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Dialogue technique au titre du premier bilan mondial

Rapport de synthèse établi par les cofacilitateurs du dialogue technique

Résumé

Le présent rapport de synthèse relatif au dialogue technique organisé au titre du premier bilan mondial est établi sur la base des contributions reçues tout au long du processus et sur les débats qui se sont déroulés pendant les trois réunions du dialogue. Il constitue une source d'informations globales et factuelles qui donne une vue d'ensemble des discussions et définit les principaux domaines dans lesquels des mesures doivent être prises pour combler les lacunes et surmonter les difficultés et les obstacles recensés dans l'application de l'Accord de Paris. On trouvera dans ce rapport une évaluation des progrès collectifs accomplis dans la réalisation de l'objet et des buts à long terme de l'Accord de Paris et des indications sur les domaines dans lesquels les Parties peuvent actualiser et renforcer leurs mesures et leur appui et intensifier la coopération internationale au service de l'action climatique.

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Abréviations et acronymes

CDN	contribution déterminée au niveau national
CMA	Conférence des Parties agissant comme réunion des Parties à l'Accord de Pari
CO^2	dioxyde de carbone
CO^2 eq	équivalent CO^2
COP	Conférence des Parties
FEM	Fonds pour l'environnement mondial
GES	gaz à effet de serre
GIEC	Groupe d'experts intergouvernemental sur l'évolution du climat
ODD	objectifs de développement durable
PNA	plan national d'adaptation
PNUE	Programme des Nations Unies pour l'environnement
SBI	Organe subsidiaire de mise en œuvre

I. Résumé

A. Contexte[1]

1. **Conclusion nº 1 : depuis son adoption, l'Accord de Paris a impulsé une action climatique quasi universelle en fixant des objectifs et en sensibilisant la communauté internationale à l'urgence de répondre à la crise climatique. Il reste cependant encore beaucoup à faire sur tous les fronts**.

2. L'Accord de Paris et le rôle central qu'il joue dans l'adoption de mesures concertées nécessaires à la lutte contre la crise climatique font l'objet d'une large adhésion dans le monde, ce qui a permis de réaliser de grands progrès en matière d'atténuation et d'adaptation et dans l'appui aux mesures prises à cet effet. Par rapport aux projections réalisées avant son adoption, l'Accord de Paris a suscité des contributions qui ont permis de réduire de manière importante les prévisions relatives au réchauffement de la planète, mais les mesures prises ne sont pas suffisantes pour atteindre les objectifs à long terme de l'Accord. Les participants au dialogue technique organisé au titre du premier bilan mondial ont relevé des difficultés et des obstacles dans tous les domaines qu'ils ont passés en revue. Au fil des discussions, ils ont également mis en avant des moyens actuels et nouveaux et des solutions créatives qui permettraient de combler ces lacunes. Il est temps d'accélérer nettement l'action et l'appui afin de réaliser des progrès au cours de cette décennie cruciale.

3. **Conclusion nº 2 : pour renforcer la riposte mondiale à la menace des changements climatiques dans le contexte du développement durable et de la lutte contre la pauvreté, les pouvoirs publics doivent appuyer les transformations des systèmes qui prennent en compte la résilience climatique et le développement à faible émission de gaz à effet de serre. Les entités non parties doivent prendre des mesures crédibles, responsables et transparentes pour intensifier la transformation des systèmes**.

4. Il est essentiel d'accélérer la lutte contre les changements climatiques pour parvenir à un développement durable. Les politiques et les mesures qui favorisent la résilience climatique et le développement à faible émission de gaz à effet de serre (GES) peuvent se renforcer mutuellement grâce à l'adoption d'approches mobilisant l'ensemble de la société et à l'élaboration de politiques intégrées et inclusives. Des progrès ont été réalisés dans l'élaboration et la communication des contributions déterminées au niveau national (CDN) nouvelles et actualisées au titre de l'Accord de Paris. Il faut s'efforcer de continuer sur cette lancée pendant plusieurs décennies, en s'appuyant sur les avancées réalisées pendant chaque cycle de CDN et dans le cadre du bilan mondial.

5. L'action climatique et l'appui à cette action sont renforcés lorsque l'ensemble des Parties et des entités non parties, notamment la société civile, le secteur privé, les organismes de financement, les municipalités et autres autorités infranationales, les communautés locales et les autochtones sont mobilisés. Les engagements honorés et les mesures prises par les entités non parties renforcent les contributions des Parties à la transformation des systèmes. Ces contributions doivent être scrupuleusement comptabilisées et transparentes afin qu'elles soient crédibles, que l'on suie les progrès accomplis sur le plan de l'intégrité environnementale et que l'on évite tout double comptage des émissions. Les initiatives des entités non parties devraient également inclure et aider les parties prenantes et les groupes souvent marginalisés, notamment les femmes, les jeunes et les autochtones, afin que tous puissent participer et contribuer véritablement à ces efforts.

6. **Conclusion nº 3 : la transformation des systèmes ouvre de nombreuses possibilités, mais les changements rapides peuvent être perturbateurs. En mettant l'accent sur l'inclusion et l'équité, il est possible de relever le niveau d'ambition de l'action climatique et d'accroître l'appui à cette action.**

[1] Les titres figurant dans le présent rapport sont uniquement destinés à s'orienter dans le document.

7. Pour parvenir à des émissions nettes nulles avant ou vers le milieu du siècle et appliquer en parallèle des mesures d'adaptation porteuses de changements, il convient de modifier rapidement et en profondeur les pratiques existantes. Une action climatique bien conçue peut produire des avantages importants et contribuer à limiter les perturbations en s'adaptant au contexte local et en mobilisant l'ensemble de la société. La prise en compte de l'équité devrait relever le niveau d'ambition et augmenter la probabilité d'atteindre les objectifs de l'Accord de Paris. Les personnes les plus touchées par les effets du climat devraient participer à l'élaboration des solutions.

8. Pour plus d'informations sur les conclusions n^{os} 1 à 3, voir le chapitre IV.A ci-après.

B. Atténuation, y compris les mesures de riposte

9. **Conclusion n^{o} 4 : les émissions mondiales ne suivent pas les trajectoires d'atténuation modélisées au niveau mondial qui sont compatibles avec l'objectif de température de l'Accord de Paris, et les possibilités de relever le niveau d'ambition et de donner effet aux engagements actuels afin de limiter le réchauffement climatique à 1,5 °C par rapport aux niveaux préindustriels s'amenuisent rapidement.**

10. Toutes les Parties à l'Accord de Paris ont communiqué des CDN comportant des objectifs et/ou des mesures d'atténuation. Un nombre croissant de Parties ont également communiqué leur stratégie à long terme de développement à faibles émissions. Les écarts d'émissions correspondent à la différence entre les niveaux d'émissions résultant des CDN et les niveaux d'émissions moyens des trajectoires d'atténuation modélisées au niveau mondial permettant de limiter le réchauffement climatique à 1,5 °C ou 2 °C. Par écarts de mise en œuvre, on entend la différence entre les mesures appliquées et les objectifs déclarés. Sur la base des CDN actuelles, l'écart par rapport aux émissions qui permettraient de limiter le réchauffement à 1,5 °C en 2030 se situerait entre 20,3 et 23,9 gigatonnes d'équivalent CO^2.

