co-Chair Calvo noted that the job of the TFI Co-Chairs had been to ensure that the mandate was followed. WG II Vice-Chair Sergei Semenov disagreed, saying that as a scientific organization, the IPCC could not let a bureaucratic error take precedence over a scientific matter, and proposed replacing reference to “emissions that would have occurred otherwise” with reference to factoring out the natural component of emissions and removals. The US called for deleting all references to “factoring out” in Volume 4 and in the Overview Chapter.

Finland suggested that the approach would be better placed in the appendix.

The CLA said the problem with deleting those references in the Overview Chapter is that the Overview would then not fully correspond with the methodology in the underlying report.

Norway opposed changing language or moving text to the appendix, calling for trust in the authors and their assurance that there is a scientific basis for the approach. Brazil drew attention to the number of studies on the subject and cautioned against establishing a precedent of changing a mandate.

Discussions continued in a contact group, which met multiple times during the week. On Saturday afternoon, Rob Sturgiss (Australia), contact group rapporteur, reported that authors and delegates had agreed on changes to address concerns expressed. The plenary then agreed to the group’s recommended changes to the paragraph in the Overview Chapter. In the paragraph on flooded lands, where it had originally stated that “methods include approaches for factoring out emissions that would have occurred otherwise if the land remained unmanaged,” text was changed to reflect that “methods include estimation of total emissions following the managed land proxy and an optional method to develop indicative estimates of the anthropogenic component of total approaches for factoring out emissions that would have occurred otherwise if the land remained unmanaged.”

With this, the paragraph was agreed.

Volume 5 (Waste): This section was approved as presented.

IPCC Plenary and Adoption of the 2019 Refinement: On Sunday night, IPCC Chair Lee reconvened the IPCC Plenary to adopt the decision on the 2019 Guidelines (Decision IPCC-XLIX-9), which included reference to a reservation by some countries. Saudi Arabia requested changing the decision language to better reflect its strong objection to the report’s treatment

of fugitive emissions from oil, gas, and coal exploration. Switzerland, with Germany, expressed concern that the wording proposed would give the impression that the entire 2019 Guidelines lacked consensus, when it was just one issue. South Africa noted inconsistencies regarding how different decisions had been adopted during the session, and requested clarification on how decisions are adopted.

Following further consultations, Sophie Schlingemann, Legal and Liaison Officer, IPCC Secretariat, announced amendments to the decision text, including reference to IPCC Principle 10(b), which is invoked when member states fail to reach consensus.

Saudi Arabia, supported by Iran and Iraq, preferred more explicit language reflecting their objection. Germany, supported by New Zealand, IPCC Vice-Chair and Science Board Chair Ko Barrett, the UK, Norway, the US, Switzerland, Japan, France, Sweden, Belgium, and Spain, said that the IPCC Principles and Procedures are there for a reason and should be followed, opposed inserting language on “objections” in the decision text, and reiterated that the specific objections would be recorded in the report of the meeting.

Saudi Arabia then proposed inserting the full text of Principle 10(b) directly into the decision, but Switzerland and others objected. IPCC Vice-Chair Barrett suggested putting the Principle 10(b) text in a footnote, which was supported by the Netherlands, the Russian Federation, France, the US, Ireland, Algeria, and Norway. To ensure balance, Germany, supported by Norway, also called for putting in a footnote the full text of the other principles referred to in the decision. Saudi Arabia objected, noting that only Principle 10(b) addressed lack of consensus, the issue under discussion. IPCC Chair Lee noted the exceptional circumstances surrounding the need for inclusion of Principle 10(b) and implored Germany to accept the text as amended. Germany cautioned against setting a precedent. However, she indicated her flexibility to accept the decision with the footnote for Principle 10(b), given the late hour. With that, the decision was adopted.

Following adoption, Germany expressed her deepest thanks to the TFI Co-Chairs, authors, review editors, chapter scientists, and many others for their hard work over many months. TFI Co-Chair Tanabe recalled the agreement by the Panel to dedicate the 2019 Guidelines to the memory of Jim Penman, UK, for his lifetime of hard work and dedication, including to the IPCC. The UK praised Penman’s long, distinguished career as a scientist in addition to his warmth and kindness as a man.

Final Decision: In its decision (Decision IPCC-XLIX-9), the Panel adopts the Overview Chapter and accepts the underlying methodology report, in accordance with, *inter alia*, Principle 10(b) of the Principles Governing IPCC Work. A footnote includes the text of Principle 10(b).

The Overview Chapter contains six sections. Section 1 is an **Introduction**, which states that the 2019 Refinement provides:

- supplementary methodologies for GHG sources and sinks only where gaps currently exist or where new technologies and production processes have emerged requiring elaborated methodologies or for sources and sinks that were not well covered by the 2006 IPCC Guidelines;
- updated default values of emission factors and other parameters based on the latest available scientific information only where significant differences from the default values presented in the 2006 IPCC Guidelines are identified; and
- additional or alternative up-to-date information and guidance, where possible, as clarification or elaboration of existing guidance in the 2006 IPCC Guidelines.

Section 2 presents **background** information on the 2019 Refinement, including on its mandate and preparation.

Section 3 identifies **key concepts unchanged from the 2006 Guidelines** that should be noted when using the 2019 Refinement.

Section 4 addresses **coverage of the 2019 Refinement**, and states that refinements are included for only those categories where the science was considered to have sufficiently advanced since 2006 or where new or additional guidance was required.

Section 5 describes the **relationship with the 2006 Guidelines**. It explains that the 2019 Refinement does not revise the 2006 IPCC Guidelines, but updates, supplements, and/or elaborates the 2006 Guidelines where gaps or out-of-date science have been identified. In addition, the Refinement does not replace the Guidelines but, rather, should be used in conjunction with them and, where indicated, with the Wetlands Supplement.

Section 6, on **specific developments in the 2019 Refinement**, includes five volumes. Volume 1 on **general guidance and reporting** contains paragraphs on:

- national GHG inventory arrangements and management tools;
- data collection strategies;
- use of facility-level data in inventories;
- uncertainty analysis;
- key category analysis;
- non-linear interpolation;
- comparison of GHG emission estimates with atmospheric measurements;
- use and reporting of models; and
- indirect GHG emissions.

Volume 2 on **energy** explains that all methodological updates made in the 2019 Refinement are in the fugitive emissions categories. It includes paragraphs on: fugitive methane (CH₄) and CO₂ emissions from mining, processing, storage, and transportation of coal; fugitive emissions from oil and natural gas systems; and fugitive emissions from fuel transformation.

Volume 3 on **industrial processes and product use** addresses new categories and new gases, expanding the scope of the 2006 Guidelines to include more manufacturing sectors identified as GHG sources, including the production of hydrogen, rare earth metals and alumina, and waterproofing of circuit boards. In addition, a basis for future methodological development is provided for fluorinated treatment of textiles, carpet, leather, and paper.

