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Summary report following the second meeting of the technical dialogue of the first global stocktake under the Paris Agreement

Report by the co-facilitators of the technical dialogue

Summary

This report contains a summary of discussions that took place during the second meeting of the technical dialogue of the first global stocktake, pursuant to paragraphs 5 and 6 of decision 19/CMA.1. The meeting took place in conjunction with the fifty-seventh sessions of the subsidiary bodies. This summary is based on 28 hours of meeting time between Parties, non-Party stakeholders and experts. The report contains the co-facilitators' reflections on the discussions held at the first and second meetings of the technical dialogue.

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Abbreviations and acronyms

ABU	Argentina, Brazil and Uruguay
AFOLU	agriculture, forestry and other land use
AGN	African Group of negotiators
AILAC	Independent Association of Latin America and the Caribbean
AOSIS	Alliance of Small Island States
AGWA	Alliance for Global Water Adaptation
AR5	Fifth Assessment Report of the Intergovernmental Panel on Climate Change
AR6	Sixth Assessment Report of the Intergovernmental Panel on Climate Change
BINGO	business and industry non-governmental organization
BUR	Biennial Update Report
CAN	Climate Action Network
CBDR-RC	common but differentiated responsibilities and respective capabilities
CDR	carbon dioxide removal
CEO	Chief Executive Officer
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CRD	climate-resilient development
CSO	civil society organization
CTCN	Climate Technology Centre and Network
DCJ	Global Campaign to Demand Climate Justice
DRR	disaster risk reduction
EbA	ecosystem-based adaptation
EIG	Environmental Integrity Group
ENGO	environmental non-governmental organization
ENGO- CAN	environmental non-governmental organization - Climate Action Network
ENGO-DCJ	environmental non-governmental organization - Demand Climate Justice
ESG	Environmental, Social and Governance
EU	European Union
ETF	enhanced transparency framework
FCPF	Forest Carbon Partnership Facility
GCB	global carbon budget
GCF	Green Climate Fund
GDP	Gross Domestic Product
GGA	global goal on adaptation
GHG	greenhouse gas
GST	global stocktake
GST1	first global stocktake
IAM	integrated assessment models
IDDRI	The Institute for Sustainable Development and International Relations
IFI	international financial institutions
IEA	International Energy Agency
IIASA	International Institute for Applied Systems Analysis
IIED	International Institute for Environment and Development
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
IPCC WG	IPCC Working Group contribution to the sixth assessment report
IPLCs	indigenous peoples and local communities
IPO	Indigenous people's organizations
JCG	Joint Contact Group
KCI	The Katowice Committee of Experts on the Impacts of the Implementation of Response Measures
LAC	Latin America and the Caribbean
LDCs	least developed countries
LGMA	local governments and municipal authorities
LMDCs	Like-minded Developing Countries
LT-LEDS	long-term low emission development strategies
LULUCF	land use, land-use change and forestry
MENA	Middle East and North Africa
M&E	monitoring and evaluation

MDB	multilateral development bank
MoI	means of implementation
NAP	national adaptation plan
NAPA	national adaptation programme of action
NBS	nature-based solutions
NDC	nationally determined contribution
NDR	needs determination report
NGO	non-governmental organization
NPS	non-Party stakeholder(s)
OECD	Organisation for Economic Co-operation and Development
OHCHR	Office of the United Nations High Commissioner for Human Rights
PCCB	Paris Committee on Capacity-Building
PPP	public-private partnership
PV	photovoltaic
RD&D	research, development and demonstration
RE	renewable energy
RINGO	research and independent non-governmental organizations
SB	subsidiary body
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCF	Standing Committee on Finance
SCF BA	Standing Committee on Finance biennial assessment and overview of climate finance flows
SDGs	Sustainable Development Goals
SDRs	Special Drawing Rights
SIDS	small island developing State(s)
TEC	Technology Executive Committee
TD	technical dialogue
TD1.1	The first meeting of the technical dialogue of the first global stocktake
TM	Technology Mechanism
TNA	technology needs assessment
TUNGO	trade union non-governmental organization
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
WGC	women and gender constituency
WMO	World Meteorological Organization
YOUNGO	children and youth non-governmental organization

I. Introduction

A. Mandate

1. Article 14 of the Paris Agreement established the GST and decision 19/CMA.1¹ laid out its modalities and sources of input. GST1 started at CMA 3 (2021) and will conclude at CMA 5 (2023). Following the first round of inputs and submissions for GST1, the technical assessment began at SB 56 (June 2022) and will end at SB 58 (June 2023). As part of the technical assessment component of GST1, three meetings of TD1² are to be held in conjunction with SB 56, SB 57 and SB 58.

2. The meetings of the technical dialogue will facilitate the expert consideration of inputs into the GST and:

(a) Undertake its work through a focused exchange of views, information and ideas in in-session round tables, workshops or other activities;

(b) Organize its work in line with taking stock of the implementation of the Paris Agreement to assess the collective progress towards achieving its purpose and long-term goals, including under Article 2, paragraph 1(a–c), in the thematic areas of mitigation, adaptation and means of implementation and support, noting, in this context, that the GST may take into account, as appropriate, efforts related to its work that:

(i) Address the social and economic consequences and impacts of response measures;

(ii) Avert, minimize and address loss and damage associated with the adverse effects of climate change;

(iii) Be facilitated by two co-facilitators, who will be responsible for conducting the dialogue and for preparing a factual synthesis report and other outputs of the technical assessment, with the assistance of the secretariat.

3. Prior to TD1.1, the Chairs of the SBs, consistent with decision 19/CMA.1:

(a) Prepared a non-paper and, after consulting with Parties, revised the non-paper,³ aiming to assist Parties and NPS in their preparation for the first GST. This paper included guiding questions for the information collection and preparation component;⁴

(b) Issued a call for inputs for the first GST;⁵

(c) Prepared guiding questions for the technical assessment and revised them based on views expressed at informal consultation with Parties held in October 2021 on this matter.⁶

4. In the lead-up to SB 57, an information note⁷ was prepared and published on the organization of TD1.2 aimed at assisting Parties and NPS to prepare for the session. Virtual informal consultations were also conducted by the co-facilitators with Parties and NPS.

5. This summary report has been prepared by the co-facilitators, based on the discussions held during TD1.2 in Sharm el Sheikh during SB 57 as mandated by decision 19/CMA.1,

¹ FCCC/PA/CMA/2018/3/Add.2.

² Note that TD1 is used as an abbreviation for the technical dialogue under the first GST and that TD1.1, TD1.2 and TD1.3 refer to its meetings.

³ Available at https://unfccc.int/sites/default/files/resource/Non-paper%20on%20Preparing%20for%20GST1_0.pdf.

⁴ Decision 19/CMA.1, paragraph 7.

⁵ Decision 19/CMA.1, paragraph 19. The call for inputs is available at: https://unfccc.int/sites/default/files/resource/Call%20for%20inputs%20SB%20Chairs_GST_reminder_Feb23.pdf.

⁶ Available at https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf.

⁷ TD1.1 information note by the co-facilitators is available here: https://unfccc.int/sites/default/files/resource/GST_Technical_Dialogue_Information_Note.pdf.

paragraph 31. This report captures and summarizes views shared during the dialogue but is not an exhaustive summary of the inputs. It also includes the co-facilitators' reflections on the discussions held at the first and second meetings of the technical dialogue.

B. Objective and general approach to the 2022–2023 technical dialogue of the first global stocktake

6. TD1.2 was organized to be an open, inclusive, transparent, and facilitative process that allowed Parties to engage and hold discussions with each other, experts and NPS.

7. As set out in the information note prepared by the co-facilitators, Harald Winkler and Farhan Akhtar, the aim of TD1.2 was to continue with concrete discussions on specific topics to identify tangible examples and opportunities that will inform Parties', observer organisations' and other NPS' efforts on enhancing climate action and support as well as international cooperation for climate action, thus facilitating progress towards implementing and achieving the Paris Agreement and its goals.

8. To achieve the objectives for TD1.2 and building upon the experience and constructive feedback received from participants of TD1.1, multiple formats for engagement were employed, including plenaries, round tables with breakout groups, a world café session, and focused exchanges.

9. Across all of these formats a total of 124 hours of meetings and discussions were held during the first week of COP 27 at SB57. This comprised a one-hour opening meeting, a three-hour closing plenary, 36 hours of breakout group discussions, four-hours of focused exchanges, and 80 hours of discussions across 20 stations of the world café. The co-facilitators also made themselves available informally to Parties and NPS prior to, during and after TD1.2.

10. On 16 August 2022, ahead of TD1.2 at COP 27, the co-facilitators issued a call for inputs for a creative space⁸ and a poster session.⁹ These formats facilitated effective and active participation, as well as allowing for an in-depth discussion of topics across the scope of the TD.

(a) The creative space aimed to provide a fora where people's voices could be heard and the co-facilitators encouraged Parties and NPS to take the SB Chair's guiding questions for the Information Collection and Preparation into consideration, as well as the Technical Assessment components of GST1. A total of nine submissions were received, and archived on a dedicated webpage,¹⁰ in the form of virtual theatre pieces, short films, video infographics and other formats. Tara Shine, co-CEO and co-founder of Change by Degrees and Chair of the board of trustees of IIED, moderated the creative space submissions, which were presented in the first week of COP 27; these were well attended and received positive feedback.

(b) The poster session call invited Parties and NPS wishing or having made a submission to TD1.2, prepare a one-page poster summary of their submission. The posters were to focus on the scope of the GST as outlined in paragraphs 2 and 6(b) of decision 19/CMA.1, taking into consideration the guiding questions for the Information Collection and Preparation, as well as the Technical Assessment components of the GST. A total of 26 posters were received, and a poster session was held in the first week of COP 27, with a launch hosted by the co-facilitators. The posters can be found at a dedicated webpage.¹¹

8

https://unfccc.int/sites/default/files/resource/message_from_cofacilitators_first_global%20_stocktake_creative_space.pdf.

9

https://unfccc.int/sites/default/files/resource/message_from_the_co_facilitators_the_first_global_stocktake_call_for_poster_inputs..pdf.

¹⁰ <https://unfccc.int/global-stocktake-td12-creative-space>.

¹¹ <https://unfccc.int/global-stocktake-td12-poster-session>.

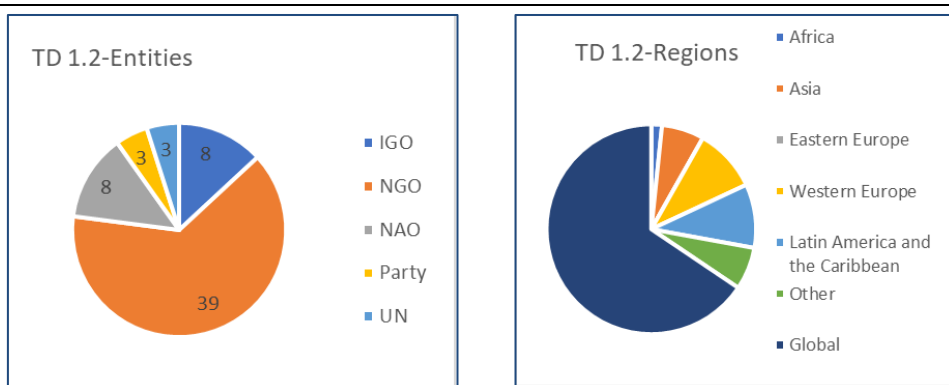
C. Summary of input received

11. A total of 61 submissions were received prior to TD1.2 and they are available on the GST information portal, organized by topics of the TD as outlined in decision 19/CMA.1. This information portal¹² provides an easy access to relevant information and thus supports a transparent, Party-driven GST process, with participation by NPS.

12. Figure 1 below shows that 58 submissions were received from different national and international organizations and non-governmental organizations and three submissions were received from Parties or groups of Parties (Antigua and Barbuda on behalf of AOSIS, Iceland, and Japan). Most of the submissions (40) were submitted by international organizations.¹³ Some submissions also addressed regional aspects.

Figure 1

Type of entities and regions from which TD 1.2 submissions were received

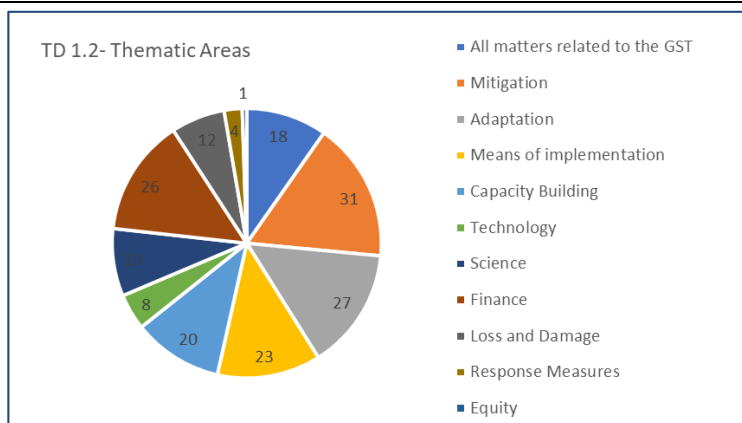


Source: UNFCCC

13. The above-mentioned inputs covered the thematic areas of mitigation, adaptation, and finance flows and means of implementation and support, as well as loss and damage. Equity and ambition, as well as best available science were discussed in a cross-cutting manner (see figure 2).

Figure 2

Thematic areas addressed by the submissions to TD1.2



Source: UNFCCC

14. Mitigation was addressed by 39 submissions, which focused on progress and ambition, associated emission gaps and further action required in mobility, food systems, public health, energy systems, agriculture, nature-based solutions and integration of the society, especially vulnerable groups. The lack of technologies and cooperation, data, and institutional domestic capacity have been mentioned as obstacles and barriers to mitigation.

¹² See <https://unfccc.int/topics/global-stocktake/information-portal>

¹³ Relevant information sources for the TD1.2 are appended to this report.

The submission from The Centre of Environmental Law pointed out the risk of harming human rights when applying new technologies, such as CCS. The Environmental Defence Fund proposed to include methane-specific targets in NDCs, as well as specific funding and capacity-building to mitigate methane emissions. Response measures were not explicitly addressed.

15. Adaptation was addressed in 39 submissions, most of them noting that further action is required, including on monitoring systems, evaluation standards, adaptation metrics, gender equitable approaches, consideration of transboundary climate risks, ecosystem-based adaptation approaches, health resilience and biodiversity. Finance was identified as the key barrier. The preparation of NAPs was seen as essential, especially if short and long-term trajectories and planning are included. Standardized monitoring systems seem to be a common demand. A submission proposed to consider the global climate indicators developed by WMO. Topics and regions specifically addressed included loss and damage to coastal zones, ocean, and the Arctic region. Several submissions noted that non-economic loss and damage, which include irreversible loss of biodiversity, cultural heritage, indigenous knowledge or traditions, should not be overlooked.

16. Means of implementation and support were addressed by 33 submissions indicating financing and capacity-building needs and calling for further action to deliver on the climate finance target agreed at COP21 and to enhance collective understanding of the scale of financing needs. Submission also motioned the access to finance by local and fragile communities and the need for the private sector to implement local solutions. Several submissions noted that regional capacity-building and knowledge transfer and cooperation (e.g., South-to-South) are a key enabler for adaptation action. A submission stressed that the level of progress and effectiveness of capacity-building should be measured and suggested that the GST should evaluate whether climate finances are being equitably distributed.

17. Cross-cutting issues, such as fairness and equity, gender equality, health, biodiversity, science and other issues were specifically addressed by 23 submissions. AOSIS called for the GST to identify opportunities to address loss and damage and provide recommendations on this matter. Integration and consideration of human rights (especially rights of indigenous people) and gender equity to allow for a just transition was also one of the key messages in the submissions.

18. System transformations, mentioned in 12 submissions, focussed on energy, land and transport systems (in that order). To a lesser extent transformation in industrial, water, agricultural, urban or health systems were mentioned.

19. Eighteen submissions provided input and recommendations on topics to be considered, including socio-cultural systems, action for empowerment, scientific evidence on system transformations, implementation of the new collective quantified goal, regional and local practical solutions, globally equal participation of NGOs, human rights-based approach, NPS, reporting on fossil fuel production and carbon capture and storage.

20. Due to the extensive and detailed information that has been submitted, as well as the wide-ranging information provided during the technical dialogue, several Parties and NPS have recommended that an online searchable tool or database be made available, building upon the existing portal. It has been suggested that making such information more readily accessible would assist Parties and NPS in preparing future climate actions.

II. Reflections on discussions at TD1.1 and TD1.2

A. Introduction and context

21. We are encouraged by the depth and breadth of the inputs that participants from Parties and non-Party stakeholders have brought to TD1.1 and TD1.2. They have all collaborated in identifying critically important challenges and barriers to progress, while also sharing experience and knowledge of solutions and actions, as well as ideas for enhanced international cooperation to advance the successful implementation of the Paris Agreement. As explained in chapter II, participation in the technical dialogue process is generating a very

rich basis upon which to build as we move to TD1.3 during the fifty-eighth sessions of the subsidiary bodies. We are very grateful for the constructive and creative engagement of Parties and non-Party stakeholders in this dialogue.

22. We also greatly appreciate the numerous written submissions by Parties and non-Party stakeholders: some updating previous submissions, others bringing in new voices, and all containing highly valuable information. Written submissions form part of the overall outputs of the GST, and we thank the secretariat for making them more accessible through improvements to the GST information portal. Making information usable is very important, and we thank participants for suggestions for including a technical annex to the overall factual synthesis report of the technical assessment phase of the GST, as we had noted in the closing plenary in Sharm el-Sheikh. The volume of information is very large, and we are exploring possibilities for a search engine to make information even more accessible and useful to Parties and non-Party stakeholders. We continue to follow a “learning by doing” approach and will continue to be guided by Parties as we make continuous improvements and evolve the dialogue process.

23. There has been significant yet inadequate collective progress towards achieving the purpose of the Paris Agreement and its long-term goals since it was adopted in 2015. While the remarkable speed with which the Paris Agreement entered into force in 2016 demonstrates a broad commitment, and Parties are making progress in implementation, we as a global community are not on track to meet its long-term goals. To make more progress, Parties need to realize the many opportunities and overcome challenges in increasing ambition in their NDCs, in an equitable manner. They also need to jointly develop and implement innovative forms of international cooperation.

24. The technical dialogue of the first GST is the first opportunity for Parties to take stock of collective progress and consider what more we can do together, and what each of us needs to do. The Paris Agreement specifically requires Parties to take into account the findings of the GST as they submit their next NDCs. The GST is a process to enable more collective action; that is, we assess collective progress, in the light of equity and the best available science, to inform greater levels of ambition. This process provides a unique opportunity for understanding collective undertakings to confront this unprecedented global challenge, to learn what is working and what challenges need to be overcome, and to provide the basis for all Parties to deliver enhanced action and support.

25. The first GST is taking place within an era of dramatic and widespread changes. Climate is one of several crises confronting our global community, which is also dealing with debt and inflation, wars, rising energy and food prices, disruptions to global supply chains, and recovering from the coronavirus disease 2019 pandemic. These global crises are compounding and challenging the ability of Parties and non-Party stakeholders to make progress on the aims of the Paris Agreement. While these crises cannot be ignored, neither can the opportunities for enhanced climate action. The cost for low-emissions energy continues to fall globally and awareness of the impacts of climate change are greater than they have ever been. The success of the Paris Agreement will ultimately be defined by how the global community responds over the next decade to these opportunities and how we confront the real challenges ahead.

26. The unprecedented scale and pace required in the global transition to a low-GHG and climate-resilient future will require integrated and holistic solutions that promote the eradication of poverty, sustainable development for all, and the protection of natural resources and systems. The nature and scale of these transformations will require sustained effort over decades, building upon progress made in each cycle of NDCs and stocktakes. Equally, as financial flows are aligned to the goals of the Paris Agreement, support commensurate with the scale of the challenge will be required, together with enabling conditions for further and more rapid progress across countries and contexts. The importance of promoting equity and the clear call to action arising from the best available science mean that such global transitions will require sensitivity to local contexts and circumstances to ensure that no community is left behind, that adaptation is locally driven and supported by international solidarity, and that transitions are truly just.

27. Parties and non-Party stakeholders have explored these challenges across all topics in TD1.1 and TD1.2. We moved from discussion on “what” in June 2022 to “how” and “how to” in December. The focus for TD 1.3 must shift to “what next”. As we said in the closing plenary of TD1.2, we have gone broad and deep in exploring the topics under consideration by the technical assessment. In this report we are sharing with all participants our reflections, particularly on what we see as emerging messages. We have distilled the emerging messages that have arisen during TD1.1 and TD1.2 and organized them into clusters: mitigation, including response measures (section B, below); adaptation, including loss and damage (section C, below); means of implementation and support (section D, below); and integrated and holistic approaches (section E, below).

28. We hope that these reflections will be useful to Parties and non-Party stakeholders in preparing for our final meeting in June 2023. Our reflections are not “final” as they offer thoughts at this point during the process. They are intended to aid the discussion to help participants understand the extent of discussions so far and where we are headed. At TD1.3 we will listen to Parties and non-Party stakeholders on these emerging messages, so that we can include the findings in the overarching factual synthesis report. There will also be a final opportunity to raise any issues that still have not had sufficient attention or would benefit from further discussion. Before that, we will (1) arrange informal virtual consultations to hear initial thoughts on this summary report (planned for 12 April); (2) issue an information note with more detailed design of TD 1.3 (by end of April); and (3) hold another virtual informal consultation after publishing the information note (second week of May). Our collective aim should be for the TD to lay a strong science-based foundation for the political consideration of outputs.

B. Mitigation, including response measures

1. Emissions are not in line with modelled global mitigation pathways consistent with the temperature goal of the Paris Agreement, and there is a rapidly narrowing window to raise ambition and implement existing commitments to limit warming to 1.5 °C above pre-industrial levels.

29. The Paris Agreement, with near-universal participation, has led to a significant increase in commitments towards limiting global warming, leading to significant reductions in forecasts of future warming (see paragraph 102 below), although the collective progress on mitigation remains inadequate towards the fulfilment of Article 2, paragraph.1(a),¹⁴ of the Paris Agreement.

30. Gaps in collective progress can be identified on two fronts. First, the mitigation ambition in NDCs is not collectively sufficient to put us on track to achieve the global temperature goal. These “emissions gaps” are the difference between the emissions levels implied by the NDCs and the average emissions levels of global modelled mitigation pathways consistent with the given temperature limits. Second, “implementation gaps” refer to how far currently enacted policies and actions fall short of reaching the committed level of action. Action is needed across both gaps: increasing the ambition of NDCs as well as increasing the implementation of policies to achieve the stated commitments, and to make progress towards achieving the goals of the Paris Agreement.

31. In 2019, atmospheric CO₂ concentrations reached 410 ppmv which is higher than at any time in at least 2 million years. Global temperatures were around 1.1C higher than the preindustrial average in 2011-2020. Trends in historical GHG emissions provide important information to understand where we are and can inform future action. Cumulative CO₂ emissions have continued to rise. Global GHG emissions in the decade up to 2020 were higher than ever before, although the rate of growth of emissions has slowed from the previous decade.

¹⁴ “Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change”.

32. The best available science as reflected in the IPCC AR6 provides information on pathways consistent with the global temperature goal and Article 4.1¹⁵ of the Paris Agreement. For a 50 per cent chance of limiting global warming to 1.5 °C with limited to no overshoot and a 67 per cent chance to remain below 2 °C, global GHG emissions need to peak between 2020 and at the latest before 2025. While global peaking of GHG emissions must occur as soon as possible, peaking will take longer for developing country Parties. Yet we have not reached global peaking of emissions.

33. All Parties need to undertake rapid reductions in GHG emissions in the decades after peaking. Limiting global warming to 1.5 °C (50 per cent probability) with limited or no overshoot implies a reduction of 43 per cent in global GHG emissions below 2019 levels by 2030 and a reduction of 60 per cent in global GHG emissions below 2019 by 2035. Net zero GHG emissions needs to be achieved globally in the early 2050s in order to stabilize the global average temperature over the long term to 1.5 °C. The basis of equity, the context of sustainable development and efforts to eradicate poverty inform consideration of these mitigation pathways.

34. Although updated NDCs indicate some increase in mitigation ambition compared with the sum of NDCs submitted up to COP 26, these increases only partly offset emissions growth and are not yet in line with global modelled mitigation pathways limiting warming to 1.5 or 2 °C. The updated NDCs close the emissions gaps very partially, by 15–33 per cent. The UNFCCC synthesis report (FCCC/PA/CMA/2022/4) provides updated information based on latest available NDCs, up to 23 September 2022. The report estimates the median emissions gap to 1.5 °C (50 per cent probability) to be 23.9 Gt CO₂ eq, without conditional elements, and 20.3 Gt CO₂ eq, with implementation of conditional elements and support. For 2 °C (67 per cent probability), the respective emissions gaps are 16.0 and 12.5 Gt CO₂ eq, respectively. Furthermore, analysis of these emissions gaps assumes mitigation actions in NDCs will be fully implemented and supported, and if either is not the case, the gaps would be even larger. Many Parties have set goals and communicated strategies aiming for net zero CO₂ or GHG emissions around or by 2050, yet in many cases near-term mitigation actions are not aligned with pathways to achieve these long-term targets.

2. Much more ambition is needed in domestic mitigation measures in NDCs to realize existing and emerging opportunities, in order to halve global emissions by 2030, reach net zero CO₂ emissions by 2050 globally, and promote equitable sharing of efforts across countries.

35. Although strengthening pledges demonstrates greater mitigation ambition, it is the implementation of mitigation measures that reduces emissions. Nearly all NDCs have effectively communicated domestic mitigation measures onto the international stage and, although mitigation measures in current NDCs are not collectively sufficiently ambitious, the Paris Agreement provides for the progression with Parties' successive NDCs to represent their highest possible ambition, informed by the GST.

36. There are now many opportunities for implementing more ambitious mitigation measures, in all sectors and systems. If fully implemented and supported, implementation of such opportunities can raise ambition to be sufficient to address the emissions gap and offer substantial potential to reduce net GHG emissions by 2030. Some mitigation options are more cost-effective than their high-emission alternatives, while many other mitigation options are available at relatively low cost. According to the contribution of Working Group III to the AR6, mitigation options costing USD 100 per t CO₂ eq or less (with estimated net emission reduction potential of 31–44 Gt CO₂ eq) could reduce global GHG emissions by at least half of the 2019 level by 2030, and options costing less than USD 20 per t CO₂ eq are estimated to make up more than half of this potential. Large contributions with costs of less than USD 20 per t CO₂ eq come from solar energy, wind energy, energy efficiency

¹⁵ “In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.”

improvements in industry, reduced conversion of natural ecosystems, and methane emission reductions (coal mining, oil and gas). These costs are global averages and will, in reality, vary depending on national circumstances. How such opportunities are realized in different contexts is also a matter of equity.

37. Although these mitigation opportunities exist, there remain significant challenges for achieving mitigation at the required pace and scale. Creativity and innovation in policymaking and international cooperation are needed to overcome the barriers to climate action and to maximize the co-benefits that accrue from climate action. While large-scale and feasible mitigation options abound, in the short-term feasibility differs across sectors and regions. Most options face higher barriers if they are to be implemented rapidly at a large scale. However, a range of enabling conditions can help with implementing these actions, including strengthening policies and institutions, finance, technological innovation, and demand-side measures including behaviour change. These barriers and potential solutions were discussed extensively at TD1.2 and we hope knowledge on solutions will be further crystalized at TD1.3.

38. Non-Party stakeholders are increasingly seeking to align their actions and initiatives with the goals of the Paris Agreement. Some estimates for mitigation actions suggest that non-Party stakeholders could reduce emissions by up to 20 Gt CO₂ eq in 2030, although more rigorous accounting and accountability is needed to avoid double counting and other methodological challenges. While mitigation actions and relevant international cooperation by non-Party stakeholders have also accelerated since the adoption of the Paris Agreement, efforts are still far from being implemented at the scale needed.

39. Accelerating action on mitigating climate change impacts is crucial for sustainable development. However, mitigation options can result in some trade-offs. These trade-offs could be managed through policy design. For example, the SDGs can be used as a basis for evaluating mitigation measures. The 2022 NDC synthesis report found that 22 per cent of Parties clarified the alignment between their mitigation measures and efforts towards the SDGs, with energy supply measures contributing to achieving SDG 7 (affordable and clean energy) (11 per cent) and AFOLU measures contributing to achieving SDG 15 (life on land) (11 per cent) being the most frequently indicated measures.

40. Experiences with NDCs also suggest that more ambitious and detailed targets would enhance clarity and provide an improved basis for international cooperation. As Parties develop new NDCs in 2025, they should increase ambition and show progression in terms of quality, comprehensiveness, and transparency. Now that the Parties have gained experience of developing NDCs, implementing relevant policies and undertaking a GST, they are better placed, as they prepare their next NDCs, to increase ambition in achieving the global temperature goal and to provide information necessary to facilitate clarity, transparency and understanding of their NDCs. And as Parties provide more ambitious NDCs in the light of their national circumstances, they should consider strengthened targets covering a greater range of global emissions across sectors and gases in order to provide a better basis for global progress in limiting global warming and enhancing international cooperation and support. Experience to date, including in systemic capacity-building, can provide a basis for achieving this progression.

41. The NDC synthesis report noted that many Parties have communicated best practices for NDC preparation, such as institutionalizing climate policy development within joint planning frameworks; strengthening stakeholder capacity to participate more substantively in NDC preparation and implementation; designing planning and reporting systems for transparency and public scrutiny; incorporating experience and lessons learned from INDC preparation and implementation efforts; conducting extensive stakeholder consultations and peer review to enhance their understanding of the NDC; conducting a preliminary assessment of pre-2020 efforts to identify gaps and needs and develop an NDC road map; mainstreaming NDC goals in existing strategies, plans and policies to obtain political support and benefit from existing arrangements; partnering with regional and international organizations to develop a robust NDC; and establishing a scientific and quantitative system for analysing and assessing progress of implementation.

3. Achieving net zero CO₂ and GHG emissions requires systemic transformations across all sectors, phasing out high-emission systems and technologies while scaling up low- and zero-emission alternatives, and implementing both supply- and demand-side measures.

42. Achieving net zero emissions globally by 2050 requires radical transformation of all sectors of the economy. While the timing of achieving net zero emissions will vary by country, all countries need to adopt a whole-of-society approach, overcome challenges and increase the ambition of near-term actions while charting pathways to net zero CO₂ and GHG emissions.

43. Net zero CO₂ energy systems include electrification of end uses, phasing down fossil fuel use over time, using new fuels to electrify applications, increasing deployment of renewable energy, boosting energy efficiency and demand-side management, greater use of batteries (with growing concerns about transition minerals), low-emissions hydrogen, and other important technologies and methods. Protecting natural terrestrial and ocean carbon sinks and other CDR methods are needed to counterbalance residual emissions to reach net zero CO₂ emissions or net zero GHG emissions. Pursuing near-term non-CO₂ GHG reductions across sectors is necessary to achieve net zero emissions by the end of the century. Assessing and addressing the positive and negative impacts of response measures, including through economic diversification and just transitions, within long-term development strategies can facilitate reaching net zero CO₂ emissions as well as net zero GHG emissions more equitably.

44. There are early signs of transformation and the necessary urgency among key stakeholders to accelerate uptake of these transformative opportunities. Yet investment in emissions-intensive activities by Parties and non-Party stakeholders also continues to grow globally. The contribution of Working Group III to the AR6 has projected that average annual (modelled) investment requirements for 2020–2030 in scenarios that limit warming to 2 °C or 1.5 °C are a factor of three to six greater than current levels, and total investment (public, private, domestic and international) in mitigation would need to increase across all sectors and regions. Dramatic increases in investments in low- and zero-carbon emission activities and technologies will be needed, including by non-Party stakeholders, as well as disinvestment from emissions-intensive activities and technologies.

Systems transformation in energy

45. Transformation of global energy systems is at the core of the challenge and opportunity of achieving net zero emissions by 2050. Energy system mitigation measures could account for 74 per cent of total global mitigation in reaching net zero GHG emissions. The IPCC AR6 projections showed that actions towards limiting global warming to 1.5 °C will reduce use of coal by 67–82 per cent, while oil and gas consumption fall more slowly; coal is hardly used for electricity generation by 2050 in such global modelling mitigation pathways, although IPCC AR6 does not prescribe pathways for any single country. A broad portfolio of options (e.g. integrating systems, coupling sectors, energy storage, smart grids, demand-side management, sustainable biofuels, and electrolytic hydrogen and derivatives) will ultimately be needed to accommodate large shares of renewables in energy systems. Demand-side measures are as important as supply-side transitions, as a part of the net zero energy system transformation.

46. A rapid reduction of the world economy's reliance on fossil fuels towards clean energy is central for just transitions to net zero emissions. In an energy road map for net zero emissions, unabated use of fossil fuels for energy accounts for 5 per cent of total energy supply in 2050: adding fossil fuel use with carbon capture, utilization and storage and for non-energy uses would raise this to close to 20 per cent. For comparison, in 2018 coal-fired power generation was the single largest source of energy-related CO₂ emissions globally, accounting for 10 Gt CO₂, and the latest NDC synthesis report noted that only 9 per cent of Parties indicated phasing down of unabated coal power generation in their latest NDCs. In addition, the removal of fossil fuel subsidies is a key strategy for addressing structural economic barriers that can perpetuate inertia to change and prevent cost-effective low-carbon alternatives from being adopted at scale.

47. Many mitigation actions can have broader benefits and help achieve other SDGs. We heard during TD1.2 that the limited amount of fossil fuels that can be burned without exceeding 1.5 °C might best be spent where it has the greatest welfare benefit. Developmental benefits of other mitigation actions include significant benefits to health, for example through lowered air pollution, greater mobility and healthy diets. Increased financing for clean energy can help provide energy access for underserved populations.

48. It would be useful to examine in more detail during TD1.3 the implications of global energy mixes by fuel in 2030/2035/2050 and the implied time frames for fossil fuels phase-out, as well as the relative importance of various financial and economic policy instruments, including subsidy reforms, while noting that differing contexts and circumstances will significantly define the pace of mitigation within regions. For example, energy poor regions with relatively poor renewable energy potential may need to rely on fossil fuels for longer, while the pace in other regions will depend on the economics of decommissioning and replacing existing emissions-intensive infrastructure with low-carbon alternatives or installing abatement measures.

Systems transformations in industry, transport, buildings and other sectors.

49. Reducing industrial emissions, which make up about a quarter of global emissions, will require demand management, energy efficiency, electrification, innovation in hard-to-abate subsectors, and greater circularity. Ambitious implementation of such measures can reduce emissions, save costs and deliver co-benefits. The share of emissions from cities is estimated to be 67–72 per cent of global emissions, when using consumption-based accounting that includes indirect emissions outside urban areas. Reducing emissions from cities will involve smart urban planning, making cities more compact, walkable and efficient. Local authorities and other actors may take measures to co-locate housing and jobs, increase electrification and transitions to low-carbon energy sources while increasing resilience through, for example, planting more trees. Buildings currently account for roughly 6 per cent of global GHG emissions. Both existing and yet-to-be-built buildings can be net zero emissions by mid-century if they use low-carbon construction materials, reduce demand, and implement mitigation options in design, construction, use and retrofits. Transportation currently contributes about 15 per cent of global GHG emissions. Phasing out internal combustion engines and using electric vehicles offers the greatest mitigation potential in the sector. In addition, demand-side interventions, such as shifting transport modes (e.g. walking and public transport), will be essential in the context of rethinking mobility. Shipping, aviation and freight transportation will require alternative low-carbon fuels and other solutions.

Systems transformations in agriculture, forestry and land use.

50. In 2019 AFOLU accounted for 13 Gt CO₂ eq to the global GHG emissions (22 per cent). Around half of total net AFOLU emissions result from land-use change: predominantly CO₂ from deforestation. Despite a decline in deforestation since 2000, the rate remains high, with 95 per cent of global deforestation occurring in the tropics but incentivized by consumers globally. Halting and reversing deforestation can provide adaptation and mitigation benefits in the near term across all forested regions. Setting zero net deforestation targets and adopting policies to conserve and restore land carbon stocks and protect natural ecosystems will result in large-scale CO₂ absorption and have further co-benefits. Land carbon accounting and incentive systems, such as REDD+ and payment for forest-based ecosystem services are increasingly implemented by governments as an effective approach for incentivizing forest conservation and restoration at different scales. In the agriculture sector, demand-side measures such as shifting to sustainable healthy diets and reducing food loss/waste, and intensification of sustainable agriculture, can reduce emissions and free up land for reforestation and ecosystem restoration. All of these options can have multiple synergies with the SDGs.

International cooperation and initiatives

51. Given the depth, breadth and pace of mitigation action required, an “all of economy, all of society” approach is needed. A wide range of actors, including businesses, cities and

other non-state actors have taken on mitigation commitments and actions. Meanwhile, international cooperation takes many forms, and a rapidly growing number of initiatives have been launched, some focused on systemic transformations and many on specific sectors. The IPCC AR6 reported on initiatives focusing on energy efficiency, buildings, transport, renewable energy, forestry, non-CO₂ emissions and agriculture, as well as multi-sectoral initiatives, assessing key actors, scale, mitigation targets, membership, and mitigation potential. However, it is important not to depict these efforts as additional to action within national NDCs, unless this is clearly established, and rigorous accounting is needed to avoid potential overlaps across and within initiatives.

4. Increasing the consideration of equity can enable greater ambition in mitigation, with tailored approaches addressing different contexts and the impacts of response measures.

52. There are many ways to consider equity (as reflected within the articles of the Paris Agreement) in mitigation, including equitable allocation of carbon space; increasing capacity and availability of options for change; minimizing costs while promoting development, the need for support across finance, technology and capacity-building for developing countries; including stakeholders in decision-making; averting loss and damage to the most vulnerable; enabling just transitions to net zero emissions; and generating criteria for benchmarking NDCs as fair and ambitious. Across all of these considerations, a common thread is that the equitable distribution and scale of action must align with, rather than detract from, the achievement of the Paris Agreement goals.

53. Given the scale of changes, all countries face potential challenges and opportunities. The transformation to low-emissions development will entail distributional consequences within and between countries. Such consequences include shifting of income and employment. While some jobs may be lost, low-emissions development can create opportunities for just transitions that enhance skills and create more jobs in advanced industries that last, with differences across countries and sectors. Global job creation is potentially 3.5 times greater than job losses. Integrated policy packages can improve the ability to address equity, gender equality and justice. Equally, adopting just transition principles and implementing them through collective and participatory decision-making processes is an effective way of integrating equity principles into policies at all scales. Just transitions are thus one way of addressing equity in mitigation.