11. Des mesures doivent être prises pour relever le niveau d'ambition des CDN en matière d'atténuation et pour renforcer l'application des mesures permettant d'atteindre leurs objectifs. L'observation des tendances passées et en cours en ce qui concerne les émissions de GES fournit des informations importantes pour comprendre la situation actuelle, ce qui y a mené et comment, éventuellement, éclairer les mesures à prendre.

12. À la vingt et unième session de la Conférence des Parties, à Paris, les Parties ont décidé de parvenir au plafonnement mondial des émissions de gaz à effet de serre dans les meilleurs délais, étant entendu que ce plafonnement prendra plus de temps pour les pays en développement. Selon le sixième rapport d'évaluation du Groupe d'experts intergouvernemental sur l'évolution du climat, les émissions mondiales de GES doivent atteindre leur plafond entre 2020 et 2025 pour que le réchauffement ne dépasse pas l'objectif de température fixé dans l'Accord de Paris. Elles ont atteint un plafond dans les pays développés et dans certains pays en développement, mais pas encore au niveau mondial. Toutes les Parties doivent procéder rapidement à des réductions importantes des émissions de GES au cours des décennies qui suivront le plafonnement[3].

13. **Conclusion n^{o} 5 : il faut intensifier l'action et l'appui ayant trait à l'application des mesures d'atténuation nationales et fixer des objectifs plus ambitieux dans les CDN afin de tirer parti des possibilités existantes et nouvelles dans tous les contextes pour réduire les émissions mondiales de GES de 43 % d'ici à 2030 et de 60 % d'ici à 2035 par rapport aux niveaux de 2019 et atteindre l'objectif d'émissions nettes nulles de CO^2 au niveau mondial d'ici à 2050.**

14. **Une action et un appui sont nécessaires d'urgence pour accélérer l'application des mesures d'atténuation nationales en exploitant les possibilités offertes dans l'ensemble des secteurs et des systèmes.** Il existe aujourd'hui suffisamment de moyens d'un bon rapport coût/efficacité pour combler l'écart d'émissions d'ici à 2030, mais des obstacles importants subsistent, notamment s'agissant de l'accès aux aides et de leur disponibilité, pour que l'on puisse mettre à profit ces moyens au rythme et à l'échelle requis. En tirant parti de

[2] FCCC/PA/CMA/2022/4.

[3] Voir par. 97 et 98 ci-après.

ces moyens et en y contribuant de manière pleine et entière, on pourra relever le niveau d'ambition de manière à réduire considérablement les émissions nettes de GES d'ici à 2030. À cet effet, il sera essentiel de faire preuve de créativité et d'innovation dans l'élaboration des politiques et la coopération internationale.

15. **Les CDN doivent fixer des objectifs d'atténuation plus ambitieux pour réduire les émissions plus rapidement et pour s'aligner sur la stratégie à long terme de développement à faibles émissions de chaque pays dans le cadre d'une transition juste conduisant à des émissions nettes nulles en 2050 ou avant, tout en renforçant la transparence pour pouvoir suivre les progrès accomplis.** Cela est prévu dans l'Accord de Paris, qui dispose notamment que la CDN de chaque Partie représentera une progression par rapport à la précédente et correspondra à son niveau d'ambition le plus élevé possible, compte tenu de ses responsabilités communes mais différenciées et de ses capacités respectives, eu égard aux différentes situations nationales, et sera éclairée par les résultats du bilan mondial. La progression peut notamment prendre la forme de réductions plus rapides grâce à l'adoption d'objectifs plus stricts et de catégories d'objectifs plus globales. L'Accord de Paris dispose que les pays développés parties devraient continuer de montrer la voie en assumant des objectifs de réduction des émissions en chiffres absolus à l'échelle de l'économie, et que les pays en développement parties devraient continuer d'accroître leurs efforts d'atténuation, et sont encouragés à passer progressivement à des objectifs de réduction ou de limitation des émissions à l'échelle de l'économie eu égard aux contextes nationaux différents. À mesure que les Parties formulent et communiquent leur stratégie à long terme de développement à faibles émissions prévoyant une transition juste vers des émissions nettes nulles avant ou vers le milieu du siècle, adaptées aux différentes situations nationales, elles devraient commencer à prendre des mesures concrètes pour s'engager sur cette voie.

16. **Les mesures d'atténuation qui permettent d'atteindre d'autres objectifs de développement durable peuvent être transposées à plus grande échelle et reproduites dans différents contextes.** Les retombées de l'application de ces mesures d'atténuation sur le développement durable jouent un rôle très important dans la diffusion et dans l'intensification desdites mesures, notamment lorsqu'elles contribuent également à l'éradication de la pauvreté.

17. **Conclusion nº 6 : pour parvenir à des émissions nettes nulles de CO^2 et de GES, il faut transformer les systèmes dans tous les secteurs et dans tous les contextes, notamment en développant les énergies renouvelables tout en éliminant progressivement tous les combustibles fossiles sans dispositif d'atténuation, en mettant fin au déboisement, en réduisant les émissions autres que le CO^2 et en appliquant des mesures axées à la fois sur l'offre et sur la demande.**

18. Même si le calendrier des mesures prévues pour parvenir à des émissions nettes nulles varie d'un pays à l'autre, tous les pays doivent adopter une approche à l'échelle de la société pour tracer des voies vers des émissions nettes nulles de CO^2 ou de GES. De nombreuses mesures d'atténuation peuvent avoir d'autres retombées positives et contribuer à la réalisation des objectifs de développement durable.

19. **La diffusion des énergies renouvelables et l'élimination progressive de tous les combustibles fossiles sans dispositif d'atténuation sont des éléments indispensables d'une transition énergétique juste vers des émissions nettes nulles.** L'électrification, l'efficacité énergétique et la gestion de la demande, ainsi que le stockage de l'énergie, sont également des éléments importants des systèmes à émissions nettes nulles[4].

20. **Les mesures visant la transformation des systèmes dans l'industrie, les transports, le bâtiment et dans d'autres secteurs, doivent permettre de réduire rapidement les émissions liées aux activités de transformation et à l'énergie.** L'application de mesures ambitieuses de baisse des émissions de GES provenant de l'industrie, des transports, du bâtiment et d'autres secteurs peut entraîner une réduction des émissions dans ces secteurs et tout au long de leurs chaînes d'approvisionnement, tout en réduisant les coûts et en produisant d'autres retombées positives.

[4] Voir par. 116 à 121 ci-après.

21. **L'arrêt et l'inversion du déboisement et de la dégradation des forêts, ainsi que l'amélioration des pratiques agricoles sont essentiels à la réduction des émissions et à la conservation et au renforcement des puits de carbone.** L'arrêt et l'inversion du déboisement d'ici à 2030, ainsi que la restauration et la protection des écosystèmes naturels permettront une absorption à grande échelle du CO^2 et auront d'autres retombées positives. Les mesures de gestion de la demande dans l'agriculture et l'intensification de l'agriculture durable, sans nouvelle extension des terres cultivées, sont essentielles et favorisent le développement durable sous diverses formes.