The Refinement provides updates on guidance for: the production of nitric acid, fluorochemicals, iron and steel, aluminum and electronics, and the production and use of refrigeration and air-conditioning equipment.

Volume 4 on **AFOLU** contains paragraphs on:

- Tier 3 model;
- IAV;
- biomass estimates;
- soil carbon;
- rice cultivation;
- flooded lands;
- livestock and manure management;
- soil N₂O; and
- harvested wood products.

Volume 5 on **waste** includes paragraphs on:

- waste generation, composition, and management;
- estimation of CH₄ emissions from landfills;
- incineration and open burning of waste;
- CH₄ emissions from wastewater treatment;
- N₂O emissions from wastewater treatment;

- non-biogenic (fossil) CO₂ emissions from wastewater treatment and discharge; and
- discharge into aquatic environments.

IPCC Trust Fund Programme and Budget

This agenda item was first taken up on Wednesday (IPCC-XLIX/Doc.2) and by subsequent meetings of the Financial Task Team (FiTT).

The Republic of Korea noted their intention to continue their annual contribution to the Trust Fund of around CHF 120,000 until 2020 and their commitment to provide an additional CHF 445,000 annually, starting in 2019 to support the AR6 SYR TSU.

Budget for the Years 2019, 2020, 2021 and 2022: On Sunday afternoon, FiTT Co-Chair Helen Plume noted that the FiTT met several times over the course of IPCC-49 and presented the updated budget proposal to delegates. She noted that new activities resulting from the SLCF decision had been accounted for. The budget was approved.

Final Decision: In its decision (IPCC-XLIX-8), the Panel, based on the recommendations of the FiTT, *inter alia*:

- approves the revised budgets for 2019 and 2020, and notes the forecast budget for 2021 and the indicative budget for 2022;
- welcomes, with gratitude, contributions and pledges from members, especially from developing countries and international organizations, and encourages all members to maintain or increase their financial support to enhance the IPCC's long-term financial stability;
- encourages members to make first-time contributions to the IPCC Trust Fund to broaden the donor base;
- encourages members to transfer funds as soon as practicable;
- expresses gratitude to the WMO, UNEP, and the UNFCCC for their financial support; and
- authorizes the Secretary to reallocate funds up to 20% of a budget appropriation line, to provide flexibility for additional trips to Lead Author meetings to support cross-WG linkages.

Resource Mobilization: IPCC Secretary Abdallah Mokssit reported on this agenda item (IPCC-XLIX/INF.5, Rev.1), saying the IPCC is on a good track but requires further resource mobilization. He highlighted, *inter alia*, an increase in the number of contributors from 24 to 39 since 2013, including from developing countries and countries with economies in transition, and generous support from Plenary host countries for translation.

Germany called for the FiTT to revise the budget to present a more realistic assessment of the resource mobilization required. The Panel took note of the document.

Working Capital Reserve: The Secretariat reported on this agenda item (IPCC-XLIX/INF.3), noting the objective is to ensure that the IPCC remains operational in case of a setback or temporary shortfall of cash. She presented a proposal to establish a working capital reserve at an operating minimum level of CHF 2 million, and to review this amount periodically. In accordance with the proposal: the FiTT would provide recommendations to the Panel for drawdown during plenary sessions; the ExCom would be empowered to approve a drawdown between sessions if needed; and the capital reserve would be replenished 12 months after drawdown.

In response to questions from the Netherlands and the UK, the Secretariat clarified that the working capital reserve would come from the existing general reserve and would also be replenished from general reserves within the Trust Fund.

WG III Co-Chair Jim Skea, for the ExCom, expressed nervousness among some scientific ExCom members about fiduciary responsibilities related to approving a drawdown. IPCC

Chair Lee said that part of the ExCom's job is to handle emerging issues that demand urgent action between sessions.

The Panel took note of the document.

Financial Stability of the IPCC: IPCC Deputy Secretary Kerstin Stendhal introduced a proposed terms of reference (ToR) for an external consultant to assess the financial stability of the IPCC (IPCC-XLIX/Doc.6, Rev.1). Delegates' questions about the consultancy included scope of work, its necessity, and appropriate funding sources.

IPCC Vice-Chair Thelma Krug underscored the difference between short-term stability and long-term uncertainty. IPCC Vice-Chair Youba Sokona noted that IPCC scientists are neither fundraisers nor finance mobilizers. The US, Sweden, and Switzerland cautioned that IPCC funding should be the responsibility of governments, not of other entities that might influence the Panel's outcomes.

Stendhal replied that the Secretariat currently sees no acute need for a consultant, and recommended that the FiTT undertake further discussions, which was agreed.

Audit of the 2017 Financial Statements: The Secretariat reported on the Audit of the 2017 Financial Statements (IPCC-XLVI/INF.2). She said no problems were found and that the 2018 Statement will be shared upon completion. The Panel took note of the report.

Report from the IPCC Task Group on Gender

On Wednesday, the Plenary considered the Report of the IPCC Task Group on Gender (IPCC-XLIX/Doc.10). Task Group Co-Chair Patricia Nying'uro (Kenya) stated that the Group aimed to develop a framework of goals and actions to improve gender balance and address gender-related issues within the IPCC, and outlined the Group's report.

Task Group Co-Chair Diana Liverman (US) reported 533 responses to a survey of IPCC participants on perceptions and experiences of gender bias, the majority of which were positive, although women were consistently less positive. She noted that 8% of female respondents cited experience of sexual harassment, while 16% reported having perceived it.

Task Group Co-Chair Markku Rummukainen (Sweden) said IPCC gender balance has improved over time, but that further action and progress is needed. He highlighted the report's recommendations on:

- national-level mainstreaming of gender balance in nominations;
- gender balance in selecting authors and Bureau members;
- training and guidelines;
- consideration of travel safety and women's health related to attending IPCC meetings; and
- development of a gender policy, implementation plan, and action committee.

During the discussion, delegates expressed support for the report, its recommendations, and a process to advance implementation. The Netherlands, supported by Norway, Switzerland, China, and Nicaragua, recommended regular progress reports. Norway called for developing ToR for a gender committee to support implementation and provide regular progress reports to IPCC plenaries. Luxembourg expressed interest in working on such ToR.

Canada noted its experience with establishing a similar committee, and France, the EU, the UK, China, and Ukraine expressed interest in participating in such a committee.

Australia, supported by Norway, called for integrating gender recommendations in the seventh assessment report (AR7). Norway highlighted gender differences in adaptation and

microfinancing. Zimbabwe and Ecuador recommended linking gender to other considerations, such as the IPCC Scholarship Programme, and participation of developing countries and women in climate science, to ensure that IPCC quality is not compromised.

WG III Vice-Chair Ramon Pichs-Madruga added that IPCC reports should develop a system for evaluating actions to address gender issues. WG I Co-Chair Panmao Zhai noted that gender bias starts with author nominations. Luxembourg underscored difficulties faced by small countries in reaching gender balance in nominations.

Bolivia recalled that the UNFCCC has a gender team and also called for support for local focal points to enhance gender balance.