54. Another way to operationalize equity in mitigation is for Parties to provide clearer information on fairness in their NDCs. All countries are expected to explain how their NDCs are fair and ambitious. The vast majority of countries (98 per cent) have already done so voluntarily, and such information becomes mandatory for second NDCs. However, there is no agreed definition of what is “fair” in the context of NDCs. Many different frameworks and criteria for assessing fairness and ambition exist, but none of them enjoy universal support. Many countries refer to equity in terms of shares of global emissions – whether a small share of total global emissions in absolute terms, per capita, in relation to GDP, or global averages, and several other benchmarks. However, a smaller set of principles of equity have been invoked in the context of a fair approach to effort sharing, including the right to promote sustainable development, inter- and intra-generational equity, harm prevention, precaution and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

55. Informed approaches can address negative impacts of response measures and promote positive synergies, including through economic diversification. Just transitions need to create decent work and quality jobs. Just transition could be enabled by finding new and creative ways for countries to maximize the potential development outcomes of such transitions across a range of industrial and geographical areas and scales. Economic diversification is one of the strategies to address negative impacts of response measures and promote positive synergies. Options to that end include green industrialization, the greening of supply chains, diversifying to related and unrelated products, and the contribution of sectors such as aviation and shipping.

C. Adaptation, including loss and damage

56. Collective progress on adaptation must undergo a step change in fulfilling the ambition laid out in Article 2, paragraph 1(b)¹⁶ and Article 7, paragraph 1¹⁷, of the Paris Agreement. The ability to adapt to adverse impacts has grown, but it is not yet sufficient to protect communities and ecosystems from increasingly frequent and intense impacts. Evidence from inputs to the TD by organizations supporting adaptation action shows that countries are making modest progress on enhancing adaptive capacity, strengthening resilience and reducing vulnerability; however, their ability to systematically monitor progress towards these aims is limited. Given inadequate progress on mitigation and adaptation, there is greater risk of loss and damage, which is already being observed.

1. **As climate change threatens all countries and communities around the world, increased adaptation action as well as enhanced efforts to avert, minimize and address loss and damage are urgently needed to reduce and respond to increasing impacts, particularly for those who are least prepared for change and least able to recover after disasters.**

57. Increasing impacts as well as loss and damage are being observed and, with projections of increased warming, risks are being compounded and cascading across systems. These impacts will become dramatically worse as temperatures increase further, resulting in some cases in loss and damage. Every 0.1 °C increase of global warming matters. An adequate adaptation response needs to be ensured in the context of the temperature goal referred to in Article 2, paragraph 1(a), of the Paris Agreement. Current and future impacts are expected to be significant and widespread, and are already eroding past development gains and, without adaptation action, will impede the ability for human development gains to be made in the future.

58. A growing body of literature and experiences demonstrates that with adaptation and climate resilient development, the impacts of climate change can be reduced, particularly when these impacts are taken into account within national and local plans and planning processes, yet the design of existing and planned infrastructure, for example, has not often taken into account climate risks. Equally, the costs and barriers to adaptation are significant and, in many cases, growing. Even with adaptation, the residual risks for loss and damage will remain and need to be managed comprehensively. Of great concern is that the capacity of some governments to recover from recent events has been exceeded, and the compounding impacts of repeated events leave very limited residual response capacity. At current global warming levels, loss and damage to human and natural systems has already been observed including, for example, damage to infrastructure, reductions of crop production, heat-induced labour productivity losses, losses due to tropical cyclones, and irreversible losses of species.

59. Adaptation is the responsibility of all governments, at all levels, and each has a role in promoting approaches to develop and utilize climate information relevant to local conditions to enable adaptation action. The most recent IPCC reports (AR6) highlight climate-resilient development, which integrates efforts to build resilience to climate change impacts alongside efforts to reduce GHG emissions and shift development pathways towards increased sustainability. There is acknowledgement in the context of Article 7, paragraph 2, of the Paris Agreement that adaptation is a global challenge faced by all, with local, subnational, national, regional and international dimensions. The Paris Agreement affirms the importance of support for and international cooperation on adaptation efforts, taking into account the needs of developing country Parties.

¹⁶ “Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production”.

¹⁷ “Parties hereby establish the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in Article 2.”

2. Collectively, there is increasing ambition in plans and commitments for adaptation, but there also remains an implementation gap, in that plans are implemented inadequately, unevenly and incrementally.

Adaptation planning and implementation

60. Many governments are coming forward with diverse portfolios of adaptation actions, policies and goals, tailored to the national and local adaptation needs. There is extensive action on adaptation reflected in NAPs – well beyond what has been officially communicated.

61. Some 139 developing countries have embarked on the formulation of NAPs although progress on developing and implementing NAPs has been slow, especially among LDCs. Yet there is only modest progress on adaptation and risk management, because the implementation of NAPs is at an early stage with limited demonstrable progress. Concerningly, efforts are failing to keep pace with increasing climate impacts and risks and plans on paper are not necessarily being implemented in practice. In addition, there is increased evidence of maladaptation across many sectors and regions as well as broader development decisions that are driving increases in climate-related risks.

62. Parties and non-Party stakeholders need to put in place durable, long-term reforms that integrate climate change risks into all aspects of planning and decision-making. The adaptation cycle can be broken down into an iterative approach for developing durable adaptation actions:

(a) Risk assessment: assessments of climate change induced risks, impacts and vulnerabilities lay the foundation for the planning and subsequent implementation of actions to adapt to these risks and impacts. Of the 80 per cent of Parties that included an adaptation component in their NDCs, 91 per cent describe key climatic changes and how these impacts affect vulnerable sectors and groups (FCCC/PA/CMA/2022/4);

(b) Planning process/mainstreaming: planning for actions that respond and reduce assessed risks from climate change are developed through an inclusive process and instituted in a policy or practice. As of 31 August 2022, at least 84 per cent of Parties have at least one adaptation planning instrument (a plan, strategy, law or policy) in place;¹⁸

(c) Implementation of adaptation actions: adaptation plans are put into practice either proactively or retroactively in response to climate change impacts. Progress on implementation is taking place across all sectors and regions, but is unevenly distributed with observed adaptation gaps (IPCC AR6 WGII contribution);

(d) Monitoring, evaluating and learning from progress: adaptation efforts are monitored and evaluated for their effectiveness in reducing risks of climate-related impacts. While monitoring and evaluation of, and learning from, adaptation progress is fundamental for effective, iterative adaptation, the implementation of monitoring and evaluation is currently limited (IPCC AR6 WGII contribution). Indeed, as of August 2021, only around a quarter of countries had a monitoring and evaluation system in place;¹⁹

(e) Iterations: based on information from the monitoring and evaluation phase, further adjustments are needed to the planning processes based on lessons learned.

63. Across the adaptation cycle, progress is being made in mainstreaming climate-related risks into decision-making, but sustained and enhanced action is needed to fully implement NAPs and processes over time towards durable changes that reduce risks equitably. Nevertheless, each stage of the adaptation planning cycle presents opportunities to understand progress, recognize the efforts of developing countries and develop further insights into the role of international cooperation in accelerating and enhancing adaptation action. 57 Parties have submitted adaptation communications that outline their experiences

¹⁸ UNEP 2022: Adaptation Gap Report available at <https://www.unep.org/resources/adaptation-gap-report-2022>.

¹⁹ UNEP 2021: Adaptation Gap Report available at <https://www.unep.org/resources/adaptation-gap-report-2021>.

and national efforts on building resilience, including priorities, implementation and support needs, plans and actions.

64. While the adaptation cycle aims to mainstream understanding of the impacts of climate change into policy and planning processes to reduce risks, there remains a residual level of risk for loss and damage. Averting, minimising and addressing loss and damage in the context of sustainable development requires actions across the spectrum of climate policies and sustainable development. There is an urgent need for more knowledge, understanding, support, policy and actions to comprehensively address risks and loss and damage. Doing so comprehensively also requires development policies and actions that reduce vulnerabilities (through poverty eradication, education, biodiversity protection, etc.) and decrease exposures (access to land, infrastructure, etc.). These efforts are also closely related to efforts on disaster recovery post-impact from slow-onset and extreme events and should take into account the extent of economic and non-economic loss and damage. Comprehensive risk management approaches minimize risks to the extent possible, offer opportunities for transferring that risk through climate risk pools and insurance programs, and internalize the risk and respond should an impact occur. There are also significant barriers to access of support for impacted communities, and a need to raise awareness of available sources of support and mobilize resources and technical assistance to those impacted. The Executive Committee for the Warsaw International Mechanism has developed knowledge products and tools for comprehensive risk management and the Santiago Network was recently operationalized to catalyze demand-driven technical assistance to developing countries on approaches to avert, minimize and address loss and damage.

Adaptation and transparency

65. Chapter IV of the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement (decision 18/CMA.1, annex) provides a modality for Parties to voluntarily provide information on their efforts across each stage of the adaptation cycle, and to have this information voluntarily reviewed by the technical expert review teams with the goal of improving reporting. In addition, reports of the Adaptation Committee present diverse methodologies and indicators that can be drawn upon to inform the monitoring and evaluation stage adaptation planning. Nevertheless, there is a need to provide clearer guidance on methodologies and metrics/indicators that are applicable in particular circumstances, including capacity-building on how to use indicators within planning and implementation.

Recognition of adaptation efforts by developing countries

66. Article 7, paragraph 14(a), of the Paris Agreement specifically calls for the GST to recognize the adaptation efforts of developing country Parties. The CMA decided²⁰ that the adaptation efforts of developing countries will be recognized in various ways. As inputs to the GST, the CMA requested that the secretariat include information on the efforts of developing country Parties in the synthesis report on the state of adaptation efforts, experience and priorities and also to prepare a report starting in 2020 and every two years thereafter on specific adaptation themes, focusing on relevant lessons learned and good practices in developing country Parties. The CMA further decided that the adaptation efforts of developing country Parties will be recognized during the high-level events of the GST as guided by the high-level committee and further information is expected on how such high-level recognition will be implemented. The CMA also requested that the secretariat prepare a report summarizing the recognition of efforts by developing country Parties, drawing on the inputs to the GST and the discussions at the high-level events.

3. When adaptation is informed and driven by local contexts and priorities, both the adequacy and the effectiveness of adaptation action and support can be enhanced and can promote transformational adaptation.

67. In order to understand the risks faced and to be able to adjust accordingly, decision makers at all levels must continually evaluate the country's particular climate change

²⁰ Decision 11/CMA.1, section II.

hazards, exposure and vulnerability. There is no single endpoint where a community can be declared fully resilient, because the contexts and risks for a community change over time. Adaptation planning and implementation entails a continuous process with iterations building on previous actions and experiences, and managing new risks as they are identified, as well as exchanging best practices with other countries and subnational governments.

68. Accordingly, there is no single process or procedure to measure progress in terms of adequacy and/or effectiveness of adaptation and support for adaptation. The adequacy of adaptation actions can be measured in stages and by the degree to which adaptation results in resilience that is sustained over time.

69. In contrast, the amount of international financial support for adaptation can be measured, although the adequacy of such support is limited compared with the scale of needs. Realigning financial flows away from maladaptation towards mainstreaming adaptation into decision-making is also a critical component in scaling up finance for adaptation to effectively support iterative and sustained adaptation actions. Adaptation efforts and support for adaptation can be undermined, or made less effective, through other decisions and circumstances that affect vulnerability and exposure to climate hazards. This underscores the need for systemic capacity-building and comprehensive risk management approaches where the risks from climate change are incorporated in decision-making at all levels.

70. There are abundant opportunities for sectoral adaptation, many of which can be integrated within existing investment or development priorities and processes. Good practices are well documented across a wide range of sectors, addressing a wide range of hazards, and are available to help guide adaptation action. The scientific literature points to various adaptation options and good practices for adapting to specific hazards related to climate change. For example, to adapt to increasing prevalence of drought and dryness, actions range from improvements in water use efficiency to the provision of crop insurance, both of which can bolster resilience; whereas for addressing sea level rise, managing and restoring coastal habitats and ecosystems, providing alternative livelihoods for coastal populations, and enhanced floodwater management are examples of good practices. There are also approaches identified that extend across hazards and sectors, such as advancing ecosystem-based adaptation, nature-based solutions and EWS. In many cases, the options identified and prioritized by Parties broadly correspond to those identified in the scientific literature, although there are gaps and opportunities for further action.

71. A fundamental starting point for enhanced adaptation action is the dissemination of climate information through “climate services” to enable informed adaptation. The knowledge base of observed and projected impacts and risks generated by climate hazards, exposure and vulnerability has increased, with impacts attributed to climate change and key risks identified. Promotion of climate services needs to be driven by user needs and ambitions rather than by external priorities. There is great need for the expansion of these efforts to reach communities that have historically not had access to climate information. This includes information on assessing and tracking risks, and ways to manage such risks. EWS can help in integrating data collection and are critical for developing risk profiles to support decision-making and help understand transboundary risks more clearly. All countries should have EWS, and some will need support in establishing or enhancing such systems, particularly SIDS and LDCs. National disaster loss databases are being established and strengthened under the Sendai Framework, and this work can improve the collection and utilization of disaster risk data, and support decision-making in many countries, as well as contributing to a composite global picture of the adverse impacts of climate change. Dissemination of top-down information from global systems to local users should be complemented by enhanced information collection to inventory events as well as implementing adaptation efforts from the bottom up. Such information is important in monitoring, evaluation and learning systems.

72. There is evidence and practical examples of locally led climate-resilient development that incorporate the risks of climate change across natural and human systems into adaptation needs assessments and planning. For example, NAPs are increasingly inclusive in terms of disadvantaged groups or people. More adaptation planning and implementation based on local engagement and locally determined priorities that also promotes procedural equity is needed to ensure an adequate response to projected risks and scenarios.

73. Climate change has a greater impact on the world's most vulnerable communities and social groups, whether in developed or developing countries, and exacerbates existing inequalities. For example, women often face higher risks and greater burdens from the impacts of climate change in situations of poverty and due to existing roles, responsibilities and cultural norms. Climate-resilient development is only facilitated by governments at all levels working with communities, civil society, educational bodies, scientific and other institutions, media, investors and businesses; and by developing partnerships with traditionally marginalized groups, including women, youth, indigenous peoples and local communities as well as ethnic and other minority groups. The success of adaptation actions and efforts to address loss and damage critically depends on engagement and support of all levels of government and all relevant stakeholders. Working together, effective adaptation actions can reduce climate risks, which are documented for specific contexts, sectors and regions and cut across systems, while paying attention to integrated, multi-sectoral solutions that address social inequities and differentiate responses based on climate risk.

74. International cooperation can help share experiences in realizing opportunities and overcoming barriers and challenges to implementation of adaptation plans (including NAPs in developing countries) and promote learning from good practices in various contexts. The IPCC and other international scientific bodies provide robust assessments of climate impacts and responses.²¹ Such activities can help shift financial flows towards climate-resilient development and transformational adaptation. International cooperation should also support disaster recovery, including short-term humanitarian response and longer-term recovery where communities are supported in building back better to increase resilience to the impacts of climate change after disasters. A key role for international cooperation is to support capacity-building in order to prepare and implement adaptation plans and to recover from climate-related losses and damages. International initiatives, including non-state actors working on adaptation, can enhance and support systemic transformations. A wide range of actors, including communities, local authorities, civil society and many others can help identify activities that require international cooperation and support.

75. More discussion on collective progress towards the global goal on adaptation is needed within the technical assessment phase of the GST, including on efforts across the adaptation cycle, and opportunities and challenges in addressing adaptation within sectors and across contexts. The ongoing Glasgow–Sharm el-Sheikh work programme on the global goal on adaptation aims to inform the first GST. Discussions at TD 1.3 can draw on lessons from that work programme, including the emerging framework for the global goal on adaptation.

4. Support for adaptation and funding arrangements for averting, minimizing and addressing loss and damage can be rapidly scaled up from expanded and innovative sources, and financial flows can be aligned with climate-resilient development to meet needs in different contexts.

76. Across contexts, finance is a critical enabler of adaptation action, yet finance availability and access are limited in almost all cases. Assessment of collective progress on adaptation finds an urgent need to rapidly scaling up finance for adaptation to meet growing needs, in terms of both the amount of funding available and the speed with which funds flow.

77. Public support and finance play a critical role in building the capacities and knowledge needed to develop enabling conditions for building resilience and away from actions that increase exposures and vulnerabilities. Many adaptation actions affect public goods and are not readily commodified and traded, although their impacts on economic development are clear. For example, public financing for infrastructure should consider climate risks and avoid funding infrastructure that increases risks from climate change. While the share of adaptation finance as a percentage of total spend on mitigation and adaptation has increased, it was still only just over a quarter of total finance flows on average in 2019–2020. With increasing

²¹ Decision 3/CMA.4, para. 21: “Invites the Intergovernmental Panel on Climate Change to consider updating its 1994 technical guidelines for assessing climate change impacts and adaptation as part of its seventh assessment cycle, as appropriate.”

flows of climate finance, the amount and effectiveness going to adaptation needs ongoing attention.

78. Public finance for adaptation needs to grow from current levels but, given the breadth and scale of action needed to address the rising risks from climate change, broader financial flows from both the public and private sectors must be aligned with climate-resilient development priorities and needs, and away from maladaptive trends that increase exposure and vulnerability to climate change risks. Such an alignment of financial flows can be enabled by mainstreaming adaptation and including considerations of loss and damage into decision-making and planning at all levels. Mainstreaming climate-resilient development into national and subnational governance and policymaking is necessary for the effective use of limited public finance for adaptation.

79. These efforts can help build enabling conditions that help align investments – domestic and international – and should take into account evolving climate risks. A greater focus on systemic capacity development, beyond mobilizing resources, is needed to create the demand for including adaptation and resilience-building into investment and development plans, as well as to build the technical capacity to support recovery after losses and damages occur. This capacity must be built in a sustainable way within national and subnational institutions. These efforts, particularly when focused on vulnerable and disadvantaged communities, can also raise awareness of available sources of support and thereby increase the mobilization of support to those most in need.

80. A variety of approaches can increase the effectiveness of support for adaptation. Standardized approaches to grant funding can enhance the ability of developing countries, including those with limited capacity, to gain access to needed funds with the urgency required to adapt. Financial institutions' procedures for providing adaptation finance should prioritize the timely provision of funds to those that need them the most while also ensuring that the support is used most effectively. Technology, innovation and technical assistance are increasingly important needs for building capacity on and tracking loss and damage, while international cooperation on technology development and transfer remains important.

81. Ongoing discussions by Parties, including through a Transitional Committee established in Sharm el-Sheikh are focusing on new funding arrangements for assisting developing countries that are particularly vulnerable to the adverse effects of climate change, in responding to loss and damage, and a fund for responding to loss and damage, as well as on existing efforts, including on climate risk pooling, EWS, and support for humanitarian response and disaster risk reduction. These discussions are indicating a wide range of relevant sources for support to efforts related to averting, minimizing and addressing loss and damage. The establishment of the Santiago Network also provides opportunities for enhancing the technical capacities of developing countries in responding to loss and damage. Against the reality that the capacities of some governments are already being exceeded, it is essential to develop a common understanding between donors and recipients of the activities needed to avert, minimize and address loss and damage for which finance is required to unlock collective progress on this issue.

D. Means of implementation and support

82. Our reflections on the means of implementation and support comprise three parts: finance, technology and capacity-building. In addition to reflections specific to each, it is important to note that these three parts function together as multiple levers of support. Capacity, technology and finance need to work together for implementing actions across mitigation, adaptation and loss and damage. Funding for technologies may support mitigation or adaptation, or both. Implementation of technologies without the requisite institutional and human capacity will not be effective. In the light of the need to dramatically scale and speed up climate action in all sectors and geographies, a more strategic, coherent and integrated approach is required to ensure the mobilization of and access to finance, technology and capacity-building support needed.

1. Scaling up and aligning global financial flows for climate action in line with the Paris Agreement goals entails unlocking trillions of dollars to support the global transition, critically through the strategic use of public international finance which remains a prime enabler for action in developing countries.

83. There is progress in mobilizing funding and in aligning public and private financial flows, yet critical gaps remain: public funding remains inadequate to address the needs of developing countries while private investment and broader financial flows are not shifting fast enough to support to lowering GHG emissions and increasing climate-resilient development. Implementation and ambition in terms of both making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development²² and providing and mobilizing scaled-up financial resources from a wide variety of sources, instruments and channels,²³ are below estimates of the finance and investments needed for mitigation and adaptation commensurate with limiting global warming to the Paris Agreement temperature goal, and for adaptation consistent with projected temperature outcomes at that or higher global warming levels.

84. Assessments by the SCF²⁴ show the general increasing trends in global flows of finance for climate action, reaching an annual average of USD 803 billion in 2019–2020, which is 31–32 per cent of the annual investment needed to follow global modelling mitigation pathways consistent with the 2 °C or 1.5 °C global temperature rise. The growth in flows of finance are being driven by an increasing number of mitigation actions in buildings and infrastructure and in sustainable transport, as well as by growth in adaptation finance. However, existing flows are small in comparison with the overall needs of developing countries. The SCF reports that most finance flows go to mitigation, with the share for adaptation increasing from 20 per cent (USD 6.4 billion) in 2017–2018 to 28 per cent (USD 8.9 billion) by 2019–2020. Many investments still support infrastructure that locks-in high emissions (e.g. USD 892 billion annual average investment in fossil fuels, plus USD 450 billion in subsidies in 2019–2020) or is not designed for resilience to climate impacts.

85. The SCF assessment also highlights increasing public climate finance flows from developed to developing countries. However, the collective goal of developed countries jointly mobilizing USD 100 billion per year by 2020 to address the needs of developing countries in the context of meaningful mitigation action and transparency on implementation was not fully met in 2020. Since then, the OECD report series²⁵ noted mobilization of USD 83.3 billion in 2020. Information obtained from bottom-up needs assessments from developing country Parties highlights the need, when mobilizing additional climate finance, to support efforts to pursue ambitious adaptation and mitigation pathways. The SCF has highlighted the limitations on assessing collective progress on climate finance and continues to identify specific actions required to address methodological and data limitations, as well as the need for enhanced reporting on climate finance. Developing countries should identify activities to be funded more clearly and improve costing of needs in relation to mitigation and adaptation as well as for averting, minimizing and addressing loss and damage. Furthermore, considering recent trends of increasing proportions of funding being allocated for adaptation, expanding the envelope of total finance could achieve greater balance between mitigation and adaptation funding. Funding arrangements to support efforts related to averting, minimizing and addressing loss and damage will also need to be enhanced and scaled up to meet rising needs.

86. There is a need to address the significant funding and investment gaps and misaligned flows that remain. Through the NDCs, NAPs and adaptation communications submitted, Parties have indicated actions and priorities for which financial investments and support are needed. The policy and broader enabling environment, as well as the availability of effective instruments for de-risking investments and create pipelines of investable products for

²² Article 2, para. 1(c), of the Paris Agreement: “Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.”

²³ Article 9, paras. 3–4, of the Paris Agreement; decision 19/CMA.1, para. 36(d).

²⁴ <https://unfccc.int/topics/climate-finance/resources/biennial-assessment-and-overview-of-climate-finance-flows>

²⁵ <https://www.oecd.org/climate-change/finance-usd-100-billion-goal>.

adaptation and mitigation, require greater attention, particularly in developing countries. In order to close finance gaps, private and public, domestic and international climate finance will need to fund activities towards mitigation and adaptation aligned with the goals of the Paris Agreement and to halt and repurpose funds activities that are not aligned.

87. Global and domestic capital markets are likely to be the primary source for scaling up investment in mitigation, while public finance may be deployed to high-impact investments and to crowd-in private sector finance. In terms of mitigation, scaling up green investments, shifting incentives away from high-emission activities and financing transitions are needed, globally; how this will be applied will differ by context. Access to capital is much more expensive in developing countries, reflecting perceived cross-border investment risks and international capital market inefficiencies. Debt and the costs of servicing debt take up a large share of some developing country budgets. Governance and monetary reforms more broadly can enable additional financial flows.

88. The scale of investment required towards development pathways consistent with the goals of the Paris Agreement highlights the need for a transformation of the financial system and its structures and processes, through engaging governments, central banks, commercial banks, institutional investors and other financial actors. For example, the need for fundamental reforms to MDBs and other IFIs has been identified for increasing concessional finance and scaling up action on mitigation and adaptation in line with achieving the objectives of the Paris Agreement.

89. Momentum behind more fundamental and impactful reforms of public financial institutions or possible new institutional arrangements is growing and more significant actions are beginning to make these institutions more aligned with achieving the goals of the Paris Agreement and more capable of addressing climate change in the context of sustainable development through options such as new mandates to existing institutions, innovative instruments and financing of just transitions across diverse contexts.

2. Achieving systemic transformations in pursuit of the 1.5 °C degree goal requires rapid deployment and adoption of cleaner technologies and accelerated innovation and development of new technologies, with growing access to these supported by appropriate enabling frameworks and international cooperation.

90. The uneven pace of global adoption of climate technologies reflects broader patterns of development, with developing countries historically having less access to opportunities to deploy technologies and possessing less capability to develop new technologies. Promoting international cooperation on technology development and transfer and innovation, between countries or regions and involving governments, the private sector, academia and research institutions and other stakeholders is crucial for knowledge-sharing, ownership, acceptance of technologies, and accelerating innovation.

91. Established processes and mechanisms on technology under the Convention, such as the Technology Mechanism, contribute to facilitating international cooperation on technology through capacity-building, knowledge-sharing, and technical and financial support to aid developing countries in their efforts to develop, adopt and deploy climate technologies. These processes and mechanisms represent the tip of the iceberg of what is needed if we are to achieve rapid systemic transformation that is aligned with achieving the goals of the Paris Agreement. Much more intensive efforts to support cooperation and innovation are essential throughout the technology cycle and across all sectors and geographies, building on existing platforms and including those that incubate small to medium-sized enterprises specializing in climate action and technology initiatives and accelerators of progress in key climate technology priorities.

92. Reductions in costs for some key technologies should enable greater deployment in all geographies, particularly in developing countries, while the need to continue to drive down costs is essential to displace high-emissions incumbent technologies. Technology development has already led to tremendous reductions in costs. The unit costs of some technologies have reduced by up to 80 per cent. Continuing to drive down these costs and those of other key technologies will be a deciding factor for whether the goals of the Paris Agreement are met.

93. Collaborative approaches to climate technology research, development and demonstration are crucial for deploying mature climate technologies and developing emerging technologies on a large scale. International collaboration, particularly in developing countries, can strengthen learning on successful climate technology initiatives, with the aim of increasing access to new and existing technologies and driving down costs. Collaborative approaches can also foster sharing of innovations in new technologies that are relevant to developing country contexts; facilitate flexible and evolving participation by countries in line with their national needs and capacities; stimulate private sector participation; and place technological research, development and demonstration in a broader ecosystem-level context (focusing on technology hardware, software and orgware, i.e. the organizational concepts and regulations that underpin the uses of technologies). Such approaches can include investments in technology development and transfer through joint research and development programmes and capacity-building.

94. Enabling environments, such as appropriate policies, institutional arrangements, and regulatory frameworks, are needed to accelerate technology deployment, foster technological innovation (including endogenous innovation), and push innovations to the implementation stage, all the while ensuring inclusive multi-stakeholder engagement and access to financial support and capacity-building.

95. There is a need for further research and development of technologies in all sectors, but particularly in “hard to abate” sectors and in technologies that are required to achieve net zero emissions by 2050 and to address overshooting in emission pathways in pursuit of the 1.5 °C temperature goal. Equally, it is important to focus research on reducing emissions and strengthening resilience, while also enhancing economic competitiveness and diversification, particularly in developing countries.

3. Capacity-building is foundational to achieve broad-reaching and sustained climate action, and requires country-led and needs-based effective cooperation to ensure capacities are enhanced and retained over time at all levels.

96. The fundamental challenge that climate change presents means the capacity to act and to cope must be strengthened in all countries, but particularly in developing countries, where the underlying institutional and foundational capacities are less developed, and the risks and vulnerabilities can be much greater.

97. Capacity-building invariably entails investing in the existing underlying social and economic systems, such as education and health. There is a need for developed countries to increase the level of support provided for strategic capacity-building to developing countries to address locally determined needs.

98. Progress on capacity-building underpins progress elsewhere. Indicators of progress on capacity-building are difficult to monitor (unlike others on dollars spent, emissions reduced, etc.), but emphasizing capacity-building within international cooperation can unlock greater progress in other areas.

99. Needs-based approaches to capacity-building involve taking a systematic approach to determining the priority capacities required to move forward in terms of implementing the key instruments of the Paris Agreement (e.g. NDCs, NAPs, LT-LEDS) and achieving the goals contained therein. Strengthening capacities, particularly at the institutional level, is a priority for developing countries. Country ownership of the development of capacity-building interventions is fundamental to ensure the actual and most pressing capacity needs and gaps are addressed. The need for capacity-building for accessing support is particularly evident, including for supporting the development and implementation of climate initiatives for mitigation and adaptation. Such support will also facilitate further private sector investment in solutions in developing countries.

100. There is also significant added value from engaging national and local actors in the provision of capacity-building support, for example through universities, research organizations, civil society organizations and even the private sector. Delivery of capacity-building through local actors and institutions can have the dual benefit of increasing institutional capacity while also increasing the skills base for specific aspects of climate

action. Capacity-building based on indigenous and other traditional knowledge systems also presents opportunities for more sustainable avenues to long-term capacity development.

101. Greater coherence and coordination of support will help ensure that needs are being met and will enhance effectiveness. Making international cooperation on capacity-building more effective and impactful is key. It would be useful to further elaborate upon the options for strengthening international cooperation on capacity-building at TD1.3.

E. Integrated and holistic approaches

1. The Convention and the Paris Agreement are processes that set norms which drive policy outcomes to increase international cooperation on climate, within and beyond the processes themselves.

102. The Convention and the Paris Agreement are the foundations of international cooperation on climate action across all topics. Significant progress has been made through the UNFCCC process, since its inception more than 30 years ago, as evidenced by the significant shifts in expectations of global temperature increase that has resulted from collective progress at major multilateral moments. At the adoption of the Cancun Agreements in 2010 the expected global temperature increase in 2100 was 3.7–4.8 °C.²⁶ In 2015, with the adoption of the Paris Agreement and commitments made through INDCs, the expected global warming reduced to 3.0–3.2 °C.²⁷ Further progress has been made under the Paris Agreement, as updated NDCs and long-term plans were announced. By COP 26 in 2021 a global temperature increase of 2.6–2.7 °C in 2100 was expected.²⁸ The Glasgow Climate Pact urged Parties that had not yet communicated new or updated NDCs to do so as soon as possible and to revisit and strengthen their 2030 targets to align with the global temperature goal. With further announcements in 2022 (COP 27) expected temperatures were reduced further, to 2.4–2.6 °C²⁹ with the possibility of 1.7–2.1 °C when taking into account the full implementation of long-term net zero targets³⁰. Yet although this progress is significant, more needs to be done inside and outside the United Nations climate process to accelerate action and support.

103. Nevertheless, the catalytic role of the United Nations climate process will be vital in the years ahead, as ambitious and equitable climate action is increasingly integrated into major economic and social policy domains globally, and as the imperative to deliver transformative outcomes in all sectors becomes more apparent and urgent. The United Nations climate process provides an important platform for catalysing implementation, sets norms in terms of transparency and accountability, and is an essential basis for international cooperation among States and with non-State actors.

104. The GST can support Parties in building mutual trust and understanding to deliver increasing levels of ambition to achieve the global goals. The GST is also enhanced by drawing on the findings and outcomes from the ongoing work of the constituted bodies as they focused on particular elements of climate action as well as other processes and work programmes under the subsidiary bodies (e.g. the Glasgow–Sharm el-Sheikh work programme on the global goal on adaptation, the mitigation work programme, the new collective quantified goal on climate finance, the Glasgow Dialogue, the just transition work programme). Conversely, the GST outputs (including the upcoming TD factual synthesis report) and outcome can inform these other processes and their outcomes and outputs, and hence accelerate implementation of climate action and support. Continued support and

²⁶ IPCC. 2018: Climate Change 2014: Synthesis Report Summary for Policymakers, p.20. Available at https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf

²⁷ UNEP. 2016: Emissions Gap Report 2016, p.Xvii. Available at <https://www.unep.org/resources/emissions-gap-report-2016>.

²⁸ UNEP. 2021. Emissions Gap Report 2021, p.XXVI. Available at <https://www.unep.org/resources/emissions-gap-report-2021>.

²⁹ UNEP. 2022. Emissions Gap Report 2022, p.XVI. Available at <https://www.unep.org/resources/emissions-gap-report-2022>

³⁰ Ibid, p.XXI, table 4.5.

engagement in the activities of the constituted bodies and work programmes can enable more lasting and robust policy outcomes.

105. Clear information and transparency are foundational elements of the Paris Agreement. Transparency can enable greater ambition by building trust and confidence that countries are doing what they pledged to do. Reporting should also respond to domestic information and policy needs and, in doing so, can provide an information base for national climate change policies. The first biennial transparency reports are due in 2024, and these and future reports will provide an enhanced information base for future GSTs. Furthermore, as Parties prepare their next NDCs, to be communicated in 2025, the information on clarity, transparency and understanding will include how a Party's preparation of its NDC has been informed by the outcomes of the GST.

106. While the focus of the GST and other processes is necessarily on Parties, the GST has been enhanced by engaging with a wide range of stakeholders from many different contexts. Other processes and bodies under the Paris Agreement could benefit from greater engagement with non-Party stakeholders to ensure that outcomes and products are based on real world experiences from a diversity of viewpoints (see paragraphs 114–115 below).

2. Governments should implement integrated policy packages that mainstream climate resilience and low GHG development and strengthen the global response to the threat of climate change in the context of sustainable development and efforts to eradicate poverty.

107. Shifting to development pathways that are more climate resilient and result in low GHG emissions requires enabling conditions to be put in place in ways that respond to the relevant contexts. Each country charts its own pathway towards achieving the SDGs and the collective goals of the Paris Agreement with the result that transitions are context sensitive and the associated integrated policy packages differ to reflect this context and particular national circumstances. For example, synergies within policy responses for climate-resilient and low-emissions development should be undertaken in a manner that does not threaten food production, as stated in Article 2, paragraph 1(b), of the Paris Agreement.

108. The IPCC AR6 identifies global enabling conditions including political commitment and follow-through policies, social and international cooperation, ecosystem stewardship, inclusive governance, innovation, monitoring and evaluation, and rapidly scaled up access to adequate financial resources. Strengthening such enabling conditions should be done immediately, while understanding that some actions will yield results quickly and others set up transformational change, which takes time.

109. Further discussions on integrated policy solutions and opportunities to address particular contexts will be explored at TD1.3 with the aim to better understand how climate action and support can be enhanced to face real-world challenges and constraints

3. Systemic transformations open huge opportunities but are disruptive. A focus on inclusion and equity can increase ambition in climate action and support when it builds trust and solidarity into an upward spiral of ambition and climate action.

110. Systemic transformations will entail broad and rapid action and can present an unprecedented opportunity for developing socially and economically while reducing impacts on the natural environment. Currently, as the IPCC AR6 noted lifetime emissions from existing and planned fossil fuel infrastructure will exceed estimates for keeping 1.5 °C within reach. Shifting from this status quo and pursuing rapid change will inevitably be disruptive, and this underlines the need for solidarity and just transition at the international and national level. The impacts of climate change are also likely to become more disruptive, and transformative adaptation can imply broad changes in existing practices. Carefully designed, climate action can generate significant social and economic progress and benefits, including health, education and employment.

111. Climate action should be informed by many dimensions of equity to enable ambition to increase the likelihood of meeting the goals of the Paris Agreement. Such dimensions include just transitions, sustainable development, environmental protection, poverty eradication and human rights. Current and historical contexts within and across nations

remain potent factors in the ability to make progress on climate goals. The global nature of the necessary transformation means that no one will be able to avoid taking action and that no one should be left behind. Yet context matters: how actions are implemented, what are the constraints in capacity to act, and where support is needed must all be considered. Climate change affects everyone, but it does not impact everyone equally.

112. Inclusivity matters and those most affected by climate impacts should be involved in crafting solutions. Throughout the technical dialogue, participants have emphasized the importance of inclusivity and collaboration, and have underlined how including all stakeholders from the outset is vital for deeper, broader and faster climate actions, and support. Actors in civil society, businesses, youth, women, labour, media, indigenous peoples, and local communities can help to build consensus for effective adaptation in different contexts.

113. Governments should engage with vulnerable communities and social groups to reduce the risks stemming from climate change and to make them part of the solutions in taking mitigation and adaptation action. Such engagement can have benefits that go beyond climate change, such as environmental conservation, poverty reduction, and achieving the SDGs.

4. Non-Party stakeholder actions can strengthen efforts for systemic transformations.

114. Non-Party stakeholders can increasingly support Parties in implementing the Paris Agreement, and in enabling countries to implement national plans. Climate action and support can be further enhanced through catalysing action by all, including all levels of government, all actors in the private sector, all civil society organizations, and all of the constituencies of the United Nations system. Inclusive cooperation across all fronts contributes to ambitious and equitable outcomes. Initiatives by non-Party stakeholders can strengthen efforts for systemic transformations, investing and transitions from high- to low-emissions emissions and climate-resilient development. In order to do so across all contexts, initiatives by non-Party stakeholders should endeavour to also include and support stakeholders from LDCs, SIDS and other developing countries and indigenous peoples, so that they can all effectively participate in and contribute to these initiatives.

115. Participants have underlined the need for accountability and rigorous accounting on the status of actions and commitments that have been made through non-Party stakeholder initiatives. Greater transparency is required on the progress these initiatives are delivering on their climate actions, focusing on the growing number of international initiatives. Good practices in accounting should be utilized by non-Party stakeholder actions across all topics. There is an opportunity to address this need when following up and implementing the recommendations of the United Nations Secretary-General High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities, while applying good practice similarly in international cooperation on adaptation, loss and damage, finance, innovation on cooperation and capacity.

5. While nations continue to pursue efforts to limit the global temperature increase to 1.5 °C above pre-industrial levels, and overshoot increases risks to people and planet, we need to plan pragmatically for scenarios of temporary overshoot.

116. The Paris Agreement global temperature goal is to hold the increase in global average temperature to well below 2 °C above pre-industrial levels and pursue efforts to limit the increase to 1.5 °C above pre-industrial levels. IPCC assessment reports tell us that average global surface temperatures will likely increase by more than 1.5 °C in the near term (2021–2040) without deep, rapid and sustained mitigation action. It remains possible that future, more ambitious emission reductions and actions to remove CO₂ from the atmosphere may allow for the return of temperatures to or below this threshold. Such a trajectory is termed an overshoot pathway in the IPCC and other scientific literature. Current emission reduction policies put us on track for warming of 2.2–3.5 °C by the end of the century, and there are relatively few modelled global mitigation pathways with an even chance of limiting warming to 1.5 °C with limited to no overshoot.