22. **Une coopération internationale plus efficace et des initiatives crédibles peuvent contribuer à combler les écarts d'émissions et le déficit d'application.** Une approche rigoureuse s'appliquant à l'ensemble de l'économie et à l'ensemble de la société doit être suivie dans tous les systèmes et dans tous les secteurs. En outre, une coopération internationale plus efficace étendue aux entités non parties est fondamentale pour appuyer les efforts des pays en vue d'accélérer les progrès.

23. **Conclusion nº 7 : les transitions justes peuvent contribuer à l'obtention de résultats d'atténuation meilleurs et plus équitables, grâce à des approches adaptées aux différents contextes.**

24. Le concept d'équité est complexe et multidimensionnel. Différents points de vue ont été exprimés au sujet des aspects de l'équité dans le cadre de l'atténuation pendant le premier dialogue technique. Tous les participants aux débats se sont accordés à dire que l'équité devait elle aussi s'inscrire dans le cercle vertueux d'un relèvement de l'ambition concourant à l'application de l'Accord de Paris[5].

25. Les principes d'une transition juste peuvent être adoptés et appliqués dans le cadre de processus décisionnels collectifs et participatifs afin de réduire les effets perturbateurs liés à la transformation rapide des systèmes.

26. **Conclusion nº 8: la diversification économique est une stratégie essentielle pour faire face aux effets des mesures de riposte, plusieurs options s'offrant dans différents contextes.**

27. Des approches avisées peuvent pallier les effets négatifs des mesures de riposte et promouvoir des synergies positives dans le cadre des stratégies à long terme de développement à faibles émissions, notamment grâce à la diversification économique. C'est l'une des stratégies permettant de remédier aux effets négatifs des mesures de riposte et de promouvoir des synergies positives. Cette diversification comprend notamment l'industrialisation verte, l'écologisation des chaînes d'approvisionnement et le développement de secteurs de produits en lien ou non avec l'environnement.

28. Pour plus d'informations sur les conclusions nos 4 à 8, voir le chapitre IV.B ci-après.

C. Adaptation, y compris les pertes et préjudices

29. **Conclusion nº 9 : les changements climatiques menaçant tous les pays, toutes les communautés et toutes les personnes dans le monde, il est urgent d'intensifier les activités d'adaptation et de redoubler d'efforts pour prévenir les pertes et les préjudices, les réduire au minimum et y remédier afin de réduire les effets croissants des changements et d'y répondre, en particulier pour ceux qui sont les moins bien préparés à ces changements et les moins à même de se relever après une catastrophe.**

30. Les mesures collectives prises en matière d'adaptation et de pertes et préjudices doivent changer radicalement pour être à la hauteur des ambitions définies dans l'Accord de Paris. Les possibilités d'assurer à tous un avenir vivable et durable s'amenuisent rapidement. Les systèmes humains et naturels ont déjà subi des pertes et des préjudices. Les effets des changements climatiques réduisent les acquis du développement humain et, faute de mesures d'adaptation suffisantes, la capacité de réaliser de telles avancées à l'avenir sera compromise. L'adaptation relève de la responsabilité des pouvoirs publics à tous les niveaux, mais la récurrence des phénomènes climatiques extrêmes sape la capacité de récupération.

[5] Voir par. 132 ci-après.

31. **Conclusion nº 10 : au niveau collectif, les plans et les engagements en matière d'adaptation et d'appui sont de plus en plus ambitieux, mais la plupart des mesures d'adaptation examinées sont fragmentées, progressives, sectorielles et inégalement réparties entre les régions.**

32. **La planification de l'adaptation est la première étape d'un cycle itératif qui permet de passer rapidement de la compréhension des risques à l'adoption de mesures d'adaptation et d'appui plus ambitieuses et plus efficaces, dont l'application doit désormais être accélérée pour accroître la capacité d'adaptation, obtenir plus d'avantages en matière de résilience et réduire la vulnérabilité.** Les Parties et les entités non parties doivent mettre en place des réformes durables et à long terme qui prennent en compte les risques liés aux changements climatiques dans la planification, la prise de décisions et l'application sous tous leurs aspects. La prise en compte des risques liés au climat dans la prise de décisions s'effectue progressivement tout au long du cycle d'adaptation. Toutefois, les mesures prises pour appliquer pleinement les PNA et les processus de planification doivent être soutenues dans le temps et renforcées afin de produire des changements durables qui réduisent équitablement les risques pour les plus vulnérables. Chaque itération du cycle d'adaptation offre la possibilité d'examiner les progrès réalisés et d'intensifier l'action menée sur la base de l'expérience acquise. Chaque étape du cycle d'adaptation est également l'occasion de mesurer au plan international les efforts des pays en développement et d'étudier les modalités d'une coopération internationale renforcée et accélérée en matière d'adaptation.

33. **La communication d'informations transparentes sur l'adaptation peut faciliter et améliorer la compréhension, l'application et la coopération internationale.** Les Parties ont intégré ou soumis parallèlement à leurs PNA, CDN ou communications nationales des communications relatives à l'adaptation qui décrivent leur expérience et les efforts déployés dans le pays pour renforcer la résilience, notamment ls priorités en matière d'adaptation, les besoins en matière d'application et d'appui, les plans et les mesures. L'action et l'appui en matière d'adaptation vont bien au-delà de ce qui figure dans les communications relatives à l'adaptation présentées. Les Parties devraient envisager de rendre compte de leurs progrès à l'occasion de la mise à jour périodique de ces communications, et prendre des mesures d'adaptation plus ambitieuses dans le cadre du cycle d'adaptation. L'élaboration des PNA se poursuit et de nombreux États intègrent l'adaptation et la résilience dans ces plans et dans leurs processus de planification. Par rapport aux CDN précédentes, davantage de CDN soumises en 2022 contenaient des informations sur l'adaptation. Les Parties qui le souhaitent peuvent également communiquer des informations sur les effets des changements climatiques et les progrès en matière d'adaptation dans les rapports biennaux au titre de la transparence.

34. On peut utiliser plusieurs méthodes et indicateurs pour mieux éclairer les progrès accomplis dans la réalisation de l'objectif mondial en matière d'adaptation. La poursuite du développement de ces outils est essentielle au suivi et à l'évaluation des efforts de planification et de mise en œuvre de l'adaptation. En s'appuyant sur les méthodes et indicateurs mis au point et en définissant le cadre de l'objectif mondial en matière d'adaptation, on devrait pouvoir effectuer une évaluation plus complète des progrès collectifs accomplis dans la réalisation de l'objectif mondial en matière d'adaptation pendant le deuxième bilan mondial.