WG II Vice-Chair Andreas Fischlin noted difficulties in appointing female CLAs and suggested inclusion of statistics on female participation in future IPCC reports.

WG I Co-Chair Valérie Masson-Delmotte called for encouraging female scientists to apply to be CLAs. Task Group Co-Chair Liverman noted that the UN Educational, Scientific and Cultural Organization (UNESCO) is the only organization that consistently reports on gender balance.

Responding to comments, Task Group Co-Chair Nying'uro agreed that gender issues should be addressed in IPCC reports. Germany called for addressing gender issues in scoping meetings rather than in the gender committee.

Co-Chair Rummukainen said consideration of gender balance and related issues should be mainstreamed in the nomination processes; even if the IPCC might not want to nominate "gender focal points" itself, it should at least make the process transparent. IPCC Deputy Secretary Stendahl said the ratio of nominations of women as focal points would be addressed.

IPCC Chair Lee invited the Task Group Co-Chairs to prepare a draft decision on the Task Group's recommendations. Deputy Secretary Stendhal suggested that a contact group develop ToR for the proposed committee.

On Saturday afternoon, Task Group Co-Chair Nying'uro introduced for Plenary consideration a draft decision from the Task Group on Gender and Gender-related Issues (IPCC-XLIX/Doc.10, Rev.1), on drafting a gender policy and implementation plan, with an attached annex with ToR for an open-ended Task Group on Gender Policy and Gender Implementation Plan (TG-Gender) to undertake this work.

While noting the issue's importance, Japan cautioned that gender concerns are not exclusive to the IPCC but are an issue for all of society, so the burden placed on the IPCC, its Secretariat, or members should be balanced with this reality.

The decision was adopted.

Final Decision: In the final decision (IPCC-XLIX-5), the IPCC, *inter alia*: establishes TG-Gender to develop a draft Gender Policy and Implementation Plan for consideration by IPCC-52, and adopts the ToR of the Group as contained in an annex.

The ToR states that, *inter alia*:

- TG-Gender will be open to IPCC members, Bureau members, and TSU staff, and be chaired by IPCC Vice-Chair Ko Barrett;
- external experts can be called upon, as appropriate;
- TG-Gender will develop the draft IPCC Gender Policy and Gender Implementation Plan; and
- the implementation plan will identify actions, tasks, roles, and responsibilities, as well as modalities for monitoring and reporting progress on the execution, review, and future updates of the implementation plan, including budgetary implications.

Progress Reports

Ad Hoc Task Group on Financial Stability: On Friday, IPCC Vice-Chair and ATG-Finance Co-Chair Youba Sokona reported no further work apart from the consultant ToR discussed under the agenda item on the IPCC's financial stability. The Panel took note of his verbal report.

Task Group on the Organization of the Future Work of the IPCC in Light of the Global Stocktake: On Wednesday, Éric Brun (France), Co-Chair of the Task Group on the Organization of the Future Work of the IPCC in light of the Global Stocktake (TG-FWLGST), presented the Group's progress report, noting that progress to date is in line with the group's action plan (IPCC-XLIX-INF.6). The Task Group solicited views on the organization of future work of the IPCC and received 20 submissions.

Co-Chair Brun said options for future work would be discussed in greater detail during a TG-FWLGST meeting on Thursday and that the results of that meeting would be presented to Plenary. Saudi Arabia sought confirmation that IPCC-49 would not take a decision on this issue. A contact group convened to further discuss proposed options in the progress report.

On Saturday afternoon, Task Group Co-Chair María Amparo Martínez Arroyo (Mexico) reported on the outcome of the contact group, explaining that the group had developed 33 criteria for judging the pros and cons of various alternatives for future IPCC work, including, *inter alia*, relevance and timeliness; scientific integrity; the IPCC's role as the leading authority on climate change; budget and workload; and availability of governments, TSUs and authors.

On progress in preparing the TG-FWLGST's report for IPCC-52, Co-Chair Brun recalled the two alternatives for the Panel's consideration: either make a decision on future work based on the seven options already identified; or gather and review more information from the IPCC and UNFCCC before making a decision. He said the contact group had proposed a third alternative: produce a paper for the GST if the UNFCCC requests.

Co-Chair Brun noted that much work remains to be done on the report for IPCC-52, including collection and analysis of opinions on the pros and cons of the different options and consideration of whether a decision should be taken at IPCC-52.

Belgium suggested complementing written opinions with numerical coding for ease of analysis.

The Panel took note of the report of the Task Group.

SROCCC: WG II Co-Chair Hans-Otto Pörtner presented this progress report (IPCC-XLIX-INF.7), noting that the second order draft is now receiving comments, and that circulation of the final draft to governments and final government review of the draft SPM will take place between June and August 2019. He also highlighted efforts to encourage and train early-career scientists to participate in review of the draft report. The Panel took note of this report.

SRCCL: WG III Co-Chair Jim Skea presented this progress report (IPCC-XLIX-INF.10), highlighting three author meetings and noting that the final draft and SPM was presented for final government review on 29 April 2019. He also highlighted an active outreach programme since IPCC-47. The Panel took note of the report.

WG I Contribution to the AR6: WG I Co-Chair Panmao Zhai presented this progress report (IPCC-XLIX-INF.12), highlighting cross-WG coordination on cross-cutting issues, including adaptation, regional issues, and scenarios; a WG I training on diversity and inclusion; and regional outreach. The Panel took note of the report.

WG II Contribution to the AR6: WG II Co-Chair Debra Roberts presented this progress report (IPCC-XLIX-INF.8), noting that 52% of WG II's authors for AR6 are new to the IPCC. She highlighted cross-chapter papers, projects, and training, and said the second Lead Author meeting in Kathmandu, Nepal, will take place 14-19 July 2019, and will focus on regional integration.

Belgium and the UK called for the preservation of all relevant and practical information on tools, good practices, and materials developed during AR6 to help jump start the work on AR7. IPCC Chair Lee underscored the Task Group on Data Support for Climate Change Assessments (TG-Data) responsibility in this area. The Panel took note of the report.

WG III Contribution to the AR6: WG III Co-Chair Jim Skea introduced this report (IPCC-XLIX-INF.11), highlighting outreach during the first Lead Author meeting in Edinburgh, Scotland, in April 2019, that drew the participation of Scottish First Minister Nicola Sturgeon, as well as many other outreach events and webinars for author training and support. The Panel took note of the report.

AR6 SYR: IPCC Chair Lee presented an update on progress regarding preparation of the SYR. He said that a scoping meeting will take place from 21-23 October 2019 in Singapore, and that the preliminary outline and elements discussed in Montreal at IPCC-46 will provide the starting point for discussions at the meeting. He noted transmission of a letter to countries asking for input on questions to be addressed in producing the SYR and announced a 2 June 2019 deadline for nominations for scoping meeting participants.