117. Limiting warming to the Paris Agreement global temperature goal “would significantly reduce the risks and impacts of climate change”, and the IPCC clearly points to

the increased risks to human and natural systems of these overshoot pathways. Impacts will increase for every 0.1 °C of global warming. Projected impacts will exceed hard limits to adaptation, primarily in natural systems. Some impacts will be irreversible as temperatures increase beyond 1.5 °C. The scale and duration of overshoot matters: higher levels of warming before temperatures decrease will mean further costs related to more ambitious GHG emission reductions and enhanced removals of CO₂, adaptation planning, and responding to loss and damage, but work on understanding specific overshoot scenarios in policy and scientific discussions is only at the very early stages.

118. Managing the implications of a potential overshoot is important, given the implications for mitigation, adaptation, loss and damage, and means of implementation and support. Planning for temporary overshoot should not imply a lack of commitment to pursuing efforts to limit warming to 1.5 °C without overshoot. Indeed, many of the pragmatic near-term steps to prepare for overshoot are the same as those efforts to limit warming to 1.5 °C. The aim of limiting overshoot requires more ambitious near-term reductions by 2030, and steeper reductions after 2030. Collectively, we need to increase mitigation ambition with the aim of reaching net zero emissions by 2050 globally. For example, even in 1.5 °C scenarios with limited to no overshoot, some measures on CO₂ removal will likely be needed to balance the remaining residual emissions from hard-to-abate sectors.

119. Regarding adaptation, efforts on adaptation such as enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change will still need to become more transformative. More information is needed on which impacts are reversible and which are irreversible. Action needs to be taken to avoid tipping points, some of which have been raised in our dialogue, such as glacier melt, melting permafrost thaw (which risks releasing large amounts of methane), forest die-back and others. and greater adaptation needs will imply greater adaptation costs. Significantly, during the period of overshoot, managing risks of economic and non-economic loss and damage will be important. For overshoot scenarios, the costs and risks associated with large scale CO₂ removal will need to be weighed against the benefits from avoided adaptation and loss and damage costs associated with higher temperatures.

III. Summary of discussions of TD 1.2

A. Summary of the opening meeting

120. The CFs outlined the organization of work for the meeting in their opening remarks and elaborated on the multiple formats that would be used at TD1.2 that built on the experience of TD1.1 and feedback received from Parties, observer organisations and other NPS.

121. The CFs invited participants to build on the discussion from TD1.1 and develop greater understanding on how to move forward with collective action under the Paris Agreement. They encourage them to highlight good practice and opportunities for enhanced actions and support, and to find creative ways of overcoming barriers and challenges to climate action in the light of equity and best available science.

122. In concluding the opening remarks, they provided an outline of events planned during the TD1.2 technical dialogue, underlining that the dialogue was intended to create a space for the open and direct conversations with a substantive focus on moving from the “what” to the “how”, guided by the norms presented at TD1.1.

B. Summary of the roundtable discussions

1. Framing of the discussions

123. Three roundtables were held following the same clusters of topics as at TD1.1³¹ Each roundtable met in two, two-hour sessions, began in a plenary setting, and then after some overall framing by the co-facilitators, four breakout groups were convened. This format enabled more in-depth discussions and focus on specific topics.

124. At the beginning of each breakout group, some introductory remarks were provided by invited experts. A facilitator was assigned to each breakout group to guide the discussions. At the conclusion of each roundtable breakout group rapporteurs nominated by groups of Parties provided a report to the plenary. The breakout group topics can be found in [section IV of the information note](#).

125. The co-facilitators encouraged participants to orient their discussions toward developing findings in response to the following SB Chairs' guiding questions:³²

- (a) What further action is required?
- (b) What are the barriers and challenges, and how can they be addressed at national, regional and international levels?
- (c) What are the opportunities, good practices, lessons learned and success stories?"

2. Summary of round table 1: Mitigation, including response measures

126. Roundtable 1 was convened by the co-facilitators in Plenary II: Ramses, from 10:00am to 12:00pm on Wednesday, 9 November 2022, followed by a second meeting that was held at the same time and location on Wednesday, 10 November 2022. The aim of Roundtable 1, as set out in the information note, was to move from the "what" to the "how", from models and pledges to implementation and action, considering barriers, challenges and opportunities.

127. The co-facilitators welcomed participants to the roundtable, presented the topics for discussion in each of the four-breakout groups, and introduced the facilitators and experts assigned to each of the breakout groups (see table 1 below). They referred participants to the prompts that had been prepared prior to the session and made available on the UNFCCC website,³³ which provided more detailed suggestions for the topic areas that would be addressed in each of the breakout groups.

128. Experts from each breakout group presented their prompts to the participants after which, participants were invited to move into the four breakout groups, which were convened in each corner of the plenary room.

Table 1

Roundtable 1: breakout groups

<i>Breakout Group</i>	<i>Topic</i>	<i>Expert</i>	<i>Facilitator</i>
1	Enhancing global mitigation pathways: Assessing collective progress on mitigation and enhancing ambition, fairness and implementation towards the achievement of the Paris Agreement long-term goals, taking into account nationally determined contributions and long-term low greenhouse gas emission development strategies by Parties	Jamal Srouji	Thelma Krug

³¹ Mitigation, including Response Measures; Adaptation, including Loss & Damage; Means of Implementation (MoI) and support, which includes capacity-building, finance, and technology.

³² SB Chair's guiding question:

https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf.

³³ Prompts can be found here: <https://unfccc.int/topics/global-stocktake/second-meeting-of-the-technical-dialogue-td12-of-the-first-global-stocktake>.

<i>Breakout Group</i>	<i>Topic</i>	<i>Expert</i>	<i>Facilitator</i>
2	Transforming energy and industrial systems: Assessing collective progress in and enhancing mitigation efforts in energy production and consumption as well as industrial and transportation systems	Arunabha Ghosh	Kaveh Guilanpour
3	Transforming land and other systems: Assessing collective progress in and enhancing mitigation efforts and preserving and enhancing greenhouse gas sinks in AFOLU, waste, and other systems	Sandeep Sengupta	Frances Seymour
4	Response measures: Assessing collective progress in and enhancing efforts made to address the social and economic consequences and impacts of response measures while implementing mitigation policies and actions towards the achievement of the Paris Agreement long-term goals	Moustapha Kamal Gueye	Samantha Smith

(a) Breakout group 1

129. The facilitator, Thelma Krug, welcomed the participants to the meeting and thanked the assigned expert, Jamal Srouji, for its prompt³⁴ and introductory remarks. She proposed that the discussion be structured around three blocks:

(a) What near term steps can Parties take to unlock the systems transformations that are needed? How can Parties implement NDCs and LT-LEDS to accelerate that ambition? How international cooperation across systems could be strengthened to present?

(b) Equity and ambition;

(i) How to improve understanding of equity when considering ambition?

(ii) How can just transitions support equity and ambition and mitigation across main sectors?

(c) How can actions from NPS support effort of Parties when implementing mitigation actions?

130. Experience was shared by participants on the value of having a long-term quantified vision to orientate mitigation policy and to align mid-term targets towards the achievement of that vision. In this regard, the value of the tools of the Paris Agreement were noted by participants, including LT-LEDS and NDC. The value of having the implementation needs and finance plans, international cooperation and accountability mechanism rooted in and owned by different governance levels and key actors, including non-state actors, nationally and sub-nationally was stressed. This includes owned analysis and monitoring frameworks that are informed by the global goals, yet tailored to national circumstances and priorities, with a transfer of knowledge where needed.

131. Participants also highlighted their experience of fostering policy integration to enhance climate action across ministries, enhancing participation of key sectors, industries, and actors most affected by transformation, as well as the value of engaging citizens, private and public actors from the ‘bottom-up’. Examples were provided of how indigenous peoples and workers can play an integral part of the solution to address climate change, when engaged effectively. The importance of sending clear policy signals to the private sector was emphasized, as well as the need to tailor policy to specific industries and to balance supply and demand side measures.

132. Another key theme in the discussion was on the importance of finding synergies between mitigation and development and to explicitly and proactively address trade-offs that are identified. This was particularly important and challenging for developing countries in bringing together the achievement of short-term development needs (e.g., access to energy and livelihood considerations) with mitigation actions. It was noted that addressing sustainable development and mitigation at the same time requires strong governance systems

³⁴ https://unfccc.int/sites/default/files/resource/FinalJamal%20Srouji_WRI.pdf.

that enable dialogue, a strong narrative tailored to national circumstances, as well as analyses of synergies to build on and trade-offs to address.

133. Participants also highlighted the critical importance of addressing barriers to implementation including finance, technological and capacity-building barriers. In this regard, it was noted that removing fossil fuel subsidies could contribute to shifting capital flows to low-carbon technologies but, without complementary policy support, could result in challenges to livelihood of populations vulnerable to higher energy prices. The value of establishing national accountability frameworks and of orientating policy toward ensuring just transitions and the achievement of livelihood opportunities for all parts of society was also emphasized.

134. For managing the transition to long-term mitigation pathways participants underlined the centrality of just transitions, not only energy transitions, but also transitions in all sectors. Participants highlighted the importance of addressing inequalities at local, national, and international level and in advancing human rights. They also emphasized the need to demonstrate that a better and a more just future can be realized through long-term mitigation pathways, which offer opportunities and benefits for communities. The importance of building capacity as well as trust through transparency and accountability, were also highlighted.

135. Participants also noted that near-term and net-zero targets should be based on the best available science. Considering the small remaining carbon budget, CBDR-RC, equity and progress made prior to 2020 were stressed. It was also noted that equity can act as an enabler to limit global warming to 1.5 °C, with recognizing the different starting points, national circumstances, capacities to act, national economic structures and that there are different pathways to mitigate GHG emissions.

136. The role of various support structures in the achievement of global and national mitigation pathways was also emphasized by participants. Partnership arrangements, support infrastructure and mechanisms for international cooperation were referred to, as well as the need for new approaches and innovations. It was noted that these support structures can improve equity and ambition, particularly when they address competing immediate needs that would otherwise undermine climate action.

137. The need to achieve alignment between trade and finance policy with the goals of the Paris Agreement was underlined, including the value of involving finance ministers, developing innovative finance instruments, and transforming trade and finance multilateral entities as important levers for policy implementation.

(b) Breakout group 2

138. The facilitator, Kaveh Guilanpour, welcomed the participants to the meeting and thanked the assigned expert, Arunabha Ghosh, for the provide in advance of the session³⁵ and the introductory remarks. The facilitator proposed using the prompt to help structure the conversation as follows:

(a) How do the energy, transportation and industrial systems transform in a world where the Paris global temperature goal is met?

(b) What are system specific lessons from progress in reducing emissions from i) energy production, distribution and consumption and ii) industry and transport, including within international bunker fuels?

139. Participants identified many pathways and systems transformations at various levels, including those that are technology specific, sectoral, and at geographical scales, including regional, national, and sub-national scales. Participants noted that successful implementation of these pathways often requires tailor made solutions that are designed based on specific geographical and socio-economic circumstances. On the other hand, participants also noted that successful policies and measures have been replicated or adapted across multiple jurisdictions. They emphasised the critical important role that policy can and needs to play in realising these pathways and system changes. It was noted that in some cases a lack of

policy is often a significant barrier to energy and industrial transformation, while in other cases policy is incoherent or unstable. Long-term policy frameworks at all levels of governance are essential, yet urgent early action and a learning by doing approach is critically important for avoiding further lock in of fossil fuel-based technologies. It was also noted that there remain vast opportunities for short-term ‘low hanging fruit’ solutions, such as energy and resource efficiency gains which have multiple benefits in addition to achieving immediate emission reductions.

140. Participants also identified various specific barriers and challenges that must be overcome if progress is to be accelerated. For many participants a key challenge was ensuring security of supply of affordable energy and managing transitions with weak energy infrastructure, such as power grid and electricity system stability and intermittency of solar and wind power generation. Participants discussed how thinking in terms of distributed and interactive energy systems can provide solutions to these challenges, and that binary thinking between grid-based and off-grid installations often becomes part of the problem. It was also noted that sectoral diversification can be a beneficial approach to grid management and transition planning. Policy approaches that target productive uses of distributed generation of electricity can be a key strategy, whereby capital costs can be better managed and income generating opportunities not only accelerate progress to decarbonisation but also have significant developmental benefits and social returns.

141. Participants also emphasised the importance of connecting policy approaches for energy supply and demand together, rather than treating these dimensions in isolation. For example, electric vehicle to grid and buildings and distributed renewable energy systems within buildings are blurring the traditional lines between supply and demand and creating opportunities to accelerate rates of decarbonisation. Urban planning for smart cities has an important role to play. Demonstrating the benefits of integrated, systemic approaches across supply and demand to all was therefore highlighted as an important action.

142. Participants identified strategies to both prevent, and address fossil fuel lock-in. Solutions include enhanced entrepreneurship, especially among women, education and capacity-building, and innovative multi-stakeholder dialogues. Dedicated policies are required targeting and supporting sustainable lifestyles.

143. Participants also highlighted the value of distributed energy systems for energy independence and security of supply, noting that centralised systems pose significant broadscale risks to energy users when they fail. It was also noted that distributed energy systems can help facilitate economic development opportunities and energy independence at the local scale, helping to alleviate poverty and providing a range of other social benefits. However, it was also noted that international support is of critical importance to transform systems towards such distributed renewable energy system, including addressing capacity-building and technology transfer needs.

144. Participants underlined the technological and financial barriers to transforming energy and industrial systems at the pace and scale required by science. In particular, it was noted that the cost of the required technologies remains as significant barriers in many developing countries. One example that was highlighted is the cost of electric vehicles, which remain considerably higher than the cost of combustion engine vehicles in most countries. Examples were also provided of policies and measures that have been used to successfully correct distorted pricing for electric vehicles and incentivise their adoption, as well as other technologies. The importance of developed countries taking the lead in decreasing the cost of technologies and in international cooperation and support for technological adoption by developing countries was emphasised, including support for enhancing their indigenous technological capacities.

145. It was further noted that non-cost barriers create inertia in industrial and energy systems which can be considerable and can be underestimated. One example of persistent non-cost barriers that was highlighted was in addressing methane emissions across oil and gas infrastructure: measures are cost competitive yet adoption by oil and gas infrastructure remains very slow. Solutions include securing stronger commitments to action, and greater accountability, stronger governmental leadership and buy-in, more effective international

cooperation across the sector, technical support programmes, and active facilitation in building a pipeline of bankable projects at scale.

146. The need to facilitate greater access to technologies for developing countries was also highlighted as an issue of concern, and of particular importance for international cooperation.

147. Participants also identified opportunities to unlock capital for transformative energy and industrial pathways, including through de-risking of investments that can be achieved through institutional reforms, bundling of projects, and instruments that blend public and private finance. Strategies and financial instruments need to address a variety of risks, including political, regulatory, technical and governance. Participants also highlighted the need for mechanisms that create incentives, and not just for technology deployment but also for resource efficiency.

148. The impact of mining associated with resource extraction necessary for renewable energy, while a very small portion of total resource flows, was noted. Participants also noted that, as is the case for all industrial and energy projects, site selection for renewable energy projects should avoid environmental and social impacts.

149. Participants highlighted the value of industry clusters in achieving circularity and in supporting opportunities for green chemistry and hydrogen, carbon capture, storage and use, direct air capture and for achieving decarbonisation synergies between industrial processes.

150. Concern was raised on the pace of decarbonisation in the shipping and aviation sectors, where some participants stressed a need for urgency both in terms of technological advancement, as well as policy development and in terms of leveraging short and medium-term gains in these sectors where options already exist.

151. In taking systemic, whole of society, and whole of government approaches to industrial and energy transformation, participants identified the need for decentralised solutions with engagement of communities and stakeholders so that all actors can participate and be part of the solution. Participants emphasised the long-term value of community based multi-sectoral approaches in contrast to purely sectoral approaches where communities may feel disenfranchised. They highlighted the experience from previous workforce transitions, and the need for comprehensive approaches to just transition planning and implementation.

(c) Breakout group 3

152. The breakout group on transforming land and other systems was facilitated by Frances Seymour, and the assigned expert was Sandeep Sengupta.³⁶ Hanadi Al Rabai'eh served as the rapporteur for the breakout group and reported a summary of the discussion to the plenary of the roundtable.

153. The breakout group discussion began by identifying priority topics and issues that warranted further discussion. Participants raised many priorities that should be discussed including: ocean issues, indicators and uncertainties, transforming food systems, water issues, deforestation free commodities, adaptation, loss and damage, co-benefits, nature based solutions, results-based payments, transformational systems, deforestation, afforestation, reforming carbon accounting to preserve ecosystem integrity, forestry, linkages with the SDGs, climate trajectories and risks, collaboration with landowners on ecosystem restoration, land policy framework, monitoring needs, harmonizing NDCs with other land targets, mangrove restoration, best practices for farmers, methane accounting, accounting small-scale sequestration, protected areas and local communities, enhanced forest coverage with long-term global goal, increasing carbon-sinks, and tradeoffs between mitigation options on land. Having considered this broad range of areas, four main pillars were adopted for structuring the discussion, as follows:

- (a) Closing gaps in data, monitoring, indicators, and accounting needed to manage carbon sinks in land and other systems;
- (b) Effectively including forests in land sector transformations;

³⁶ https://unfccc.int/sites/default/files/resource/FinalSandeep%20Sengupta_prompt.pdf.

- (c) Restoration of terrestrial and marine ecosystems;
- (d) Transforming food systems as part of the land transformation.

154. Participants identified many promising approaches that are being piloted at local, national, regional, and global levels to address gaps and uncertainties in data, improve monitoring, and indicators needed to improve management of land- and marine-based carbon sinks.

155. Examples provided at the local level included governments and universities piloting initiatives to assist farmers with access to data and monitoring tools, including for methane. Examples were provided from the EU (for monitoring carbon), Brazil (for commodity supply chain transparency), and New Zealand (for management of methane emissions).

156. At the national level, an example was provided in South Africa which has set-up a national data and monitoring system to assess and prioritize carbon sinks across major biomes and identify options for restoring ecosystem function for carbon and other benefits. In the context of updating its NDC, the Seychelles has undertaken a process to reset baselines for protecting mangroves and seagrass as carbon sinks and involving communities in the process to help hold government accountable to targets. In these and other cases, access to international finance, capacity-building, and technology has contributed to success.

157. At the regional level, the establishment of platforms for exchange of data and tools among scientists (for example, in the Mediterranean region of the EU), city officials (for example, mayors in the Asia region) and other stakeholder groups have accelerated the closing of data and capacity gaps.

158. Several participants stressed the need for monitoring and accounting systems to bridge across systems, including the nexus between land and water management, the nexus between terrestrial and coastal/marine ecosystems, the nexus between land and food systems (one highlighting a multi-stakeholder initiative to monitor food loss waste in the United States), and also they highlighted the need for integrated monitoring systems to understand and the impacts on climate change on terrestrial sinks (e.g., mortality due to fire and drought).

159. Participants identified payments for forest-based environmental services as an effective approach to incentivize forest conservation and restoration across scales and many success stories were mentioned during the discussion. For example, Brazil has implemented domestic payment for ecosystem services initiatives in the Atlantic and Amazon forests to reward small holders for protecting lands, and success stories were highlighted in Indonesia through results-based finance for reducing deforestation from the World Bank, FCPF, the GCF, and the Government of Norway.

160. Regarding REDD+ in particular, participants identified large gaps in access to finance, capacity-building and technology support. They identified some success factors to reduce that gap to generate emission reductions and to meet technical requirements of standards for results-based payments. The importance of trust building between sources and recipients of REDD+ finance was noted to reduce burdensome requirements for meeting standards.

161. Participants also identified the failure of land carbon accounting and incentive systems (including payment for ecosystem services and REDD+) to value ecological integrity, and to provide adequate reward and recognition to countries and landowners that protected their carbon stocks, as a significant barrier to progress. Promising approaches identified to overcome these barriers included developing a carbon accounting approach for standing forests that recognizes the value of ecological integrity; adopting the UN system of environmental economic accounting endorsed by the G7; differentiating between natural forests and monoculture plantations; and establishing a network among high forest, low deforestation countries across regions to address this issue collectively.

162. Participants identified numerous successful examples and lessons learned from restoration efforts in their countries and regions. While recognizing these efforts, participants underlined the fundamental importance of conserving natural ecosystems in the first place, because restoration of carbon stocks in disturbed natural ecosystems can take long timeframes and successful results are the subject of significant uncertainties.

163. Participants noted that it is critical to incentivize and sustain good stewardship of natural ecosystems – not just to reduce destruction or prompt restoration. The lack of a systemic approach risks perverse outcomes that incentivize natural forest clearance to access finance linked to restoration. Examples were provided of agroforestry programs in Mexico that are designed to manage this risk.

164. The need to recognize and manage linkages between terrestrial and marine ecosystems was also identified. To illustrate this, an example in Suriname was highlighted where management of waste systems with high organic content has been effective in the control greenhouse gas emissions while also preventing leaching of nutrients into the adjacent marine ecosystem. It was noted that access to international finance for initiatives such as these can be challenging and that simplification of the requirements for accessing international finance would be advantageous to accelerating progress.

165. The value and importance of early engagement of local stakeholders in the design of locally appropriate restoration solutions was a repeated theme from several other examples that were shared, often using benefits other than carbon sequestration as an entry point. These included community-based mangrove restoration with women fishers in Senegal and dryland restoration with Bedouin women in Jordan which increased women’s status and livelihoods. A government program in New Zealand was also highlighted which engaged farmers and other land use actors in whole of catchment management.

166. Furthermore, many examples related to the importance of combining “top-down” and “bottom up” planning and accounting, were raised during the discussion. For example, forest restoration in the United States has invested in up-front planning with local communities with payoffs in longer term performance. Restoration of degraded wetlands requires tailoring to local needs, in addition to forest carbon accounting systems that have been designed for large-scale timber plantations, and don’t work for small-scale riparian and wetland restoration efforts. The importance of monitoring for outcomes of restoration efforts that are of interest to key stakeholders was noted, in addition to the opportunities for capturing co-benefits from restoration efforts, as the initiatives in Australia to reestablish wildlife corridors had benefits for water flow, agricultural productivity, and carbon as well as for biodiversity have illustrated.

167. Participants identified numerous successful examples and lessons learned for influencing the effects of food systems on efforts to protect terrestrial and marine carbon sinks, where are many untapped opportunities to reduce the drivers of land-use change by engaging with food systems, including shifting production systems to regenerative agriculture, reducing food loss and waste (e.g., via changes in expiry dates), diet shifts (e.g., through dietary guidelines), and public procurement.

168. At the national level, a combination of private sector support, cross sectoral and multi-level collaboration, and access to finance can combine to incentivize and support restoration efforts, as illustrated in Ghana’s program to restore degraded forest lands through cocoa agroforestry, with many non-carbon benefits. Similarly, multi-stakeholder jurisdictional scale approached can be an effective approach to removing deforestation from commodity supply chains (e.g., Produce Conserve and Include initiative in Mato Grosso, Brazil).

(d) Breakout group four

169. The facilitator, Samantha Smith welcomed the participants to the meeting and thanked the assigned expert, Moustapha Kamal Gueye, for the prompt³⁷ provided and introductory remarks. The facilitator proposed organising the breakout group discussion around two topics, as follows:

(a) What specific measures, policies, and programmes including financing can Parties and NPS implement to address the social and economic consequences of response measures in national and local contexts?

(b) How can mechanisms for consultation, social dialogue, and community engagement be strengthened to forge social consensus in the implementation of mitigation

³⁷ <https://unfccc.int/sites/default/files/resource/FinalMoustapha%20Kamal%20Gueye%20v2.pdf>.

policies and actions, taking into account equity considerations, in particular with respect to gender and diversity?

170. Participants emphasized how just transition policies can be effectively implemented through well devised plans, including financing arrangements, allocation of responsibilities for targeted actions, and assessments of progress, including ex-ante assessment and monitoring of the impact as policies are being implemented. Specific examples were provided by national governments of effective policy implementation.

171. Several national experiences exist of “managed transitions” with policy and institutional coordination. These include the EU Just Transition Platform complemented by financing with regional investment banks, coal sector transition strategies in China, and more recent policies such as the US Inflation Reduction Act incentivizing clean energy and other sectors and including measures to promote unionized employment opportunities that offset job losses in fossil fuel-based energy.

172. Participants highlighted how just transition is key to enable deeper ambitions for accelerating mitigation. Furthermore, mitigation policies can be complemented by a range of other policies such as social dialogue, education and training, economic diversification and transformation.

173. The need for sector-specific policies in energy, agriculture, fishery, extraction, and energy intensive industries was referred to. Further, it was noted that mitigation in areas such as in energy and coal mining can have much broader implications for the entire economy of a country, region, or community and thus ensuring a just transition in these areas are critical.

174. Some Parties highlighted the needs to further enhancing the existing work under the response measures forum and its KCI, including the need for a UNFCCC process to assess the impacts of mitigation policies; the need to operationalize the recommendations from the response measures and its KCI to the COP, CMP and CMA; and the need for reporting the impacts of the response measures and the just transition under the transparency process.

175. A just transition mechanism under the UNFCCC or UN – building on existing workstreams and offering capacity-building, exchange of experience and best practices and finance – was proposed as a possible way to foster international cooperation.

176. Social dialogue between trade unions, employers, and government, and consultation and stakeholder engagement with local communities, including women groups, youth, indigenous and tribal communities, are imperatives, and reflect the human right to participation and the right to free, prior, and informed consent. In this context, it was noted that countries are developing national methodologies for consultation.

177. Examples were provided of where countries have regulatory obligations for national and local consultations in the development of policies and projects. The importance of informing communities in advance, communicating in local languages, and allowing for feedback, and considering redress mechanisms to offset negative impacts were all underlined.

178. Codifying agreements resulting from national and local consultations, such as with the “national climate agreements” in Suriname, can ensure that agreements reached are not reopened when policies are being implemented.

179. There is value in going beyond consultation to aim for co-ownership, as this can significantly increase the likelihood of successful implementation. Citizen and local community ownership of energy production in Costa Rica, Chile, Germany, among other countries, were given as specific examples.

180. Participants mentioned how fostering consultation/dialogue on domestic legislation that might have transboundary effects could help prevent trade disputes, promote international cooperation, and be facilitated by an enabling framework at international level to support just transition policies.

181. Participants also discussed linkages to other issue areas and groups including energy, transport, land use, finance, trade, supply chain management, the SDGs, gender, youth, and indigenous peoples.

3. Summary of round table 2: Adaptation, including loss and damage

182. Roundtable two was convened by the co-facilitators in Plenary II: Ramses, from 12:00pm to 02:00pm on Wednesday, 9 November 2022, followed by a second meeting that was held at the same time and location on Thursday, 10 November 2022.

183. The co-facilitators welcomed participants to the roundtable, which began in a plenary setting, presented the topics for discussion in each of the four-breakout groups, and introduced the facilitators and experts assigned to each of the breakout groups (see table 2 below). They referred participants to the prompts that had been prepared prior to the session and made available on the UNFCCC website,³⁸ which provided more detailed suggestions for the topic areas that would be addressed in each of the breakout groups.

184. Experts from each breakout group presented their prompts to the participants after which, participants were invited to move into the four breakout groups, which were convened in each corner of the plenary room.

Table 2

Roundtable 2: breakout groups

<i>Breakout group</i>	<i>Topic</i>	<i>Expert</i>	<i>Facilitator</i>
1	Art 7.14 a: Recognize adaptation efforts of developing countries	Alvin Chandra	Richard Klein
2	Art 7.14 b: Enhance the implementation of adaptation action: moving from plans to implementation and increasing ambition towards transformative adaptation, taking into account barriers, challenges and opportunities	Anne Hammill	Thomas Hale
3	Art 7.14 c: Review of the adequacy and effectiveness of ongoing adaptation and support at different scales	Anand Patwardhan	Ko Barrett
4	Assessing collective progress and enhancing efforts on averting, minimizing and addressing loss and damage, moving from knowledge generation to implementation	Richard Choularton	Debra Roberts

(a) Breakout group 1

185. The discussion from breakout group one acknowledged the capacity, finance and technical challenges affecting adaptation efforts, and recognized that the GST should take into consideration the gaps, challenges, and adaptation needs of developing countries as well as the implementation efforts of developing countries using domestic resources and project development.

186. Modalities for recognizing the adaptation efforts of developing country Parties have been established by decision 11/CMA.1. Participants nonetheless reflected on additional potential avenues for such efforts to be recognized, including through case studies on adaptation lessons, lessons learned both through stories of success and failure, a metric of actions, a on locally led adaptation, Adaptation Communications, National Communications, and NDCs to communicate adaptation needs and implementation, South-South/North-South cooperation.

187. Modalities to recognize adaptation efforts should demonstrate and use the information showing adaptation efforts across multiple different levels – from local, regional, and national levels, and, where possible, provide guidance for them.

188. Further modalities include IPCC guidelines, gaps and methods, communicating through stories, compendium of storylines, regional groups and continental groups bringing people together, transboundary and cross-border examples of risks and challenges, which capture local level actions and NGO led research on adaptation. Participants also recognized

³⁸ Prompts can be found here: <https://unfccc.int/topics/global-stocktake/second-meeting-of-the-technical-dialogue-td12-of-the-first-global-stocktake>.

the value of information from the Adaptation Committee, who has a mandated role in recognizing the efforts of developing country Parties.

189. Emerging needs identified through the dialogue recognized areas of support such as methods, recognition of local adaptation (local governments, youths, women, cities, farmers) in national adaptation efforts, capturing lessons on what has and has not worked, articulating adaptation support, challenges in translating adaptation information and guidelines, and vulnerable groups such as indigenous people, women and children experiencing climate risks.

190. Critical lessons identified include the need to capture nationally driven adaptation but also locally led adaptation, such as those led by farmers, cities, youth, and women. Many highlighted that implementing adaptation requires resources and political will. Throughout the two sessions of the breakout group, participants also addressed the questions that had been made available prior to the session in the prompt.³⁹

191. Participants discussed how adaptation efforts could be more accurately captured within a framework. They noted that NDCs currently do not capture local or regional issues and that adaptation plans at the local level are not connecting with NAPs fully.

192. Scaling national adaptation plans across multiple levels was discussed as an implementation instrument. Participants noted that as a result of financial and technical constraints, many countries have not submitted NAPs, and that existing NAPs have not been validated yet.

193. Participants recognized the challenges of current methodologies around costing adaptation needs. They identified the challenges of capturing domestic efforts and accounting for adaptation efforts that countries are contributing through domestic resources and how to capture this within the UNFCCC and specifically which adaptation efforts would count towards efforts.

194. It was further noted that there is a lack of documentation and link to how domestic investments have been made and lacking guidance on a framework for how to capture local activity in national plans and reports. A Party specifically noted the difficulty in capturing domestic efforts because there are too many methodologies and a need to develop a clear methodology for identifying and costing adaptation needs and priorities that considers sub-national needs.

195. Participants noted the importance of incorporating the role of youth in the development of NAPs, particularly in developing countries that are disproportionately affected by climate change. Many stressed a need to ensure funding for adaptation is directed at local levels engaging youth.

196. Participants discussed that the GST should be taking stock of the gaps as well as the knowledge, technology, capacity-building, and finance actions to share best practices and lessons learned.

197. Participants specifically noted that sharing lessons learned, particularly from projects that did not succeed as well as projects that did succeed would support action and help to formulate best practices for success. Participants also noted that more information about how actions could be improved would also be a critical mechanism of support.

198. Participants acknowledged the need for further support for methodologies when it comes to adaptation costing, finance, capacity-building, and technology support. A question was posed regarding how the GST should assess support. Participants noted the need for capacity-building to bring priorities forward at a ministerial level and working across silos to distil priorities.

199. Participants recognized the need for data access, further data infrastructure, and an agreement on standards for data and discussed how the GST could ensure countries can share information more broadly. Some Participants highlighted the challenges in the right of access

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https://unfccc.int/sites/default/files/resource/2022_28%20Oct.%20Progress%20on%20Article%207.14_Alvin%20ChandraFinaldocx.pdf.

to information and that this was an area for further North-South and South-South cooperation. A Party recognized that there are already many reporting vehicles to address adaptation and to utilize existing frameworks rather than add additional reporting requirements since developing countries do not have the capacity to meet these requirements.

200. Several participants highlighted the challenges from a lack of funding causing difficulty in implementing projects. Countries noted that although eligible for funding, participants are unable to implement NAPs and projects due to a lack of funding or project rejection. An example given was that although there have been several exercises and funding for the design of climate action plans, there was a lack of funding to fully implement the plan itself. A donor country specifically noted that there was a need to create clearer pipelines for project- and programmatic-based approaches to support country level priorities in seeking funding.

201. Participants noted the need for further stakeholder engagement and systems in place to track data about monitoring and evaluation. They also noted the need to mainstream and coordinate with ministries to ensure that there was national responsibility for specific actions within climate action plans, including ongoing projects. Some participants specifically asked how mainstreaming could be tracked and noted the difficulty in tracking actions assigned to specific ministries and the challenges of silos to track progress.

202. In response to the second question concerning how adaptation efforts have been developed and implemented so far, participants noted that NAPs have not yet been finalized and the challenges to ensure that actions are not just reacting to current challenges, but also planning ahead for future occurrences. Participants noted the need to also look beyond local and regional levels, but also to sectoral levels.

203. Participants asked what types of methodologies were available for adaptation planning strategies and guidance on the correct adaptation approaches that should be highlighted in the GST. They also responded to the question of guidelines stating it would be helpful to include guidelines for specific stakeholder groups such as indigenous groups, women, and the youth to be properly captured.

204. Participants noted that the objectives of multilateral finance and trade entities are not aligned with the goals of the Paris Agreement. It was noted that the IMF and WTO objectives should be reviewed to address current trade rules as enforcement against unfair practices. Countries noted that existing financial rules are indebting developing countries due to currency exchanges and the need to address existing frameworks. Participants also noted there is a large discrepancy in terms of costing for adaptation and mitigation efforts and how they are supported with private sector funding.

205. Participants noted a need to strengthen data monitoring mechanisms on basic services and climate. Participants noted the need for disaggregated data, for example on age and gender. The need for capturing more local information into national reporting, such as local and community-based exercises on family and community life plans, was also noted.

206. Participants noted it is not just about including diverse groups into national plans, but also recognizing what is already being done at the sub-national and local level. This is helpful in scaling up and connecting actions. Of particular focus was the challenge to deconstruct technical terms to scale down to local levels. An example was Nigeria's initiative to develop a glossary of technical terms for climate communications so that the local people can understand and take action. This was noted as helpful in addressing the gap between NAPs and local action, but many local communities do not have the tools to assess actions taken. Therefore, COP28 could clarify how NAPs can be localized in their territory to ensure that locally led adaptation actions are included in the assessment of progress towards NAPs.

207. Participants noted the many difficulties in reporting adaptation efforts and the knowledge gap that exists. They suggested that IPCC should prepare a specific report to identify the adaptation gap and keeps working on metrics, parameters, and indicators for adaptation and on strengthening adaptation research. It was highlighted that there was a need to demonstrate adaptation not only as a local concern, but globally and the GST needs to highlight the global issues as well.

208. Participants discussed how climate modelling scenarios could be used in national adaptation plans and stressed the need for more scientific effort in these areas. To this end the GST could play a role in identifying the gaps and provide a more solid, technical basis for an adaptation discussion and a better balance between mitigation and adaptation.

209. In framing the discussion on the final question on the recognition of adaptation efforts, the facilitator suggested that the development of a national adaptation tracker could be designed to take stock of efforts that are currently taking place. Participants noted that an IPCC taskforce on adaptation tracking, like the taskforce on GHG emission inventories, could be a possible mechanism to consider. Establishing milestones for quantitative and/or qualitative targets and for global goals are important for assessing progress.

210. Participants discussed the need for a monitoring, evaluation and learning system, that takes stock of adaptation activities like finance and efforts at a local level. Noting the adaptation information already required in the UNFCCC reporting system, participants discussed whether further reporting would be needed under the enhanced transparency framework, for example for ensuring that what was planned as domestic finance for adaptation is captured.

211. In ensuing discussions participants noted the usefulness for exchanging information and providing capacity-building of a knowledge adaptation cities hub that integrates multilevel action and best practices or lessons learned. This would also support the need to highlight sub-national work and progress by local communities by translating technical information and communicate through stories from local groups and provide a better perspective on how they are adapting to climate change.

(b) Breakout group 2

212. The discussion in breakout group 2 focused on how to enhance the implementation of adaptation action and how to increase ambition towards transformative adaptation.

213. Participants discussed how to mainstream adaptation in planning, budgets, sectors and at different levels, with the engagement of different stakeholders, including public and private sectors finance opportunities. Further discussion focused on multilevel governance and broad stakeholder engagement (from subnational level, but also from indigenous peoples and local communities) as well as data collection and information sources – including monitoring and evaluation and access to information or translation of data for non-expert users. Transboundary adaptation and risks of maladaptation featured as well as the means of implementation, including finance, capacity-building and technology.

214. Elements noted to strengthen implementation for adaptation actions at local, national and international scales included:

- (a) Access to data, information tools and technology;
- (b) Constant updating of governments on the implementation of adaptation policies;
- (c) More effective identification and delivery of solutions at the sectoral level;
- (d) More effective private sector solutions.

215. Barriers to implementation identified in the discussion were:

- (a) The imbalance between means of implementation for adaptation and mitigation;
- (b) The lack of integrating of adaptation into existing national and sub-national planning processes (possibly leading to maladaptation);
- (c) The need to integrate adaptation into local existing planning processes;
- (d) The capacity required at various levels for the implementation of NAPs and associated adaptation initiatives.

216. Monitoring, evaluation and learning was highlighted as an important process in overcoming several barriers in enhancing implementation and examples of regional

initiatives were shared including on transboundary adaptation. Several participants highlighted the important role of nature and nature-based solutions or ecosystem-based adaptation, also in relation to local and indigenous knowledge.

217. As regards the NAP process, which was seen as a key process to facilitate identification of climate risks and preventing maladaptation, participants:

(a) Noted the need to align them with SDGs for better synergy as well as more coordination between nature-based solutions and adaptation policies;

(b) Also noted they are at too high level and causing large implementation gaps and the need for tighter linkages to local and regional policy making to capture community engagement and adaptation mechanisms working more accurately at all scales. Clear targets and action-plans for adaptation and key milestones are needed to define the pathways to implementation;

(c) Highlighted that the design of NAPs currently does not include transboundary risks and cross-cutting adaptation initiatives. It was acknowledged that NAPs are not the only instrument to address transboundary risks for adaptation. An example of the River Rhine Commission was provided to demonstrate that transboundary managements of risks is feasible as seen through the establishment of a committee to discuss water systems in case of severe flooding;

(d) Further noted that developing NAPs is complicated and that support for their design and implementation is essential. Participants also suggested the need to assess how multilateral institutions can better support adaptation planning and implementation;

(e) Noted that establishing adaptation goals for the various subnational governments and sectors is an effective way to enhance implementation and acts as the foundation for implementation plans.