35. **Les efforts d'adaptation des pays en développement sont pris en compte et le seront encore davantage lors des manifestations de haut niveau organisées dans le cadre de la cinquième session de la Conférence des Parties agissant comme réunion des Parties à l'Accord de Paris (CMA).** Les efforts d'adaptation des pays en développement parties ont été pris en compte de diverses manières[6].

36. **Conclusion nº 11 : lorsque les mesures d'adaptation sont judicieuses et déterminées par les circonstances, les populations et les priorités locales, la pertinence et l'efficacité de l'action et de l'appui en matière d'adaptation sont renforcées, ce qui peut également favoriser une adaptation porteuse de transformations.**

[6] Voir par. 150 ci-après.

37. En modifiant les attributs fondamentaux des systèmes, les approches de l'adaptation porteuses de transformations ouvrent de nouvelles possibilités d'adaptation aux risques liés aux changements climatiques et aux effets de ceux-ci.

38. **Tous les systèmes et secteurs présentent des possibilités d'adaptation, dont beaucoup ont été intégrées aux priorités et processus de développement existants.** Les bonnes pratiques adoptées dans de nombreux secteurs et sur différentes questions afin de faire face à un large éventail de risques, sont bien répertoriées et peuvent contribuer à orienter les mesures d'adaptation (voir la figure 2). Les publications scientifiques décrivent différentes possibilités d'adaptation et de bonnes pratiques face à des risques précis liés aux de changements climatiques, ainsi que des modalités de coopération internationale[7].

39. **La diffusion d'informations sur le climat par les services climatiques constitue un préalable essentiel à l'amélioration des mesures d'adaptation permettant de répondre aux besoins et aux priorités à l'échelle locale.** Ces services climatiques permettent d'éclairer le choix, la planification et l'application des mesures d'adaptation grâce à des informations et des prévisions climatiques exploitables. Ils améliorent la réponse aux risques et scénarios prévus, favorisent l'inclusion sociale et évitent de déplacer les risques vers d'autres acteurs ou de renforcer les vulnérabilités existantes[8].

40. **La coopération internationale peut contribuer au partage d'informations tirées de l'expérience sur la manière d'exploiter les possibilités et de surmonter les difficultés et les obstacles liés à l'application des plans d'adaptation, et promouvoir l'apprentissage grâce aux bonnes pratiques dans différents contextes.** La coopération et les initiatives internationales, y compris celles des entités non parties contribuant à l'adaptation, peuvent appuyer et renforcer les transformations des systèmes associant les communautés, les autorités locales, la société civile et les entreprises. Les partenariats avec les groupes traditionnellement marginalisés, notamment les femmes, les jeunes, les autochtones et les communautés locales, ainsi qu'avec les groupes ethniques et autres groupes minoritaires sont d'une importance vitale.

41. **Conclusion n° 12 : pour prévenir les pertes et préjudices, les réduire au minimum et y remédier, il est urgent de prendre des mesures dans le cadre des politiques climatiques et des politiques de développement afin de gérer les risques de manière globale et d'aider les communautés touchées.**

42. Limiter le réchauffement à l'objectif de température mondial énoncé dans l'Accord de Paris réduirait considérablement les risques liés aux changements climatiques et les effets de ces changements résultant de niveaux de réchauffement plus élevés. À chaque fraction de degré de réchauffement de la planète, les effets des changements climatiques augmenteront. Les effets prévus dépasseront les limites strictes de l'adaptation, principalement dans les systèmes naturels. Certains seront irréversibles lorsque l'augmentation des températures dépassera 1,5 °C. Il est nécessaire de mieux comprendre de quelle manière éviter les points de bascule et comment réagir si un tel point est atteint, et d'améliorer les connaissances, la compréhension, l'appui, les mesures et les activités afin de gérer les risques de manière globale et de prévenir les pertes et préjudices, de les réduire au minimum et d'y remédier.

43. **Conclusion n° 13 : il faut rapidement trouver des sources de financement novatrices et plus importantes afin d'intensifier l'appui à l'adaptation et de développer des mécanismes de financement pour prévenir les pertes et préjudices, les réduire au minimum et y remédier. Les flux financiers doivent pouvoir répondre aux besoins urgents et croissants d'un mode de développement résilient aux changements climatiques.**

44. L'évaluation des progrès collectifs en matière d'adaptation a mis au jour l'urgence qu'il y avait à augmenter rapidement le financement de l'adaptation, afin de répondre aux besoins et aux priorités croissants des pays en développement[9].

[7] Voir par. 156 ci-après.
[8] Voir par. 157 à 161 ci-après.
[9] Voir par. I.D.48488 ci-après.

45. Le montant des financements destinés à l'adaptation et leur efficacité doivent faire l'objet d'une attention constante afin de s'assurer que les flux financiers répondent aux besoins d'un développement résilient aux changements climatiques et d'éviter toute erreur d'adaptation[10].

46. Pour plus d'informations sur les conclusions n[os] 9 à 13, voir le chapitre IV.C ci-après.

D. Moyens de mise en œuvre et d'appui et flux financiers

47. Dans ses articles 9, 10 et 11 respectivement, l'Accord de Paris considère que le financement, la technologie et le renforcement des capacités sont des leviers essentiels à l'action climatique. Il dispose en outre, dans le paragraphe 1 c) de l'article 2, qu'il sera essentiel de rendre les flux financiers compatibles avec un profil d'évolution vers un développement à faible émission de gaz à effet de serre et résilient aux changements climatiques. Le renforcement de l'ambition climatique passe également par la transformation du système financier international.

48. **Conclusion n[o] 14 : la mobilisation accrue de fonds pour l'action climatique dans les pays en développement suppose un redéploiement stratégique des financements publics internationaux, qui restent un moteur essentiel de l'action, et la poursuite d'une plus grande efficacité, notamment en ce qui concerne l'accès, l'appropriation et les effets.**

49. **Il est nécessaire de mobiliser rapidement davantage de ressources pour appuyer l'action climatique dans les pays en développement afin de répondre aux besoins urgents.** Le financement par les pays développés de l'action climatique dans les pays en développement a augmenté depuis l'adoption de l'Accord de Paris. Plusieurs rapports constatent un accroissement de la mobilisation de ce type de financement, qui reste néanmoins insuffisant[11]. Il convient d'accélérer les efforts faits pour accroître le financement de l'action climatique provenant d'un large éventail de sources, d'instruments et de filières, compte tenu du rôle notable que jouent les fonds publics. À eux seuls, ces fonds ne suffisent pas à combler l'écart entre les besoins de financement et les flux financiers actuels, en particulier dans les pays en développement. Tout en restant plus modeste, la part de l'adaptation dans le financement de l'action climatique mobilisé a augmenté (de 20 % en 2017-2018 à 28 % en 2019-2020) et a progressé à un rythme plus élevé que le financement de l'atténuation.

50. **L'accès au financement de l'action climatique dans les pays en développement doit être amélioré.** Un accès simplifié et amélioré au financement de l'action climatique peut permettre de débloquer plus rapidement les fonds dont les pays ont besoin en urgence tout en répondant mieux aux besoins locaux. Les banques multilatérales de développement et les autres institutions financières internationales ont la possibilité d'évoluer et de renforcer leur rôle afin d'atténuer les risques financiers, de réduire les coûts d'investissement, d'améliorer l'accès aux financements et de contribuer à la soutenabilité de la dette.