Chair Lee called for nominating experts with broad cross-disciplinary experience to better integrate and synthesize the findings of the SRs, the WG reports, and the TFI's work in a policy relevant, but not policy prescriptive, manner. He said that the Republic of Korea had offered to fund and host the SYR TSU.

While noting the majority of scoping meeting participants would be those involved in SRs and WG reports, WG III Co-Chair Jim Skea stressed the importance of having experts from beyond the IPCC process to provide a critical outside perspective, including those with a policy background and from other global assessments.

France suggested disseminating a call to all AR6 authors in search of nominations. Norway asked for a precise deadline to complete the SYR work. Saudi Arabia called for ensuring that the SYR represents the underlying science. The US stressed the importance of ensuring that the underlying report is accurately reflected and engaging the WG Co-Chairs and TSUs at every stage of the process.

TFI: TFI Co-Chair Kiyoto Tanabe presented this progress report (IPCC-XLIX-INF.4) and elaborated on the process to develop the 2019 Refinement and other TFI activities, highlighting that, *inter alia*:

- a version of the software with Tier 2 livestock categories will be released in June 2019;
- work on land use, land-use change and forestry (LULUCF) is expected to be completed in late 2019;
- the TFI has continued its work to maintain, improve and promote the Emission Factor Database (EFDB);
- the TFI convened three side events during the Katowice Climate Change Conference in December 2018; and
- the TFI has continued collaboration with the UNFCCC to help inventory compilers better understand and use TFI products.

Co-Chair Tanabe announced that TFI Bureau member Sabin Guendehou (Benin) will resign at the beginning of June 2019 to begin working for the UNFCCC Secretariat. On the Africa region

selecting a replacement, IPCC Secretary Mokssit said that letters will be sent to African member countries and that election of a new Bureau member will take place at IPCC-52.

The Panel took note of the TFI report.

Communications and Outreach Activities: On Thursday, Jonathan Lynn, IPCC Secretariat, reported on communications and outreach activities since IPCC-48 and future plans (IPCC-XLIX/INF.9). He highlighted activities surrounding the finalization and release of SR15 and noted many innovations, including a WMO/IPCC pavilion at UNFCCC COP 24.

During the ensuing comment-and-response period, participants expressed appreciation for the work done and made numerous suggestions.

In response to a suggestion by Switzerland, supported by France and China, Lynn noted that the IPCC webpage has links to other UN processes and products but said these will be made clearer.

WG I Vice-Chair Edvin Aldrian called for conveying information on the Sustainable Development Goals (SDGs) and gender, particularly to focal points. Regarding his suggestion to produce videos of outreach events, Lynn noted that some are already livestreamed but agreed this effort should be increased.

France, with Belgium, lamented that no translations of SR15 into other UN languages exist yet on the website. Lynn said the issue is complicated by the need to allow authors and Bureau members the opportunity to ensure accuracy. Belgium noted a Walloon IPCC e-news bulletin, available in many French-speaking countries, which published a special issue on SR15 just after its publication. WG I Co-Chair Valérie Masson-Delmotte described citizen initiatives to release French and Portuguese translations of SR15, and called for native UN language speakers as focal points to review the accuracy and scientific quality of the translations and ensure their quick publication.

In response to interventions from Belgium and China, Lynn said that the SROCC's approval is expected to take place on the same day as the 2019 UN Climate Summit in New York, US, and that the report will be publicized during the Summit.

Saudi Arabia called for ToR for communications and outreach to ensure that representatives communicate accurately, clearly, and consistently. Lynn noted an existing overarching communications strategy, which is continuously reviewed, and said that speakers must limit themselves to approved IPCC findings. Saudi Arabia then called for a detailed and transparent IPCC information disclosure policy.

In response to Sweden, Lynn expressed enthusiasm to work more intensively with focal points and noted ongoing outreach around SR15, including presentations of findings at intergovernmental bodies and in regional fora. With the Republic of Korea, he supported using social media as part of the IPCC "armory."

Lynn agreed with Norway's suggestion to increase the number of webinars. Norway also suggested a dedicated communications expert at the TSU level.

The Plenary took note of the report and IPCC Chair Lee said the communications team would take the suggestions and guidance into consideration.

Admission of Observer Organizations

On Thursday, the Secretariat introduced this agenda item (IPCC-XLIX/Doc.5), noting that eight observer organizations had requested IPCC observer status since IPCC-47. She added that the Office of the UN High Commissioner for Human Rights had also requested IPCC observer status and had been added to the list of UN Bodies and Organizations as Participating Organizations.

The Panel decided to admit the eight organizations as IPCC observer organizations.

Final Decision: In its decision (IPCC-XLIX-3), the Panel decides to grant the following eight organizations IPCC observer status:

- European Space Agency;
- UN Foundation;
- Iuventum (Germany);
- Group on Earth Observations;
- Greenplanet (India and Canada);
- Green Climate Fund (GCF);
- Scientific Committee on Oceanic Research; and
- Instituto Bem Ambiental.

IPCC Scholarship Programme

On Friday morning, IPCC Vice-Chair and Science Board Chair Ko Barrett presented an update on the IPCC Scholarship Programme (IPCC-XLIX/Doc.9, Rev.1), noting that the final selections of the fifth round of scholarship awards will be presented at IPCC-50. She said the new Board of Trustees will meet for the first time in the coming months, and reiterated that the Scholarship Programme will consider supporting chapter scientists from developing countries in addition to supporting Ph.D. and Post-Doctoral students, in accordance with a decision by the Panel at IPCC-47.

Highlighting the limited amount of money available in the Scholarship Programme Trust Fund, IPCC Chair Lee and Barrett asked the Panel to provide guidance to the Board regarding how to most efficiently allocate funds, noting the potential of cost-effective travel scholarships for chapter scientists to attend Lead Author meetings.

WG I Vice-Chair Carolina Vera stressed the importance of specificity regarding the Scholarship Programme's goals, how the work is to be conducted, and how participants are expected to help the IPCC achieve its goals.

Ghana, supported by Tanzania, India, Kenya, Angola, Nigeria, South Africa, Belgium, Algeria, Comoros, Botswana, Zimbabwe, Burkina Faso, and Bolivia, expressed concern that support for chapter scientists would drain the Trust Fund of its limited resources, rendering it ineffective in its support for Ph.D. and Post-Doctoral students; and called for immediate financial mobilization to ensure the Programme's sustainability and facilitate the meaningful participation of developing countries in the IPCC. While expressing appreciation for the important role that chapter scientists play, they urged caution in supporting them at the expense of students. Tanzania noted concern over the lack of a concrete plan regarding how the Board of Trustees plans to facilitate the urgent resource mobilization required.

Saudi Arabia, supported by South Africa, France, Belgium, Algeria, Burkina Faso, and Bolivia, suggested that additional organizations be sought for funds to support the Programme in general and for chapter scientists in particular. Nigeria, supported by Comoros and Burkina Faso, suggested reaching out to the GCF for financial contributions.