218. Participants noted that the planning process needs to be inclusive and transformational rather than incremental. They also noted the need to develop sectoral-level solutions, which have transformative impact to build resilience. Examples included improved communication and preparedness planning to turn early warning systems into action, peer to peer learning to transfer practices across all countries and strengthening cost-benefit analysis that link the reduction of risks considering issues of just transition.

219. Participants stressed the need to foster social inclusion and the involvement of marginalized groups and youth in the implementation of adaptation actions. For example, Bangladesh's comprehensive NAP used a strong community-based approach to adaptation and Chile built a climate risk atlas at national and subnational scale and included multiple stakeholders.

220. It was noted that developing standards to guide implementation for urban areas are helpful for supporting regional capacity. For example, the AdaptBrazil platform included a catalogue of activities that can be adopted by subnational governments and the Dominican Republic conducted financial stress tests that include adapting to climate change.

221. Participants noted the need to connect regions and organizations more clearly to national level actions. Furthermore, there is a clear need to develop policies at subnational levels and include the subnational and community levels within the engagement process. To this end, some participants suggested to adopt a rights-based approach, which encompasses cross-cutting issues such as gender and indigenous communities.

222. Capacity constraints continue to be a limiting factor in scaling up resources at all levels and capacity-building needs to be scaled up, including through the LDC Adaptation Initiative. In this context, the exchange of information between subnational governments and training for local authorities on adaptation policy were noted as critical.

223. Participants focused on the implementation of adaptation policies and the modalities to receive updates from governments and non-state actors on progress. They highlighted the fact that national financing strategies are not aligned with the investor needs and noted the importance for climate finance to reach subnational levels. Participants also noted the difficulty in mobilizing private finance for adaption and the reliance on public finance and

the need for more finance to be dedicated to nature-based solutions. They noted that only a minority of countries have received funding to implement the NAPs and that further finance and support is need.

224. On governmental support, participants noted the lack of sufficient resources, that bilateral finance was the key modality to support implementation and the time lags for accessing finance through global institutions. On non-state support and inclusion, participants suggested a portfolio-level approach of adaptation action by non-state actors using resilience as a tool.

225. Participants recognized that learning, monitoring and evaluation is critical to implementation and it needs to be built-in to catalyse South-South cooperation. Participants noted the need for pilot studies demonstrating what has worked and what has not, as well as examinations of maladaptation risks and the co-benefits arising from adaptation. The example of ClimateAdapt platform was provided showcasing its compilation of case studies.

226. Participants noted that the perspectives of indigenous people are still not being adequately captured in adaptation plans and projects. For example, Nepal's work on mapping customary areas of indigenous people played a crucial role in managing resources and was seen as a good practice.

227. Early warning was noted as being needed to integrate data collection and critical for developing risk profiles underlying decision-making and the value chains to strengthen multi-stakeholder approaches and understand transboundary risks more clearly. The need to develop clear metrics to facilitate the analysis of the effectiveness of adaptation measures was also highlighted.

(c) Breakout group 3

228. In reviewing the adequacy and effectiveness of ongoing adaptation and support at different scales, participants highlighted the need to more clearly track and channel as much support as possible to local levels using a full adaptation cycle analysis.

229. Participants noted that most adaptation actions are focused on public goods, yet there is lack of sufficient public resources and grants to implement planned actions. Participants noted that the readiness program of the GCF is difficult to access, is taking too long to access finance (almost 3-4 years) and the need to have more prompt access to finance. They noted the burden of allocating resources from domestic budgets that will constrain the allocation of finance to other development issues. SIDS stressed that existing global financial mechanisms are not delivering on their needs and that existing funds do not have the resources that are needed to account for current and future damages. Participants also emphasized that resourcing should also not contribute to more debt by ensuring the use of grants and not loans.

230. Participants noted the need to look at existing vulnerability, that concessional finance is not sufficient and the need for more grant-based finance. Grants were also noted as needing to be more gender-responsive and new additional funds are needed for loss and damage to support women and minorities that are often more impacted by events.

231. Participants highlighted that to assess adequacy implies assessing the access procedures, which have different requirements for every fund, and stressed the need for common procedures for all funds. Participants suggested that having a standardized template for application to all the climate funds and guidance documents to support the application to funds would be helpful. The technical support to share across countries between public and private sectors was seen as critical. Accreditation was also noted as another issue, particularly the time it takes to become accredited. On average, it is taking almost 3 years for accreditation, but it expires after five years and there is a lack of capacity to keep up with reporting requirements.

232. Participants noted the need to look at conservation and transformation and the capacity to bring in new partners through IFIs to respond to climate risks and the need to establish a specific space in the GST to discuss whether the IFIs and finance institutes are really meeting climate goals. Participants also noted the need to increase support to achieve SDGs and more clearly link support between achieving SDGs and achieving adaptation

goals. Understanding how to de-risk adaptation was noted as a key initiative in supporting finance outcomes and the lack of data as being a critical challenge in applying to funds.

233. Participants noted that measuring effectiveness should be based on a needs-based approach with direct linkages between mitigation and adaptation. Assessing adaptation needs should incorporate local, regional, and sectoral needs as well as loss and damage followed by an assessment on the ground to identify whether things are adequate and effective.

234. Participants noted that when assessing adaptation support there is also a need to look at the technological support and the need for technology transfer given that there are currently many restrictions to gain access.

235. An emphasis was placed on assessing adequacy in adaptation based on vulnerability and the level of intervention and support that is needed to provide resilience. Adequacy should look at whether the target group under consideration is more resilient as a result of the intervention and how to assess support for those most vulnerable. Resilience should also consider how issues are interconnected and intergenerational and their compounded risk and additionality of costs. The case of Small Island Developing States (SIDS) was highlighted as populations are moving towards larger land masses and how to assess loss and damage alongside borders and sovereignty in cases of displacement.

236. Participants noted the need for more research on adaptation to assess progress in adaptation that goes from global to local levels. They noted the lack of agreed methodologies to achieve the needs. Participants highlighted the need to provide a substantive outcome from the GST on how far we have come in supporting adaptation such as institutional mechanisms to assess the gaps and understand how to move forward.

237. Participants noted the difficulty in measuring progress and how a baseline should be established. Where possible, quantitative targets and measures for adaptation should be used to assess adequacy at different levels with data support, research, and methodologies from the IPCC.

238. Participants noted that the methodology need to not only assess the risk but also the support and associated costs. Participants noted the lack of data to assess the risks and needs which ultimately indicates the level of support needed.

239. Participants noted the need to understand how to evaluate adequacy and effectiveness of support more clearly from the global perspective and the use of financial flow indicators to track and evaluate adequacy. This includes looking at the full adaptation cycle, assessing needs as well as the risks, exposure, vulnerability, and implementation.

240. Participants acknowledged the need for more enhanced monitoring and evaluation capacities in countries. They noted the lack of sufficient resources to inform climate change creating uncertainty and the need for more enhanced early warning systems to confront impacts. Monitoring and evaluation frameworks are important for not only assessing risks and needs, but also adequacy and effectiveness. A mapping process to capture the state of adaptation in countries would be helpful to track progress.

(d) Breakout group 4

241. The breakout group on loss and damage emphasized the importance of taking into account the whole spectrum of climate risks and ensuing L&D, and anticipating and undertaking efforts to avert, minimize and address them accordingly. The breakout group focused its conversation around two questions, as follows:

(a) What tangible opportunities exist to improve the capacities of vulnerable communities and countries to access technical, finance, and other necessary support and implement concrete actions to enhance comprehensive risk management to reduce and respond to loss and damage?

(b) How can planning processes and support providers better integrate the capacities, finance, and actions needed to reduce vulnerability, increase resilience, and strengthen response and recovery from climate extremes and the impacts of slow-onset events, and thereby enhance understanding, action and support, to avert, minimize and address loss and damage?

242. Participants particularly highlighted the aspects related to finance for addressing loss and damage. Gaps exist in funding for actions across the whole spectrum of loss and damage, with most notable gaps for supporting efforts around managing non-economic losses and for responding to losses associated with slow onset events. The need to ensure that countries have the capacity to effectively use the financial resources that are made available was also noted.

243. Participants noted the importance of finance as being predictable, structured, and accessible before losses or damages occur, thus enabling countries to enhance prevention and preparedness. Participants noted that access to finance is important, but also the need to ensure that countries have strong institution to manage natural disasters, contingency plans to distribute financial support to where it is needed, and social protection systems to support people to recover. Participants also noted there is need to provide support for enabling debt concessions that better integrate humanitarian and development support.

244. In addition to funding, actions such as policy changes were highlighted as important components of effective responses to loss and damage. Policy coherence and integration across policy domains – such as disaster risk reduction, adaptation, humanitarian, etc. – holds the potential to improve the effectiveness of comprehensive risk management and action on loss and damage.

245. In order to better understand loss and damage, methodologies for assessing loss and damage, as well as related guidance, are additional areas where further work can be beneficial.

246. Participants also reflected on the different understandings and definitions of loss and damage and its key dimensions, as well as the relationship between adaptation, mitigation, and loss and damage. In particular, it was noted that there is not yet a common understanding of loss and damage, with different definitions being used by different communities and institutions. Loss and damage were highlighted as an issue of the past, present, and future, with short-, medium-, and long-term needs, and with attention needed across all these time horizons.

247. The discussions also touched on themes of equity and justice, including the need for just transitions to be central to averting, minimizing, and addressing loss and damage. A whole-of-society response is imperative. Inclusion of, and support to vulnerable and marginalized communities, including women, youth, indigenous peoples, and smallholder farmers, was highlighted as foundational to effectively averting, minimizing, and addressing loss and damage. There may be a tension between the urgency and need to act quickly on the one hand, and ensuring equity, procedural justice, on the other hand.

248. Several participants emphasized that consideration of human mobility in the topic of loss and damage, including integration in international agreements for refugees and migration, is important. Related to this, considering children, including climate change-related child displacements, requires an explicit and systematic focus in discussions on loss and damage. Consideration of health, including mental health, is also key for effective action on loss and damage.

4. Summary of round table 3: Finance flows and means of implementation / climate finance and finance, technology and capacity-building support

249. Roundtable 3 was convened by the co-facilitators in room Memphis and Osiris, from 11am to 1pm on Tuesday, 8 November 2022, followed by a second meeting that was held in Plenary II: Ramses from 3pm to 5pm on Thursday, 10 November 2022.

250. The co-facilitators welcomed participants to the roundtable, presented the topics for discussion in each of the four-breakout groups, and introduced the facilitators and experts assigned to each of the breakout groups (see table 3 below). They referred participants to the prompts that had been prepared prior to the session and made available on the UNFCCC

website,⁴⁰ which provided more detailed suggestions for the topic areas that would be addressed in each of the breakout groups.

251. Experts from each breakout group presented their prompts to the participants, after which, participants were invited to move into the four breakout groups, which were convened in each corner of the plenary room.

Table 3

Roundtable three breakout groups

<i>Breakout Group</i>	<i>Topic</i>	<i>Expert</i>	<i>Facilitator</i>
1	Aligning financial flows and meeting needs for system-wide transitions to net zero emissions and transformative climate resilient development	Nick Robins	Preety Bhandari
2	Enhancing the catalytic role of international climate finance for scaling up climate action	Sandra Guzman	Josué Tanaka
3	Enabling and enhancing cooperation on innovation and technology development and transfer	Gabriel Blanco	Sara Traerup (Day 1) Kentaro Tamura (Day 2)
4	Enhancing and retaining capacities in support of Paris Agreement implementation	Ayman Cherkaoui	Sonja Klinsky

(a) Breakout group 1: Finance: Aligning financial flows and meeting needs for system-wide transitions to net zero emissions and transformative climate resilient development

252. Breakout group one was facilitated by Preety Bhandari with expert input from Nicholas Robins. The discussion highlighted several important themes for how progress towards aligning financial flows and meeting needs for system-wide transformation can be achieved.

253. Firstly, participants emphasized how finance is a means to end, and as such, an outcome focused approach to aligning financial flows is essential, requiring ambition, implementation and accountability across public and private finance. A potential desired end state would be to ensure that every financial decision is consistent with the goals of the Paris Agreement. Participants also noted the importance of recognizing the differentiation and complementarity between Article 2.1(c) and Article 9 in the context of the UNFCCC. It was noted that the discussion focused on aligning finance to achieve net zero, with relatively little attention given to the important role that alignment of financial flows can have for achieving resilience and adaptation to the impacts of climate change.

254. Participants also discussed the vital need for leadership to achieve alignment of finance with the Paris Agreement, especially from anchor institutions in the financial system. Notably, financial ministries (as well as central banks and regulators) need to be leading the process. The importance of establishing legal frameworks was also highlighted both for the implementation of national climate policy, as well as specifically for the alignment of financial flows. Participants spoke to how this leadership would set the context within which national budgets and the work of public finance institutions take place. It would also guide and provide important signals to all other components of the finance system, including commercial banks, investors, insurers, capital markets and others. Participants emphasized that efforts to drive alignment need to address both public and private finance and in so doing, build a mutually reinforcing rather than a siloed approach.

255. Participants underlined how crucial it is to ensure that aligning finance for mitigation and adaptation is people-centred. It was emphasized that just transitions are trust-building mechanisms for financial action that embed a rights-based approach (human rights, labour

⁴⁰ Prompts can be found here: <https://unfccc.int/topics/global-stocktake/second-meeting-of-the-technical-dialogue-td12-of-the-first-global-stocktake>.

rights, gender and Indigenous Peoples). The need for finance for social protection in the transition, to underpin adaptation and support loss and damage, was also noted.

256. The breakout group also engaged on how reform of the international financial architecture will be vitally important to achieving alignment. Participants noted the principles associated with this reform agenda, notably equity, nationally driven approach of the UNFCCC and Paris Agreement, consideration of local context, and vulnerability. It was also noted that addressing debt stress will be needed, including using mechanisms such as SDRs and ‘debt for climate’ and ‘debt for nature’ swaps. Beyond the financial system, alignment in the context of trade was also noted by participants.

257. Participants were of the view that it will be critically important that each country develops its own path in terms of the mixes of levers to align finance, working in cooperation internationally. Fundamental features include setting clear goals, sizing financial needs, reforming incentives and prices (including through phase out of fossil fuel subsidies, fiscal reform, carbon pricing) and deploying public finance for high impact investments, such as finance for strategic investment in infrastructure and technologies. Participants underscored a critical gap that must be addressed across all countries in building investable pipelines of projects. In this regard, one critical need is concessional public finance to enable the crowding in of private capital (i.e., blended finance).

258. Participants noted that private financial institutions are increasingly making timebound commitments, setting targets to align investments and actions with the Paris Agreement, taking action and improving disclosure. These efforts are fundamentally driven by policy goals, but also by fiduciary duty and reputational risk. Participants underscored that climate and ESG efforts should not unintentionally penalize developing countries, where most investment is needed. Transparency on targets and delivery needs to be strengthened, with clear guardrails, which can be aided by science-based taxonomies as well as credible transition plans (including timebound short-, medium- and long-term targets, as well just transition principles).

259. Regarding the outcomes of the GST1, participants stated that it can send important signals to Parties and NPS, particularly to ensure that there is clear national ownership for delivering commitments to aligning financial flows with the Paris Agreement, and to highlight and encourage the required leadership role that finance ministries and central banks can and need to play.

260. Participants also envisage an outcome of the GST in underscoring the need to put in place arrangements for making progress and for transparently tracking the progress towards the alignment of financial flows with the Paris Agreement, as well as the recognition that there is an important requirement for capacity-building across the financial system to deliver alignment. The work of the SCF was highlighted in this regard. It was also noted that the GST should highlight where there are key misalignments between financial flows and the Paris Agreement so these can be addressed. Furthermore, participants expressed the view that the GST has an important role to play in highlighting the need to boost efforts to align finance for adaptation, as well as loss and damage.

(b) Breakout group 2: Finance: Enhancing the catalytic role of international climate finance for scaling up climate action

261. Breakout group two was facilitated by Josué Tanaka with expert input from Sandra Guzman. The assigned rapporteur for the group was John Henry Melo (Colombia). The breakout group acknowledged the prompts prepared for the meeting and the question highlighted which included:

- (a) What has to happen for developing countries to determine their needs and priorities?
- (b) How can these needs be translated into clear investment plans and bankable projects?
- (c) What approaches can better connect countries’ needs with financial resources?

(d) How do we continue to work toward a balance of financial support between mitigation and adaptation in practice, taking into account differences across sectors, regions, and over time?

(e) How can climate finance be most effective at catalysing just transitions across systems?

262. The need to scale up finance was universally agreed among participants, and participants acknowledged that finance has a central role in catalyzing just transitions in meeting the goals of the Paris Agreement. It was also clear that there is a significant gap between expressed needs for climate finance and available financial flows. Participants highlighted the extensive work that has been undertaken within the UNFCCC process and by Parties and NPS to identify and assess adaptation and mitigation actions and the needs of developing countries as well as the costs and benefits associated with climate action. Participants highlighted the reports of the SCF,⁴¹ and other constituted bodies of the Convention, in this regard.

263. While there was a view that assessment of needs has so far been inadequate or lacking in sufficient depth, there was also a view that the most pressing priority is in identifying and accessing specific sources finance. Participants identified significant barriers that are experienced by developing countries in accessing finance and the systemic need for capacity-building to support access and implementation. Participants highlighted that the capacity-building support is one significant solution to addressing barriers to developing a pipeline of bankable projects. Participants also highlighted various processes and reports under the Convention that inform the GST in relation to assessing the adequacy of support provided, including the periodic review and relevant reports of the SCF.⁴²

264. Participants underlined the fundamental importance of assessing adaptation needs as well as the costs associated with adaptation. They also emphasized how challenging it can be to structure bankable adaptation projects and how clear guidance and methodologies are required. It was suggested that the GST should address this challenge.

265. Participants noted that tailoring the specific types of financing to adaptation projects is very important. Participants from developing countries highlighted how grant-based financing is usually required for adaptation projects and how loans are affecting the economies of developing countries. They highlighted how costs of adaptation as well as loss and damage in developing countries can be a large fraction of GDP.

266. Participants also highlighted how important it is to involve the private sector when planning and executing NAPs and NDCs.

267. Participants identified gaps in financing that require attention in certain regions and key sectors (e.g., agriculture) as well as priorities that have been identified by local communities, indigenous peoples, as well as gender-based approaches to climate action.

268. It was also noted that only 36 NAPs had been developed and participants registered the need for support and collaboration to significantly increase the proportion of countries with these plans in place.

269. As adaptation finance is relatively new (physical climate risk assessment was provided as an example), frameworks are still being built to underpin financing. The costs associated with adaptation are also often not well understood.

⁴¹ See the first report on the needs of developing country Parties related to implementing the Convention and the Paris Agreement. Available at https://unfccc.int/sites/default/files/resource/54307_2%20-%20UNFCCC%20First%20NDR%20technical%20report%20-%20web%20%28004%29.pdf

⁴² See the Fifth Biennial Assessment and Overview of Climate Finance Flows. Available at <https://unfccc.int/topics/climate-finance/resources/biennial-assessment-and-overview-of-climate-finance-flows> and the report on progress towards achieving the goal of mobilizing jointly USD 100 billion per year to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation. Available at https://unfccc.int/sites/default/files/resource/cp2022_inf02.pdf.

270. Participants called upon developed countries meet the pledges that have been made to double their financial support to adaptation. The need for the effort in tackling adaptation to be the same as that for mitigation was also highlighted, including levels of financing. And participants also highlighted how the impact on biodiversity needs to be considered when taking adaptation measures.

271. There were also calls for developed countries to fulfill their obligations for support to developing countries, including the USD 100 billion goal. Some participants underlined that the GST should include considerations for the implementation of pre-2020 commitments. There were also calls to increase transparency in funding provided by developed countries, while also continuing to increase the effectiveness of funds allocated, simplify procedures, and speed up disbursement.

272. There were calls from participants for the founding principles and objectives of multilateral financing and trade organizations to be reviewed and modified in accordance with Article 2.1 of the Paris Agreement. It was also suggested that multilateral financing institutions begin a program of national debt swaps for action in mitigation and adaptation in developing countries.

273. There were also important barriers and solutions identified in relation to improving data quality and availability and in improving communication between stakeholders and actors in financing adaptation and mitigation action.

(c) Breakout Group 3: Technology: Enabling and enhancing cooperation on innovation and technology development and transfer

274. Sara Traerup facilitated the first meeting of the breakout group on technology, and Kentaro Tamura facilitated the second day, with expert input from Gabriel Blanco. The assigned rapporteur for the group was Sibusiso Mazomba. The breakout group used the prompts prepared for the meeting and the question highlighted to organize their discussions:

(a) What kind of actions/activities in innovation and technology development/transfer should be supported through international cooperation that can effectively contribute to strengthen national system of innovation, technology (research and) development and technology transfer, taking into account national and local circumstances?

(b) What are the enablers, innovative approaches and support needed to accelerate the uptake of existing and boosting new technologies (including endogenous technologies and indigenous practices), in adaptation and mitigation?

275. Actions/activities in innovation and technology development/transfer highlighted by participants included the importance of stakeholder engagement from all levels of society. The need to engage locally active actors was emphasised including academia, private sector, local government, civil society, gender, indigenous and youth. The discussion further underlined importance of engaging and empowering stakeholders at an early stage in the process of developing technology development and transfer initiatives to address climate change. It was suggested by participants to better use regional climate weeks and NAP EXPOs to bring stakeholders together to enhance international cooperation.

276. Participants underlined that a systems approach is required, instead of narrow isolated interventions that have limited impact and provided examples, including from the UNFCCC Technology Mechanism's new joint work programme, which applies a systems approach, such a national system of innovation and digitalization on which both the TEC and CTCN will work.

277. Participants also emphasised the need for international cooperation across the whole technology cycle, from research to commercialization and mass market deployment. They recommended a stronger interface between technology providers and specialized organizations. Several participants also highlighted that the Technology Mechanism can facilitate international cooperation through already existing venues, such as the UNFCCC regional climate weeks and other similar forums where technology stakeholders can gather to exchange good practices and initiate partnerships.

278. Integration across finance, technology and capacity-building practitioners, including within the UNFCCC process was also suggested as a means to achieve stronger overall outcomes for climate action. The need for coordination was identified and potential synergies were highlighted. Participants noted that the Financial Mechanism is central to achieving integration and greater effectiveness.

279. Long term strategies and planning, both at central and local levels, were also considered essential for supporting innovation and technology development and transfer. Investment over longer time horizons was raised as an important solution. Examples of technology accelerators & incubators were raised that lack provision of stable funding.

280. Finally, the importance of supporting countries, including SIDS and LDCs, in identifying technology needs and implementing these priority technologies was emphasized by several participants. These technologies need to be context specific. In addition, it would strengthen the technology needs assessment process if there is a clear venue for implementing the prioritised technologies through a funding plan or investment programme.

281. Participants identified a range of enablers, innovative approaches and support technology deployment, including:

(a) Institutional strengthening through investments in capacity-building, as well as regional institutions, including regional finance mechanisms;

(b) Pricing carbon emissions to address market failures and to manage the risks associated with technology deployment and ensure that technological change is sustainable. Participants also highlighted the power of fintech, i.e. financial technology which embeds finance in every technological solution;

(c) Capacity-building and stronger education systems, which are fundamental underpinnings of endogenous technological capabilities. Funding RD&D as well as the implementation of enabling policies for technology development and transfer were also highlighted by participants. It is also noted that a consistent and sustained focus on specific technologies and priorities, which are aligned with national/regional circumstances and priorities is a strategy for success. The necessity of coordination of and cooperation among national actors in technological development was also underlined;

(d) Ownership, particularly for local and indigenous applications, is an essential enabler for success. Participants shared examples illustrating how technology ownership determines success, as in the case of technology adoption in agriculture among indigenous groups;

(e) Private sector involvement in technology initiatives is of critical importance, yet a partnership approach is necessary, and public private partnerships have proved to be a key enabler as technologies require strategic support and collaboration between both private and public sectors;

(f) Digital technologies are also important enablers and governance frameworks and safeguards are required to facilitate their application to help accelerate deployment of technologies for mitigation and adaptation;

(g) Sharing knowledge and data on technology development and transfer is an important enabler and inclusive mechanisms are needed for reliable data exchange, building on existing digital platforms. Various modalities for sharing and promotion of lessons learned and successful experiences with technology transfer and cooperation are also important.

(d) Breakout Group 4: Capacity-building: Enhancing and retaining capacities in support of Paris Agreement implementation

282. Breakout group four was facilitated by Sonja Klinsky with expert input from Ayman Cherkaoui. The facilitator reminded the breakout group of the prompt that had been prepared prior to the meeting and the questions contained in the prompt were used to structure the conversation, namely:

(a) What are the most effective modalities for building and retaining capacities at national level, i.e. the role of peer to peer learning, North-South-South cooperation, communities of practice, etc.;

(b) How to enhance country ownership in the definition of capacity needs and gaps and in determining priorities for support, particularly as regards new and/or emerging needs coming out of the Paris Agreement, for example the ETF, Article 6, LT-LEDS etc. How to strengthen the role of national institutions, for example, academia and research institutions, as providers of capacity-building in a more permanent and sustained manner and how international support can assist in this?

(c) How to improve the coordination and coherence amongst support providers to maximize the effectiveness of capacity-building interventions. How can the effectiveness of capacity-building support be monitored and used to inform more impactful outcomes?

283. In response to the first question on effective modalities, participants converged on the importance of focusing on systemic approaches that can connect local- to national-level actions. Participants highlighted:

(a) Supporting the building and strengthening of institutional level capacity is a key strategy for moving to more systemic capacity-building and retention. This entails a shift away from individually focused training towards ensuring longevity and robustness of institutions;

(b) Focusing on the capacities of local governments, NGOs and civil society groups as key nodes that can connect communities and bottom-up experiences to national level priorities and funding mechanisms. In this regard, capacity-building should be tailored to specific circumstances and target specific needs at different levels;

(c) Locally based engagement processes that are rooted in local languages, actions and experiences that can be connected to each other and to local and national programs. One example used was the making of climate information accessible to local communities in their local languages;

(d) Mandate-driven systemic capacity-building whereby government policy and legislation stimulates and promotes capacity-building at national, sub national and local levels.

284. The importance of investing in foundational capacities that create the conditions for all other capacity-building efforts was also underlined by participants. Identified key foundational capacities included:

(a) Basic education opportunities and access to education, noting that many people remain excluded due to limited educational opportunities. Incorporating climate change in school curriculum, as well as in adult education opportunities was highlighted;

(b) Taking a long-term and systemic view of capacity development, for instance looking at education as a continuum: as a basic right resulting in universal access, ranging through to the development of strong doctoral programs (e.g., utilizing fellowship programs), talent development programs (to help with capacity retention), mentorships, and lifelong learning opportunities;

(c) Adequate salary/incentives to retain people, noting high turnover rates that results from non-attractive salaries in the government sector;

(d) Funding models that work on a long-term basis with multiple impact areas, are country owned and promote regional corporation;

(e) Institutional designs that consider future uncertainties and build institutional resilience.

285. In considering the second question, especially country-owned and identified capacity-building needs for climate action, participants were of the view that mapping systemic capacity needs can be useful in identifying how to prioritize and direct efforts. Key ideas emerging from efforts to do this included:

(a) Leveraging the private sector as a source of data about where the capacity gaps are as they often know what is missing in implementation efforts;

(b) Taking a longitudinal view that includes looking for example at tools and resources (human and financial) needed to ensure development of capacity over time (e.g., roster of experts, leaders/champions and collaboration platforms);

(c) Linking universities with other entities in society and ensuring that research is tied to action so that it can address local capacity-building needs. The need to increased collaborations between universities and policy makers was also highlighted.

286. On the aspect of the second question concerning strengthen the role of national institutions participants identified the need to:

(a) Establish and strengthen communication mechanisms to facilitate uptake of research outcomes by policy makers;

(b) Enhance data collection and processing systems (at appropriate levels of disaggregation) so that different groups in society (e.g., across age, gender, ethnicity) can be recognized and considered with targeted capacity-building opportunities;

(c) Secure and maintain long-term funding for research strategies that enhance capacity;

(d) Establish frameworks that will better connect educational facilities with industry so that there is a better utilization and matching of graduates with relevant opportunities.

287. Finally, in discussing the third question on how to improve the coordination and coherence among support providers to maximize the effectiveness of capacity-building, participants highlighted:

(a) Designing monitoring and evaluation systems around learning with clear indicators to help measure capacity-building (e.g., the number of green jobs created, or how many people have been able to take climate action);

(b) Better use of the PCCB in a more pragmatic way to build and track capacity, and the effectiveness of support;

(c) Strengthen cooperative approaches at the grassroots level;

(d) Complement regular capacity-building support efforts by incorporating more actively, modalities such as north-south-south cooperation and peer to peer learning amongst countries in a regional context. This needs to be anchored with a strong focus on national and local ownership as regards the identification of capacity needs and gaps and the design of the most effective interventions addressing those needs;

(e) Improved communication amongst support providers and with recipients on designing interventions to avoid duplication and maximize impact. This includes greater cooperation on defining clearer effectiveness of support indicators.

C. Summary of the focused exchanges

1. First meeting: pathways towards low GHG emissions and climate-resilient development

288. The first meeting of the focused exchanges was facilitated by the CFs, where four panel members delivered introductory remarks followed by an interactive discussion among Parties, observer organizations and other NPS.

289. The panellists comprised Debra Roberts, Co-chair of the IPCC WGII; Jim Skea, Co--chair of the IPCC WGIII; Henri Waisman, Senior researcher at IDDRI and lead author on the IPCC special report on 1.5 °C ; and Racquel Moses, CEO at the Caribbean Climate-Smart Accelerator.

290. Mr. Roberts emphasized the importance of understanding the intersections between different agendas required to achieve transformative change, and to kickstart transformative action. Key system transitions are regarded as a prerequisite to transformative change. Roberts highlighted the following key points:

- (a) Climate resilient development can only be achieved through ambitious reduction of GHGs and enhanced adaptation, undertaken in a way that contributes to sustainable development;
- (b) Equity and justice are core to achieving climate resilient development;
- (c) Integrated development planning can be used to enhance adaptive capacity and reduce emissions;
- (d) Climate resilient development requires a whole of society response and needs to engage all spheres of government;
- (e) Urbanization provides an opportunity to advance climate-resilient development when the following issues are considered:
 - (i) Equitable adaptation and mitigation in development planning;
 - (ii) Partnerships with local, private sector, civil society and informal sector.

291. In making his introductory remarks to the focused exchange discussions, the second panellist, Jim Skea, highlighted the need for interaction between adaptation and mitigation, underlining that it is not meaningful to divide between adaptation and mitigation and between mitigation co-benefits from adaptation actions. Mr. Skea reminded participants of the many options available in all sectors at reasonable costs and presented the following main points on pathways towards low GHG emissions and climate-resilient development:

- (a) Even without considering co-benefits, global benefits of mitigation outweigh mitigation costs. Benefits include distributional benefits and avoidance of catastrophic costs;
- (b) There is a need for high-level interaction or collaboration between IPCC WGII and WGIII;
- (c) Mitigation actions should include forest management, agroforestry, urban systems, spatial planning, etc.;
- (d) Response options combining both adaptation and mitigation do not fall under one ministry and require multilevel decision making including local governments.

292. In his remarks on pathways towards low GHG emissions and climate-resilient development, Henri Waisman reiterated that climate actions should be country driven, country-led and country owned, and that national pathways can be extremely helpful in determining national conditions. He pointed out the need to contextualize transformations to consider specific transformations needed for specific national circumstances, whereby pathways can inform how these transformations can effectively happen inside the countries. Mr. Waisman highlighted on the following areas:

- (a) Pathways can identify under which conditions they can be compatible with the country's socio-economic actions;
- (b) Policy actions can maximize the synergies between climate actions;
- (c) Transitions cannot happen without coordination between actors to reach climate goals and objectives;
- (d) Pathway will depend on how they are seen as a process to involve a different set of stakeholders or actors to serve as an exploration tool for the different set of actors;
- (e) International discussion on pathways will deliver the benefits if used as a tool for facilitating action;
- (f) Pathways can provide the elements critical to guide the international technical dialogue.

293. In providing her initial comments to the focused exchange discussions, Racquel Moses remarked that increased momentum for action is required and highlighted that Caribbean states are keen to be a voice at the table and a source of new conversations.

294. Following the introductory remarks by the four panellists, participants expressed the need for creating holistic and integrated decarbonization plans in enabling pathways towards low GHG emissions and climate-resilient development. A Party recommended implementation of decarbonization plans to build carbon resilience. A Non-Party participant suggested decarbonizing should be based on synergies with both adaptation and mitigation without focusing on decarbonization alone. Key points on decarbonization made by Party and Non-Party participants included:

(a) Enhancing engagement of multiple stakeholders in the development of NDCs and all decarbonization and financing plans;

(b) Integration of the developing countries in decarbonization actions through providing them with enabling technologies;

(c) Intensifying mitigation by implementing Article 6 of the Paris Agreement and decarbonization to reduce emissions in developing countries using initiatives, such as Joint Carbon Mechanism;

(d) Identifying different sectors and corresponding roles in climate policies and communicating them in NDCs.

295. Some Parties cited examples of low carbon pathways strategies they have implemented. A Party mentioned mainstreaming low carbon pathways into national planning, setting an economy wide target of net-zero by 2050 and back casting to set targets and actions for all sectors. Another Party expressed that effective low carbon development strategy helps create jobs, reduce pollution and provide other socio-economic benefits.

296. A Non-Party representative, representing 210 million members in 165 countries, highlighted that solutions that are still business-as-usual need systems transformation to be more effective, with a just transition based on human rights, right to work, etc. Such transitions must specifically define what the private sector needs to do and encompass financial actors in public policy development.

297. Participants emphasized on the need to get different actors around the table including private sector and financial actors, for social dialogue between different actors. Remarks were made on barriers for subnational entities to engage with national governments and international community pathways towards low GHG emissions and climate-resilient development. The following recommendations were made:

(a) Increase momentum to for subnational entities to participate in dialogues on climate-resilient development dialogues;

(b) Create spaces for subnational governments to share their experiences by telling their stories of success and failures (Talanoa dialogue) and to propose solutions;

(c) Organize dialogues at a regional level such as the annual climate summit in MENA to develop actions and policies to address the various needs of countries;

(d) Provide a platform for citizens assembly for people that want action on climate change;

(e) Climate policy to be comprehensive supported by strong societal engagement;

(f) Share technology, knowhow and lessons between countries, particularly developed and developing countries;

(g) Institute reformational action with full and active participation of indigenous peoples, and ensure traditional knowledge is one of the basic elements in the transition.

298. A Party remarked on the importance of creating synergies between GHG reduction and climate resilient development and extending adaptation planning from national to regional levels while integrating it into national planning. Another Party noted the developmental challenges to implementing low-emission development strategies and that

pathways should be informed by the SDGs. Public private partnerships in promoting adaptation and technology transfer in developing countries are crucial to address weather-related disasters.

299. A Party noted that mitigation and adaptation actions should be linked, which should be enabled by redirecting financial flows. Another Party remarked that in most cases pathways towards low GHG are mostly mitigation centric and putting mitigation and adaptation together will add burden on countries that bear adaptation burdens. The Party made the following points:

- (a) Adaptation finance falls short, and finance is largely for mitigation;
- (b) Historical pathways have eliminated some adaptation pathways and, in this context, equity and fairness and the principle of CBRD are an important element;
- (c) High vulnerability population makes climate resilient development challenging;
- (d) Retrofitting in high-carbon societies needs to be the focus of mitigation and adaptation should be the focus in vulnerable societies.

300. A Non-Party representative remarked that the cost of actions and inaction cannot be discussed in isolation without costs of damages and co-benefits. Cost of climate change impacts are higher than mitigation in most conservative estimates. Cutting emissions to 2 °C warming reduces the level and buys time for adaptation. Inter-generational equity is an important consideration because the future impacts will fall on youth. In addition, the Non-Party representative made the following points:

- (a) Ecosystem services are critical to climate resilient development. For example, SIDS have mangroves that can help adapt but their ecosystem services will be severely jeopardized in the case of rapid climate change;
- (b) There is a need for additional support for marine research and conservation.

301. Participants noted the importance of regulatory direction and governance on pathways towards low GHG emissions and climate-resilient development, for example, aligning NDCs and LT-LEDS. The right enabling environment should be implemented by developing a national framework based on science and justice to make the transition fair and reduce poverty. The following key points were made:

- (a) Recognize that local and national frameworks developed in the global north cannot deliver on just transition in the global south;
- (b) Climate policies should have a strong societal engagement involving a diverse range of stakeholders including youth, indigenous people, private sector and non-state actors;
- (c) Prove the business case for new technologies, properly responding to starting points and addressing real world challenges (e.g., electric vehicles);
- (d) Transition should build on lessons learnt and only with investment implementation plans that incorporated socioeconomic perspective and needs and are consistent with science and IPCC reports;
- (e) Equitable and regionally relevant transitions need to address the cost of solutions;
- (f) Just transition requires support from international community including grant-based finance;
- (g) Real low emission pathways solutions need to be promoted and not those promoting non-equitable solutions;
- (h) Just transition will take a long time, and system change is needed to address issues including gender inequalities;
- (i) Avoid false solutions, in that aspect some mentioned geo-engineering;
- (j) Incorporate local and indigenous solutions;

(k) Recognize fundamental transformation of society and lifestyle changes are inevitable under the backdrop of multiple benefits of transitioning to climate-resilient development.

2. Second meeting: Focused exchange on international cooperation on holistic and integrated approaches

302. The second meeting of the focused exchanges was also facilitated by the co-facilitators, and was attended by Party delegates, observer organizations and other NPS. They invited the panellists to deliver brief remarks to set the context for the discussions.

303. The panellists comprised Chizuru Aoki, a lead environmental specialist from the GEF; Navroz Dubash from the Centre for Policy Research; Manuel Pulgar-Vidal, World Wide Fund for Nature; Lindsey Cook, representative, Human Impacts of Climate Change, UN Quebec Offices; and Rachel Kyte, from Tufts University.