51. **Orienter le financement de l'action climatique vers des activités tangibles et continuer à renforcer le suivi, l'évaluation et l'apprentissage peut répondre plus efficacement aux besoins, en particulier dans les pays en développement.** Il est important d'accroître et de suivre l'efficacité du financement de l'action climatique pour ce qui est de l'accès, de l'appropriation et des effets pour mieux répondre aux besoins en matière d'appui et obtenir les résultats escomptés.

52. **Conclusion n[o] 15 : des milliers de milliards de dollars doivent être débloqués et les investissements doivent être réorientés vers l'action climatique à différentes échelles pour que les flux financiers − internationaux et nationaux, publics et privés − soient compatibles avec un profil d'évolution vers un développement à faible émission de GES et résilient aux changements climatiques.**

[10] Voir par. 522 ci-après.

[11] Voir par. 183 à 185 ci-après.

53. Il faut poursuivre les efforts sur tous les fronts pour répondre aux besoins d'investissement, notamment en rendant les flux financiers compatibles avec un profil d'évolution vers un développement à faible émission de GES et résilient aux changements climatiques. Même si l'on peut faire appel à des fonds publics pour encourager les investissements à fort impact et pour attirer les fonds du secteur privé, les marchés financiers nationaux et mondiaux constitueront probablement la principale source de capitaux pour financer l'intensification des mesures d'atténuation et d'adaptation. Bien que les fonds publics continueront à jouer un rôle clé dans le financement de l'adaptation, une participation accrue du secteur privé est nécessaire pour que les flux financiers soient compatibles avec un développement résilient aux changements climatiques.

54. **Les possibilités de financement de l'atténuation et de l'adaptation peuvent être améliorées en créant des conditions favorables et en surmontant les difficultés.** L'existence d'un cadre directif et d'un environnement général favorables, ainsi que la disponibilité d'instruments efficaces pour réduire les risques liés aux investissements et la création d'une réserve de produits et services en matière d'adaptation et d'atténuation dans lesquels il est possible d'investir, peuvent contribuer de manière importante à la mobilisation de fonds à l'échelle nécessaire. D'autres mesures doivent être prises pour atténuer les risques, réduire les coûts d'investissement et améliorer l'accès.

55. **Il est essentiel de débloquer et de redéployer des milliers de milliards de dollars pour répondre aux besoins mondiaux en matière d'investissement, notamment en réorientant rapidement les flux financiers à l'échelle mondiale pour adopter un profil d'évolution vers un développement à faible émission de GES et résilient aux changements climatiques.** D'importants flux financiers continuent d'être orientés, notamment au moyen de subventions, vers des investissements dans des activités et des infrastructures à fortes émissions qui manquent de résilience. Il est essentiel de réorienter ces flux pour réaliser rapidement et durablement les objectifs de l'Accord de Paris.

56. **Une approche systématique visant à modifier les flux financiers est nécessaire pour soutenir une action climatique efficace à l'échelle et à la vitesse requises.** L'ampleur des investissements nécessaires pour atteindre les objectifs de l'Accord de Paris souligne la nécessité de transformer le système financier et ses structures et processus et de maximiser l'efficacité des initiatives de coopération internationale en matière de financement climatique.

57. **Conclusion n° 16 : les technologies plus propres disponibles doivent être déployées rapidement, tout en accélérant l'innovation, le développement et le transfert de nouvelles technologies, afin de répondre aux besoins des pays en développement.**

58. Une coopération internationale plus efficace et stratégique portant sur la mise au point et le transfert de technologies et l'innovation permettrait une transformation rapide des systèmes alignée sur la réalisation des objectifs de l'Accord de Paris. Il est essentiel de s'employer activement à soutenir la coopération et l'innovation tout au long du cycle technologique, partout et dans tous les secteurs. La réduction des coûts et l'amélioration de l'accès aux fonds pour certaines technologies clés devraient permettre un déploiement plus important de celles-ci dans toutes les zones géographiques, en particulier dans les pays en développement. La poursuite de la baisse du coût moyen du capital pour ces technologies et la réduction des coûts unitaires pour d'autres technologies clés en faveur d'une transition juste dans le secteur de l'énergie et dans d'autres secteurs seront des facteurs décisifs pour la réalisation des objectifs de l'Accord de Paris. Des environnements plus favorables, associant toutes les parties prenantes et garantissant un accès à l'aide financière et au renforcement des capacités, devront être mis en place.

59. Les approches collaboratives de la recherche-développement et de la démonstration des technologies climatiques sont essentielles pour le déploiement de technologies matures et pour le développement à grande échelle de nouvelles technologies. Elles peuvent comprendre des investissements dans le développement et le transfert de technologies grâce à des programmes communs de recherche-développement et au renforcement des capacités. La recherche-développement nécessaire pour parvenir à des émissions nettes nulles de CO^2 d'ici à 2050, en particulier dans les secteurs où il est difficile de réduire les émissions, est fondamentale. La recherche est également nécessaire pour comprendre le rôle de la technologie et de l'innovation dans l'appui à une adaptation porteuse de transformations.

60. **Conclusion nº 17 : le renforcement des capacités est fondamental pour parvenir à une action climatique durable et de grande envergure, et nécessite une coopération efficace, pilotée par les pays et fondée sur les besoins, afin que les capacités soient renforcées et préservées dans le temps à tous les niveaux.**

61. Les contraintes liées aux capacités constituent des obstacles à la politique climatique sous tous ses aspects, y compris l'atténuation, l'adaptation, la facilitation et l'utilisation de la technologie et du financement, ainsi que la prévention, la réduction et la prise en compte des pertes et des préjudices. Pour être efficace, le renforcement des capacités doit être systémique ; à cet effet, il convient d'investir dans les systèmes sociaux et économiques sous-jacents. Les compétences, notamment humaines et institutionnelles, doivent être conservées au fil du temps.

62. L'appui stratégique apporté aux pays en développement en matière de renforcement des capacités doit être intensifié pour répondre aux besoins déterminés au niveau local, compte tenu notamment des modes traditionnels d'acquisition des connaissances. Il est essentiel que la coopération internationale en matière de renforcement des capacités devienne plus efficace et produise davantage d'effets. Une plus grande cohérence et une meilleure coordination de l'aide, y compris au sein du système des Nations Unies, permettront de veiller à ce que les besoins soient satisfaits et renforceront l'efficacité.