WG I Co-Chair Valérie Masson-Delmotte, supported by WG III Vice-Chair Diana Ürge-Vorsatz, China, Jamaica, Saint Kitts and Nevis, Germany, the UK, and the Bahamas, stressed the importance of having chapter scientists from developing countries, noting their status as early career researchers and the important capacity building that can be enabled by facilitating their participation in the IPCC. Chad suggested allowing Masters level students to apply to the Scholarship Programme.

Summarizing the feedback from delegates, IPCC Vice-Chair Barrett noted consensus that the Programme:

- continue to prioritize support for PhD and Post-Doctoral students;
- look for ways to support chapter scientists without draining the Trust Fund of its resources; and
- seek the mobilization of significant financial resources immediately.

IPCC Chair Lee said this guidance would be communicated to the Board of Trustees and provided to delegates in writing.

On Saturday afternoon, IPCC Vice-Chair Barrett presented updated language to serve as guidance for the IPCC Scholarship Programme Board of Trustees, intended to reflect the views of delegates as expressed during Plenary discussions on Friday.

Belgium, supported by Tanzania, India, Benin, Algeria, Chad, Congo, Iraq, and WG I Vice-Chair Fatima Driouech, asked to add reference to support for Masters students.

Ghana, supported by Tanzania, India, Benin, Nigeria, Algeria, Zimbabwe, Togo, Congo, Kenya, Bolivia, and WG I Vice-Chair Driouech, called for amending the text to clearly state that financial support for chapter scientists should be conditional on additional funds being mobilized for the Programme and that IPCC Chair Lee would lead the resource mobilization effort. WG I Vice-Chair Noureddine Yassaa suggested approaching IPCC observer organizations for additional funding.

WG I Vice-Chair Carolina Vera expressed support for language reflecting that chapter scientists would be eligible for funding. Saint Kitts and Nevis, Jamaica, and the Bahamas concurred, adding that chapter scientists should be considered for funding on equal footing with PhD and Post-Doctoral students.

WG I Co-Chair Valérie Masson-Delmotte, supported by the Bahamas, suggested analyzing the success of the Scholarship Programme to date, and reaching out directly to chapter scientists to gather data on their experiences. She noted difficulties regarding decisions on effectively utilizing limited resources without such data.

Vice-Chair Barrett noted the challenge of reconciling the differing positions of delegates and reminded the Panel that the Scholarship Board has the authority to make the final decision on how the funding is spent. She also reiterated that at IPCC-48, the Panel decided to consider using the Scholarship Fund to support chapter scientists. In response to a comment from Saudi Arabia, IPCC Chair Lee noted that the mandate of the Scholarship Board is to mobilize financial resources and elect its own Chair, but said he would personally assist with resource mobilization. Following additional interventions and clarifications that participants' concerns would be reflected in the report of the session, the text was approved as proposed by Vice-Chair Barrett.

Final Decision: In its decision (IPCC-XLIX-4), the Panel provides guidance to the Board of Trustees, stressing:

- the need to continue to prioritize the funding of post-graduate scholarships for developing country scientists, especially from the least developed countries;
- the benefit of supporting chapter scientists from developing countries to participate in IPCC work in ways that do not undermine the ability of the Scholarship Fund to continue to support postgraduate activities, possibly by limiting Scholarship Fund support during AR6 to modest levels of support for travel or honoraria; and
- the need to mobilize additional resources for the Programme's activities in order to expand the ability of developing country scientists to contribute to advancing climate science and participating in the IPCC's work.

Task Group on Data Support for Climate Change Assessment

On Thursday afternoon, IPCC Secretary Mokssit reported on the selection of members of TG-Data and a proposal to amend the TG-Data ToR (IPCC-XLIX/Doc.7, Corr.1). Noting that 15 members had been selected but one had stepped down, and that gaps in expertise had been identified, Mokssit proposed amending the ToR on membership to increase the number of members from 15 to 20, and to reflect that IPCC Bureau members may nominate TG-Data members.

France, Switzerland, Japan, and others supported these proposed amendments. Kenya, supported by Canada, Botswana, Zimbabwe, Tanzania, and others expressed concern about both amendments, noting lack of clarity regarding the need for 20 members and a potential conflict of interest with Bureau members both nominating and confirming TG-Data members. Following more detailed information about the expertise gaps identified and the additional TG-Data members proposed by WG II Co-Chair Hans-Otto Pörtner, delegates agreed to increase the number of TG-Data members from 15 to 20.

IPCC Chair Lee, supported by WG II Co-Chair Hans-Otto Pörtner and IPCC Vice-Chair Youba Sokona, questioned the term "conflict of interest" and pointed out that IPCC Bureau members nominate and select authors as standard practice. WG II Vice-Chair Andreas Fischlin and WG I Vice-Chair Edvin Aldrian concurred, suggesting that a contact group convene to ensure that the concerns raised by Kenya and others are adequately addressed. A contact group, co-facilitated by Japan and Tanzania, was established to discuss the proposed amendment to allow Bureau members to nominate TG-Data members.

On Saturday afternoon, Contact Group Co-Facilitator Ladislaus Chang'a (Tanzania) presented the agreement reached in the contact group, which allows for Bureau members to nominate experts. Proposed language was adopted as presented, with a minor editorial amendment.

Final Decision: In its decision (IPCC-XLIX-6) on the selection of TG-Data members, the Panel:

- notes the 14 members that have already been selected;
- amends the TG-Data ToR to add that, in addition to nominations by the IPCC Secretariat, governments and observer organizations, IPCC Bureau members may nominate additional experts, as appropriate; and
- amends the TG-Data TOR to increase the upper bound of TG-Data members from 15 to 20.

The TG-Data's ToR and mandate are contained in an annex to the decision.

Report of the IPCC Conflict of Interest Committee

Conference of Interest Committee Chair Youba Sokona reported that the Committee found that all recent member updates of information submitted to the Panel were in order. He said the Committee recommended that:

- if an IPCC Bureau member also serves as a national focal point, language on potential conflicts of interest should be inserted into letters inviting focal points to IPCC sessions; and
- TSUs should remind their members of potential conflicts of interest.

The Panel took note of his verbal report.

Short-Lived Climate Forcers

On Friday afternoon, TFI Co-Chairs Kiyoto Tanabe and Eduardo Calvo presented the outcome of the May 2018 expert meeting on future work on SLCFs (IPCC-XLIX/Doc. 8), which

agreed that the objectives of the IPCC's work should be to fill gaps in existing methodologies and develop and disseminate methodological guidance on SLCFs. They presented two options for consideration by the Panel for taking forward the IPCC's work on SLCFs: Option A would prepare supporting materials for the next assessment cycle, while Option B would create a methodology report for publication in 2022 or 2023. Noting the substantially different timelines and human and financial resources of the two options, the TFI Co-Chairs and IPCC Chair Lee invited the Panel to decide on a way forward.

Noting that the sixth assessment cycle already has a heavy workload and raising concerns about the high cost and feasibility of Option B, New Zealand, Denmark, Japan, the UK, the US, Luxembourg, Sweden, Canada, China, India, Netherlands, Ghana, France, Belgium, Argentina, Turkey, Indonesia, and the Republic of Korea expressed a preference for Option A. Some delegates noted that choosing Option A would not preclude developing a methodology report at a later date.