304. In her opening remarks, Chizuru explained that the GEF supports countries on issues including climate change, biodiversity, land issues, chemical waste and how they manifest global concerns on food security, water security, as well as rising sea levels. The GEF looks at how to support countries on climate change and other environmental issues in a holistic and integrated way and has finalized the GEF 8 replenishment, which started on 1 July 2022. Implementation of the replenishment manifested that countries have a lot of flexibilities and opportunities in an integrated systematic way, as opposed to working on climate adaptation and mitigation in silos. GEF supports systemic inventions such as:

(a) Looking at food security issues from land use to climate adaptation and mitigation perspectives;

(b) Looking at urbanization through sustainable cities initiatives bringing together different levels and sectors;

(c) Biodiversity and nature conservation.

305. Ms. Chizuru noted that not every tone of carbon mitigated is similar across the globe, as some certain areas have irreplaceable carbon, and some areas with important biodiversity value, such as the Amazon, Congo, North America, Madagascar, Himalaya and other regions, hence to look at interventions that will have also have mitigation benefits as well as protecting biodiversity, and how international community gather together to provide support with the integration of local and indigenous communities that are custodians of the vital reserves.

306. In his opening remarks, Navroz Dubash, the second panellist speaker, explained he focused on the “decarbonization while developing and facing adaptation” challenge that developing countries faced, compounded by loss and damage problems. He remarked that developing countries are in a big development shift, including urbanization, demographic transition, job creation, etc. From a climate equity perspective, decarbonization needs to come first. It is possible to look for synergies between development and mitigation, but not necessarily in a way that prioritize decarbonization.

307. Navroz Dubash acknowledged that every country is different, and as such packing multiple transitions on top of each other we need to take four lessons learned:

(a) Capacity and knowledge: whereby, often the knowledge that goes to developing countries often is contested, coming from countries that do not face similar challenges, and consultants that do not have a deep understanding of the local challenges. Starting point is then how to structure international cooperation around capacity in a way that begins with the ability of developing countries to envision their own future development path. Space must be provided, including modelling analysis and development policies rather than pre-packaged solutions;

(b) Transitioning to renewable energy: whereby, given that developing countries are starting from a low energy base, fossil fuel can be used given its greatest welfare impact. Transitioning to renewable energy cannot be instantaneously for developing countries;

(c) Institutions and governments: whereby there is a need to coordinate across multiple sectors because these issues cover multiple sectors. Consensus is a challenge, as

well as managing a just transition. Usually ministries of environments are used, but they may not have the broadness of scope or heftiness to address all the coordination challenges and manage a just transition on their own. There should be some degree of reporting on institutional development as part of climate change reporting framework as it is an important enabling condition;

(d) Financing: whereby, in addition to adequacy and predictability for development transitions, control of the finance is a salient issue. Public financing should not crowd out private financing, since having flexible finance arrangements that developing countries can control as public finance is important for them to steer their own progress.

308. In his panellist remarks, Manuel Pulgar-Vidal reminded participants that the discussion was on how to promote international cooperation for holistic ambitions rather than fragmented scenarios. In his intervention, Mr. Pulgar-Vidar highlighted the following:

(a) Fragmentation in timing: most of the NDCs were set for 2020 and 2021, just before COP 26, which took a decision on enhancing, within 2022, NDCs by developing long-term strategies on mitigation work programme, also discussed at COP27. The Covid crisis created difficulties, including inflation and economic problems, and later an energy crisis. This necessitates integration of timing and updates to goals that we need to attain in the mitigation work programme, coupled with strengthened international cooperation;

(b) We are not on track: both the emission reduction and adaptation gap reports indicate we are not where we should have been. In adaptation, there is a gap between needs and available resources, the cost of needs being ten times the available resources;

(c) Credibility gap: need to strengthen the credibility of the climate change process for a clear and well-defined net-zero strategy, including mechanisms that can secure high quality interventions, and probably net-zero regulations to restore credibility;

(d) Fragmentation in accepting the IPCC WGIII report: emissions are growing mostly in cities and IPCC recommends strengthening the work of subnational governments. We need to promote holistic international cooperation to raise ambition;

(e) Fragmentation between short- and long-term strategy development: some countries have not developed long-term strategies. Glasgow decisions included an encouragement to include short- and long-term strategies in the NDCs and unfortunately this is not happening. It is difficult to increase ambitions if long-terms strategies are not aligned with the NDCs. The GST process should encourage Parties to define and refer to long-term mitigation strategies in their NDCs;

(f) Fragmentation in relation to finance: the current USD100 billion pledge and the discussions on the new collective quantitative goal. Parties have not fulfilled the first pledge, and there are no conditions for discussing the new collective quantitative goal. Parties have to strengthen their work on this.

309. In starting her remarks, Ms. Lindsay Cook explained her understanding that holistic and integrated refers to approaches, which address the root causes driving climate change while also helping heal related planetary crises, including existential rates of species extinction, chemical pollution, soil erosion, and ocean acidification; and prioritize people and protection of nature, over profit and power interests.

310. Ms. Cook explained that research has shown a ‘human rights-based approach’ results in more coherent, legitimate, and sustainable policy, as applied in different areas, including the AR6 with Human-rights based approaches, known as ‘rights-based approaches’ that encompass human rights, including the rights of Indigenous Peoples. Such approaches imbed meaningful public participation in decision making, access to information, and education; gender equality; just transition; protection of biodiversity; intergenerational equity and child rights; and cooperation as a human rights obligation.

311. Ms. Cook reflected on holistic, and integrated approaches that can dramatically scale up climate action but need greater international cooperation that the GST engagement can signal. She pointed out on the need for GST to emphasize the importance of truthful engagement with people about what is happening, why it is happening, and how they can help, with a focus on the following areas:

(a) Article 12 of the Paris Agreement on climate change education;

(b) Truthful engagement, for example, in high consumption in high emitting countries, because 10 per cent of households with the highest per capita emissions contribute up to 45 per cent of emission;

(c) Truthful engagement on diet whereby 1/5th of GHG emissions is linked to human diets, yet scientific findings on meat and dairy, the unsustainable production/consumption of which drives land degradation and species extinctions, are usually suppressed in intergovernmental negotiations.

312. Expounding on the GST process, Ms. Cook narrated that the GST could highlight how sustainable and just economic systems, and sustainable agriculture transitions, are essential for a stable climate and environment:

(a) Both the AR5 and AR6 identify economic growth as the top driver of CO₂ emissions;

(b) The Paris Agreement calls for sustainable lifestyles and sustainable patterns of consumption and production, with developed country Parties taking the lead;

(c) The GST can integrate the IPCC definition of sustainable land management and signal the need to include ‘environmental cost’ in the definition of ‘cost’;

(d) The GST can break down silos and signal international cooperation to support accountability movements – the rights of nature, ecocide, ecological rights of children, a Fossil Fuel Non-Proliferation Treaty, an International Court of Justice advisory opinion on human rights obligations in the context of climate action and dropping ‘limited’ from ‘limited liability’.

313. In her presentation. Ms. Cook elaborated on the need for the GST1/TD process to stress the effectiveness of community-based, bottom-up climate action, including examples of positive regulation to promote decentralized renewable energy ownership that has massive holistic and integrated benefits, including peacebuilding, citing the following examples:

(a) Positive – regulation in Germany, where impoverished people can own solar panels through the right to a state development bank loan, and the right to sell energy at a subsidized rate that directly repays the loan, leading to individual ownership and a helpful income;

(b) Negative – in England (not Scotland or Wales), community-led sustainable energy groups struggle to get permission to build a community on-shore wind turbine;

(c) Worldwide – most solar panel ownership remains accessible only to the middle to upper class households.

314. Ms. Cook emphasized that the GST must keep focused on emissions reduction at source, lest we miss the brief window to influence our children’s chances and their right to a liveable and sustainable planet. She remarked that mankind now recognizes dangerous climate change is happening, but because many root causes offer lucrative financial profits, climate action is lagging. The safer IPCC temperature pathways reflect rapid reduction of fossil fuels, yet disturbingly fossil fuels, the main driver of climate change, are still being re-framed as okay and rely on carbon off-sets. Despite IPCC warnings that land can shift from sink to source, geo-engineering technologies are promoted, rather than general mitigation. Geo-engineering technologies, like carbon capture storage that is not yet available to scale, are energy-intensive, expensive, emissions inefficient and pass challenges of limited storage, leakage, and delayed action onto our children. The GST can emphasize how real human security is a liveable and sustainable planet. Ms. Cook pointed out that:

(a) Humans currently spend over 2 trillion every year on military expenditure, explained as ‘security’;

(b) The GST process can signal the urgent need for proper rules in reporting military and conflict-related emissions, both under the Paris Agreement and in national inventory guidelines under the IPCC;

(c) The GST process can highlight how climate finance can be raised through shifting military funding away from weapons that kill people, and toward climate action and loss and damage.

315. On climate finance issues, Ms. Cook explained that the GST process can signal the critical need for grants rather than loans in a world facing a sovereign debt crisis, including other critical areas as listed below:

(a) To signal how debt relief could benefit holistic and integrated policies in countries crippled by debt repayments intensified by COVID 19;

(b) To raise climate finance through polluter pays taxation, such as taxing fossil fuels at extraction, international aviation, and financial transactions – creating revenue for integrated action, support to vulnerable communities, and loss and damage;

(c) To signal the critical role of international cooperation to regulate banks' investment in fossil fuel infrastructure, and to shift billions out of fossil fuel subsidies and into climate action;

(d) To embrace the language of responsibility – we are liberated when stop denying and stop avoiding. Historically responsible, extraction wealthy countries, can do so much more.

316. In concluding her presentation, Ms. Cook stressed the need for the GST to signal international cooperation to stop the arrest and killing of environmental defenders, our prophets, because silencing them is silencing our future.

317. In her presentation, the fifth panellist, Rachel Kyte of Tufts University, explained that financial reforms are needed to achieve our climate goals. The inequalities in the economies need to be addressed with more emphasis on a clean planet, peace, and ethical use of technology. We have a crisis of waste and pollution and climate, and we are struggling to meet the basic needs for people around the world, especially for developing countries. COVID and climate have created an unsustainable inequality. Crisis of peace, proliferation, bioterrorism and of global economy. Further, she stated that:

(a) There is a galvanization in the financial sector to enhance a clean transition that is undergoing though not yet very visible. For public finance, there is a need for taxation beyond labour but also the pollution of waste. There is a need to rethink how taxation is undertaken. Public finance should foster actions to undertake climate action at scale;

(b) There is a process to increase subsidization of climate action and involvement of private financial institutions to enhance net zero and there is a need to connect these economies. The global stake take should highlight how the public sector should take more risks, how prices don't reflect our values, why the market economies cannot get the pricing signals right and defining to multiple stakeholders what is net zero for integrated and holistic climate ambitions and actions.

318. Ms. Kyte further explained that the global system is beginning to move, with an understanding that we must change and adapt, we cannot just keep going. There is a massive movement in the financial sector, the first order of business. In public finance we can see what we tax, what is the revenue source for a transition. We do not have taxation that focuses on pollution and waste, only labour. We can do the following:

(a) Making finance flows consistent with lowering Greenhouse Gases and more resilient to climate change, since we have processes for transparency and reporting as well as carbon markets;

(b) Making market finance more risk-free. How do crises affect our values? We need to look at system reforms – we need them to achieve our goals;

319. Following the introductory presentations by the four panellists, participants highlighted the essence of working using an integrated and holistic approach for climate action.

320. On the objectives and effectiveness of the GST, Parties recommended giving the process more attention by enhancing involvement of observer organizations and adding more

actors and offering them spaces for their interventions to strengthen implementation through the engagement of multiple organizations. Other recommendation on this item included the following:

(a) Developing reliable indicators to implement actions to achieve the Paris Agreement. These indicators should cover equity, emissions, and loss and damage, among others, and this can be done at the next COP in Dubai;

(b) Enhancing sector-based stock take approaches when designing programs and activities to enhance adaptation and mitigation actions but also to increase political will;

(c) Reflecting from a linear economy to a circular economy such that emissions are avoided and retained in every sector for transport, energy, manufacturing, and the construction sector among others with the various development actors. There is a need to integrate a circular economy transition into policies that would make the private sector accelerate its actions to address climate change;

(d) Reaching out to various stakeholders such as international banks to establish a holistic approach through policies with the different regional governments. This enables the region to push for their actions to address climate actions and the working together of different ministries, for example, those in the environment, natural resources, and finances among others. Human rights should be brought in all the implementation actions.

321. On enhancing engagement of multiple stakeholders in the development of decarbonization and financing plans, a Party recommended the strengthening and building climate finance initiatives to increase funds for climate action. The Party remarked that plans for enhanced transparency, technology transfer and capacity-building should be commensurate with increased funding for climate action. Other comments on decarbonization initiatives and financing made Party delegates and NPS included the following:

(a) Increasing investment in developing countries for them to raise ambitions for their climate pathways for both adaptation and mitigation;

(b) Recognizing that international cooperation is linked to trade and finance and has been positive in several ways, for example in technology transfer and banning of polluting products. However, it has also become a barrier to international trade where developed countries are importing polluting products from developed countries;

(c) Increasing systematic reform of finance banks in the green transition and address risk aversion in investing in developing countries, prioritize debt solutions, and lower the cost of borrowing money as multilateral financing has unsustainable for most of the poor countries;

(d) Tackling the debt crisis through a climate-focused debt suspension or restructuring to enhance the loss and damage actions. There should also be an increase in policy-based guarantees, non-debt alternatives, and options that don't require sovereign guarantees;

(e) Amending the global climate systems to reflect the true cost of climate change in developing countries;

(f) Eliminating fossil fuel subsidies through international cooperation;

(g) Provisioning for public subsidies to be invested in the green transition as opposed to the dirty one and the participation of fossil fuel companies in the UNFCCC processes should be assessed to minimize the conflict of interests;

(h) Enabling and facilitating for climate action in developing countries, developed countries should internationally cooperate for trade, financing, supply chain, and manufacturing to strengthen the global economic and social ground.

322. On moving toward a net zero ambition, Parties, observers and other NPS advocated for increasing investments in actions that are clearly stated and proven by the IPCC to be green and minimize distrust of the international community in failure to meet their climate commitments. A Party recommended that rather than developed countries promoting their

technologies and private sectors interests for economic reasons, proven technologies and practices that have a local perspective and are easily replicable in the different economies should be given priority. Other recommendations on moving to net-zero ambition through international cooperation on holistic and integrated approaches included the following:

(a) Consideration of opportunities for regional, transnational cooperation to broaden stock takes for cities across the world and consider various NAPs, climate justice, and their plans to net zero, which will in turn inform the various UNFCCC processes;

(b) Putting the most vulnerable as a benchmark for the path to net-zero to foster actions to increase resilience and adaptation which results in a broader action to address climate change as opposed to benchmarks in the developed nations which might increase the inequality gap;

(c) Increase more discussion on loss and damage to look at what humanitarian organizations must do, where the gaps are, and what should be done to increase finances to address these challenges;

(d) Strengthening structures to enhance capacity-building and local knowledge sharing to foster climate actions;

(e) Making provisions for a fair share of what amount of carbon should be cut with different methodologies but there should be a specific criterion with clear marks of what each country must undertake in both adaptation and mitigation not to leave any country aside;

(f) Increasing human rights integration in climate actions especially the rights of indigenous and local communities;

(g) Adopting and promoting the transition of the transport and urban development sector such as electric vehicles in various cities for developing and developed countries;

(h) Making provisions for energy crisis among developing countries and avoiding cut-off of fossil fuels to enable enough time for the green transition gap;

(i) Making sure of the long-term climate perspective shifts the paradigm of social economic development to a resilient net-zero society that respects intergenerational equity and includes indigenous peoples, women, and young people;

(j) Establishing net-zero and resilient policies within the various national policies and activities;

(k) Assessing the taxation of fossil fuels and understanding their impact, especially between countries that are still highly dependent on fossil fuels and the developed countries which have diversified their energy.

323. Participants highlighted the need for increased capacity-building to developing countries as an important facet of international cooperation on holistic and integrated approaches. One Party commented that developing countries should be supported in capacity-building to develop inventories for their greenhouse emissions to enhance transparency and setting of measurable climate targets. Other comments on capacity-building included the following:

(a) Enhancing capacity-building initiatives in the international corporation, e.g., funding initiatives for developing countries to turn NDCs from standard documents to national policies and plans;

(b) Enhancing equity through capacity-building for countries to implement their agenda, especially the energy needs and adaptation measures. There is a need for enhances technical and scientific research on climate action and its transfer to developing countries;

(c) Building capacity through international climate knowledge-sharing hubs to increase agricultural output with lesser emissions.

324. Participants made several crosscutting remarks on international cooperation on holistic and integrated approaches. These included enhancing green transition through technologies with international rules on how to efficiently enhance climate action. A Party commented that transboundary water management is still needed to minimize pollution and

link water usage to both adaptation and mitigation, and hence need for cross-sector cooperation for managing water and energy for the long term. Other cross-cutting comments brought up included the following:

(a) Making decisions that are people-centric and build the capacities of the people by empowering them to take their own climate decisions;

(b) Creating platforms that offer equal opportunities for various stakeholders to raise their voices including the most vulnerable communities beyond the ultra-technologies and these technologies should also be assessed for their contribution to the communities and economies;

(c) There should be respect for human rights and ensure meaningful representation of indigenous peoples, youth, women, and children;

(d) Recognizing children's rights in the implementation of climate action since climate change has a high impact on the vulnerable including children;

(e) The climate action implementations should integrate the local knowledge from the indigenous and local communities. This integration should ensure that there are safeguards for indigenous peoples, their meaningful engagement, and the respect of their land tenure as some of these developments are implemented on their lands. The indigenous people should be taken as partners;

(f) Long-term strategies should be implemented across all sectors, and adaptation should be integrated at all levels as was noted in Glasgow at COP 26;

(g) Creating a formal international stakeholder panel that captures inputs from all the observers' constituencies along with a contribution from the various global partners and climate champions. This enables sharing of data, knowledge, and experiences to guide climate action;

(h) Agriculture is part of the solution to address the climate crisis. With accurate data and science, agriculture can decarbonize the economy and ensure proper land usage and promote sustainable food systems and avoid high trade-off with habitats and biodiversity, land degradation, and increased carbon emissions;

(i) Building systems that incentivize the transition to green sustainable food systems other than penalizing them is essential, including creating and maintaining strong international markets for sequestering carbon on the land and improving biodiversity and sustainability through place-based data and matrix;

(j) Equity should be talked about in tangible terms as a component to enhance safe and greener economies. The difference in the emissions produced by the developed countries for their development should be put into consideration as they are at different levels of development in technologies which is not the case with developing countries that don't have these technologies and financial resources to adopt them.

D. Summary of the world café

325. As elaborated in the information note for the session, the world café setting was expanded at TD1.2 to include a total of 20 topic stations, building on the success of this setting at TD1.1. In this facilitated setting, relevant experts, Parties, constituted bodies, observer organizations and other NPS discussed specific issues in dynamic, interactive exchanges across all thematic areas of the GST/TD.

326. Twelve stations followed a similar format as at TD1.1, with four stations each covering issues related to mitigation, including response measures, adaptation including loss and damage, and means of implementation and support. Eight additional tables related to system transformations (energy, transport, industry, agriculture, health, land, water, and urban) provided a space for dynamic, interactive exchanges on specific implementation opportunities and challenges in each of these systems and sectors in an integrated manner. The topics and the expert facilitators for each topic station can be found in table 4.

327. At the beginning of each world café topic station, the facilitator provided a brief introduction to the topic and emphasized the aim of the discussion, which was sharing ideas, forging greater understanding and connections between participants, and identifying creative approaches to address gaps and barriers.

Table 4

Overview of topics and expert facilitators of the world café tables

World Café tables	Expert Facilitators
Mitigation, including response measures	
1 Urgency to move from incremental to transformational change in order to reduce global GHG emissions around 43% below 2019 levels by 2030, around 60% by 2035 and 84% by 2050 as outlined in the IPCC AR6	Deborah Ramalope
2 Early signs of transformation and key mitigation actions to accelerate it, including avoiding new fossil fuel intensive infrastructure, preparing to enable the transition by further advancing zero carbon technologies, market structures and planning for a just transition, and applying the zero-emission technology and behavioural changes to sustain reductions to zero across systems	Kelly Levin John Kilani
3 Concrete action to be taken by national and subnational governments, institutions facilitating international co-operation, businesses financial institutions and citizens to accelerate transformation towards net zero CO ₂ or GHG emissions	Natalie Unterstell
4 How do we develop creative and imaginative approaches to impacts of response measures, building on discussions at TD1.1?	Lebogang Mulaisi
Adaptation, including loss and damage	
5 How can adaptation needs of countries be better addressed: innovative tools/support, including finance, technology, enabling environment, across different scales to move away from incremental to transformational adaptation?	Anne Hammill
6 How can support be given for EWS at local, national, regional and global scales? How do we use scientific advances in attribution of climate change impacts, in taking regional and local action?	Anthony Rea
7 Methodological gaps: how to assess adequacy and effectiveness of adaptation action and support, how to assess and address transboundary, cascading and compounding risks and impacts, across multiple scales?	Marcia Toledo
8 Technical assistance for averting, minimizing and addressing loss and damage: How to build across efforts on disaster response, longer-term recovery and sustainable development?	Animesh Kumar
Means of implementation and support	
9 How to shift existing financial flows and trends	Sonia Dunlop
10 Supporting deployment of solutions at scale: What can we learn from experience of supporting mitigation and adaptation	Juan Hoffmaister
11 Technology and innovation cooperation: Tools, actors and systems	Rasmus Valanko
12 Capacity-building: How to enhance and retain institutional capacities at the national level (exchange of experiences and lessons learned)	George Manful
Systems transformations	
13 How do we transform energy systems?	Christophe McGlade Youba Sokona
14 How do we transform land systems?	Frances Seymour Pasang Dolma Sherpa

World Café tables	Expert Facilitators
15 How do we transform transport systems?	Peter Newman Nguyen Minh Quang
16 How do we transform water systems?	Vidhisha Samarasekara
17 How do we transform industrial systems?	Lydia Elewa Maosheng Duan
18 How do we transform agricultural systems?	Martial Bernoux
19 How do we transform urban and key infrastructure systems?	Siir Kilkis
20 How do we transform health systems?	Jess Beagley Naeema Al-Gasseer

1. Summary of the world café

Station 1: Urgency to move from incremental to transformational change in order to reduce global GHG emissions around 43% below 2019 levels by 2030, around 60% by 2035 and 84% by 2050 as outlined in the IPCC AR6

328. At station 1, participants stressed the need to align long and short-term targets. Sectoral analyses were also highlighted as an essential underpinning for ambitious NDCs and the value of developing sectoral roadmaps and investment plans was raised by several Parties. The development of sectoral benchmarks was mentioned as useful means for tracking progress. Furthermore, mitigation potential analysis was highlighted as important way to inform implementation plans.

329. Participants in station 1 also discussed the sustainable development benefits and/or co-benefits of long-term transformative climate action. Experiences were shared of how legislation for long term emission reduction efforts can be important in enabling co-benefits, such as poverty eradication. The need to assess sustainable development benefits was also raised, to ensure that development plans and climate plans are aligned and to secure the buy-in from sectors when co-benefits are presented.

330. Participants identified the need for a platform for knowledge exchange and information sharing to support more effective learning across jurisdictions. It was also highlighted how incentives need to be provided for information sharing. International cooperation and partnerships were also highlighted as important, such as just energy transition partnerships accompanied by transition plans and financing. The power of building global alliances on specific issues was also highlighted as were other forms of partnerships, for example, dialogue with academia, companies, public policy makers on specific opportunities such as green hydrogen. The central role of policy was also underlined, with various examples provided, as well as incentive mechanisms for first movers and accelerating rates of adoption, such as well-designed subsidies and policies that can drive demand for solar solutions.

331. Several participants also highlighted the need to formalize emissions reductions targets of NPS, and to track the commitments made by the private sector. It was also suggested that a guidance document for national governments on good practices in setting targets and tracking progress of NPS would be helpful.

332. Equity was highlighted as vitally important in international cooperation, and it was suggested that the GST process develop a fair share methodology and criteria to allocate the global carbon budget. The need to take into consideration common but differentiated responsibilities and respective capabilities between developed and developing countries was also underlined.

Station 2: Early signs of transformation and key mitigation actions to accelerate it, including avoiding new fossil fuel intensive infrastructure, preparing to enable the transition by further advancing zero carbon technologies, market structures and planning for a just transition, and applying the zero-emission technology and behavioural changes to sustain reductions to zero across systems

333. The conversation focused primarily on early signs of transformational change for mitigation, as well as critical conditions that can enable change, including:

(a) Exogenous change: crises can create unforeseen windows of opportunity for transformational change. For example, one participant noted that the energy crisis in Europe is changing people's perceptions about the long-term costs and benefits of solar panels, such that it increases adoption of the technologies and supporting the transition to clean energy;

(b) New technologies, practices and approaches: several participants emphasized the important role that new zero- or low-carbon technologies (e.g., green hydrogen, sustainable aviation fuels, zero-emission fuels for maritime shipping, and solar and wind power) can play in catalysing the transformational changes required to mitigate climate change, particularly across the hard-to-abate sectors;

(c) Regulations and incentives: it was noted that Governments can play a critical role in enabling transformational change, for example, by de-risking private sector investments, investing in complementary and necessary infrastructure, and creating regulatory certainty;

(d) Leadership from key change agents: leadership on establishing public-private partnerships, as well as partnerships among companies, was noted by several participants as a critical enabling condition for change. Similarly, participants also emphasized the critical role that individual leaders played in sparking change in specific sectors;

(e) Behaviour change and social norms: the importance of shifting behaviours, social norms, and values was emphasized as a key condition for change across many different sectors.

334. The important role of institutions as drivers for change was also highlighted by participants. Several participants emphasized that it is critical to ensure participatory, inclusive decision-making process where those impacted by transformational changes have a voice in decision-making processes. They also noted the importance of ensuring that benefits are equitably shared among those impacted and that the costs of these transitions are reduced (e.g., the importance of re-training programs and creation of new job opportunities for those in impacted industries). Another participant noted the importance of reforming multilateral development banks, as some of their policies inhibit change.

335. Participants highlighted many examples of transformational change that are emerging in the systems discussed in other world café tables, including power, buildings, industry, transport, and food. Several participants noted the importance of being clear-eyed about "false solutions," referring to carbon capture and storage. With regard to the role of the GST in accelerating systemwide transformations, a participant suggested that it could provide example enabling actions that countries can draw from to support implementation.

Station 3: Concrete action to be taken by national and subnational governments, institutions facilitating international co-operation, businesses financial institutions and citizens to accelerate transformation towards net zero emissions

336. The world café discussion on mitigation at station 3 focused on concrete action to be taken by national and subnational governments, institutions facilitating international co-operation, businesses financial institutions and citizens to accelerate transformation towards net zero emissions.

337. To stimulate conversation, the expert recalled findings from the IPCC WG III, noting that there has been considerable expansion of laws addressing mitigation at national and subnational governments, currently covering 53 per cent of global emissions. She emphasized that national and subnational policies have led to the effective reduction, removal and avoidance of emissions, in many countries. She also recalled that the aggregated impact

and potential of NPS in climate action is significant, including through demand-side mitigation and the role of individuals, particularly those with high socioeconomic status.

338. Several participants emphasized the need for policy signals that stimulate rapid shifts by both private and public sectors and provide more certainty for investors. Some participants referred to sectoral commitments and plans as means to shape expectations, including by one noting the Glasgow methane and forests declarations as examples. A few participants noted that long-term strategies and NDCs aligned with 1.5C scenarios are critical to set a shared direction of travel and to build confidence around a rapid transition to net zero emissions. It was noted that rolling back on mitigation targets, including through NDCs, offers a signal contrary to the Paris Agreement.

339. Some participants referred to the 'ambition loop' as an important reference for building Paris-aligned policies at national and subnational levels. The proper monitoring and evaluation of these policies over time was mentioned as an important mechanism for increased action by a few participants. Building trust and credibility around NPS action was also mentioned.

340. Participants discussed various policy tools yet to be scaled up at national and subnational levels, including public procurement, carbon pricing, mandatory disclosure of climate risk by financial institutions, taxes, subsidies, public data transparency, and others. Participants supported the provision of incentives for the private sector to accelerate the transition, including by some noting the role of mandatory disclosure of climate-related information. A few participants mentioned that voluntary approaches are insufficient to speed up NPS action.

341. Several participants emphasized that climate concerns need to be integrated in all legislative pillars, including budget processes. One participant mentioned that integration should encompass the whole of government, so that all ministers become climate ministers.

342. Participants noted that building societal support is critical for accelerating the implementation of mitigation policies and to aim for more ambitious NDCs. Specific examples of multi stakeholder governance arrangements were provided, including just transition commissions and public dialogue processes in Spain, Ireland, Scotland and South Africa.

343. On the issue of budget, participants highlighted securing resources to finance transitions, phasing down fossil fuel subsidies as well as taxation of fossil fuels as important means to make financial flows compatible with the Paris Agreement goals. Building societal support for getting these policies approved was highlighted as an essential enabler, with a few citing recent examples of nations that were able to secure budgets for climate action. Many participants highlighted the phase out of fossil fuel subsidies as a critical measure, with one noting the need to ensure proper tracking of this process. One participant noted that many developing countries are constrained by high debt and suggested that debt cancellation could free fiscal space for enhanced climate action.

344. Some participants noted that the NDCs should be converted into investment plans, with a few providing concrete examples of how international cooperation is supporting modelling and financing efforts to that end. One participant shared an example of how de-risking tools and capacity-building initiatives are enabling the implementation of NDC targets in Colombia. A few participants mentioned integration of human rights as a powerful instrument to accelerate action. Gender-responsive approaches were also cited.

345. The role of citizens was emphasized, both in terms of creating concrete solutions, like the example of citizen-led energy cooperatives in Europe, and in demanding changes in infrastructure. One participant noted the importance of creating appropriate channels for citizens' contributions. The role of civil society was also emphasized, including in supporting both business and financial institutions to build climate-related capacity.

Station 4: How do we develop creative and imaginative approaches to impacts of response measures, building on discussions at TD1.1?

346. This station focused on creative and imaginative approaches to impacts of response measures. Some participants emphasised institutional responses, referring to the KCE and

the need for an implementation body or mechanism on just transitions that focuses on global and national level policies.

347. Participants highlighted the importance of taking inclusive approaches to response measures and just transition planning, including the need to address both informal and formal workers in the just transition, the need to address all sectors of the economy and not just the energy sector, the importance of giving balanced attention to both genders and to youth.

348. Participants underlined the importance of a sound basis for just transition planning and how detailed analysis of sectors should be undertaken to ensure effective implementation of the strategies. They also underlined the importance of the provision of information on where financing for just transition initiatives could be accessed at the regional and global level. A participant suggested the creation of dedicated funding arrangements for just transitions, while it was also highlighted that the arrangements for supporting just transitions and mitigation should not be separated.

349. Some participants elaborated ideas for partnerships between governments and NPS to support just transition planning and implementation. Others highlighted the critical importance of transparency in social dialogues and stakeholder consultations on just transition planning and mechanisms. It was noted that tangible and practical assessments are required to understand the impact of response measures policies on the ground.

2. Adaptation, including loss and damage

Station 5: How can adaptation needs of countries be better addressed: innovative tools/support, including finance, technology, enabling environment, across different scales to move away from incremental to transformational adaptation?

350. The participants at this station focused their attention on how adaptation needs can be better addressed. Participants addressed adaptation pathways and the assessment of adaptation needs. Views and experiences were shared on the challenges faced, including which tools and methods are suitable in different situations and the need for clearer guidance for practitioners. It was suggested that mapping different methods to different levels of governance would be useful. It was also noted how important it is to clearly define the boundaries of system in assessing needs.

351. Participants highlighted the need to enhance cooperation and partnership between actors at multiple levels as a way of better addressing needs and harnessing knowledge and capability. Also, participants discussed how communications strategies can be used to frame adaptation in different ways for different actors to mobilise and secure support and action. Similarly, participants identified opportunities for translating and localizing climate information as a means of engagement and support, which often requires the use of local languages and the need for capacity-building in climate literacy, while at the same time offering benefits in tapping into local climate knowledge.

Station 6: How can support be given for early warning systems at local, national, regional and global scales? How do we use scientific advances in attribution of climate change impacts, in taking regional and local action?

352. At this station, participants discussed the support needed for EWS at various scales. Above all, it is essential to have EWS early in the planning process instead of as an afterthought, so that people and communities are prepared for extreme weather events and secured with early action plans.

353. The design of EWS should be people-centred and inclusive. Some aspects to consider include identifying the vulnerable population within the scope, receivers of the EWS information, and current gaps in the EWS provision. Social variables and social vulnerability markers should be included, as well as strong coordination between different sectors (a “co-production” of knowledge), to increase interactions across social groups. Assessment and feedback mechanisms should be incorporated into the EWS to provide actionable plans and improve effectiveness. Finally, participants share successful examples of EWS that have decreased mortality rates from extreme weather events.

354. A solid EWS needs support from comprehensive and robust data at every scale. Easily accessible and interpretable data should be in place before planning, including models and forecasts that forecast short-term weather events and long-term climate conditions at different scales. However, it is important to consider technical capabilities and language barriers when using the data. Skills in models and forecasts tend to drop off quickly over time; therefore, improving both the resolution and accuracy of predictions can enhance the prediction capacity of EWS. Other datasets are also encouraged to add in addition to weather, including pests, health/disease, etc.

355. Moreover, financial and technical support is needed to implement EWS. Financing for disaster management is required to predict costly damage in advance; in the long run, funding should shift from disaster response to preparedness. Existing financing mechanisms include, but are not limited to, SOFF and CREWS. Investment in communication systems, such as loudspeakers, radios, and computers, will also help deliver the message effectively and efficiently to the people and communities. Developing countries and regions especially called for sustained financial support and long-term capacity-building, including skills training, to improve information systems and infrastructures to build better EWS.

356. On a local level, participants suggest an “end-to-end” approach to better support people and communities due to the local impact of extreme weather events. Creating an EWS at a local level that involves people and community in the decision-making process is necessary for community mobilization and participation. Leaders who implement EWS should have the best interest of the people and focus on increasing awareness and communicating solutions and actions effectively to the general public. Scaling up, EWS also must be part of the broader risk management on a national scale, potentially incorporated into the regulatory frameworks. Other areas of climate adaptation should be considered and included in EWS. Platforms for international collaboration, such as multi-country disaster response plans, are strongly encouraged.

357. The second question for station 6 discusses how scientific advances in attributing climate change impacts should occur in regional and local actions.

358. Regarding attribution science, participants explain the positive feedback of climate change and the difference between weather extremes and normal variability. Since some disasters are more related to human development, adequate preparations can significantly decrease the impact of climate change. One key challenge is disentangling causes from effects. Participants pointed out that conversations and actions should focus more on impacts than causes; additionally, attribution studies underpin the relevance to loss and damage and global stocktake, which needs to be supported by resilience building and EWS.

359. Additionally, science communication should not be kept within scientists, but between scientists, the public, and policymakers. Methodologies of data usage should be more mainstream by expanding data availability to the community and democratizing the process of interpretation. Integrating traditional knowledge and empirical experiences can help fill the information gap and advance scientific research. Expanding communication channels through social media can also facilitate information exchange, especially for the early warning system. Scientists and decision-makers should also have more dialogues on knowledge generation.

360. Challenges still need to be addressed in the technical and financial aspects of data collection and usage. Developing countries in the Global South face particular shortages of historical observations, reliable climate models, science education, and skills training. One solution is to digitize observations and keep records, but more financial and technical investments are needed.

Station 7: Methodological gaps: how to assess adequacy and effectiveness of adaptation action and support, how to assess and address transboundary, cascading and compounding risks and impacts, across multiple scales?

361. The facilitator, Marcia Toledo, initiated discussions, presenting participants with the following questions to guide their discussions:

- (a) What criteria should be used in assessing adequacy and effectiveness of adaptation and resilience-building actions?
- (b) How should this assessment incorporate the range of possible future climate scenarios?
- (c) How should transboundary, cascading and compounding risks and impacts be considered in assessing adaptation and the planning of resilience actions?
- (d) How to assess drivers and capabilities (financial, information, technological) that may support effective and adequate adaptation and resilience building?
- (e) What methodological challenges with data requirements should be considered in making these assessments at different scales and in different sectors?

362. On criteria to be used in assessing adequacy and effectiveness of adaptation and resilience-building actions and how such assessment incorporates the range of possible future climate scenarios, participants noted that adequacy means making sure actions taken are a good fit, address national needs, are localized and people-centric approaches are used in their implementation. Participants highlighted the need for understanding where there are evidence gaps, and what action orientated research would be needed to address adequacy. Participants underlined several other highlights on assessing adequacy and effectiveness while considering future scenarios, including the following:

- (a) Actions that are scaled, staged, and include timeframe of implementation because IPCC has shown that adaptation practices are beneficial until certain temperature increases;
- (b) Qualitative and quantitative criteria need to be incorporated while recognizing that not everything can be measured, even if it can be counted;
- (c) Community engagement is critical in determining need, adequacy, and effectiveness of actions. Being gender responsive and sensitive to human rights will ensure that actions taken do not read to negative costs and maladaptation and take into consideration trade-offs where necessary. This will also entail being clear on how to quantify, assess and measure those needs;
- (d) Holistic integration of actions that brings together humans and nature using programmatic approaches in sectors or systems, for long-term transformation based on the best available science;
- (e) Actions that are evidence-based, capturing of local knowledge, effectively address current and projected needs and have room for expansion of mitigation ambition;
- (f) Effectiveness should include timeliness, predictability and availability of support for implementation of the actions, and such support should create more debt for developing countries;
- (g) Assessment of adequacy and effectiveness of adaptation and resilience-building actions should reinforce M&E systems and be systematically sustainable.

363. Participants noted that climate change has transboundary, cascading and compounding risks and impacts, and this should be considered in planning of assessing adaptation and resilience actions. It was noted that effective communication and clear and relatable messaging are necessary to avoid mass anxiety and give assurance of human security. Participants underlined the use of SDGs, which already exist, and these can be linked to adaptation where there are synergies. The discussion highlighted mainstreaming the business and other entrepreneurs and their need to adopt and involve them in the process. Participants cautioned against communication that is paternalistic, but rather empower communities for solutions and ambition.

364. On how to assess drivers and capabilities (financial, information, technological) that may support effective and adequate adaptation and resilience building, participants emphasized on the need for effective national and regional programmes for training, education, awareness raising, tailored to the needs of the audience. It was underlined that implementation of such programmes needs to first determine the outcome, then build up

outputs that are systematic and have intervention logic and define the metrics. Use of planning tools, usually NAP, is important.