63. Pour plus d'informations sur les conclusions nos 14 à 17, voir le chapitre IV.D ci-après.

E. Prochaines étapes

64. Le premier dialogue technique s'est appuyé sur les meilleures données scientifiques disponibles, en s'inspirant des conclusions du sixième rapport d'évaluation du Groupe d'experts intergouvernemental sur l'évolution du climat et d'autres sources de connaissances, et a bénéficié de la participation active d'experts. Pendant le dialogue, il est apparu clairement que de nombreuses solutions réalisables et propositions créatives visant à surmonter les difficultés recensées au cours des phases de collecte et de préparation des informations et d'évaluation technique du bilan mondial étaient prêtes à être appliquées. Des lacunes en matière d'information sont également apparues, que la communauté scientifique pourrait combler dans les années à venir afin de mieux éclairer le prochain bilan mondial et les programmes de travail ainsi que d'autres processus découlant de l'Accord de Paris. Les informations issues du premier bilan mondial peuvent alimenter les processus découlant de l'Accord de Paris menés actuellement et les programmes de travail établis dans le cadre de l'Accord, lesquels peuvent à leur tour contribuer à l'évaluation des progrès collectifs dans les futurs bilans mondiaux. Lorsque les Parties établiront leurs prochaines CDN, elles pourront s'appuyer sur la mine d'informations techniques tirées des deux phases de collecte et de préparation des informations et d'évaluation technique du premier bilan mondial.

65. Le premier bilan mondial s'inscrit dans un contexte de multiples et profonds bouleversements. Depuis son adoption, l'Accord de Paris a impulsé une action climatique quasi universelle, mais la communauté mondiale n'est pas en passe d'atteindre les objectifs à long terme qui y sont énoncés, malgré les progrès réalisés. L'Accord de Paris en lui-même et le bilan mondial jettent les bases d'un relèvement du niveau d'ambition en renforçant l'action et l'appui pour faire face à la crise climatique. Le premier bilan mondial se déroule à un moment critique pour l'accélération des progrès collectifs. Comme le montrent les conclusions techniques présentées dans le présent rapport, tous les acteurs doivent faire beaucoup plus, sur tous les fronts, pour atteindre les objectifs à long terme de l'Accord de Paris.

66. Pour de plus amples informations, voir le chapitre V ci-après.

[*Anglais seulement*]

II. Introduction

A. Mandate

67. Article 14 of the Paris Agreement provides that the CMA shall periodically take stock of the implementation of the Paris Agreement to assess collective progress towards achieving its purpose and long-term goals, referred to as the GST, and decision 19/CMA.1 laid out the modalities and sources of input of the GST, including that the GST will be conducted with the assistance of the subsidiary bodies.[12] CMA 3 welcomed the start of the first GST,[13] and the consideration of outputs will take place at CMA 5.

68. The TD facilitated expert consideration of inputs from the sources identified for the GST.[14] CMA 1[15] decided the TD would:

(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;

(c) 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.

69. Prior to the start of the first TD, the Chairs of the subsidiary bodies:

(a) Prepared a non-paper and, after consulting with Parties, revised it,[16] aiming to assist Parties and non-Party stakeholders in preparing for the first GST, and including guiding questions for the information collection and preparation component of the first GST;

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

(c) Prepared guiding questions for the technical assessment component of the first GST and revised them[17] on the basis of the views expressed by Parties on this matter at informal consultations held in October 2021.

B. Scope of the report

70. This synthesis report has been prepared by the co-facilitators on the basis of the inputs received throughout the technical assessment and the discussions held during each of the three meetings of the TD. The report provides a comprehensive overview of the discussions held during the TD and identifies key areas for further action to address challenges in the implementation of the Paris Agreement. It provides insights into collective progress towards achieving the purpose and long-term goals of the Paris Agreement and informs Parties about

[12] Decision 19/CMA.1, para. 4.
[13] Decision 1/CMA.3, para. 76.
[14] See decision 19/CMA.1, paras. 36–37.
[15] Decision 19/CMA.1, para. 6.
[16] Available at https://unfccc.int/documents/274746.
[17] Available at https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf.

potential areas for updating and enhancing their action and support, as well as for enhancing international cooperation for climate action.

C. Possible action by the subsidiary bodies

71. The subsidiary bodies may wish to consider this report as part of their deliberations on the conclusion of the first GST.

III. Summary of the process for the technical dialogue of the first global stocktake

72. As part of the technical assessment component of the first GST, three meetings of the TD were held in conjunction with SB 56, SB 57 and SB 58, and a summary report on each meeting was prepared by the co-facilitators.[18] Building on the approach taken at TD1.1 and adopting a learning-by-doing approach, the TD served to facilitate the expert consideration of inputs into the GST through focused exchanges of views, information and ideas at in-session round tables, workshops and other relevant activities.

73. The work of the TD was organized in the thematic areas of mitigation, adaptation, and means of implementation and support. The findings on the topics presented in chapter IV below have no hierarchy, and the numbering and wording of subchapters are solely used for ease of reference. The TD considered efforts related to the social and economic consequences and impacts of response measures and to averting, minimizing and addressing loss and damage associated with the adverse effects of climate change (see annex I for a better understanding of the sources of specific information used in preparing key findings and supporting information). The TD was a Party-driven process, with observer organizations and other non-Party stakeholders participating (see annex II for details on the approach taken to the TD).

74. The arc of discussions during the TD included laying the information base, including on well-known gaps and on what is being done at TD1.1 and identifying how to bridge gaps and shift the focus to implementation at TD1.2, and concluded with focused discussions on next steps, including how Parties and non-Party stakeholders could make further progress in their collective efforts towards achieving the Paris Agreement goals at TD1.3.

IV. Findings of the technical dialogue on the first global stocktake under the Paris Agreement

A. Context

75. **Key finding 1: since its adoption, the Paris Agreement has driven near-universal climate action by setting goals and sending signals to the world regarding the urgency of responding to the climate crisis. While action is proceeding, much more is needed now on all fronts.**

76. The rapid entry into force of the Paris Agreement in 2016 demonstrated broad global commitment to its purpose. Since its adoption, Parties have adopted policies and taken action aligned with the goals of the Paris Agreement. While Parties are making progress in implementation, the global community is not yet on track to meet the long-term goals of the Paris Agreement.

77. However, significant progress has been made since the entry into force of the Convention almost 30 years ago, as evidenced by the significant shifts in projections of global temperature increase in 2100. At the adoption of the Cancun Agreements in 2010 the

[18] Available at https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogue-of-the-first-global-stocktake#Relevant-documents.

expected global temperature increase in 2100 was 3.7–4.8 °C.[19] In 2015, with the adoption of the Paris Agreement and commitments made through INDCs, the expected global temperature increase reduced to 3.0–3.2 °C.[20]

78. Further progress was made under the Paris Agreement, as updated NDCs and long-term plans were announced. By COP 26 a global temperature increase of 2.6–2.7 °C was expected in 2100.[21] 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. Announcements at COP 27 indicated expected temperatures were reduced further to 2.4–2.6 °C with the possibility of reaching 1.7–2.1 °C when taking into account the full implementation of long-term net zero targets.[22]

79. After six IPCC assessment cycles, global awareness of the impacts of climate change has never been higher and the need for integrating climate adaptation into decision-making has never been clearer. Support and finance for climate action have increased significantly in the past decade, and the growing awareness of the risks of climate change have led to significant efforts to scale up support for climate action in developing countries. Through the GST process, 137 non-Party stakeholders have submitted information on their actions to support the goals of the Paris Agreement. At this early stage, the Paris Agreement has enhanced efforts concerning climate change mitigation and adaptation and facilitated the provision of support to where it is most needed.