Noting the need for urgent action to combat climate change, Saudi Arabia, Nicaragua, Ecuador, Algeria, Norway, Mexico, and UNEP expressed preference for Option B, with Saudi Arabia expressing support for producing the report by 2022.

Many delegates called for beginning work as soon as possible, regardless of which option was chosen, with many also noting that work could begin during this assessment cycle and conclude during the next assessment cycle. France suggested that work should continue between cycles. Echoing these sentiments, Paraguay noted that perhaps a third option could combine aspects of both options.

In response to questions regarding the difference between supporting materials and a methodology report, including the quality implications of choosing one over the other, TFI Co-Chairs Tanabe and Calvo clarified that supporting materials are produced through expert meetings and are not approved by the Panel but, rather, are official IPCC documents used by inventory compilers. They said the Bureau had determined no difference in quality between the two options.

Delegates made various suggestions on the possibility of splitting the SLCF work between the two assessment cycles, including splitting the writing across two cycles, or taking a decision during the sixth assessment cycle and beginning work in the seventh cycle. Germany and Norway suggested that scoping could also take place in the sixth assessment cycle, to further expedite the work.

Co-Chair Calvo noted that Option B would be more challenging, difficult, and costly, while the money allocated for Option A was small in comparison to the value that would be derived from the product. A contact group, co-facilitated by Ghana and Canada, was established to discuss options to address SLCFs, their financial implications, and means of funding, as well as timing and deadlines.

Reporting back on contact group deliberations on Saturday afternoon, Contact Group Co-Facilitator Jacqueline Gonçalves (Canada) presented a newly created Option C: to begin work on SLCFs as soon as possible while simultaneously taking account of the heavy workload of the sixth assessment cycle. She noted that preparatory work would take place during the sixth assessment cycle, including adoption of the SLCF methodology report outline, while further methodological work would take place in the seventh cycle.

Contact Group Co-Facilitator Nana Ama Browne Klutse (Ghana) noted that while the contact group did not consider a detailed financial assessment, the financial impact of Option C was not expected to exceed costs that were proposed for Options A or B.

In response to a question from IPCC Vice-Chair Ko Barrett, Co-Facilitator Gonçalves responded that the TFI would be responsible for leading this effort. TFI Co-Chair Calvo noted that the TFI would carry this work forward and elaborate on precise activities and budgetary implications for delivery to the Panel. The Panel accepted Option C as the way forward.

On Sunday afternoon, the Panel discussed the decision text on SLCFs. Tanzania requested clarification on the sentence stating that preparatory work is to be completed as soon as possible. Contact Group Co-Facilitator Gonçalves responded that the terminology is deliberately vague to provide flexibility. China concurred, noting that the ability to finish all the preparatory work in the sixth assessment cycle depends on future plenaries. Following minor amendments to improve clarity, the decision was adopted.

Final Decision: In its decision (IPCC-XLIX-7), the Panel decides that the TFI will produce a methodology report on SLCFs. The Panel also approved the modalities for preparing the report, which are contained in an annex to the decision and state that:

- the preparatory work for the methodology report (including supporting materials and scoping) is to be completed as soon as possible, starting in the sixth assessment cycle;
- further methodological development will take place in the seventh assessment cycle;
- three to four expert meetings will produce a series of supporting materials to be published after each meeting but no later than 2022;
- these supporting materials will be used to inform the scoping of methodological work for SLCFs;
- the scoping meeting will consider the work of WG I (April 2021) and WG III (July 2021); and
- the report's outline will be presented for Panel approval soon after the scoping meeting.

Matters Related to UNFCCC and Other International Bodies

On Sunday afternoon, Florin Vladu, UNFCCC Secretariat, outlined collaboration between the UNFCCC and the IPCC. He noted that, *inter alia*: the outcome of work for the first GST may inform the planning of future IPCC work; and that the GST modalities could be revised after each GST, which may also inform AR7 planning.

He also said the Subsidiary Body for Scientific and Technological Advice (SBSTA)-IPCC Joint Working Group had proposed ideas to facilitate further interaction and coordination between the IPCC and UNFCCC. The Panel took note of the oral report.

Any Other Business

On Sunday evening, IPCC Deputy Secretary Stendahl reported on collaboration between the IPCC and IPBES, noting an invitation by IPBES to collaborate on a joint technical report. She explained that the ExCom considered the invitation, but that it had concluded that given the IPCC's hectic work schedule now and in the foreseeable future, preparing a joint technical paper would be difficult at this stage.

WG II Co-Chair Hans-Otto Pörtner also highlighted possible future collaboration with the Convention on Biological Diversity, noting that biodiversity-related issues had been reflected in the SR15 and will be included in SRCCCL and SROCC.

France asked that information be presented at IPCC-50 on correspondence between IPBES and the IPCC. Norway suggested collaboration could also take the form of expert meetings and side events. The Panel took note of the oral report on IPCC/IPBES collaboration.

Closing Plenary

On Sunday evening, Secretary Mokssit announced that IPCC-50 will take place from 2-6 August 2019 in Geneva, Switzerland.

In closing, IPCC Chair Lee said that the acceptance of the 2019 Refinement will help countries build trust in international processes and will ensure consistency and comparability of national reporting. He said that TFI TSU Head Andrej Kranjc would be retiring, and said the 2019 Refinement was the “crowning achievement of a distinguished career.” He gavelled the meeting to a close at 11:15 pm.

A Brief Analysis of IPCC-49

“Do you Kyoto?”

As the Intergovernmental Panel on Climate Change (IPCC) gathered at the Kyoto International Conference Center for its 49th plenary session, delegates were reminded of the historic role of the venue in the development of multilateral agreements to halt climate change. The Kyoto Protocol, whatever its merits and (mis)fortune, was recalled by speakers as a hopeful time. In their greetings, the Japanese hosts asked “Do you Kyoto?” meaning “Are you doing something good for the environment?”

Twenty-two years after adoption of the Kyoto Protocol, as global emissions have continued to increase unabated, it is difficult to summon optimism. Still, there is now a dizzying array of agreements, processes, and mobilization at all levels. The international climate regime has vastly expanded and ever more countries, entities, and individuals actively take part in global efforts to combat climate change.

Key to determining the success (or failure) of these efforts is a common methodology to assess greenhouse (GHG) emissions and removals. This was the main task of the IPCC in Kyoto: to adopt the 2019 Refinement to the 2006 Guidelines on National GHG Inventories prepared by scientists according to IPCC Principles and Procedures.

This analysis provides some background to the session, reviews the main decisions taken, and places the outcomes in the larger context of climate change action.