365. Participants discussed solutions to be considered and addressed when dealing with methodological challenges with data requirements in assessing adequacy and effectiveness of adaptation and resilience-building actions. The need to work under the GGA work programme was highlighted, with a focus on knowledge and needs, followed by identification of finance sources. It was acknowledged that there is no one strategy for adaptation for all as highlighted by the IPCC, but rather an understanding that we are looking at the methodologies at the bottom level for the ordinary person.

Station 8: Technical assistance for averting, minimizing and addressing loss and damage: How to build across efforts on disaster response, longer-term recovery and sustainable development?

366. This station was focused on loss and damage, in particular technical assistance and how to build across efforts on disaster response, longer-term recovery and sustainable development. Participants emphasized that while continuing to enhance mitigation ambition, the world needs to prepare for a world where losses and damages will continue to increase. Participants outlined the following needs and recommendations for the GST to avert, minimize and address losses and damages:

(a) There is a clear need to move from a mode of event-centric reactive responses to prevention-centric resilience building. This requires better understanding of future risk scenarios and projections and effectiveness in translating and communicating these understandings into potential impacts, especially at the local level. It is understood that failure to anticipate adaptation actions result in losses and damages;

(b) Averting, minimizing, and addressing losses and damages requires a multi-sector effort spread across climate change adaptation, disaster risk reduction and humanitarian actions. Common bases for coherent implementation exist, ranging from ecosystem-based approaches to early warning systems, besides social protection and risk insurance;

(c) Countries need an integrated policy and regulatory basis for implementation through comprehensive risk management that synergizes different policy and regulatory instruments. Developing countries need technical assistance in strengthening their policy and regulatory environment;

(d) While the issue of losses and damages evolved from a political discussion to a technical one, a more thorough understanding of its concepts and practices is needed. Participants expressed the view that the GST can make a major contribution by facilitating the estimates of losses and damages as a key parameter to judge the level of success of mitigation and adaptation measures. This would provide an ‘outcome level’ metric for climate action, which in turn needs investment in the evidence base/data on losses and damages. It was suggested that countries report on their losses and damages as part of their NDCs;

(e) The siloed institutional mechanisms often impede coherent implementation. People and communities need to be kept at the forefront and centre of discourses. This requires employing intersectional and human rights-based approaches;

(f) Despite high appreciation of the value of averting and minimizing losses and damages, or prevention and preparedness, funding in these ex-ante measures remains low. Climate financing for prevention and preparedness should be enhanced as key adaptation measures. It should be ensured that such funding is well-targeted through better investments in social protection and long-term resilience building.

3. Means of implementation and support

Station 9: How to shift existing financial flows and trends

367. Participants at station 9 focused on how to shift financial flows and trends. Throughout the discussion, participants identified specific policy options and recommended approaches

and measures that could be taken towards achieving the Paris Agreement. The expert facilitator summarised the discussion at the end of the world café by highlighting several aspects that were recurrent.

368. Firstly, participants highlighted just transitions as an approach to addressing political economy challenges of the transition and the real-economy impact of shifting away from emissions-intensive financing, as well as the particularly the concerns of developing countries in this regard. There was a discussion amongst participants on a suggestion that the GST may recommend just transition partnerships for every developing country between now and 2030. It was suggested that prior to replication at scale, best practices be distilled, and learnings derived from the experiences within jurisdictions where just transition partnership approaches are being trialled.

369. The importance of principles of equity, and the nationally driven, bottom-up approach was underlined throughout the discussion. Participants also highlighted the various principles of the Convention and the Paris Agreement.

370. There was also extensive discussion on implementing Article 2.1(c) of the Paris Agreement and that there is no one-size fits all approach for its implementation. It was also noted that the inadequacy of data and financial market information hampers evidence on Article 2.1(c), and that this affects understand of the baseline, progress, and of what can be achieved. The importance of enabling environments was highlighted for the achievement of Article 2.1(c), including through changes to policy frameworks. It was also suggested that a global mechanism may be useful for assessing progress on climate finance and multilateral institutions and finance institutions. It was noted that most activity within the financial system regarding Article 2.1(c) was occurring in Europe and North America and there was a need to facilitate efforts more proactively in other regions.

371. The critical importance of addressing mis-aligned financial flows was also emphasized by participants, including strategic divestment or transition away from harmful flows and the application of the ‘do no significant harm’ principle, as well as the need to address subsidies and policies that underpin mis-aligned flows. The need to proactively address the implications of declining fossil fuel revenues was also mentioned.

372. The importance of addressing the cost of market entry for investors in developing countries and small markets were mentioned, as well as need to increase geographic representation and inclusiveness of the financial system (capital market centres in North America, Europe, Asia) and various measures were suggested. The central role that multilateral development banks and development finance institutions need to play was underscored for mobilizing private finance, and the need for financial structuring such as first-loss tranches and securitization.

373. The wide range of potential policies and measures discussed were acknowledged including green bonds, sustainability linked instruments, carbon pricing, measures that address energy efficiency, the important role of taxonomies, and specific measures that target adaptation and loss and damage, including debt-for adaptation swaps. Debt sustainability concerns of developing countries were highlighted by several participants. Financing strategies for cities and municipalities were also discussed as an important lever for bottom-up approaches in the transformation. The need to create more direct financing channels for local actors was mentioned both in relation to mitigation and adaptation, as well as the need to facilitate building of pipelines of investable projects and initiatives.

374. There was also a call within the discussion for systemic thinking what to finance and how to use finance in the most efficient way as possible. For example, some highlighted the need to avoid and address maladaptation or climate extremes and need for coping policies and mechanisms, while others pointed to the strategic importance of climate-negative investments. Furthermore, participants highlighted the need for greater direct access and other local level financial access schemes. The potential for fintech to scale-up access to finance was underlined, as were financial solutions for scaling-up access to finance for green solutions (e.g., financing for small-scale solar kits in rural areas).

375. Participants also highlighted the role of finance roadmaps and investment plans as well as the importance of costing of national climate plans. It was noted that the UNFCCC

needs-based assessment is a useful step forward there is a need to build on that and for a more systematic and systemic approach. Participants mentioned the need for human rights-based, principles-based approaches, including those that are geared to achieve people-orientated financing.

376. In general, it was noted by participants how the GST can provide value through its signalling function, but also by outlining best practices, measures and policies that should be taken to achieve progress. In this regard, it was notable that climate resilience and adaptation did not receive adequate attention during the world café discussion, with the focus of participants being on decarbonization aspects, and it was suggested that this imbalance be highlighted and addressed.

Station 10: Supporting deployment of solutions at scale: what can we learn from experience of supporting mitigation and adaptation?

377. The facilitator, Juan Hoffmaister, initiated discussions by asking participants to consider solutions and scale of mitigation and adaptation measures and activities.

378. Taking the GCF as an example in considering perspectives of both solutions and scale, the group started the conversation by defining “scale”. Participants emphasized that the concept of scale was multidimensional and multi-contextual. Two critical features of “scalability” included size and replication – the capabilities to scale up relevant institutions and replicate small projects with best-practice interventions. It is important to match mitigation and adaptation actions to the right perspectives of scalability. Like the GCF, many MDBs provided the overall infrastructure of supporting projects to scale up, but the other dimension of replicating smaller-sized projects should also be considered. Participants provided the following reflections on scale attributes, these should:

- (a) Be linked to sustainability of mitigation or adaptation interventions;
- (b) Include both horizontal and vertical perspectives, the width and depth of interventions;
- (c) Be inward looking in enabling transformation;
- (d) Not be a barrier to prioritization and SDGs;
- (e) Include innovation and propagation elements;
- (f) Not be exclusive to only large finances;
- (g) Not be a perverse incentive or red tape of collaborations;
- (h) Not create exclusion of certain categories of stakeholders, including women, private sector, academia, etc.

379. Participants emphasized that scale of needs in mitigation and adaptation actions should be more than a resource but integrated at the planning level. In this case, understanding the right scaling of TNAs and NAPs becomes critical in making sure the right adaptation and mitigation measures are implemented and risks of undertaking no action is not limited to big actors. The key challenge remained was the lack of resources to support planning-level scalability.

380. On reaching the right level of scale, participants came up with the following points:

- (a) Sharing best practices, experiences, and knowledge;
- (b) Developing sector specific, principle-based objectives (e.g., rights, etc.);
- (c) Striving for just transition that is scale driven with local context at both country and local level ownership;
- (d) Incapsulating inclusivity of finance so that all possible sources of finance are considered.

381. Participants discussed the scale context of GCF projects and underlined the need to scale-up participation of accredited entities in the development of projects, as being facilitative for meeting country specific objectives. The need for more financing through

accredited entities was underlined. Participants made the following comments in relation to scaling considerations under the GCF mitigation and adaptation umbrella:

- (a) Enhancing the readiness approach by creating dedicated institutions for readiness activities in the countries;
- (b) Strengthening institutions are that beyond traditional climate sectors (with the potential challenge of maintaining at scale);
- (c) Fragmenting climate funds to enhance direct access and avoid diverse cycles;
- (d) Maintaining readiness beyond readiness consultations.

382. The participation group also reviewed positive trends observed during the past years, such as the inclusion of diverse voices, the increasing support of marginalized and indigenous groups, enhanced awareness from the private sector globally, and the creation of mechanisms for local-specific problems.

383. To enhance the scalability of the Paris Agreement Article 2.1(c), multi-year thinking should be incorporated into corporates' exit strategies, with the enlarged pool of blended finance. National regulations should also align with long-term sustainability.

Station 11: Technology and innovation cooperation: tools, actors and systems

384. Participants highlighted the critical role of effective stakeholder engagement and involvement across all levels to identify real solutions and innovations that lead to transformational outcomes for technology development and transfer. Stakeholder engagement should take place early in the process (and in the technology cycle) and should include engagement of young people and indigenous peoples to ensure the appropriate use of technologies. Translators should be involved in conversations among different stakeholder groups and disciplines for more effective communication. Empowering multiple stakeholders, identifying and engaging different roles of government and private sector are critical technology development and transfer.

385. Youth engagement was highlighted in the process of technology development and transfer. Providing youth with opportunities to engage in training programmes and policy-making processes is important, given that youth are among the earliest adopters of technologies and have the potential to drive scalability and sustaining adoption over time.

386. Regarding new technologies and the digital divide, a participant noted that, although digital technologies have an increasing role in tackling climate change, we must also anticipate and address the potential negative effects of new technologies exacerbated by the digital divide.

387. Several participants discussed the importance of including the perspectives of indigenous peoples and the integration of indigenous knowledge and technologies; or, technologies may not meet the needs of communities once deployed. One participant shared a successful example of a programme in Vietnam where indigenous people were given the resources to perform their own carbon accounting. The result was a comprehensive mapping of resources, including the rituals and practices that contribute to these resources, and an opportunity to for indigenous people to influence decision making. Similar initiatives are short term and project based.

388. Different perspectives have shed light on the potential of scaling-up indigenous knowledge and technologies. From the standpoint of funders, these projects are generally small scale and represent a lower return on investment. Indigenous technologies and knowledge are also considered less risky than more "modern" technologies, given their longer presence in history. Upscaling traditional knowledge should be done with respect for indigenous people and their right to consent.

389. Technology roadmaps function as tools to map out and engage with different stakeholders, from industry leaders to local governments, while creating an understanding of the technology itself and its functions. Roadmaps can also be used to visualize actors with similar interests. Additionally, roadmaps can bring information together to identify needs and opportunities, similar to setting climate targets and plotting a pathway.

390. The TNAs should be included in climate-related finance, where developed countries refer to the needs described in TNAs and BURs to guide their financing decisions. Developed countries must report what they have transferred (e.g., technology or financial cash) while developing countries report on what they have received (e.g., financing for technology). In this way you transfer technology, capacity-building, and finance.

391. The role of local communities, as sources of technological innovation, is complemented by using less-known traditional technologies and giving people the means to innovate themselves. Village-level research and engagement can help companies better understand the scale of their technologies, for example, providing energy/cooking technologies at the household level.

392. Successful examples of the localization of technologies and roadmaps offering practical guidance to Parties have been shared, stressing participation, education, and training programmes for local communities.

393. The theme of financing for technology development and transfer permeated the discussions and touched upon diverse aspects. Access to finance and advancement of technology is a “chicken and egg situation” where finance is needed to access technologies, while technologies are needed to accelerate access to finance. Participants shared the example of using satellite imagery to inform insurance providers on their decision-making process and trigger pay-outs. There was ongoing research in Kenya on the role of mobile and digital technology in accelerating access to finance. Another participant noted how frontier technologies such as blockchain were used to simplify the process of applying for finance and its potential applicability to Parties as a means of accessing climate finance.

394. The role of public financing for climate technologies was highlighted. Through the facilitation of Paris Agreement Article 6, public funding has been used to incentivize private investment. Therefore, the private sector should take on public responsibility; accountability of public and private funding should be emphasized to generate global goods.

395. The private sector plays a critical role in financing technology solutions to address climate crisis, while investors should take the scalability of technology into consideration.

396. A common understanding and clear definition of “climate” or “green” investment should be reached. Common classification systems and taxonomies were highlighted as mechanisms to create security/ reassurance for private investments and protect them from greenwashing. However, uncertainties about their applications remain and need to be addressed, for example the EU taxonomy.

397. One participant questioned the availability of an overall mapping of different funding mechanisms available to support technology development and transfer at different stages of the technology cycle for size/scale-specific technology projects.

398. Mobile penetration has facilitated access to finance and micro-finance institutions for climate-related disaster risk management and localization. One participant proposed to create an incentive mechanism that leverages mobile payments to break down large finance into small funding amounts to fund smaller scale projects, which would potentially address the bottleneck of limited accessibility to those looking for smaller amounts.

399. Capacity-building and financing needs for effective technology development and transfer take place at different stages of the technology cycle. For example, investing in early education can have positive spill-over effects on the capacities and knowledge at the university level. For technology commercialization, it is important to bring legal concerns into capacity-building when starting a new business or venture.

400. Investments are needed in the early stages to build the readiness and capacity of countries, considering respective institutional capacities and governance mechanisms, to manage large financing for technology development and transfer projects.

401. Regarding the definition of innovation within the context of technology development and transfer, one participant mentioned that more inclusive language around innovation should be used to empower stakeholders, especially young people, and indigenous groups, and eventually scale up and adopt solutions widely. Another participant highlighted that innovation refer to new technologies and technologies that exist but have not been leveraged.

Despite the replicability and effectiveness through proven practices, indigenous knowledge was undervalued by “modern” technologies and western science and should be invested more. We need to adopt a broader view of innovation and scale to raise finance.

402. Responding to the question of “how” we enable technology transfer, the concepts of radical innovation and incremental innovation were highlighted as means through which to increase efficiency and reduce costs, as we’ve seen for solar photovoltaic (PV), wind power, electric vehicles.

403. The purpose of envisaging innovation needs to reach beyond a response to the Global North. Moreover, technological innovations need a human dimension that incorporates financial, social and policy innovations, in addition to the “hardware/gadgets” perspective.

404. Another participant from the private sector observed that risks often serve as sources of innovation. “Innovation” was often described as pre-meditated directions, whereas “change” was less predictable/constraining and could be curated just as much as it took place by chance. One participant suggested using “change” with a sense of shared urgency to innovate mechanisms that incentivise and mobilize actions and collaborations. The ongoing energy crisis in Europe was an opportunity to reflect on how to capture the moment for technology innovation and prepare for the next change.

405. Some participants referenced innovation hubs as platforms to bring stakeholders from different backgrounds together in a network to foster cross-pollination of ideas. One participant highlighted the role of the network effect and network aggregation in countries with no start-up scene. The network effect allows start-up/businesses to grow bigger and welcome new participants who look to benefit from the network (Unilever given as an example for use of the network effect). The catalytical role of incubators and accelerators in attracting start-ups was also raised and one participant highlighted the need for regional accelerators in order to drive more innovations.

406. Innovation needs to be owned fairly so that technologies could be shared equitably. The Covax vaccine was cited as an example of a global initiative aimed to provide vaccines for developing countries, which ended up nevertheless being too centred on the Global North.

407. Open-source technologies could help break down barriers in the access to technologies. One participant shared an example from their country, where the department of natural resources often encounters difficulties in finding open access data. The participant also cited examples of countries which were not allowed to access certain websites or use certain commercial software, for example ArcMap, because of sanctions. Companies and civil society could collaborate to develop more open-source technologies.

408. Several examples of international collaboration were shared by participants, including collaboration with the private sector (an example of Volkswagen shared), triangular collaboration between academia, funding entities and start-ups; and north-south collaboration where supply and demand need to match. One participant noted that international collaboration could continue to have a positive impact on reducing the cost of solar PV by 20 per cent by 2030. Another participant highlighted that international collaboration needed more than financial resources to function successfully.

409. The potential implications of having manufacturing sites produce technologies locally and managed internationally opened more discussions, especially when a company conducted its management and manufacturing separately in the Global North and Global South. Participants raised the question of whether the manufacturing site should be managed by a national company, because technologies were manufactured locally instead of the origin of the company managing the business.

410. One participant highlighted the importance of incentive systems in supporting a more systematic approach to international collaboration, noting that the motivation for collaboration is not solely based financial aspects.

411. The issue of IPR was discussed by several participants. One participant evoked the need for a reform to IPR systems and the need for a waiver in trade in IPR. One participant referred to IPR as a topic that is “banned” from being discussed within the framework of the UNFCCC, whereas everybody outside the UNFCCC is talking about it.

412. The issue of Covid vaccines was brought up; one participant expressed the need for a climate system review, adding that there was a lack of solidarity from the Global North during the pandemic crisis. The participant referenced the Trade-Related Aspects of Intellectual Property Rights (TRIPS) as an example of waiver for developing countries to increase manufacturing capability and hubs.

413. Another participant noted that not all vaccines were from the global North and that a lot of IPRs are held in developing countries (e.g., China- Solar PV, and India). Therefore, the participant noted that IPR was perhaps not necessarily the problem for technology transfer.

414. Several participants cited the UNFCCC Technology Mechanism and highlighted its role as a body within the UN related to technology transfer. One participant expressed their disappointment at the technology negotiations and the technology mechanism discussions, adding that Article 10 was the weakest at the acknowledgement of technology transfer. Another participant noted the relevance of the first periodic review of the technology mechanism as input to discussions on technology development and transfer, looking at how technology can foster international collaboration in technology assessments (referring to technology needs assessments and technology action plans) and identifying gaps and solutions. The same participants expressed that there was no clear linkage between the technology and the financial mechanisms.

415. One participant shared that the CTCN, the implementation arm of the technology mechanism, was embarking on a new five-year programme and sought to gauge from the group their overall awareness of the CTCN and whether that was a model that was needed more of.

416. One participant from the NGO sector highlighted the importance of having clear governance frameworks in place when talking about technology innovation; all people should have the right to benefit from science and its applications. These governance frameworks could include aspects such as impact assessments and considerations of participation and respect for human rights. The same participant cautioned against jumping the gun and rolling out unproven technologies hastily. The discussions on governance frameworks have seen no progression over the years and remain at the stage of “what if” situations.

417. Another participant noted that technology assessments needed to be carried out before introducing new technologies, citing for example, the introduction of genetically modified elements as a solution in climate agriculture and the lack of capacity to assess whether the technology is harmful.

418. The principle of technological neutrality was discussed, and one participant noted that the technology neutral approach referred not only to the gadgets or products themselves but also to policies. One participant noted the need for technology-neutral targets. Another noted that not all technologies could be deployed. Technology-neutral could also be seen as an entry point for unproven and/or un-economical technologies such as geo-engineering, highlighted one participant. Unproven technologies may maximise climate benefits on decisions but might also compromise other benefits.

419. Further discussion on geo-engineering ensued, with some participants noting real concerns over its deployment. One participant referred to discussions under Article 6.4 regarding the definition of removals in a broad way, evoking ocean fertilisation. The participant highlighted the need to focus on reductions as opposed to a focus on un-proven geoengineering options with unknown impacts. Another participant highlighted the absence of governance framework to regulate or govern the deployment of geoengineering moving forward.

420. Responding to the question of what the proven-good technologies were, participants referred to technologies that ensured local needs and which could also consist of low-tech solutions.

421. Regarding the role of academia, an example was shared on a project in Guyana on climate-smart agriculture (the digitization and mapping of crops and variations) that was funded by the CARICOM secretariat and the Government of Canada. Thanks to linkages that were established with an education programme, the outcomes of the project were directly

applied and introduced into the curriculum (a food production course), thereby securing the longevity of the programme.

422. One participant pointed to the gap between the theory and the implementation of climate technology development and transfer noting that a lot of the thinking on technology stayed within academia and without reaching reality/implementation in the field. Another participant noted that there was a high penetration of technologies - the technologies were there but needed to be utilized.

423. Notions of impact vs. scale (in terms of how much money), technology and innovation affordability for all and the need to sustain technology innovation over time were aspects raised by participants.

424. One participant asked how nature and biodiversity loss fit into the discussions on technology development and transfer, and the debate between nature-based solutions or ecosystem-based approaches was still going.

Station 12: Capacity-building: How to enhance and retain institutional capacities at the national level (exchange of experiences and lessons learned)

425. This station focused on how to enhance and retain institutional capacities at the national level. Participants elaborated their collective experience and lessons learned across 6 dimensions:

(a) Building and retaining systemic capacity requires both sectoral and system level capacity efforts:

(i) At sector level participants noted that effort may include government mandates (such as requirements for certain kinds of certification, developing of specific training programs connected to these forms of certification) which trigger changes in both private and public sector engagements.

(ii) Development of sector specific toolkits, peer learning and other applied learning programs to enhance institutional strengthening at the country level.

(iii) Targeted partnerships to retain national capacity-building and to avoid reliance on consultants (for instance long-term partnerships between academic/research institutions, governments, private sector).

(iv) Building and maintaining networks across all relevant actors.

(b) Systemic efforts go beyond sectoral capacity-building initiatives and include:

(i) Governmental mandates, targets and/or legal requirements that trigger investments in public and private sector and that empower people to make and demand investments in education, training etc.;

(ii) Maintaining a “cushion” and a “pipeline” of trained experts in the public sector so that if key people leave, they are replaced as new people always being mentored, and some redundancy is built in;

(iii) Sustained commitment to intragovernmental communication and coherence: across ministries, within ministries, across scales from local to national governments;

(iv) Developing private sector connections and interactions with public sector but recognize the possible conflicts of interests.

(v) Adequate public sector human resourcing to enhance staff retention including salary, recognition, feelings of empowerment, opportunities for growth in career.

(vi) Political will to amend institutional mandates and generate the required strategic capacities to help these institutions integrate and mainstream climate change actions in medium and long-term national development planning and budgetary frameworks.

(vii) Regionally coordinated efforts and sharing resources, including expertise.

(viii) Nominating a dedicated ministry for climate change to liaise across government to help implement climate actions effectively.

(c) It is essential to think of capacity-building as a long-term effort. This has implications such as:

(i) Ensuring that funding is long-term, not project based, and connect to a systemic view of capacity. Good practices include funders taking very long-time view, “theme” based funding that involves flexibility and groups of peer countries, funding connected to systemic commitments to capacity development.

(ii) Looking at all enabling conditions and improving them across the country (including all basic pre-conditions for capacity such as health, education, IT and communications, infrastructure provision etc).

(iii) Working to support the entire education system so that is a continual flow of talent into the national context.

(iv) Strategies at the level of educational institutions can include targeted professorships in key priority areas of research, support for doctoral programs; regular contact between governments, private sector and academia to ensure research efforts aligning with national priorities.

(v) Purposeful efforts at all levels to integrate young people into decision processes through mentorship and sustained growth opportunities.

(d) Retaining capacities is important at institutional and national level:

(i) At institutional level:

a. Appropriate and adequate salary, opportunities for growth, recognition, good working conditions that reflect the whole person including things like parental leave policies.

b. Creating institutional memory and institutional documentation (for example of policies, procedures, data, etc) so that if key people leave the underlying processes are not also lost.

c. Use of mentoring and train the trainers approaches to ensure information/ knowledge is shared with many within the institution to create a cushion if someone leaves.

d. Provide time for learning, including reflection opportunities, opportunities to put lessons into practice, opportunities to try new things without fear of failure.

e. Investments in building leadership at all levels

(ii) At national level:

a. Commitment to long term development of the entire pipeline of talent development and retention.

b. Programs to incentivize the return of those who have left.

c. Reintegration programs that attempt to get people back might include targeted hires, specific programs of support.

d. Building adequate capacity requires adequate financing, including for:

e. Liaison between ministries, for connecting actors, developing new initiatives, and track effectiveness.

f. Developing adequate data collection, management and analysis processes so that capacity gaps can be effectively identified and tracked.

g. Ensuring that appropriate incentives are in place for talent development and retention.

(e) Mapping and monitoring capacity strengths, gaps, and opportunities:

- (i) Develop strategic vision of where and how to prioritize capacity development, it is useful to have some overview of what is needed and where they are needed;
- (ii) Use the private sector as a source of data, for example on what skills are missing;
- (iii) The role of the PCCB both to help assess capacity and share knowledge;
- (f) Grassroots engagement is essential:
 - (i) Capacity-building efforts at the very local level are very important as this is where many climate actions must happen and where efforts to protect vulnerable people are most pressing.
 - (ii) Addressing persistent barriers to accessing capacity-building resources at local level and address these through strategies requires use of local languages and avoidance of any jargon, truly respectful engagement processes that connect with local communities in appropriate ways and active efforts to engage women, youth, other marginalized populations.

4. Systems transformation

Station 13: How do we transform energy systems?

426. The WC facilitators, initiated discussions on the WC topic “how do we transform energy systems” by linking transformation of energy systems with meeting the 1.5⁰C temperature increase. They elucidated on areas of interventions, including interventions in society, urban planning, infrastructure, energy consumption and management, etc, where transformations and the associated decarbonization must occur.

427. The facilitators underlined the fact that each country has own energy systems, cognizant that some countries are in the process or changing, some are locked in their current energy system. Overall, they conceded there is a huge opportunity to transform energy systems, and in some circumstances include carbon capture storage, low carbon energy technologies, energy efficiency improvements because such options exist. The question they wanted participants to discuss and provide energy systems transformations can be implemented.

428. Responding to the introduction provided by the facilitators, one Party delegate explained that from a national perspective, there are opportunities to transform by implementing plans to reduce fossil fuels consumption, and such plans can provide significant results in a short-term period. In the power sector, the market system should be adopted accordingly, aligning it with implementation plans to reduce use of fossil fuels.

429. A non-Party stakeholder explained that they developed a scenario for the energy system to meet 1.5 ⁰C goal, and this needs to be implemented by 2050. It was elaborated that the world community needs to think about the next 10 years because of the cumulative nature of CO₂ emissions and stressed on criticality of starting now, because starting after 2030 will compound the warming problem. Of importance is to identify the short- and long-term technologies needed to transform the energy system to align with 2030 reduction goals because these technologies are available. Questions on how we decarbonize sectors: the industry, aviation, etc need to be asked and answers provided, and decarbonization seen as going beyond the electricity sector.

430. On financial facets of energy system transformations, a non-Party stakeholder explained that USD 1.3 trillion is currently spent globally on energy, and this amount need to be increased to USD 4 trillion to meet the technology implementation goals. It was noted that most elements of energy system transformation, especially switching to renewable energy, will present funding constraints to LDC and this should be acknowledged. The following recommendations were noted:

- (a) Recognizing the importance of funding energy systems transformation and emphasized that funding should be superseded by international cooperation which would make it possible for energy systems transformation to dip beyond the energy sector, for

example recycling of minerals or reduction of the global demand for certain products the production of which creates artificial energy demands;

(b) Promoting funding for energy systems interconnectivity, including regional power grids and natural gas pipelines for countries to take advantage of regional environmentally friendly or less carbon intensive energy sources;

(c) Diversifying the nature of international and national funding to include grants, concession loans and tax incentives for companies in high impact climate friendly investments;

(d) Incentivizing avoidance of fossil fuels use in developing countries;

(e) Aligning between donor countries and receiving country goals whereby developing countries need to drive the conversation to communicate their energy systems transformation needs and goals;

(f) Providing energy systems transformation financing that includes funding to research industrial policies tailored to country resource profiles.

431. An NPS remarked that change management is critical in implementing energy transformations, and it is important that this be institutionalized and incorporated in the government structure. An example of France was cited, whereby there exists an energy transition minister, the ministry incorporating human rights experts as well as energy experts. It was noted that such inclusion and combined reforms in governance are critical in getting perspectives from many elements of society in energy systems transformations. Further contributions by participants on energy systems transformation change management included:

(a) Refraining from associating energy systems transformation with digitization since energy systems can be physical or tangible. The physical and digital aspects of energy systems transformation need to be reconciled and integrated;

(b) Implementing energy systems transformation in a way that creates an environment for developing countries to bypass dirty energy technologies that developed countries relied on for their development and putting emphasis on recycling;

(c) Recognizing the interlinkages between energy systems transformation and other systems, whereby food security straddles all of it. It is important to connect these systems, for example fertilizers based on fossil fuels and energy transition. Food insecurity will cause buying more fertilizers, and as such coordination between sectors and policies is required. In the case of energy transition and food security, promoting agroecology or technology solutions that decrease reliance on fertilizers will make energy systems transformations less susceptible to global shocks;

(d) Recognizing that energy systems transformation will translate to energy infrastructure changes in some areas, for example, reduced our emissions by moving from coal to natural gas should be accompanied by developing gas storage structures, and in extending of power grids, due consideration given to removing transmission roadblocks;

(e) Enhancing technology innovations to align with decarbonization, including carbon capture and storage, with due diligence on environmental and leakage issues.

432. Participants underlined cognizance of different circumstances of countries in considering energy systems transformations. An NPS remarked that geographical locations and resource endowment of a given country are important factors in considering pathways to energy systems transformation. For countries that rely on hydrocarbons energy systems transformation should not be seen in the same context as countries that rely on imports of hydrocarbons. Participants made the following additional points and observations:

(a) In some countries policies and measures can be re-tooled to allow for energy systems transformations, as noted by a recent IEA study on using coal more flexibly, for example, using coal as peaking plants;

(b) Additional modelling would be helpful for guiding other countries to increase emission reduction ambitions, because all countries have different goals and targets;

(c) Greenhouse gas emissions reductions are the primary metric in modelling energy transformations, and as such modelling needs to broaden to address more issues;

(d) Energy systems transformation should be implemented in a manner than mainstreams energy security and energy transition, noting that some countries in Europe suffer from high prices because of lack of a proper balance between energy security and transition;

(e) Transformation to community and people centred energy production, including decentralized renewable energy production.

433. On engagement and consultations with the public and private sector stakeholders in processing energy systems transformation, participants underlined the importance of inclusiveness, not leaving anyone behind. Key highlights included the following:

(a) Involvement of local, civil society, and other stakeholders in the energy systems transformation effort for depoliticizing the climate and clean energy agenda such that it is not used as a perverse incentive in electioneering;

(b) Inclusion of the private sector in a way that reconciles between their bottom-line revenue and social responsibilities;

(c) Sensitization of communities to energy systems transformations, including demisting wrong public perceptions on renewable energy like offshore wind farms;

(d) Promotion of strong society support and cooperation, whereby governments should emphasize the co-benefits of energy systems transformations, (including health, air quality, etc) emissions trading system, energy efficiency targets and polluter pays principles;

(e) Development of a just transformation that ensures everyone survives the energy systems transition without making the population suffer, including signals from public and private sectors, and addressing skills transfer for workers.

434. Participants deliberated on the relevance of guiding policies for energy systems transformation. One Party recommended development of coherent, strong policies as a roadmap for energy systems transformation since it requires transitions in the policy space. Another Party delegate recommended that transformation of energy systems must go hand in hand with comprehensive in policies and a national regulatory framework with elements like binding emission targets, emissions trading system, energy efficiency targets.

Station 14: How do we transform land systems?

435. The facilitators of the WC 14 theme, “How do we transform land systems?”, started the technical dialogue by giving a brief introductory presentation, stating that land systems are fundamental to climate change and as such understanding what the land used to be in the past and what does it need to become is of critical importance. The reminded participants that in addition to its fundamental importance in climate change processes, land has cultural and spiritual values in most parts of the world.

436. One Party delegate reiterated on the introductory remarks by stating that having a national strategy is important is in restoring ecosystems, since once they restored land will produce desired goods and services, including mitigation and other benefits. The delegate cited a research study that assessed the carbon sink of land across the country in 9 biomes and found out that 2 biomes carry 80 per cent of the carbon sink and most of sink potential is in the soil. Mitigation and policy scenarios were then assessed to determine whether they erode or restore the sink potential of land.

437. On legal issues in connection with transformation of land systems, an NPS underlined the importance of affirming land rights legally in transforming land systems, and cited an example whereby land rights were affirmed by the national supreme court and approved by the UN High Commissioner on Human Rights, setting an environment for landowners to have a legal standing that empowers them to introduce land transformations in crop production and use their land sustainably. It was highlighted that for transformation of land systems, it is important to know where the customary territories are; delineate and map indigenous people territories; support customary land rights; and develop a data management

system from the indigenous people. Participants made the following further remarks on transformation of land systems legal facets:

(a) Addressing legal challenges when governments try to develop tourism areas and avoiding social and legal confrontations with indigenous communities and NGOs;

(b) Recognizing and respecting the rights of indigenous communities living in areas designated for economic development activities including national parks, hydropower, mining, cement etc. Government plan for better protection of ecosystems should not be a justification for confrontations with communities;

(c) Recognizing informal land governance systems of communities in areas demarcated for economic activities and integrate the traditional arrangements into land planning, knowing that opportunities to claim ancestral domains; some IPs just assert customary domain;

(d) Developing local laws for natural resources along with customary systems.

438. Party delegates recommended use of science in the transformations of land systems, including reliable mapping of lands and sinks, distribution of plots, and use of satellite data, and avoid reliance on top-down information only but rather integrate bottom up and top-down data into system transformation and land planning. One Party delegate commented they have a web-based platform for carbon sinks information, but this information is static as it does not reflect land use, and when such information is available it should be assessed for potential of mitigation options at a lower spatial scale. Other comments provided on science and transformation of land use included the following:

(a) Using nature-based solutions in transformation of land systems, for example, use of natural riverbank restoration in Kula Lumpur Malaysia, which adds in green spaces in city, good for wildlife and people – wellbeing. In Brazilian pantanal (wetlands), cattle farming has helped preserve nature, biodiversity, and megafauna in the landscapes. Initiatives by WWF with landowners in Brazil include identifying what pastoralists are doing and developing models of low-impact ranching;

(b) Using geoscience in transformation of land system, for example, the Global Forest Observations Initiative (GFOI) and transitioning to satellite data sources for GHG inventories and understanding both land cover and land use;

(c) Tailoring data needs to specific context of country since there are many examples of good remote sensing but they're not very useful because not connected to the use of the data;

(d) Updating ecosystem datasets since current land use change maps have significant gaps for efforts to reduce emissions from deforestation and forest degradation in developing countries (REDD+);

439. On aligning between government measures for transformation of land systems and current land use practices, an NPS stated that to farmers land systems transformation is a top concern and the following issues must be recognized:

(a) Farmers are part of the value chain, and they need to make money. It may happen their intention to restore land will contradict requirements for emissions efficiency, for example practicing less intensive farming per hectare. Farmers need to be educated on what they need to do;

(b) Policy development and changes need to be flexible to respond to the diversity of farming and local context. For example, in a programme in South Africa, "We're all in this together", farmers were being encouraged to plant pine trees to offset their emissions and restore riparian areas, but some farmers wanted to do flax and others wanted to implement more locally appropriate riparian solutions. Policy incentives were overencouraging planting of pines, but now they have started to recognize the prevailing issues;

(c) Some farmers are not doing good things and others are trying to do the right thing but face barriers. They all need to be supported.

440. Participants made recommendations on governance and financing aspects in relation to transformation of land systems. One Party recommended Italy need to learn from each other on matters of governance of transformation of land systems. Other comments relating to governance and finance matters included the following:

(a) Developing institutions in a manner that encourages systematic transformations by breaking down silos at international and local level, including joint initiatives and integration between the conventions that address similar issues, to avoid duplication of effort. For example, same land issues are being discussed under different Rio conventions;

(b) Protecting traditional knowledge in transformation of land systems, and development of regional network for indigenous people;

(c) Developing innovative financial instruments and applying experience working on complex systems in finance for complex land systems and getting finance to them. Land systems values are very entangled, but the finance sector tends to oversimplify, and we haven't been able to change the risk-return dynamic that exists between investors and investees in land systems;

(d) Focusing on outcomes-based financial instruments. For example, currently, trees are not considered assets because they have maintenance costs, and maintenance of trees is a liability, so they're using perpetual bonds – a bond where the borrower can pay back the principle whenever (or never). The alternative could be payment on delivery for ecosystem services – instruments to pay the tree for the service it provides;

(e) Transforming people from being financial hedgers to nature hedgers. For example, provide upfront capital to reduce flooding risks, reduce the risk that they will have to pay out over time;

(f) Making the government an outcome buyer by putting together common asset trusts, idea that no one should own a tree and creating a legal way to manage such public assets;

(g) Enabling deal structuring. For example, Chicago would like a deal structured to create a tree canopy fund and they need to orchestrate liability, understand how much value it would provide, and need to convince someone to give the initial investment to get through the early risk phase;

(h) Financing at the landscape level since there are lots of entangled risks and stakeholders in land issues, so it's better to aggregate the values into common assets and if is done at landscape level then you can create sizable systems-level investments;

(i) Facilitating for interconnectivity of systems involving more tertiary infrastructure/ roads to allow food to be sold where it's produced.

Station 15: How do we transform transport systems?

441. Facilitators for the WC Topic 15 initiated the technical dialogue on transformation of transport systems by making a short presentation on transport systems and recapping on prompts for transformation of transport systems, namely:

- (a) Land transport EV pathways;
- (b) Shipping and aviation fuels;
- (c) Demand structures of transportation services;
- (d) Novel fuels and carbon capture and storage (CCS);
- (e) Transformative change through community and youth engagement.

442. Responding to the question how countries can achieve transformation of the transport system, a Party delegate started off the discussion by stating that it is important to give the transport system transformation enough time to happen. Iceland was cited as an example, whereby the EV penetration into the transport system is now at 60%, from 20% five years ago. EV infrastructure included equipment for charging a vehicle at home.

443. On governance of transformation of transport systems, Participants underlined the importance of collaboration between political and transition leadership. An example was cited of an initiative that included political leaders and a transition council, whereby political leaders make decisions, and the transition council implements the decisions. The private sector should be involved. Other points made by the participants included:

- (a) Some options on transformation of transport systems will work in some countries but not in others, depending on country circumstances;
- (b) Research and development (R&D) is important in transports systems transportation, including availability of better and lasting batteries;
- (c) Promotion of other modes of transport, including cable cars, shared transport, smaller vehicles etc, through policy and financial mechanisms;
- (d) Development of net zero corridor strategies;
- (e) Initiation of education programs to reduce the need for travel and structures for walkable-based cities;
- (f) Making EVs more affordable.