80. The window to keep limiting warming to 1.5 °C within reach is closing rapidly, and progress is still inadequate based on the best available science. Global emissions to date are not in line with modelled global mitigation pathways consistent with the global temperature goal of the Paris Agreement nor are they aligned with longer-term emission reduction goals. Impacts of climate change are increasing and threaten all countries, yet adaptation efforts to date have focused on planning and have not yet driven the broad changes necessary to enhance adaptive capacity, strengthen resilience and reduce vulnerability. Losses and damages are already being experienced. Finance – international and domestic, public and private – needs to be urgently scaled up and made more effective, and much finance still flows to activities that increase GHG emissions and vulnerabilities to climate change.

81. In short, much more action and support are needed to make urgent progress on the long-term goals set in the Paris Agreement. The Paris Agreement sets out a framework for cooperation and action that has already begun to catalyse efforts around the world by many actors. This catalytic role will continue to be vital in the years ahead, as the imperative to deliver systems transformations becomes ever more urgent.

82. **Key finding 2: to strengthen the global response to the threat of climate change in the context of sustainable development and efforts to eradicate poverty, governments need to support systems transformations that mainstream climate resilience and low GHG emissions development. Credible, accountable and transparent actions by non-Party stakeholders are needed to strengthen efforts for systems transformations.**

83. The unprecedented scale and pace inherent to the global transition to a low GHG emissions and climate-resilient future urgently require the consideration of integrated and holistic solutions that promote the eradication of poverty, sustainable development, and the protection of natural resources and systems. Efforts must be sustained over decades, building

[19] See p.20 in IPCC. 2018. *IPCC Special Report on the Impacts of Global Warming of 1.5 °C above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty.* V Masson-Delmotte, P Zhai, H-O Pörtner, et al. (eds.). Geneva: World Meteorological Organization. Available at https://www.ipcc.ch/sr15/.

[20] See p.4 of the executive summary in UNEP. 2015. *The Emissions Gap Report 2015*. Nairobi: UNEP. Available at https://wedocs.unep.org/handle/20.500.11822/7450.

[21] See p.XII of the executive summary in UNEP. 2021. *Emissions Gap Report 2021: The Heat Is On – A World of Climate Promises Not Yet Delivered*. Nairobi: UNEP. Available at https://wedocs.unep.org/bitstream/handle/20.500.11822/36991/EGR21_ESEN.pdf.

[22] See key messages in UNEP. 2022. *Emissions Gap Report 2022: The Closing Window – Climate crisis calls for rapid transformation of societies*. Nairobi: UNEP. Available at https://www.unep.org/resources/emissions-gap-report-2022.

on progress in each cycle of NDCs and GSTs. 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.

84. **Long-term strategies for climate-resilient and low-emission development can be made mutually supportive through whole-of-society approaches and integrated, inclusive policymaking.** The AR6 identifies multiple enabling conditions for climate action, 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. The contribution of Working Groups I, II and III to the AR6 also identifies constraints to taking climate action, including poverty, inequity and injustice; economic, institutional, social and capacity barriers; siloed responses; lack of finance, and barriers to finance and technology; and trade-offs with SDGs. 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. Finding creative ways to overcome barriers and challenges within national contexts requires dedicated attention by policymakers and other actors.

85. **The demonstrable implementation of commitments and actions by non-Party stakeholders can strengthen Parties' efforts for systems transformations. Rigorous accounting and accountability are needed to lend credence to non-Party stakeholders' contributions**. Non-Party stakeholders increasingly support Parties in implementing the Paris Agreement and in enabling Parties to implement national plans by aligning their activities with the goals of the Paris Agreement. Climate action and support are enhanced by catalysing action by all Parties and non-Party stakeholders, including civil society, the private sector, financial institutions, cities and other subnational authorities, local communities and Indigenous Peoples. Such inclusive cooperation across all fronts contributes to ambitious and equitable outcomes and is required to fully achieve the Paris Agreement goals. Initiatives by Parties and non-Party stakeholders can strengthen efforts aimed at facilitating systems transformations, investing in the transition from high to low GHG emissions and achieving climate-resilient development. Non-Party stakeholders should endeavour to include and support stakeholders who are often marginalized, including women, youth and Indigenous Peoples, so they can all effectively participate in and contribute to these initiatives.

86. The need to rigorously track progress in implementing actions and commitments that have been made through non-Party stakeholder initiatives is deemed essential to understanding collective progress. Greater transparency is required on the progress of these initiatives in delivering on their climate actions. Non-Party stakeholders should use good practices in rigorous accounting to promote understanding of the contribution of their actions. In addition, increasing the accountability of non-Party stakeholders on whether their actions and announcements have resulted in measurable change will lend credibility to announcements. While recognizing the contributions by non-Party stakeholders can increase their ambition and implementation, careful analysis is needed across Party and non-Party stakeholder actions to ensure environmental integrity and avoid double counting.

87. **Key finding 3: systems transformations generate many opportunities, but rapid change can be disruptive. A focus on inclusion and equity can increase ambition in climate action and support.**

88. Systems transformations present an unprecedented opportunity for developing socially and economically while reducing impacts on the natural environment. However, they will entail broad, rapid and often disruptive action. As noted in the AR6, lifetime emissions from existing and planned fossil fuel infrastructure will exceed estimates for keeping limiting global warming to 1.5 °C within reach, yet reaching net zero CO_2 emissions by mid-century will require a transformation of energy systems to clean energy sources. The impacts of climate change are also likely to become more disruptive, and transformative adaptation can include broad changes in existing practices. Such disruptions can be minimized by taking a whole-of-society approach, which is also informed by local context. Carefully designed climate action can generate significant social and economic progress and benefits, including in health, education and employment.

89. Increasing the consideration of equity can enable greater ambition in climate action and support and increase the likelihood of meeting the long-term goals of the Paris Agreement. Dimensions of equity include just transitions, strengthening resilience, sustainable development, environmental protection, poverty eradication and human rights. Historical, current and changing contexts within and across nations remain potent factors in the ability to make progress towards climate goals. The global nature of the transformation needed 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 affect everyone equally.

90. Inclusivity matters and those most affected by climate impacts should be involved in crafting solutions. Throughout the TD, participants emphasized the importance of inclusivity and collaboration, and emphasized that including all stakeholders from the outset is vital for more impactful climate action and support. The benefits of social inclusion extend beyond climate change to include conservation, poverty reduction and achieving the SDGs.

91. Approaches to climate action that are aligned with a country's human rights obligations would make marginalized groups part of the solutions.