“You cannot reduce what you cannot measure”

The IPCC’s work to develop guidance and methodologies for compilation and review of national GHG inventories is one of the most important, yet often overlooked, tasks of the Panel. These commonly agreed methodologies form the basis for all measurement, reporting, and verification of GHG emissions and removals. The Guidelines are used not only by governments as they compile information on their emissions and removals, but also by non-governmental entities, including corporations, and anyone engaging in voluntary GHG reduction programmes and carbon markets. As noted by Michael Gillenwater from the GHG Institute, “All modern-day GHG programmes, methods and policies have their roots in the IPCC Guidelines.”

The first IPCC inventory guidelines were developed in 1994, during the IPCC’s second assessment cycle. These Guidelines were revised and/or complemented by other reports in 1996, 2000, and 2003. The current Guidelines were published in 2006, based on scientific work done through 2005. While some supplements on specific matters have been developed since then (the 2013 Supplement on Wetlands, and the 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol), it was clear that the guidance could use refining in some areas in order to reflect the latest scientific and technical knowledge. In 2016, IPCC-43 in Nairobi approved a proposal to produce a methodology report that would refine the Guidelines, and IPCC-44 in Bangkok approved the outline for the refinement. Over 280 scientists and experts then worked for more than two years on the 2019 Refinement, which was finally completed in Kyoto.

Still, there were moments of genuine concern that the scientific integrity of the process would be compromised. Even though the underlying report is the purview of the chapter scientists and authors (governments are only supposed to approve the Overview Chapter), revisions were made during discussions in Kyoto to the underlying report as well as to the Overview Chapter. Changes made included those relating to afforestation, forestry, and land use, namely reporting the impact of natural disturbances, approaches to separating human effects from natural ones when estimating wetland emissions, and biochar. The authors, however, agreed to the changes and they remain responsible for the underlying report.

More worryingly, a small number of delegations questioned the authors’ integrity during their objections to what they characterized as inconsistent treatment of fugitive emissions from oil and gas exploration on the one hand and coal exploration on the other, in spite of the authors’ assurance that they had considered all options and that any other approach was simply not scientifically justified. These countries registered their objections to the decision on adopting the 2019 Refinement, thereby threatening the ability of the session to come to a successful close. Fortunately, the IPCC Principles and Procedures include steps to be taken when consensus cannot be reached. After protracted discussions and consultations, these Procedures were applied and the objection was recorded, although not without drama. The Panel managed to adopt the 2019 Refinement more than five hours after IPCC-49 had originally been scheduled to end.

Other Continuous Refinements

Besides the 2019 Refinement, IPCC-49 took up other matters related to ongoing attempts to improve IPCC processes and practices, including a decision on the terms of reference for a Task Group on Gender Policy and a Gender Implementation Plan to oversee and enhance gender balance in IPCC processes.

The IPCC is also looking at ways to align its work with the Global Stocktake (GST) process under the UN Framework Convention on Climate Change’s (UNFCCC) Paris Agreement, with a decision on the matter expected by IPCC-52.

And although it has only just completed its work on the 2019 Refinement, methodological work by the Task Force on Inventories will continue in earnest, as the Panel agreed to begin work as soon as possible on developing a methodology report on calculating emissions from short-lived climate forcers, such as tropospheric ozone and its precursors, particulate matter, and some hydrofluorocarbons, that have lifetimes in the atmosphere that vary from a few days to a decade and are often also air pollutants.

The Panel also devoted lengthy discussions on how to better manage funds under the IPCC Scholarship Programme, including deciding on guidance to be submitted to the Board of Trustees on use of the Scholarship Fund for scientists from developing countries. As always, enhancing participation by developing countries in all aspects of the IPCC process remains a key challenge.

As was noted throughout the meeting, the use of the 2006 Guidelines and, ideally, the 2019 Refinement, in accordance with the Paris Agreement Work Programme, is likely to require additional funding for capacity building. While dealing with the political or financial implications of the Guidelines is not within the purview of the IPCC—that task falls to other processes and organizations—the need for capacity building naturally arose.

As IPCC Vice-Chair Thelma Krug noted during the IPCC-49 press conference, the largest capacity needs for developing countries relate to the underlying data and knowledge gaps, not the use of the Guidelines, which are flexible and include plenty of guidance. The 2019 Refinement, for example, includes chapters on data collection strategies and institutional arrangements. As Krug noted, one of the most helpful aspects of the reporting Guidelines for countries is the identification of key categories and sources of emissions, which allows any country to identify relevant policies to more effectively reduce its emissions. The guidelines for national GHG inventories, therefore, are a critical tool to prioritize resources, capacity, and knowledge, and to target policymaking where they can have the greatest impact.

Science, Meet Policy

For the IPCC, the work of accepting the 2019 Refinement comes just six months after the adoption of the Special Report on Global Warming of 1.5°C (SR15), which was prepared jointly by the IPCC's three Working Groups. In less than three months, the Panel is expected to approve the Special Report on Climate Change and Land, and fifty days later, in mid-September, the Panel will take up the Special Report on the Ocean and Cryosphere in a Changing Climate. While 2019 is an eventful one for the IPCC, 2020 and 2021 will be just as busy as the Panel and its Working Groups draft and adopt the reports that will make up the AR6.

All of the IPCC's work will, in turn, be taken up by the UNFCCC. The reporting and review process based on the common use of the inventory guidelines is key to the trust necessary to implement the Enhanced Transparency Framework under the Paris Agreement. It will be the UNFCCC parties who will have to decide on the use of the 2019 Refinement as the technical basis for GHG reporting. Unfortunately, the objections by a small number of countries to the treatment of fugitive emissions from oil and gas exploration as compared to those from coal in the underlying report could lead to problems when the 2019 Refinement is taken up by the UNFCCC. As some participants noted, the lack of consensus could be used to protract negotiations and delay the COP's adoption of the 2019 Refinement as the common basis for reporting.

Regardless of possible delays in the sphere of multilateral governance, efforts to address climate change will not abate given the overwhelming evidence of substantial and accelerating impacts. The IPCC has played a key role in motivating these efforts. SR15 transformed discussions on climate change, giving impulse and motivation to public engagement and mobilization, of which the international School Strike for Climate movement, the Sunrise Movement, and the Extinction Rebellion are some notable examples. Similarly, the detailed technical work undertaken by the Panel and adopted in Kyoto is fundamental to

climate policy at all levels and should help us better understand where we stand in the fight against climate change. One can only hope and mobilize to ensure all this work serves its ultimate purpose: to reduce GHG emissions and help avert the worst impacts of climate change.