444. On avenues for promoting EV when implementing transformation in transport systems, participants underlined the importance of stimulating the market for EV through policy and financial mechanisms. Where possible, tax incentives for promoting EV should be considered, including tax reduction on charging equipment. Other EV promotion recommendations made by participants included the following:

- (a) Noting that the initial transition to EV is significantly expensive, and cheaper in the long term, with an array of benefits;
- (b) Conducting prerequisite research to determine EV implementation strategy for example, urban mobility research, and determining the benefits, including public health spinoffs;
- (c) Refraining from providing fossil fuel subsidies, including subsidies for development of hydrogen fuel;
- (d) Including solar charging stations for EVs;
- (e) Considering EV trains in mining.

Station 16: How do we transform water systems?

445. The facilitators provided guiding questions to enable a focused discussion on transformation of water systems. These included:

- (a) What do we need to do to move from the ‘What’ to the ‘How’?
- (b) What do you see as concrete outputs you would like to see declared around water at COP?
- (c) What are the barriers and the challenges?
- (d) Is there a consensus on what is needed?
- (e) What are the opportunities, good practices, and lessons learned that we could build on to transform water systems?

446. On creating an integrated and holistic management is required to resolve the present water crisis Party delegates and NPS underlined the need to explore different approaches to how we build climate resilient water systems. The following points were put forward:

- (a) There is a need to explore different approaches to how we build climate resilient water systems. We need more integrated, forward thinking policies that are not only adaptable to changing climatic conditions, but also seek to maximize economic and social welfare. Balancing these options bring with them multiple challenges especially when you must consider these aspects in an equitable manner and at the same time ensure the continued health of ecosystems. Nature-based solutions (NBS) around water present strong

opportunities to maximize climate resilience for water management which at the same time enabling a ‘systems approach’ for water;

(b) Many of the challenges that farmers and rural vulnerable communities face in developing countries - relate to capturing, storing, and accessing uncertain rainfall, managing water resources, recovering from floods and droughts, enhancing soil moisture retention and improving water-use efficiency. While solutions exist to help address these issues there remain numerous obstacles to address the capacity needs in-country to address them. Climate Finance remains impossible to access; Internal budgeting around water in public sector agencies do not always reflect the needs to build resilience in water systems;

(c) New knowledge and evidence is required to build inclusive water management as uncertainties and climate shocks expand;

(d) Connecting water systems science to water security priorities to meet increased climate change ambition is key but to do this there is a need to address multiple drivers of change — including soaring water demand for food production, energy generation, and economic development, among other uses — while prioritizing marginalized communities, vulnerable people, youth, and equality between women and men;

(e) Recognize that there is a global water crisis and respond accordingly, through:

(i) Multi-stakeholder processes at basin level which are housed in the right institutions;

(ii) Governance through regulations and inclusive accountability mechanisms;

(iii) Functioning markets that ensure investment and running costs are met.

447. Participants made comments on unilateral effort to transform water systems, whereby some countries have initiated exciting water MRV initiatives, notably the Glasgow Fair Water Footprints, Water Tracker, and the Resilient Water Accelerator. It was underlined that more partners are needed in these initiatives for a sustained change in a system such as a market mechanisms, regulations, and accountability mechanism, to deliver positive impact on water security in both rural and urban settings. It was further emphasized that the UN Water Conference is the moment for world leaders to recognize the global water crisis and make it their own and tackle the crisis.

448. On adopting a systems approach is important to understand component interactions, one Party cited the government theory of change based on three interlinked failures - policy, governance, and markets. It was remarked that addressing these failures should bring private investment when blended with public money, and with risk shared between partners. In turn, the resulting water infrastructure, will be sustained by functioning markets, and the use of nature-based solutions will reduce cost, increase resilience, and deliver multiple outcomes. Likewise, UK Govt WASH support is based on systems thinking.

449. Participants made remarks on water accounting as an important aspect to be considered to better foster linkages between water-dependent sectors. On this matter, the following issues were underlined:

(a) Working in sectoral silos will not resolve the crisis created by climate change. Considering water within a ‘siloed’ context will have a huge impact on water resources. We will not be able to move towards building or indeed raising our climate ambition around water without this being addressed;

(b) Facilitating for cooperation between upstream and downstream aspects given that water does not ‘know’ or follow boundaries, and the strong upstream-downstream linkages, especially within large river basins like the Indus. What happens upstream will have impacts downstream;

(c) Taking stock of available water is important, before we think about how we manage it, where it is moving and where it is utilized. This will enable us to understand trade-offs and synergy among water-dependent sectors such as energy, food, and ecosystems;

(d) Considering a systemic and integrated approach to water management for all sectors, given 90 per cent of water use is for agriculture.

450. Participants underlined the importance of public/community engagement in water systems transformation, and local-level adaptation is crucial for policy reform. They highlighted on need for understanding individual and community responsibilities in transformation of systems, including need to have opportunities for community voices to be heard and adopting local-level adaptation principals.

451. On providing finance and capacity development in water systems transformation, it was underlined that priority be given to developing a knowledge base and increase South-south collaboration/ partnership on available information, technology, and learnings from each other. The following key points were made:

- (a) Capital investment around water infrastructure is of less priority and not sufficient;
- (b) Explore creating water markets in the same way as we have carbon markets;
- (c) Only 0.1 per cent of financing is on water infrastructure;
- (d) Need to prioritize adaptation funding to water sectors;
- (e) Climate financing does not come to the government (but rather to other bodies, an example shared was UNDP).

452. Participants suggested that adopting a water security plan for countries as a potential way be a way forward, whereby understanding the problem and identifying the value of water is imperative. This will entail adopting a ‘Water for all sectors’ approach, based around best practice with priority given to nature-based infrastructure, building on regional synergies and learning.

Station 17: How do we transform industrial systems?

453. The facilitators of the WC 17 theme, “How do we transform industrial systems?”, started by initiating a discussion on challenges to transformation of industrial systems. Participants identified the following challenges:

- (a) Lack of understanding by the private sector on how climate change will affect their supply chain thereby giving focus only on decarbonization and not resilience;
- (b) Reluctance to transform, doing things the same way;
- (c) Lack of standards;
- (d) Lack of finance;
- (e) Global economic crisis delaying transformation process and technology transfer;
- (f) Key industries facing problems, including steel, cement/ceramics, chemicals;
- (g) Negative subsidies.

454. Reflecting on the common challenges facing industry and seen as hampering fast transformation of industrial systems, participants made several recommendations and suggestions on possible solutions to the challenges constraining transformation of industrial services, including:

- (a) Develop local-led solutions to the challenges faced in transformation of the industrial systems
- (b) Develop industry standards, for example the International Energy Agency (IEA) standard for low carbon steel and cement products
- (c) Promote private investment in areas dominated by public investments
- (d) Use stick and carrot approach in promoting transformation of industrial systems where necessary, including government incentives and fines.
- (e) Create demand for low-carbon solutions – pioneering the transition with green procurement by government

(f) Exhaust potential of electrification with renewable energy where significant additional electricity generation is required

(g) Promote green hydrogen for chemicals and steel and blue hydrogen from fossil fuels, where appropriate

(h) Develop a monitoring and evaluation system to assess progress towards decarbonization target, within a set timeframe and following a roadmap

(i) Increase resource efficiency and research for new solutions to decarbonization.

455. Participants underlined enabling factors that could make the suggested and recommended solutions work, and these included the following:

(a) International collaboration, like the Breakthrough Agenda set up at COP 26, which includes steel industry

(b) Just transition: loss of jobs should not necessarily happen, since the transformation process can be implemented in conjunction with reallocating of skills. There should be special consideration for people close to retirement, and a legislation for job protection

(c) Developing financing mechanism for deploying new technologies that have high impact on decarbonization

(d) Provide financing for social protection to allow for just transition

(e) Create an environment in form of policies and measures for carbon pricing to make fossil fuels more expensive than the decarbonization solutions

(f) Develop standards for high-quality carbon credits.

Station 18: How do we transform agricultural systems?

456. Facilitators for the WC Topic 18 initiated the technical dialogue on transformation of the agricultural systems by asking participants to give their views on what could be the challenges and interventions in transforming the agricultural systems to facilitate a shift to low emissions in the agricultural and related sectors. Most of the proposed interventions highlighted complementarity, potential overlaps with other round tables in the room, particularly concerning land, water and in certain aspects urban, energy and health.

457. Participants highlighted four main bottlenecks to transformation of agricultural systems, namely:

(a) Availability of data and right information for decision making, including approaches in measuring the impact of transformation, indicators that go beyond GHG dimensions and include other benefits, and socio-economic dimensions of the transformation, the SDG angle

(b) Limited access to finance and investments, including metrics and definition of the same for possible scaling up

(c) Capacity challenges inherent in limited knowledge, innovation, capacity-building and peer-to-peer interaction by players in the sector

(d) Policy inadequacy/insufficiency; for example, how to mainstream agriculture into climate change policies and how to internalize lessons and recommendations from scientific bodies like IPCC and global processes like UNFCCC, including Food and Agriculture for Sustainable Transformation Initiative of the Egyptian COP27 Presidency.

458. Participants proposed the following interventions and pathways for transformation of the agricultural systems:

(a) Consider all challenges in transformation of agricultural systems as going beyond climate change, and encompassing a global context including conflicts, food security, health, biodiversity, and rural development, imperatively necessitating for a holistic and integrated solutions

(b) When designing/implementing solutions/pathways for transformation of the agricultural systems, farmers should be put at the centre

(c) Consideration should be given to both adaptation/resilience and mitigation, and other SDG-related co benefits, including synergies and trade-offs

(d) Within the same agricultural systems, diversity of contexts should be fully considered, because whether locally or nationally, farmers do not share the same starting point

(e) Transformation should encompass the entire value-chains, including the consumers, i.e. procurement, production, demand side, food waste, etc.

(f) The efficiency aspect of food production (less land-more food) needs to consider other factors, especially the nutrition aspects and long-terms sustainability, not just elevated production levels

(g) In considering agricultural systems transformation, focus should go beyond farming areas and include urban aspects on circular economy, food loss and waste, urban waste, consumption, etc

459. Some participants underlined the on-going discussion in the Koronivia Joint Work on Agriculture as an important process in identifying options for transformation of the agricultural systems.

Station 19: How do we transform urban and key infrastructure systems?

460. The facilitator for the WC Topic 17, initiated the technical dialogue on transformation of urbans by stating that urbans need to be seen as a system that emitted 29 GtCO_{2e} in 2020, and those emissions must be reduced to net zero. The facilitator underlined three strategic areas for urban and infrastructure systems transformation, namely:

- (a) Better urban planning for opportunities for reducing energy and material use
- (b) Electrification in combination with switching to renewable energy sources
- (c) Enhancing urban carbon uptake and sinks to contribute to net zero efforts

461. Considering recent assessments on urban systems provided by the Intergovernmental Panel on Climate Change in the “Mitigation of Climate Change” report, the facilitator put before the participants three questions to guide discussion on how to transform urban and key infrastructure systems:

- (a) How to bring urban systems to net zero GHG emissions
- (b) How to implement common strategies in different urban typologies

462. How to increase the co-benefits of mitigation actions in urban areas Participants underlined the need for designing urban areas for people through people centred design and action, , including locating living areas near public services like schools and jobs to minimize demand for transport and energy. The importance of planning urban areas, as more compact, unified systems was underlined alongside increasing renewable energy penetration and resource efficiency. It was noted that urbans are at different entry points of mitigation potentials and actions, and emerging and growing cities have the opportunity of implementing net zero strategies from the initial development stages. Other comments made by the participants included the following:

- (a) Developing cities with people-oriented perspective including creating walkable cities for accessibility and reduced transport distances
- (b) Taking into consideration shading orientation and energy/material demand when undertaking urban planning, especially for any high-rise buildings
- (c) Limiting the availability of car parks in order to encourage use of public transport and engagement in active mobility while reducing carbon lock-in and providing health benefits

(d) Making use of solar energy in buildings when possible, switching to clean energy supply, and using urban infrastructure to support renewable energy

(e) Creating a conducive environment for recycling of water and other waste materials to increase resource efficiency and reduce environmental stress

463. Participants underlined the need to develop cities in a manner that creates a habitat for people without destroying nature and natural assets. Placing nature at the centre from the very beginning of urban planning has an important role for increasing carbon sink and co-benefits for sustainable development, including clean air and wellbeing. It was emphasized that people connect to nature and nature creates traditions and values, and in turn urban planning will manifest the culture of the city. Current urban development practices require a major shift to increase mitigation opportunities for decarbonization, resource efficiency, land use efficiency, and teamwork to avoid carbon lock-in. Other comments on optimum city development plans that align with mitigation included the following:

(a) Developing urban plans in a manner that focuses on mitigation and allows flexibility for supporting system level transitions for decarbonization

(b) Keeping in mind that extensive use of concrete in city development increases heat trapping, risk of flooding and need for air conditioning

(c) Planning and designing cities with a decentralized energy supply plan to allow for modern clean energy supplies to be incorporated and increased in future

(d) Incorporating zoning in the design of urban areas to include green zones, vehicle free areas and connection to district-level clean energy supply

(e) Abiding by the city development and greening masterplan and avoiding trade-offs that can increase emissions as cities continue to grow.

464. Participants voiced the need for widespread teamwork across all sectors that come together in urban areas – energy, buildings, transport, land and environment, and social policies – so that it is possible to up-scale decarbonization and resource efficiency through options such as renewable energy, energy communities, and urban green and blue infrastructure. Participants shared experiences from cities around the world that are already targeting net zero emissions and the challenges that still necessitate attention to speed up processes, including more integrated planning and implementation of strategies for healthy clean energy cities. The ongoing process of cities learning from one another was given as an option to increase synergies.

465. The involvement of different stakeholders in urban planning was highlighted by participants. The need for active engagement of citizens, the private sector and other NPS and approaches for their engagement was underlined. Greening of cities should be undertaken as a coordinated teamwork of cross-sectoral collaboration when tackling climate change. Emphasis was put on change management and ensuring that there is enough awareness on the dual benefits that can be provided for social well-being and reduction of vulnerabilities, including energy and transport poverty, even when they are seen to have clear mitigation benefits.

466. Throughout the technical dialogue, practical ways of connecting spatial planning, urban form, and infrastructure, electrification and switching to net-zero emissions resources, socio-behavioural aspects, and urban green and blue infrastructure were discussed among participants. Different experiences were shared for urban areas that are emerging, rapidly growing, and established urban areas. It was discussed that when realized in an integrated way, there are positive spill-over effects across energy systems, service provision, and natural areas within and surrounding urban areas.

Station 20: How do we transform health systems?

467. Facilitators of discussions of topic WC 20, initiated the discussions by providing to participants a background on the healthcare sector on hospitals, clinics, community health centres, social care facilities, and ambulance transportation indicating that they play a key role in delivering both mitigation and adaptation.

468. In their presentation of background information, the WC facilitators stated that the health impacts of climate change include those relating to heat, the spread of vector-borne diseases, nutrition insecurity, and acute injury and deaths during extreme weather events – as well as damage to physical healthcare infrastructure. This necessitates disaster preparedness, adaptation, and resilience in the health sector to protect health security, noting that the healthcare sector is one of the three sectors most often prioritized for adaptation in Parties' nationally determined contributions (NDCs). The facilitators presented the following points:

(a) Increasing the level of care provided to a growing population, the health sector must also play its part in reducing emissions, while recognizing common but differentiated responsibilities and respective capacities. The health sector contributes almost 5% of global emissions, and as a major employer, it represents around 10% of global GDP. In addition to being responsible for its own operations, it also plays a role in cross-sectoral mitigation efforts, as well as through its supply chains and purchasing power.

(b) At COP26, and in the months since, 61 governments committed to climate-resilient health systems and 56 to sustainable, low-carbon health systems (of which 22 have committed to net zero health systems).

(c) For governments to deliver on commitments, it is essential to consider means of implementation, including finance, technology transfer and building capacity. The Global Stocktake plays a key role in ensuring accountability and must also serve to promote human rights including the right to health and a healthy environment.

469. Following the background remarks of the facilitators, participants discussed different options and interventions required for effective transformation of the health systems, underlining five key areas of action, namely adaptation, mitigation, finance, intersection with other sectors and role playing.

470. On transformation of the health systems by implementation of adaptation measures at national and local level to address the growing and changing health threats of climate change, participants discussed the importance of surveillance measures including early warning systems (for heat, drought, and other hazards). The following points were put forward:

(a) Research is needed to correlate changes in the climate with disease incidence, for example, water-borne disease after floods, or vector-borne diseases with changes in temperature and precipitation. Projections based on how health threats such as vector-borne disease vary with changing weather patterns enable advance preparedness, readiness, and disaster planning. One Party delegate commented on how links between air pollution, clean water, dengue and malaria in higher altitude regions is not yet well understood to be related to climate change, and that data can help to inform adaptation priorities.

(b) Resilient healthcare infrastructure is needed: in the Caribbean, the Pan American Health Organization (PAHO) SMART hospitals initiative offers co-benefits for mitigation and this can be replicated.

(c) The capacity of the workforce must also be strengthened - there is a need for practitioners to understand emerging issues (i.e. threats to health and healthcare infrastructure) so that, for example, symptoms of heat stress are recognized rather than being misdiagnosed. One Party mentioned how the capacity of health professionals, not least in the face of shifting disease threats, are a challenge, and that it is important to build capacity in the use of new software.

(d) Participants underlined the importance of maintaining access to health and healthcare in times of multiple crises. Access to medicines must be maintained during and following an extreme weather event: this can be ameliorated by resilient supply chains and innovative medical delivery. A Party from the small island states (AOSIS) commented on the need to transport people from one island to another to reach specialized hospitals, and how public-private partnerships can offer solutions in this regard.

(e) Training and licensing requirements can incentivize healthcare professionals to undertake new training. Participants shared that licensing rural healthcare providers in

mountain regions, who are facing difficulties in accessing medicinal plants due to biodiversity loss, can elevate the challenges being experienced and trigger action.

(f) Public health can in be perceived as a resilience strategy, whereby healthy societies are more able to recover from the economic impacts of an extreme weather event, while also placing a lower burden on medical systems, thus also reducing healthcare sector emissions.

471. Participants discussed the link between implementation mitigation measures at national and transformation of the health systems in the context of reduction of health sector emissions. The following interventions and comments were made:

(a) Mitigation interventions in the health sector can be applied from the point of procurement and supply chain management (including energy efficient refrigeration and more climate-conscious packaging of supplies) through to waste management (including ending incineration) through clear guidance and strict legislative criteria. Global methodologies and standards can be helpful for establishing baseline measures and for identifying the most effective interventions in different sectors. Sunway Medical Centre, Malaysia was cited as a success story for such interventions.

(b) Within healthcare settings, retrofitting hospitals offers co-benefits mitigation and adaptation, including shifting from long used anaesthetic gases, which have very high warming potential, to low emission alternatives. Other measures can include use of traditional medicines, food sourcing for patients and low-emissions diets. Participants suggested that renewable energy can be installed and used in health facilities, and less extreme heating and cooling supported by natural ventilation systems. Other mitigation measures include provision of care via digital consultations to avoid emissions due to travel. Adequate prevention and primary healthcare provision will reduce the need for treatments which are more emissions intensive. Standard decarbonization pathways in health care should be considered.

472. On what can be done to enhance finance, technology transfer, and build capacity in the transformation of health systems, Participants discussed on how best practices be exchanged and scaled up. A Party delegate noted that finance for health sector action in response to climate change can be mobilized from three main sources: international climate finance, health and development finance, and domestic resources. It was underlined that international climate finance for the health sector is currently low, despite the health sector being in the top three most vulnerable sectors identified by Parties in NDCs. Only 0.3% of multilateral climate change adaptation funding was allocated to the health sector from 2018-2020. Other comments from participants included the following:

(a) Regarding international health and development finance, some institutions, such as the Global Fund for HIV, Malaria, and Tuberculosis, are very focused on individual diseases, rather than on cross-cutting drivers. It would be beneficial to support such institutions in the alignment of their flows.

(b) Regarding domestic resources, more cohesive planning is critical. One source of finance from domestic resources could be from taxing, for example, tobacco or foods high in sugar, or to reallocating subsidies currently channelled to fossil fuels to health promoting interventions such as renewable energy, healthcare, and social protection.

(c) Quantifying the changing burden of disease risk can also help to mobilize financing flows. Including budgetary allocations in NDCs for health sector actions may help to unlock international climate finance. Identifying best buys for climate change and the health sector offers one mechanism to build the investment case for actions. For example, it is known that the economic savings of climate action typically outweigh the costs.

(d) A non-Party stakeholder noted that excellent examples of mitigation in the health sector exist in low and middle income countries, at a fraction of the cost observed in high income countries, presenting an opportunity to collate best practices, notable that the cost is not necessarily aligned to quality. Another non-Party stakeholder commented that her country had the most expensive health system in the world, but that life expectancy was not comparatively longer. A Party stakeholder underlined the need to align systems transformations and financial flows.

(e) It was observed that framing climate change in health terms can provide a “human face” to the issues and may itself help to unlock finance across sectors.

(f) Participants underlined the importance of developing a database to promote the sharing of good practice, including use of technologies being used in provision of telecare and digitalized systems to speed up implementation and the delivery of results. It was noted that not all good practice is published in peer reviewed journals.

473. On how the health sector collaborate with other sectors to enhance climate action and protect health, participants suggested a mechanism of coordination between health and other climate relevant sectors, including the engagement of the health ministry in the development of NDCs. It was noted that the NDC includes a specific goal on understanding the trends of climate sensitive disease through forecasting. The NDC also refers to air pollution reduction co-benefits which help mainstream health and climate, for example in coordination with the Climate and Clean Air Coalition participants focused their discussion on the concept that approaches to disease prevention can contribute to mitigation in the health sector, through reduced demand for health care service. It was highlighted that benefits can be reaped through action across sectors, including in the food and agriculture sector, with multiple participants referring to aspects of the “food-agriculture-nutrition nexus” which offers important synergies between mitigation and adaptation, and delivers significant co-benefits. The following comments were made:

(a) Local, fresh, organic plant-based diets high in plant-based foods and low in red meat and processed foods both have a lower carbon footprint and lead to reduced incidence of diseases such as diabetes and cardiovascular disease, while growing different potatoes suited to the changing climate can help to address food insecurity

(b) National food strategies can be improved through stronger links to climate considerations.

(c) The energy sector presents co-benefits since clean cooking solutions reduce the burden - especially on women - of respiratory, cardiovascular, neurological and foetal conditions, and transitions to renewable energy improve air quality, reducing the risk of respiratory and cardiovascular diseases)

(d) In the urban and buildings sectors, optimum ventilation planning can help address the Urban heat Island effect, as well as improving vitamin D production through increased exposure to sunlight. Nature based solutions such as green infrastructure both have a cooling effect and promote mental health

(e) Participants underlined that improving quantification of health co-benefits using available tools can help to make the case for action across sectors clear. It was noted that only 10% of NDCs quantify health co-benefits. A non-Party stakeholder cited an example the Indian government has championed, a “lifestyle for environment initiative”, which integrates waste, air pollution and water pollution.

(f) Systemic change and enablers are critical, and responsibilities should not be placed on individuals. Rather, it is vital to “make the healthy choice the easy choice”, for example with allocation of agricultural subsidies in agriculture to production of foods which protect both the climate and public health. This integrated approach can be referred to as “policy coherence” or “health in all policies”.

(g) Participants recommended that coordination between the health sector and other be ameliorated through the establishment of cross-sectoral inter-ministerial platforms, because an integrated approach to health, equity and the social determinants of health can support strong outcomes for both planet and people.

474. Participants discussed roles that can be played by individuals, families, institutions in transformation of the health systems. The importance of community led adaptation with transformative engagement was underlined, as well as the benefits of social cohesion and education, which can also be provided to patients by health care professionals. It was noted that private sector engagement can drive action in some cases. A Party delegate shared national experience on development of the health national adaptation plan, whereby consultations were conducted with a variety of stakeholder groups.

E. Summary of the closing plenary

475. The closing plenary was convened by the GST1/TD co-facilitators and closing remarks were given by Simon Stiell, UNFCCC Executive Secretary, Marianne Karlsen and Tosi Mpanu-Mpanu, the SB chairs. Welcoming remarks were followed by highlights of the TD1.2 on the three thematic areas of mitigation and response measures; adaptation, including loss and damage; and means of implementation and support, including finance, technology, and capacity-buildings, presented by designated cluster rapporteurs. The co-facilitators presented a summary of the discussions during the focused exchanges session; systems transformation dialogue; and initial reflections on the TD1.2 technical dialogues. They also provided preliminary thoughts towards TD1.3, to be held in June 2023. Party and NPS were then invited to give closing statements.

476. The first opening remarks were presented by Mohammed Nasr He emphasized the importance of GST as the Paris Agreements architecture through which Parties shall assess the collective progress towards the purpose of the Agreement and its long-term goals in a comprehensive and facilitative manner. The technical dialogue is also a pillar of the GST process, allowing an exchange between Party and NPS on all elements of the Paris Agreement in a balanced, open, inclusive, and holistic manner. Mr. Nasr thanked the co-facilitators for designing a process that created a space for exchanges and dialogue between stakeholders and acknowledged positive and constructive interventions during the different sessions of TD1.2. He also thanked all participants for their deep engagement in the process and expressed looking forward to a collaborative next round and conclusion of the technical dialogues in Bonn next year for a smooth transitioning from the technical phase to the political one.

477. In his opening remarks, the UNFCCC Executive Secretary stressed the importance and value of the GST process and stated that, while the technical dialogue was in a technical phase, it was not a technical exercise. The GST is an ambition, accountability, and an acceleration exercise, intended to make sure every Party is holding up their end of the bargain and knows where they need to go next, and how rapidly they need to move to fulfil the goals of the Paris Agreement. The GST may be taking stock of past actions, but it is about forward momentum, mostly in identifying opportunities for action on mitigation, adaptation, finance, transparency and incorporating players outside the process.

478. Mr Stiell remarked that although NDC reports showed countries are starting to bend the curve downwards on global GHG emissions, the efforts remain highly insufficient to limit global temperature rise to 1.5°C. The GST is an opportunity for comprehensive actions in mitigation, adaptation, and means of implementation and support, including elements of loss and damage and response measures. Mr Stiell commended the co-facilitators for finding innovative ways to facilitate the GST dialogue and encouraged all to start thinking ahead to the next steps and underlined the GST to be a major milestone and one of the main outcomes of COP 28.

479. In his remarks, Mr. Stiell expressed his keenness to hear from Parties, in addition to the technical outputs, on what are the potential key political messages, how the high level engagement in Doha should be prepared, and that work on a draft decision and/or declaration, and how it will look like, should begin. He underlined the importance of the work of the joint SBSTA and SBI Contact Group on the matter, especially when considering the interlinkages with other relevant ongoing processes such as the mitigation work programme, the Glasgow–Sharm el-Sheikh work programme on the global goal on adaptation, the ad hoc work programme on the new collective quantified goal on climate finance, and the Glasgow dialogue on loss and damage. He emphasized on the outputs from the GST to focus on action such that they ultimately inform Parties in a way that they can rapidly update and enhance their actions and support in a nationally determined manner and in a way that enhances international collaboration.

480. In their closing remarks, the SB chairs, Marianne Karlsen and Tosi Mpanu-Mpanu, thanked the co-facilitators for their work throughout the year, the UNFCCC Executive Secretary and staff for facilitating the GST process, and all the participants for participating and sharing their experiences during the GST process. They reiterated the need for a strong

outcome that enables the process to move forward in a way that ramps up what we need to do to reach the 1.5°C and all the other targets, and stressed on working together do all we can to achieve our collective goals.

481. The opening remarks were followed by presentations of key points from the thematic discussion areas, by designated cluster rapporteurs.

482. The first thematic cluster presentation was on mitigation, including response measures, by Frederick Pischke, who stated that discussions on mitigation, including response measures, were held in a roundtable format with four breakout groups held over two meetings, preceded by brainstorming at four World Cafe stations. The roundtable breakout groups included topics on enhancing global mitigation pathways; transforming energy and industrial systems; transforming land and other systems; and response measures. The World Café topics focused on enhancing global mitigation pathways; transforming energy and industrial systems; transforming land and other systems; and how do we develop creative and imaginative approaches to impacts of response measures.

483. Mr Pischke stated that during the discussions, participants engaged deeply into discussions that allowed a nuanced exchange on the “how” to address barriers, challenges and identified solution and raised many examples of good practices and success stories across the topics of the round table and world cafe stations. Key issues included aligning short term, midterm and long-term goals and just transitions with 1.5°C pathways, whole government approaches and integration across governance levels and ministries. Emphasis was put on the importance of including diverse actors and stakeholders into decision making processes, particularly women, youth and children, indigenous peoples, local communities, and other people living in vulnerable situation, especially within the AFOLU sectors. The importance of reliable finance and support to developing countries and a financial system that supports mitigation and addresses the barriers to implementation was highlighted. Other key areas highlighted included:

- (a) Basing targets on the best available science and equity
- (b) Collaboration, co-investments and partnerships to reduce uncertainty around new technologies and systemic changes
- (c) Integrating data collection and data systems to aid transparency, accountability and policymaking
- (d) Sector specific and subnational and regional specific policies are an important supplement to national policies on just transition
- (e) Additional opportunities for collaboration and cooperation to address the implications of response measures to support just transition
- (f) Creating ownership and buy in as well as understanding impacts and benefits of climate change policies.

484. Highlights of the session on adaptation, including loss and damage, were presented by Mariana Rokini. She stated that discussions were held in a roundtable format with four breakout groups held over two meetings, and a world cafe setting comprised of four topic tables. The roundtable breakout groups included the topics of recognized adaptation efforts of developing countries, enhancing the implementation of adaptation actions; review of adequacy and effectiveness of ongoing adaptation and support at different scales; assessing collective progress; and enhancing efforts on averting, minimizing and addressing loss and damage. The World Cafe topics focused on addressing adaptation needs; early warning systems and scientific advance in attribution; methodological gaps; and technical assistance.

485. Ms Rokini explained that participants discussed how developing countries have implemented adaptation efforts using domestic resources; adaptation effort at subnational scales; the reality of how constraints on finance, technology and capacity affect these efforts. Participants also examined how to mainstream adaptation in planning budgets and across sectors in system transformations; taking a whole of society approach and inclusive governance underpinned by data in transboundary adaptation and reducing the risk of maladaptation.

486. Ms Rokini stated that dialogue participants highlighted that effective adaptation requires understanding of the specific needs and priorities of each country or community, assessed through common methodologies and supported by data and sustained monitoring. Adequacy of actions can be construed in stages and by the degree to which adaptation results in resilience that is sustained over time; the cost of financing in terms of amount, availability and access modalities and speed with which funds flow; as well as the role enabling conditions can play in addressing gaps. Assessment of support should include aspects such as capacity-building, technology, and availability and use of relevant data and information. Dialogue participants shared views on how those most impacted by climate impacts should be involved in crafting the solutions. As such, effective adaptation is best achieved through an inclusive approach attentive to gender, human rights, inclusion of young people, a respect for indigenous and traditional knowledge.

487. Regarding loss and damage, Ms Rokini explained that participants discussed practical means to integrate loss and damage into policies and plans; how plans require institutional capacity to implement; finance for addressing loss and damage; the need for greater investment in the evidence based information on tracking loss and damage both globally and nationally; climate justice and inclusion; the importance of action outside the UNFCCC; and enhancing coordination among actors; and scaling up action and support to reduce losses and improve recovery. At the World Café many participants highlighted how the realization of the Santiago Network provides a key opportunity to strengthen capacities at different levels.

488. A report back on means of implementation and support was provided by Kassim Gawusu-Toure. He explained that the means of implementation including finance, technology and capacity-building discussions were held in a roundtable format with four breakout groups held over two meetings and the World Cafe setting comprising four topic tables. On climate finance, two breakout discussions focused on aligning financial flows and international climate finance. With regards to financial flows and trends, participants discussed outcomes -understanding finance is a means to an end; leadership by anchor institutions - that finance is for the people; the international architecture and national frameworks for finance; the role of private finance; and how GST can send signals to the broad range of actors and processes needed to support low greenhouse gas and climate resilience pathways.

489. Mr. Gawusu-Toure narrated that with regards to international climate finance, participants discussed how developing countries have used NDCs and NAPs to determine and report their needs that doubling finance for adaptation and parring it with mitigation finance remains a challenge. The challenges are related to meeting the mobilization goal and the catalytic role of international climate finance in having further investment solutions. Participants also discussed how to address a range of issues including barriers to assess the need for long term funding, converting NDCs into investment plans and changes to budget and technology.

490. Dialogue discussions on technology needs assessment and the implementation included sharing common performance standards approaches to common action and technology development and transfer, technology engagement and the critical role of private sector and taking a system approach. Participants brought a rich array of examples and good practices that demonstrate how to make progress in technology development and transfer for adaptation and mitigation.

491. In the discussions on capacity-building, key items discussed included the role of taking systemic and long-term views that link grassroots levels to national level, that capacity efforts are need-based and context specific. The importance of measurement and assessment of capacity-building effectiveness; strategies for enhancing systemic and institutional capacities and the importance of investing in foundational capacities, including education, infrastructure; and governance institutions, generally, were highlighted. Many specific best practices emerged, demonstrating the breadth of engagement with capacity across all sectors and levels. Retention of capacity emerged as a major challenge at all institutional levels. Taking a long view of capacity-building efforts was a strategy designed to address this, as was the value of identifying and providing incentives to retain and develop capacity.

492. After the thematic cluster rapporteur reports, the co-facilitators stated that new elements were introduced to address intersections and systems transformations for adopting a more holistic and integrated approach to the discussions. They explained that eight new stations were added to the World Cafe, focusing on systems transformation, such as the energy sector, land, transport, water, urban, and key infrastructure, agriculture, industrial and health systems. Further, focused exchange panel session on pathways towards low greenhouse gas emissions and climate resilient development, and a second focused exchange panel on international cooperation on holistic and integrated approaches were conducted.

493. The co-facilitators explained that during the first focused exchange on pathways towards low greenhouse gas emissions and climate resilient development, ideas were shared for many sides, including building a common understanding of the importance of inclusivity, and participatory engagement across all aspects of the development process, and how these are a key determinant for success and the transition to such pathways. Participants also noted the real-world considerations that will shape implementation actions to realize opportunities that can result in outcomes on adaptation and mitigation that are mutually supportive, that also addresses the socio-economic needs of the poor and vulnerable communities. It was noted that the context matters; successful low greenhouse gas emissions, reductions and climate resilient development must consider the regional, national and local circumstances. Building from the ground up with knowledge of where we need to collectively go, we can build and better enable just transitions across scales and systems.

494. At the second focused exchange on international cooperation on integrated and holistic approaches, the co-facilitators explained that panellists presented a variety of perspectives on international cooperation on integrated and holistic approaches, each speaking from a long experience of what is working well and requires further action and support. Multiple systems are under stress from simultaneous crises. While there are signals that these things are beginning to move, we have yet to see results on the ground. The fact that context really matters was highlighted by many participants. They discussed how context from a broad global context, for example, the connections of climate and development, and the reform of the international financial architecture, but also in the same conversation offered experiences from countries of implementing these approaches at local and national scales.

495. The co-facilitators stated that the focus exchanges contributed to a shift in tone and level of conversation and invited participants who had not already done so to send details and examples and the illustrations that they offered through the GST information Portal.

496. The co-facilitators mentioned the launching of a poster session as well as a creative space at COP 27, noting that both were well received, and well attended. They thanked everyone that submitted entries to both initiatives and invited participants to see how the GST discussions were now they've captured graphically and went on to conclude the reporting back session of the closing plenary.

497. The reporting back session was followed by a session on initial reflections from the TD1.2 dialogue, facilitated by the co-facilitators. They highlighted that for TD1.2, a goal was set for moving from a discussion of "what" to the high end of the "How to". The discussion identified a set of opportunities, good practices and actions that can help address the gaps, barriers and challenges faced in striving to achieve all the goals of the Paris Agreement.

498. In their reflection, the co-facilitators stated that they went both deep and broad, and TD1.2 provided the chance to brainstorm together in the World Cafe sessions, and to work together in the round tables and in the breakout discussions on concrete outputs that centre on the core issue, and to engage in the focused exchanges on integrative and holistic approaches. In doing so, the co-facilitators grappled with real world challenges and opportunities that are at the heart of raising ambition and realizing the goals of the Paris Agreement. The co-facilitators and secretariat team would then digest what was heard and reflect that more fully in a summary report of TD 1.2.

499. The co-facilitators shared some initial thoughts very initial thoughts towards TD 1.3, explaining that the precedent sessions were instructive in turning towards TD 1.3. and the subsequent preparation of a factual synthesis report of the technical component of the GST. They noted TD 1.2 as a bridge that allows moving towards key technical findings as we

consider the focus of TD 1.3, and as such it was important to take stock of all that had been addressed so far in order to both begin distilling clear messages that are emerging in some areas and to identify and devote time to those areas that still need further exchanges in order to harvest progress. The co-facilitators noted that participants highlighted the need to capture the extensive body of technical knowledge in a more accessible and searchable form, and for that a technical Annex to architectural synthesis would be considered.

500. Following their presentation on TD1.2 reflection, the co-facilitators invited opened the floor for comments from participants, starting with groups of Parties and Parties and observer constituencies thereafter.

501. Pakistan for the G-77 Plus China welcomed the conclusion of the second technical dialogue and expressed appreciation for the co-facilitators work. They acknowledged the challenging circumstances on availability of rooms during COP27 and recognized the modalities that enabled the consideration of a large array of interventions and insights, providing a wealth of information and perspectives. They welcomed active participation of both Parties and NPS as fundamental to the success of the technical dialogue, and urged the co-facilitators to continue improving the way in which the views and perspective is of all Parties are properly taken note to ensure a balance of different views and discussions are well reflected in the summary report of the TD1.2.

502. In relation to various issues raised by Parties with respect to the thematic areas of the Global Stocktake, the G-77 Plus China took note of the fundamental importance of suitable environments that are conducive to fully participatory and inclusive discussions. They noted there were many logistical challenges which affected both the World Cafe and the round tables because of the design of the available spaces for discussions during COP 27 sessions, including logistical limitations of access, acoustics and fragmentation, which led to less dynamism in the World café session. They expressed disappointment at too many scheduling clashes with other mandated events and discussions in other agenda items that had the effect of limiting participation. For subsequent discussions, they urged for consideration of arrangements that allow for more spaces for focused discussions on specific topics that cut across all thematic areas for the Global Stocktake, and encouraged the co-facilitators to consider modes of work that would enable delegations, especially small ones, to follow the proceedings more closely since having too many meetings and activities work in favour of delegations with more experts able to attend them.