Upcoming Meetings

International Conference on Climate Action – ICCA2019:

This conference will bring together all relevant stakeholders in preparation for the UN 2019 Climate Summit. ICCA2019 will provide the opportunity for vertical dialogue and cooperation among all levels of government. **dates:** 22-23 May 2019 **location:** Heidelberg, Germany **www:** <https://www.icca2019.org/>

50th Sessions of the UNFCCC Subsidiary Bodies: The 50th sessions of the UNFCCC Subsidiary Bodies will meet in June 2019. **dates:** 17-27 June 2019 **location:** Bonn, Germany **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **email:** Secretariat@unfccc.int **www:** <https://unfccc.int/event/first-sessional-period-sb-50>

Resilient Cities 2019: Resilient Cities – The Annual Global Forum on Urban Resilience and Adaptation, which was first launched in 2010, aims to connect local government leaders and climate change adaptation experts to discuss adaptation challenges facing urban environments around the globe and forging partnerships that could have lasting impacts for cities. **dates:** 26-28 June 2019 **location:** Bonn, Germany **contact:** ICLEI – Local Governments for Sustainability **phone:** +49-228 / 976299-28 **email:** resilient.cities@iclei.org **www:** <https://resilientcities2019.iclei.org/>

High-level Political Forum on Sustainable Development (HLPF) 2019: HLPF 2019 will address the theme “Empowering people and ensuring inclusiveness and equality.” It will conduct an in-depth review of SDG 4 (quality education), SDG 8 (decent work and economic growth), SDG 10 (reduced inequalities), SDG 13 (climate action), and SDG 16 (peace, justice and strong institutions), in addition to SDG 17 (partnerships for the Goals), which is reviewed each year. **dates:** 9-18 July 2019 **location:** UN Headquarters, New York **contact:** UN Division for Sustainable Development Goals **fax:** +1-212-963-4260 **email:** <https://sustainabledevelopment.un.org/contact/> **www:** <https://sustainabledevelopment.un.org/hlpf/2019>

IPCC WG II AR6 Second Lead Author Meeting: The second Lead Author meeting of IPCC Working Group II will convene to continue preparations for the Sixth Assessment Report. **dates:** 14-19 July 2019 **location:** Kathmandu, Nepal **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/calendar/>

IPCC WG I/II/III Preparatory Meeting of the Drafting Authors for SRCLL: This preparatory meeting of the drafting authors for the Special Report on Climate Change and Land is being organized by WG III. **dates:** 30-31 July 2019 **location:** Geneva, Switzerland **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/calendar/>

IPCC-50: The 50th session of the IPCC is expected to approve the Summary for Policy Makers of the Special Report on Climate Change and Land. **dates:** 2-6 August 2019 **location:** Geneva, Switzerland **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/calendar>

IPCC WG I AR6 Third Lead Author Meeting: The third Lead Author meeting of IPCC Working Group I will convene to continue preparations for the Sixth Assessment Report. **dates:**

26-30 August 2019 **location:** Toulouse, France **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/calendar>

IPCC WG I/II Preparatory Meeting of the Drafting

Authors for SROCC: This preparatory meeting of the drafting authors for the Special Report on the Ocean and Cryosphere in a Changing Climate is being organized by WG II. **dates:** 17-18 September 2019 **location:** Monaco **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/calendar>

IPCC-51: The 51st session of the IPCC is expected to approve the SPM of the Special Report on the Ocean and Cryosphere in a Changing Climate. **dates:** 20-23 September 2019 **location:** Monaco **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/calendar>

UN 2019 Climate Summit: UN Secretary-General António Guterres will convene the UN Climate Summit under the theme “A Race We Can Win. A Race We Must Win,” to mobilize political and economic energy at the highest levels to advance climate action that will enable implementation of many of Sustainable Development Goals. Its aim to challenge states, regions, cities, companies, investors and citizens to step up action in nine areas: mitigation; social and political drivers; youth and public mobilization; energy transition; climate finance and carbon pricing; industry transition; nature-based solutions; infrastructure, cities and local action; and resilience and adaptation. **date:** 23 September 2019 **location:** UN Headquarters, New York **www:** <http://www.un.org/climatechange/>

SDG Summit: The HLPF, under the auspices of the UN General Assembly, will assess progress achieved so far since the adoption of the 2030 Agenda in September 2015 and provide leadership and guidance on the way forward that would help accelerate implementation of the 2030 Agenda and SDGs. **dates:** 24-25 September 2019 **location:** UN Headquarters, New York **contact:** UN Division for Sustainable Development Goals **fax:** +1-212-963-4260 **email:** <https://sustainabledevelopment.un.org/contact/> **www:** <https://sustainabledevelopment.un.org/sdgsummit>

IPCC WG III AR6 Second Lead Author Meeting: The second Lead Author meeting of IPCC Working Group III will convene to continue preparations for the Sixth Assessment Report. **dates:** 30 September-6 October 2019 **location:** TBD **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/calendar>

African Climate Risks Conference 2019: The African Climate Risks Conference 2019 will convene under the theme, “Dismantling Barriers to Urgent Climate Adaptation Action.” The conference will: disseminate results and share insights from new and ongoing climate science and adaptation research in Africa; provide a forum to identify common priorities in African climate research for development through African-led discussions; help ensure greater impact of ongoing research programmes; and link researchers and other actors instrumental in moving research into policy and practice. It will convene in parallel to the eighth Conference on Climate Change and Development in Africa. **dates:** 7-9 October 2019 **location:** Addis Ababa, Ethiopia **contact:** Conference organizers **email:** info@acrc2019.org **www:** <https://www.africanclimaterisksconference2019.org>

SYR Scoping Meeting: A scoping meeting for the SYR will take place in Singapore. **dates:** 21-23 October 2019 (TBC) **location:** Singapore (TBC) **phone:** +41-22-730-8208/54/84 **fax:** +41-22-730-8025/13 **email:** IPCC-Sec@wmo.int **www:** <http://www.ipcc.ch/>

2019 UN Climate Change Conference (UNFCCC COP 25): The 25th session of the Conference of the Parties (COP 25), the 15th meeting of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP), and the second meeting of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA) will convene to review implementation of the Paris Agreement and the Convention. **dates:** 2-13 December 2019 **location:** Santiago, Chile **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **email:** Secretariat@unfccc.int **www:** <https://unfccc.int>

For additional meetings, see <http://sdg.iisd.org>

Glossary

2019 Refinement	2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
AFOLU	Agriculture, forestry and other land use
AR6	Sixth Assessment Report
AR7	Seventh Assessment Report
ATG-Finance	<i>Ad Hoc</i> Task Group on the Financial Stability of the IPCC
CLA	Coordinating Lead Author
COP	Conference of the Parties
ExCom	Executive Committee
FiTT	Financial Task Team
GCF	Green Climate Fund
GHG	Greenhouse gases
GST	Global Stocktake
IAV	Interannual variability
IPCC	Intergovernmental Panel on Climate Change
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
SDGs	Sustainable Development Goals
SLCFs	Short-lived climate forcers
SPM	Summary for Policymakers
SR	Special Report
SR15	Special Report on Global Warming of 1.5 °C
SRCCCL	Special Report on Climate Change and Land
SROCC	Special Report on the Ocean and Cryosphere in a Changing Climate
SYR	Synthesis Report
TFI	Task Force on National Greenhouse Gas Inventories
TG-Data	Task Group on Data Support for Climate Change Assessments
ToR	Terms of reference
TSU	Technical Support Unit
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WG	Working Group
WMO	World Meteorological Organization