503. The Group of 77 (G-77) and China underlined the use of formats that allow for greater interactivity among the participants, such as the focus exchanges, and called for greater efforts to ensure equity in participation, including in relation to language barriers. They expressed the expectation that the next session of the technical dialogue, feedback given would be considered.

504. The African Group, associating with the G-77 and China, expressed appreciation for the co-facilitators' sincere efforts to make things successful. They noted previous concerns raised about linkages with the other mandated programs and duplications, participation that was affected by overlaps with other meetings. They highlighted that scheduling arrangements be managed to ensure that delegations, particularly the small ones. They noted that in the mitigation roundtable and World Cafe discussions, topics were generally helpful to collate mitigation related elements. However, the questions Parties were responding to were limiting, particularly in the response measures discussions. In the adaptation discussions, the questions were limiting and, in some instances, not related to the understanding Parties have of the issues in the other adaptation agenda item negotiations. They expressed concerns with a selective way the views expressed were captured in both the World Cafe tables and the round tables, particularly the case in the adaptation and response measures discussions, and expressed intention to reiterate the points they made in their full statement for inclusion in the summary report.

505. For subsequent discussions, the African Group recommended a narrower focus on the topics that address the very central question of how we're going to address the gap in a way that nudges the technical dialogue towards the technical dialogues final outcome, and emphasized on achieving the goals of the Paris Agreement in a manner that enables a just transition where best available science and equity is considered across all climate actions.

506. Australia, on behalf of Canada, Iceland, Israel, Japan, New Zealand, Norway, Ukraine and the United States underlined the Global Stocktake as an important process for increasing the urgency and ambition of climate action, and the participation of Parties in the Umbrella Group in the second session of the first technical dialogue of the GST. They expressed appreciation confidence in the CFs and recognized the extraordinary amount of their effort in the process. They thanked all Parties for their contributions, in particular NPS for contributing their insights, noting that they shoulder much of the burden of implementation that will lead to the achievement of our Paris Agreement goals. They also thanked the secretariat for their efforts in supporting the technical exchange.

507. The European Union (EU), on behalf of the EU and its 27 Member States, stated that the Global Stocktake is at the heart of the Paris Agreement ambition cycle, and they remain fully committed to contributing to and learning from this process. They thanked the co-facilitators, the secretariat and all experts, facilitators, rapporteurs, notetakers, Parties and NPS for their respective roles in the GST process. They expressed satisfaction with the co-facilitators in continuing to take an innovative course to develop more inclusive and interactive technical dialogue accessible to Parties and NPS. The EU highlighted the importance of having diversity of voices around the GST table, counting on the co-facilitators to continue with this level of inclusivity.

508. The EU underlined a few observations based on their experience on roundtable one on mitigation, including the response measures, on the urgency of increasing ambitions and actions, and that to keep the 1.5°C target within reach. It is important that the GST captures all available near-term options and solutions for increasing ambition and action. Science is very clear on how to do this to keep climate change impacts manageable in all areas, including mitigation, adaptation, and dealing with the loss and damage. The EU key messages from the discussions highlight the importance of adaptation policy and mainstreaming adaptation across different levels of governments and inclusive governance that brings in NPS, local communities, and indigenous peoples.

509. On loss and damage, the EU highlighted actions needed to avert, minimize, and address loss and damage, underlined by building a common understanding of loss and damage; capacity-building and policy enhancements; disaster risk reduction; and anticipatory action. The need for increased provision and access to loss and damage finance was complemented by a focus on development support for the most vulnerable people and communities, in particular children, youth, women, and indigenous peoples.

510. The EU referred to roundtable three on the means of implementation, that the GST can help move tracking systems, common understanding of tools, indicators, and methodologies for tracking stock of finance flows, building on what already exists. On promotion of SCF reports, regarding alignment, the EU expressed regrets that discussions were less about adaptation than mitigation. Discussions also lacked integration of physical climate risks, which could be a topic for a deep dive for the next technical dialogue, and while the definition of climate finance and taxonomies for sustainable investments were highlighted, as well as the complexity of procedures, a cross cutting approach to remove these barriers would be useful. The European Union expressed looking forward to the joint contact Group conclusions on a process that should allow creation of the political momentum towards a stronger outcome of the GST.

511. Switzerland, on behalf of the EIG, stated that recent IPCC reports show we are not on track to reach objectives of the Paris Agreement and the window of opportunity is closing on keeping 1.5°C alive. The GST is therefore a key political moment for the Paris Agreement strengthening and informing the ratchet mechanism for EIG. The GST should lead to concrete recommendations to fulfil the Paris Agreement goals with ambitious action. It should also foresee proper follow through in how those recommendations are then implemented, including through the full participation of different NPS in this implementation. It is paramount that GST incorporates a human rights gender intergenerational and intersectional approach.

512. Switzerland thanked the co-facilitators for the new formats tested out during the session, in particular, the opportunity to study how to ensure systems change in an integrated way. At the same time, Switzerland felt there was still a way to go to identify

recommendations that can really make the GST exercise transformative and truly meaningful. There are a number of questions that deserve our full attention:

- (a) How can we collect those practices experiences and make them available for all?
- (b) How could we articulate concretely those practices with the different pathways for long-term low emission and climate resilient development compatible with 1.5°C objective?
- (c) How could we upscale these practices?
- (d) How can we break barriers for an accelerated implementation?
- (e) How could we still bridge the remaining knowledge gaps and connect our work with the best available science, in particular on risk and ongoing impacts of climate change, such as tipping points in the global climate system on more precise pathways at a sectoral or system scale, as the IPCC shows in its last Working Group View report?
- (f) How do we make these policies, experiences and practices effective and action actionable to accelerate the phasedown of unabated coal and phase out of inefficient fossil fuel subsidies?

513. Switzerland expressed appreciation for the informal exchanges on the roundtables and felt it could have been more conducive to hold the roundtables such that all could hear what was said. The breakout groups ended up being similar to the World Cafe format, and it was also noted the breakout groups could pose a challenge for small delegations. The focused exchanges should be retained in the future, particularly looking at intersectional aspects of climate action. However, it can be helpful to have more precise direction for discussions to make the most of these exchanges.

514. Trinidad and Tobago, on behalf of AOSIS, associating with the statement made by Pakistan on behalf of the G-77 and China, expressed intention to submit substantive views on the roundtables in writing. They underlined the need for a stronger connection between COP 27 discussions and the focus questions set for TD 1.3 and indicated that prompts and questions asked during COP 27 session seemed very broad and quite general. And, as a result, there was concern that the assessment of outcome through the synthesis report may not produce the kinds of key messages that are expected. Trinidad and Tobago expressed hope for the next and final session of the technical dialogue to have deepening consideration of recurring themes, further specifying where the gaps exist, further explore solutions to blockages and gaps that have been identified. They deemed it more valuable to have two formats of work rather than three and proposed adapting the round tables to a focused exchange and keeping the World Cafe session, perhaps with less tables. They recommended for the TD1.2 summary report to be issued well before the next session to Parties time to consider the issues fully enrich discussions at TD 1.3.

515. Saudi Arabia, speaking on behalf of the LMDC, aligned with the statement made by the G-77. and China. They expressed representing the challenges opportunities and diverse climate and development aspirations of over half of the world's population, and that appreciation of the diversity is crucial in discussion on ambition. Saudi Arabia indicated that the integrated and cross-sectional discussions and the great number of modalities got to a point where it was difficult to follow, especially amongst the different members of the different delegations within the LMDC Group. They called for more simplified modalities at the next session that should be more focused to avoid language or mandates that are outside of the mandate of the GST and the Paris Agreement.

516. On the issue of equity, Saudi Arabia stated they viewed equity not just as a fashionable add on term that that doesn't have deep and important meaning within the history of climate change. Equity is firmly ingrained in historical emissions, historical responsibility, and the subsequent planetary effects of those emissions. The Developing World now being most acutely affected by those repercussions needs immediate financial support and immediate adaptation. Considering all what was mentioned, and wanting to be extremely ambitious in climate targets, the equitable distribution of the remaining carbon budget based on the historic responsibility of the total carbon budget is pertinent in responding to the urgent transitions.

According to one of the pathways, and from best available science, it is expected that oil and gas will be in the global mix until at least around mid-century, if not longer. We need to be honest that the IPCC model projections of a global trajectory of 1.5°C and 2°C have no considerations of national and regional circumstances, historical responsibility, and equity. If we are to be guided by equity, we need to ensure this is being reflected when we talk about the best available science. The scenarios assume a World which is still grossly unequal even in 2050.

517. Saudi Arabia underlined that some technologies will probably be needed more than the projected pathways show. In this regard, it is more productive to focus discussions on a full and not selective depiction of science and all possible solutions included. The right to development is a right that includes economic growth to enable sustainable development, poverty eradication, energy access and economic diversification. Developing countries need to pursue the livelihoods of their people, including children. Efforts to pursue climate action should emphasize the intrinsic relationship that climate change actions, responses and impacts have on equitable access to sustainable development and the eradication of poverty, as outlined in the Paris Agreement. Therefore, historical responsibility and equity are at the heart of the Convention and its Paris Agreement. As noted by the UNFCCC executive secretary, GST should be used as an ambition and accountability exercise to ensure that every Party is holding up on their commitments. This is critically why the LMDC Group feels the discussion on gaps in the implementation of pre 2020 commitments and backtracking on commitments should be discussed at length within the GST, with a clear way forward. Saudi Arabia reiterated the request for such a dedicated discussion in the upcoming session.

518. Saudi Arabia noted that the entire GST discussions seemed to be taking place in the form of a loop, that most participants were saying the same thing, or different parts of the same thing. There was a feeling of going around in circles, which make it difficult to specifying outputs and messages that will positively affect us all. Urgent need to reduce emissions and to support all technologies that are available and will be available in the context of protecting the earth should not be at the detriment of today's needs. We need to pursue both simultaneously. Urgency of mitigation is for future needs. Developing countries are being disproportionately impacted today, so we need to urgently scale up the provision and mobilization of finance from developed to developing countries, not just for future needs.

519. Saudi Arabia highlighted that adaptation action and support must be a priority for the protection of human life today and not for the impacts of 10, 20, 30, or 40 years from now. Just and equitable transitions is about making sure we can all be ambitious, whilst also protecting the most vulnerable everywhere in light of the principles of the Convention and its Paris Agreement. We need to raise the status of all because this is what the Multilateral system is about. It's not about discussing what is relevant for one national context but rather what will protect everyone, and through the GST, we need to make sure no one is left behind and that ambitious progress that preserves equity and the rights of sustainable development are made across mitigation and response measures; adaptation including loss and damage; and means of implementation and support.

520. Saudi Arabia stated that developing countries will now more than ever need to understand, assess and address the social and economic consequences and impacts of response measures when setting ambitious mitigation targets. In this regard, we need to move beyond just understanding and assessing those impacts. We need to do more in addressing these impacts and within the GST and beyond. We need to stop going around in circles.

521. Saudi Arabia took the opportunity to announce a just and equitable transition mechanism, and expressed optimism about its launch, inviting all Parties to support the proposal and have further discussions on how it can be housed. They expressed seeing the mechanism as a crucial vehicle to move past talking about justice and fairness in a vacuum to having a dedicated space to operationalize equity and address response measures.

522. Speaking on behalf of the Island Group, Columbia began by associating themselves with intervention made by Pakistan on behalf of the G 77 and China. Columbia stated that he GST session brought in a plethora of concrete examples and suggestions providing inputs on the questions of how we can achieve the climate transformation, rather than simply the what needs to change, with concrete solutions giving hope that the 1.5°C goal can be achieved. For

example, industrial sectors that were long held as hard to abate now have pathways and pilot combining holistic changes in markets, materials, processes, and technologies. We finally heard the answer to the age-old question on what climate finance is, and that finance flows must be in line with Article 2.1(c) of the Paris Agreement.

523. Columbia underlined that concrete suggestions of technical criteria on how to achieve and keep track of finance flows, combined with the concept of net climate finance, can guide Parties, private sectors and financial institutions towards achieving the 1.5°C aim. The dialogue provided innovative suggestions on how to bridge the enormous knowledge gaps that are hindering transformational adaptation and how transformations can be implemented in our land use, for example, improving resilient agriculture systems with zero emissions through for sustainable management in the land of indigenous people. We draw lessons from the dialogue experts that climate action is not only financial or technological mitigation or adaptation, but rather integrated and holistic action that take us towards the low emission development to ensure just transitions.

524. On gender and human rights, Columbia welcomed the idea of identifying human approaches to guide the work, recognizing that such approaches can integrate efforts to address the environment and climate impacts and preserve the rights of the most vulnerable in the process. They stated that the GST must be a critical milestone, and therefore, we need to start identifying convergences on messages, and encouraged all Parties to focus on the wealth of experiences this week and remain fully committed in the process, ensuring the most participative outcome possible, particularly small delegations who sometimes find it challenging to engage in all modalities.

525. Brazil, speaking on behalf of Argentina, Brazil and Uruguay supported the statement made on behalf of G-77 and China. Brazil reiterated on point made by the G-77 and China on considering arrangements that allow for more space for focused discussions on specific topics that cut across all the thematic areas of the GST. Brazil expressed support of comments by the UNFCCC Executive Secretary, as elaborated also by Saudi Arabia on behalf of the LMDC.

526. Senegal, on behalf of the LDCs LDC Group and aligning with a statement deliver by G-77 and China, suggested having additional intersectional discussions to have a broader engagement and focused input. TD 1.3 should start considering how we bring together all the technical inputs from the discussions to help in raising ambition in limiting temperature rise to 1.5°C, a lifeline for our most vulnerable countries, and critical to reduce future loss and damage. GST will, not only help to understand where we are, but also give clear guidance in achieving the goals of a Paris Agreement.

527. Algeria spoke on behalf of the Arab Group, which associated itself with the statement made by Pakistan on behalf of the G-77 and China. The Arab Group continues to highlight the need that actions cannot be dissociated from support. This implies considering Article Two of the Paris Agreement with a set of provisions like Articles for dealing with NDCs, Article 7 on adaptation, as well as Article 9, 10 and 11 on means of implementation. It is essential to note that countries in the region are doing a lot to fight climate change and adapt to its effects. Unfortunately, these actions are not accounted for due to the lack of adequate knowledge. We agree that fossil fuel subsidies that undermine environmental integrity should be phased down. But our countries must have an alternative for that, with due considerations of the socioeconomic consequences.

528. Norway expressed that GST is a core element of the Paris Agreement ambition cycle, and the outcomes shall inform Parties in updating and enhancing the NDCs as well as international cooperation for climate change climate action. The technical dialogue has been highly inclusive, interactive, and focused on solutions. It is crucial to look at the different systems in a systemic way, the energy system, the transport system, food production system, financial system, system for industrial production, etc. To implement the transitions that we need, it is important to address all the bits and pieces within these systems. The systemic approach makes it possible to connect these and to look at how they are connected throughout the whole value chain, from production and planning and all the way to the end users. This way it is possible to create a seamless transition to low or zero emission societies.

529. India aligning itself to the statements made by Pakistan on behalf of the G77 and China and Saudi Arabia on behalf of the LMDC, stated that it was clear that system transformations, as discussed in the sessions of the GST are a tremendous challenge for developing countries. The term transformation in fact is applicable in the case of developed regions where highly carbonized systems have been in place for decades. The demonstration of rapid decarbonization and thorough transformations in energy and land systems in these regions is not only necessary for meeting the Long-term goal of the Paris Agreement but can also have the welcome effect of reducing costs of these technologies and options for the developing world as well.

530. India underlined that for developing countries, the question is not one of transformation, but of sustainable development. Most of the infrastructure that is required to achieve universal wellbeing in developing countries is yet to be built. The potential for doing this through renewable energy systems alone is yet unclear. The costs of integrating these technologies in the national and regional grids are still substantial. And the impacts of these measures in the near medium and long term are still unclear and are going to be substantial. The principle of equity and CBD RRC become critical in approaching questions of system transformations. This principle must inform discussions of technical dialogue of GST.

531. India pointed out that the GST should stick to its main purpose and not become a vehicle for making global prescriptions for system transformations within countries. Global mitigation pathways and the best available science tell us to limit warming to a certain level, and the key metric is the global carbon budget. It is not the timing of net zero but the cumulative emissions till the time of net zero that determine the level of warming. India reiterated the concerns raised by Saudi Arabia on behalf of the LMDC on that global pathways that are currently available do not include concentrations of equity, and CBD RRC must be the basis on which climate action must be implemented.

532. In conclusion, India noted that there were discussions on climate resilient development pathways as well. And the options available for mitigation can have synergies with adaptation but can also have significant trade-offs. Policymakers cannot focus simply on the core benefits where there are also large trade-offs that can vary across regions. Arguing that mitigation and adaptation can happen in the same place can result in focusing all the mitigation action in developing countries where infrastructure is yet to be built. We note with concern that in many of the discussions this is what happened, that the focus was on regions where infrastructure is yet to be built. Multiple options of retrofitting exist in places where infrastructure already exists. Reducing disruptive consumption and moving to sustainable consumption is not only required to meet the global goals of the Paris Agreement, but it would also be reflective of the principles of equity and CBDR-RC. Clubbing mitigation and adaptation should not become tantamount to adding mitigation burdens on to those who already bear considerable adaptation burdens. The IPCC report states that regions and people with considerable development constraints have high vulnerability to climate hazards, and that opportunities for climate resilient development are not equitably distributed around the world.

533. The United Kingdom stated that at this juncture when the GST process is two thirds of the way through the technical assessment, it is vital we take the progress so far and begin to work out what it means for our collective action going forward. This is to ensure that the GST fulfils its mandate as a five yearly ambition ratcheting mechanism under the Paris Agreement, based on evidence, and also to anchor this process in the context of the critical decade 2030, the years that will determine whether we can keep a temperature goal of 1.5°C alive and minimize the impacts of climate change and our populations every day, month and year counts. To achieve this, we need technical and also political results. The GST process was designed to enable both, which is why the technical dialogue that has been taking place this must inform political momentum towards solutions and outcomes as we prepare for COP 28. We look forward to hearing about the presidencies plans in this regard.

534. The United Kingdom welcomed the efforts made by the co-facilitators to ensure that conversations focus further on homing in on solutions and opportunities for enhancing our climate action, as well as international cooperation, and welcomed the ongoing participation and contributions of NPS, and recognized the support provided by the high-level champions for Non-Party stakeholder participation and the GST in response to the encouragement from

Parties in Glasgow. Together, we need to shape the watershed moment that the GST was intended to be and provide the evidence and the signals for Parties as well as NPS so that we can all enhance our actions, support and international cooperation.

535. The Russian Federation stated that it considered the GST the most important provision for assessment of the progress towards achieving the long-term goals as formulated in Article 2 of the Paris Agreement. In accordance with decision 3/CMA.3, we support the preparation of the first GST to be undertaken in 2023 under the provisions of Article 14.2 of the Paris Agreement that was initiated at the 56th meeting of UNFCCC SB in Bonn. The talk of the implementation of the Paris Agreement referred to in Article 14, should equally consider mitigation, adaptation and the means of implementation and support. However, these provisions have not been fully taken into consideration, resulting in one sided and politicized debates. Within the consideration of mitigation issues, the global goal is for holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels Article 2.1(a). This was substituted for limiting the temperature increase to 1.5°C, thereby breaking the integrity of balance language of the Paris Agreement as a whole. We encourage to follow the agreed language of Paris Agreement within consideration of equity, fair, ambitions, urgent and real greenhouse gas emission mitigation.

536. The Russian Federation encouraged avoiding of narrowing GST topics to selective conclusions of the IPCC SAR that deal with intended intensity of global temperature growth since such an approach result in politicization of efforts of the IPCC as a community of scientists. It called for objective and unbiased scientific assessment that considers different viewpoints and enhance participation of scientists and experts from different regions of the world, as well as improved utilization of scientific information, data and knowledge available in all official UN languages.

537. Russian Federation supported the broadening of adaptation agenda since adaptation has become an urgent necessity for all countries, not only for global south but also because the spill-over heat waves and melting of permafrost. As such, it is important to note that consideration of global adaptation goal must not be limited to provision of financial support to adaptation efforts only in developing countries. Recognize and consider the importance of differences in natural and geographic conditions, and social and economic development.

538. Russian Federation stated it now has commitments on providing financial assistance to support developing countries combat climate change, and provides assistance on a voluntary basis through a number of international platforms including the Green Climate Fund, and through bilateral cooperation in the area of adaptation to climate change. It emphasized being against measures such as artificial limitation and restriction on the level of products and services as it may result in discrimination in international trade and worsen economic position and sustainable development of other countries, contrary to provisions of Paris Agreement.

539. China aligned itself with the statement made by Pakistan on behalf of G 77 Plus China and by Saudi Arabia on behalf of LMDC. China expressed full support to co-facilitators leadership and commitment to work with all Parties and stakeholders towards a meaningful and successful GST. China suggested that the GST topics and prompts in the technical dialogue be designed to be more responsive and focused to the mandate of the GST, and the views and discussions be captured in a balanced manner. Clear substantial and substantive discussions and views be provided on the following points:

(a) Need for systematic stocktaking and drawing lessons from the pre 2020 implementation and delivery

(b) Ensuring a just transition for developing countries. China support the Sharm el Sheikh just and equitable transition Mechanism announced by Saudi Arabia

(c) The necessity for developed countries to take the lead towards Paris Agreement goals by achieving net zero significantly earlier than the global timeframe, taking into consideration equity and CBDR at different starting points of developed countries and developing countries

(d) Noting that means of implementation and support by developed countries is a critical basis for developing countries to achieve Paris Agreement

(e) Unilateral measures must be abandoned to enhance international cooperation towards achieving the Paris Agreement goals.

540. Kenya aligned with statements made by G-77 and African Group of negotiators. It stated that in assessing our progress towards achieving the practical to limiting warming to 1.5°C, GST must inform on political momentum for action. We note with alarm exceeding 1.5°C poses substantial risks for developing countries, and it is alarming we are not on track to achieving the Long-term global goal of 1.5°C. Parties have different responsibilities and capacities to contribute to the Long-term global goal, but many are constrained by structural inequalities. Equitable action therefore requires fair consideration of the remaining carbon budget, inclusive decision making and a just transition.

541. Kenya noted the inadequacy of management of engagement spaces and scheduling of meetings. As mentioned by AGN, there were overlaps with other meetings within the process. This affected participation and especially for small delegations. It called for improvement on this.

542. After presentation of statements from Parties, the CFs invited observer organizations to make brief statements.

543. Jennifer Huang, from the Center for climate and energy solutions, and speaking on behalf of the research and independent NGOs, welcomed the opportunity to engage alongside Parties through the technical dialogue. The arrangement allowed NGOs to convey the expertise of the Ringo community in these discussions. We express our full support for this process and welcome the wide range of stakeholders involved the dynamic and interactive nature of the World Cafe, and the focused exchanges which allow us to take a broader look at where there are synergies, cross cutting themes and intersectional opportunities.

544. Ms Huang emphasized the GST dialogue process be informed by the best available science but should not be limited to quoting experts. NGOs recognize the need for support and technology to reinforce developing country expertise, scientific analysis, and support the inclusion of diverse and disaggregated data on climate information as well as indigenous traditional and local knowledge. The research community has a key role to play in this and welcomes continued efforts to ensure a robust and transparent approach to the analysis of the inputs. The GST process should reflect the voices of all constituencies, Parties and stakeholders, offering their experiences challenges and best practices and solutions that can point us to the pathways and opportunities for enhanced climate action and international cooperation.

545. The Global Trade Union Congress stated that delivering on the goals of the Paris Agreement is the big question that needs to be answered by the GST. One big conclusion of the GST is already more than clear, we are not on a pathway to 1.5°C. This must be recognized in the clearest way. Complaining will not solve anything, nor bring change. The global Trade Union movement was happy that the social dimension of the climate debate has been picked up so many times in the dialogues. In the following sessions, we need to further unpack the just transition in mitigation, adaptation and means of implementation. Just transition is about social dialogue, involving government, labour, and employers. It is about decent work, labour rights, protection and promotion, social protection, and additionally about consultation with affected stakeholders consistent with human rights and equity. The Trade Union movement has put this on the dialogue table, hoping it will be integrated in the GST conclusions next year at COP 28.

546. Ann Bar, speaking on behalf of the Women and Gender constituency, stated that GST, as the mechanism to ratchet up ambition by the end of next year, needs to provide strong and transformative outcomes. Concrete recommendations to the Parties are expected on how to address the looming emissions gap, the mounting adaptation gap and the quantitative and qualitative gap in providing mandated climate finance, including the urgently needed additional finance to address loss and damage in a way that is accessible. There have been proposals of false scientifically unproven solutions, like CCS, and it is not clear why the discussions are hyping up private sector engagement? The focus should be on the

responsibilities and opportunities of the public sector, such as strengthening gender machineries, social support systems and citizens engagement. Local women, indigenous, people, youth, people living with disabilities and community are suffering from devastating climate impacts, including massive losses and damages. Their needs, expertise and leadership should be recognized. For this to happen, the GST must transform into a political process leading to a strong and clear COP decision.

547. Shreya Casey from Nepal, speaking for the children and youth constituency and as a representative of the children and youth non-governmental organizations, Youngers, stated that the GST TD 1.2 at COP 27 was more open and participatory to stakeholders than the TD1.1 in Bonn, as Parties shared the impacts from the ground and tested good practices. While we welcome this participatory attitude, we call upon Parties to increase the meaningful participation of children and youths throughout this process, and to advance this based on intergenerational justice. Further, we'd like to call for caution regarding stakeholders with conflicts of interest, who seek solutions that are neither aligned with the goal of the Paris Agreement, nor backed by science. Science is crystal clear that current climate plans and commitments by countries will take us to 2.5°C by the end of the century, which is unacceptable. We say this boldly and with profound frustration and anger.

548. Ms. Casey stated that carbon capture and storage and national oil and gas are not the solutions to achieve 1.5°C. Countries, especially higher emitters, must, as a matter of urgency, phase out fossil fuels before 2050 with an equitable just transition by adopting a human-rights centred approach. We are in a climate crisis that requires urgent action. We ask Parties to look at the how the climate crisis is reaching across the world and the devastating impacts that people in your own country are experiencing. Moreover, take GST as an opportunity to identify the ambition gap, and step up to make bold plans and realistic mechanisms for mitigation emissions, scaling up of financial support for adaptation in vulnerable countries and addressing loss and damage. She invited Parties to take a moment to reflect on why we are conducting this GST. The ultimate goal is to protect people, ecosystems and our planet from the devastating impacts of climate crisis and to achieve climate justice. We all need to take charge and take action. We have no more time to lose. Our present and future literally depend on it.

549. Roland Martin from the International Chamber of Commerce, speaking on behalf of the business and industry constituency, stated that strengthening dialogue between governments and all stakeholders within the GST has the potential to significantly raise ambition and collective action. As we move forward with GST this exchange between the science, policy non state actor interface will be critical. The following concrete suggestions are provided:

550. An effort from focused discussions on innovative global solutions that merge ecological imperatives with economic realities, such as market mechanisms and other instruments. This should also be done with the highest possible Integrity towards societal needs which the GST can address.

551. The COP pavilion and side events space provide a unique space for the whole society to discuss and showcase practical solutions to drive ambition and action. Capturing these experiences and knowledge in the form of high level and technical panel discussions with government, business and civil society actors into the GST process should be explored.

552. Maine Pootie, speaking on behalf of the Climate Action Network (CAN) International, reminded all stakeholders two important elements concerning the GST process:

(a) The mandate of the GST to rely on the best available science. This is not about defending political or economic priorities but to look at what climate science shows, especially the IPCC. We cannot listen or accept, in the UNFCCC context, statements arguing for developing solutions with high risk on human rights and or prolonging fossil fuel dependency. We have few years left to save billions of lives. The GST process should be about real and local solutions that rapidly reduce emissions through fossil fuels phase out, decrease energy demand, and scale up new renewable energies.

(b) Parties should start the discussions on the political outcome of the GST. Drafting conclusions will take time, and we need this additional time and propose workshop

rounds at the minimum. We want these additional discussions to be inclusive and binding on the good practices of the technical dialogue we had so far.

553. Victor Manabadi, speaking on behalf of the environmental NGOs; Demand Climate Justice; and Civil Society Equity Review, which includes CAN International, stated that the UNFCCC executive secretary reminded us that the GST is an accountability exercise, to see where we stand and to inform more ambitious actions. However, it is not the role of UNFCCC to say how we should manage the remaining atmospheric space. Parties must do this. But they are not doing so under the Paris Agreement. We still face a free for all, with the biggest free riders speeding over the cliff. Equitable sharing of the remaining carbon space for a just global transition is required. The next political dialogue must reflect on the relevant technical data to transparently assess countries fair shares. Operationalizing equity requires deep political discussions and making difficult decisions on acceptable criteria for equitable carbon space shares. References to relevant data such as country's dependence on fossil fuels, fossil fuel GDP proportion, government revenues, fossil fuel industry employment percentages as well as country's capabilities to transition equitably, all these aspects need to be part of the consideration, in addition to other indicators.

554. McCauley Jones from Australia, representing the farmers constituency, encouraged everyone in the room to help farmers to be a part of the solution. Farmers need help with better climate research and more investment to reduce agricultural emissions and improve adaptation in the agricultural sector. Better management and measurement of agricultural sector greenhouse gas emissions are needed, and better management of agricultural sequestration. Farmers are committed to the world transitioning to net zero and in line with the Paris Agreement but cannot measure what they cannot manage. Farmers are also committed to contributing towards ending the global food security crisis. Along this journey, farmers are being stretched in many different directions towards reducing emissions and protecting biodiversity, water quality while trying to maintain profitability and their wellbeing and that of rural communities. Farmers need to be involved as early as possible throughout the GST process.

555. Mr. Conde, on behalf of the International Indigenous Peoples Forum on Climate Change welcomed reports about collective achievements in increasing national climate policies and finance for capacity-building. Serious concerns remain about increasing cases of violations of human rights in the transitions. Incidents of land grabbing and criminalization of indigenous peoples in response to their legitimate actions to defend their lands are still happening. While they appreciate the commitments made by a number of Parties and donors to finance forests protections, only 7 per cent was provided directly to indigenous peoples. Decisive steps are needed to accelerate access of these funds by indigenous peoples and local communities. Arrangements should be put in place for direct financial and other forms of support to enhance protection of oceans and conservation activities, including support of sustainable livelihoods. Measurement of climate finances should not only look at the amount of finance deployed and geographical scope, but also look deep in terms of how much of the finance is addressing the needs and wellbeing, as well as strengthening the resilience of marginalized and vulnerable groups, including indigenous peoples. In the GST process, we wish to see examples of how indigenous knowledge around forests adaptation and resilience-built capacity in the areas of implementation, in addition to mitigation benefits. Capacity-building should include both indigenous peoples and governments so that they are able to effectively engage in shaping national policies. Capacity-building for governments and other entities should include their ability to better appreciate and understand the context, perspectives, and aspirations of indigenous peoples.

556. A representative for the Local Governments and Municipal Authorities (LGMA), Ms Eunice Article, director of Global Advocacy at ICLEI the LGMA focal point, stated her satisfaction that that urban was added to the GST themes. She recommended that focused exchange dialogue sessions be made publicly available on the web of Ozone platform COP 20. Recalling the concrete proposals for the next steps of GST, she underlined that it is people who elect their governments that make their governments accountable. Therefore, LGMA fully support the idea that the process must go to a political level.

Appendix

Relevant information sources for TD1.2

Information source	Link
<i>Relevant to preparations for TD1.2</i>	
Non-paper by SB chairs	https://unfccc.int/sites/default/files/resource/Non-paper on Preparing for GST1 0.pdf
Call for inputs for the GST1 TD.12	https://unfccc.int/sites/default/files/resource/message to parties and%20observers sb chairs call%20for%20inputs first gst.pdf
Guiding questions for the technical assessment component of GST1	https://unfccc.int/sites/default/files/resource/Draft %20GST1 TA%20Guiding%20Questions.pdf
GST information portal containing inputs to GST1	https://unfccc.int/topics/global-stocktake/information-portal
Information note on TD1.2 of GST1	https://unfccc.int/sites/default/files/resource/GST%20TD1 1 sreport 26 09 2022 Final.pdf
<i>Some inputs received/prepared for TD</i>	
Inputs to the technical assessment component of GST1	https://unfccc.int/topics/global-stocktake/information-portal
Synthesis report for the technical assessment component of the GST1 on greenhouse gas emissions (GHGs) by sources and removals by sinks and mitigation efforts undertaken by Parties	https://unfccc.int/documents/461466
Synthesis report on the state of adaptation efforts, experiences and priorities	https://unfccc.int/documents/470435
Synthesis report on the overall effect of Parties' NDCs and overall progress made by Parties towards the implementation of their NDCs	https://unfccc.int/documents/461517
Synthesis report on finance flows and means of implementation and support and mobilization and provision of support	https://unfccc.int/documents/461992 https://unfccc.int/sites/default/files/resource/GST_SR_23d_MOI.pdf
Synthesis reports for the technical assessment by UNFCCC and constituted bodies and forums and other institutional arrangements serving the Paris Agreement	https://unfccc.int/topics/global-stocktake/events-and-inputs/unfccc-and-constituted-bodies-synthesis-reports-and-webinar-for-the-technical-assessment-component
<i>Statements submitted during TD1.2 plenaries</i>	
Written statements by Parties and NPS	https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogues-of-the-first-global-stocktake/second-meeting-of-the-technical-dialogue-td12-of-the-first-global-stocktake
<i>Roundtable 1: Mitigation, including response measures</i>	
Breakout Group 1 - <i>Enhancing global mitigation pathways: Assessing collective progress on mitigation and enhancing ambition, fairness and implementation towards the achievement of the Paris Agreement long-term goals, taking into account nationally determined contributions and long-term low greenhouse gas emission development strategies by Parties</i> with expert Jamal Srouji and facilitator Thelma Krug	https://unfccc.int/sites/default/files/resource/FinalJamal%20Srouji_WRI.pdf
Breakout Group 2 - <i>Transforming energy and industrial systems: Assessing collective progress in and enhancing mitigation efforts in energy production and consumption as well as industrial</i>	https://unfccc.int/sites/default/files/resource/RT1.2 Arunabha%20GhoshFinal.pdf

<i>and transportation systems</i> by expert Arunabha Ghosh and facilitator Kaveh Guilanpour	
Breakout Group 3 - <i>Transforming land and other systems: Assessing collective progress in and enhancing mitigation efforts and preserving and enhancing greenhouse gas sinks in AFOLU, waste, and other systems</i> by expert Sandeep Sengupta and facilitator Frances Seymour	https://unfccc.int/sites/default/files/resource/FinalSand_eep%20Sengupta_prompt.pdf
Breakout Group 4 - <i>Response measures: Assessing collective progress in and enhancing efforts made to address the social and economic consequences and impacts of response measures while implementing mitigation policies and actions towards the achievement of the Paris Agreement long-term goals</i> by expert Moustapha Kamal Gueye and facilitator Samantha Smith	https://unfccc.int/sites/default/files/resource/FinalMou_stapha%20Kamal%20Gueye%20v2.pdf
Roundtable 2: Adaptation, including loss and damage	
Breakout group 1 - <i>Art 7.14 a: Recognize adaptation efforts of developing countries</i> by expert Alvin Chandra and facilitator Richard Klein	https://unfccc.int/sites/default/files/resource/2022_28%20Oct.%20Progress%20on%20Article%207.14_Alvin%20ChandraFinaldocx.pdf
Breakout group 2 - <i>Enhance the implementation of adaptation action: moving from plans to implementation and increasing ambition towards transformative adaptation, taking into account barriers, challenges and opportunities (Art 7.14b)</i> by expert Anne Hammill and facilitator Thomas Hale	https://unfccc.int/sites/default/files/resource/FinalpromptAnne%20Hammill_Prompt_v2.pdf
Breakout group 3 - <i>Art 7.14 c: Review of the adequacy and effectiveness of ongoing adaptation and support at different scales</i> by expert Anand Patwardhan and facilitator Ko Barrett	https://unfccc.int/sites/default/files/resource/RT2.7_A_nand_Patwardhan_Prompt_final.pdf
Breakout group 4 - <i>Assessing collective progress and enhancing efforts on averting, minimizing and addressing loss and damage, moving from knowledge generation to implementation</i> by expert Richard Choularton and facilitator Debra Roberts	https://unfccc.int/sites/default/files/resource/FinalRichard%20Choularton_Prompt.pdf
Roundtable 3: Means of implementation and support: Finance, technology and capacity building	
Breakout group 1 - <i>Finance: Aligning financial flows and meeting needs for system-wide transitions to net zero emissions and transformative climate resilient development</i> by expert Nick Robins and facilitator Preety Bhandari	https://unfccc.int/sites/default/files/resource/RT3.9_Nick%20Robins_Prompt%20v2%20TC.pdf
Breakout group 2 - <i>Finance: Enhancing the catalytic role of international climate finance for scaling up climate action</i> by expert Sandra Guzman and facilitator Josué Tanaka	https://unfccc.int/sites/default/files/resource/FinalSandra%20Guzman_prompt%20V2.pdf
Breakout group 3 - <i>Technology: Enabling and enhancing cooperation on innovation and technology development and transfer</i> by expert Gabriel Blanco and facilitator Sara Traerup (Day 1) Kentaro Tamura (Day 2)	https://unfccc.int/sites/default/files/resource/RT3.11_Gabriel%20Blanco_Prompt%20V2%20%281%29.pdf
Breakout group 4 - <i>Capacity - Enhancing and retaining capacities in support of Paris Agreement implementation</i> by expert Ayman Cherkaoui and facilitator Sonja Klinsky	https://unfccc.int/sites/default/files/resource/Final_Ayman%20Cherkaoui_prompt.pdf
Other potentially relevant information sources	
UNFCCC GST webpage	https://unfccc.int/topics/global-stocktake/global-stocktake

TD1.2 webpage	https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogues-of-the-first-global-stocktake/second-meeting-of-the-technical-dialogue-td12-of-the-first-global-stocktake
Global stocktake creative space at COP 27	https://unfccc.int/global-stocktake-td12-creative-space
Global stocktake poster session at COP 27	https://unfccc.int/global-stocktake-td12-poster-session
GST events at Regional Climate Weeks	https://unfccc.int/topics/global-stocktake/global-stocktake-governance-and-facilitation/the-global-stocktake-at-regional-climate-weeks-2022