B. Mitigation, including response measures

92. **Key finding 4: global 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 in order to limit warming to 1.5 °C above pre-industrial levels.**

93. Implementation of the Paris Agreement, with its 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 paras. 77–78 above). While all Parties to the Paris Agreement have communicated NDCs that include mitigation targets and/or measures, collective progress on mitigation remains inadequate to date towards the fulfilment of the provisions in Article 2, paragraph 1(a), of the Paris Agreement to hold the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this will significantly reduce the risks and impacts of climate change. The Agreement's temperature goal has informed many Parties' new and updated NDCs as well as LT-LEDS. Non-Party stakeholders have also made efforts to contribute to this goal, including by aiming for net zero emissions. Also, as at 23 September 2022, 53 LT-LEDS have been communicated, representing 62 Parties to the Paris Agreement.[23]

94. Gaps in collective progress on mitigation can be identified on two fronts. First, the mitigation ambition of NDCs is not collectively sufficient to achieve the Paris Agreement temperature goal. Emissions gaps are the difference between the emission levels implied by the NDCs and the average emission levels of global modelled mitigation pathways consistent with limiting warming to 1.5 °C or 2 °C. Second, implementation gaps refer to how much currently enacted policies and actions fall short of reaching stated targets and pledges. Action is needed across both gaps to increase the ambition of NDCs and the implementation of policies to achieve the stated targets, and to progress towards achieving the goals of the Paris Agreement.

95. In 2019, atmospheric CO_2 concentrations reached an annual average of 410 ppm, which is higher than at any time in at least 2 million years, while concentrations of CH_4 were 1,860 ppb and of nitrous oxide were 332 ppb, which were higher than at any time in the last 800,000 years. Earth's global average surface temperature in 2011–2020 was around 1.1 °C higher than the pre-industrial average.

96. Trends in historical and ongoing GHG emissions provide important information to understand the current situation, how it came to be, and how it can inform future action.[24]

[23] See https://unfccc.int/sites/default/files/resource/GST_SR_23c_Addendum_Final_02230417.pdf.

[24] Differing views expressed by participants on pre-2020 emissions and regional contributions to historical emissions are captured in the summary reports on TD1.

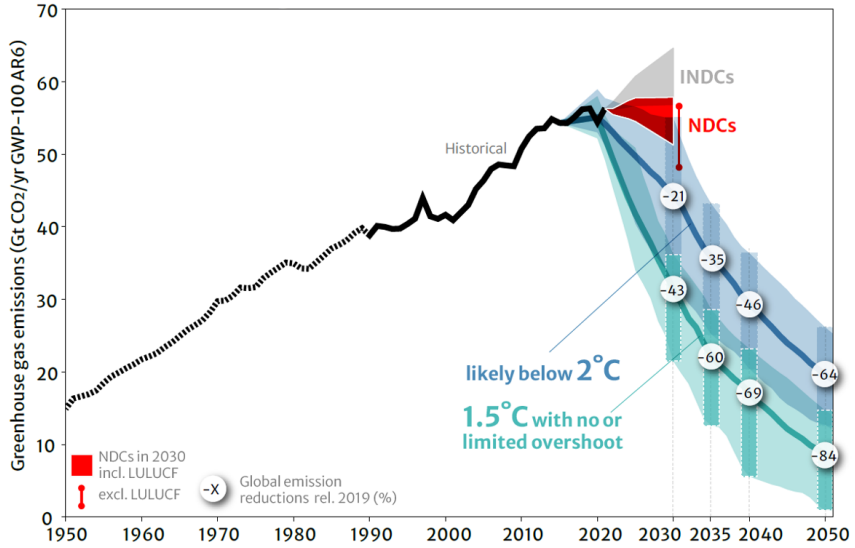
Historical cumulative net CO_2 emissions from 1850 to 2019 were 2,400 ± 240 Gt CO_2, of which 58 per cent occurred between 1850 and 1989, and about 42 per cent occurred between 1990 and 2019. Average annual GHG emissions between 2010 and 2019 were higher than in any previous decade on record, but the rate of growth between 2010 and 2019 (1.3 per cent per year) was lower than that between 2000 and 2009 (2.1 per cent per year).

97. The best available science as reflected in the AR6 provides information on pathways consistent with the global temperature goal and Article 4, paragraph 1, of the Paris Agreement. Global GHG emissions are projected to peak between 2020 and at the latest before 2025 in global modelled pathways that limit warming to 1.5°C (>50 per cent) with no or limited overshoot and in those that limit warming to 2°C (>67 per cent) and assume immediate action. Global peaking of emissions has not yet been reached but, while global peaking of GHG emissions should occur as soon as possible, peaking will take longer for developing country Parties.

98. All Parties need to undertake rapid and deep 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 around 43, 60 and 84 per cent in global GHG emissions below the 2019 level by 2030, 2035 and 2050 respectively, as assessed by the IPCC (see figure 1).[25] In these scenarios, the median time frame for reaching net zero CO_2 emissions globally is in the early 2050s, and net zero GHG emissions by the early 2070s.[26] The basis of equity, the context of sustainable development and efforts to eradicate poverty inform consideration of these mitigation pathways.

Figure 1

Historical emissions from 1950, projected emissions in 2030 based on nationally determined contributions, and emission reductions required by the Sixth Assessment Report of the Intergovernmental Panel on Climate Change



[25] See table SPM.1 in IPCC. *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. PR Shukla, J Skea, R Slade, et al. (eds.). Cambridge and New York: Cambridge University Press. Available at https://www.ipcc.ch/report/ar6/wg3/.

[26] See table SPM.2 in IPCC. *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Edited by PR Shukla, J Skea, R Slade, et al. (eds.). Cambridge and New York: Cambridge University Press, 2022. Available at https://www.ipcc.ch/report/ar6/wg3.

		Reductions from 2019 emission levels (%)			
		2030	2035	2040	2050
Limit warming to1.5°C (>50%) with no or limited overshoot	GHG	43 [34-60]	60 [49-77]	69 [58-90]	84 [73-98]
	CO_2	48 [36-69]	65 [50-96]	80 [61-109]	99 [79-119]
Limit warming to 2°C (>67%)	GHG	21 [1-42]	35 [22-55]	46 [34-63]	64 [53-77]
	CO_2	22 [1-44]	37 [21-59]	51 [36-70]	73 [55-90]

Sources: Upper panel: Historical data from the IPCC for 1950–1989 and from the 2022 NDC synthesis report for 1990–2020; 2030 projections from NDCs; and the reduction scenarios from the AR6 Synthesis Report (IPCC. 2023. *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Core Writing Team, H Lee, and J Romero (eds.). Geneva: IPCC. Available at https://www.ipcc.ch/report/ar6/syr/). Lower panel: table SPM.5 in the AR6 Synthesis Report.
Abbreviation: LULUCF = land use, land-use change and forestry.

99. New and updated NDCs submitted before COP 26 indicate an increase in mitigation ambition compared with previous INDCs; however, this increase only partly offsets emissions growth and is not yet in line with global modelled mitigation pathways that limit warming to 1.5 or 2 °C. These NDCs close the emissions gaps only partially, by 15–33 per cent. A total of 169 Parties updated 142 NDCs, and 74 per cent of these Parties strengthened commitments to reduce or limit emissions for 2025 and/or 2030. Parties were requested to revisit and strengthen the 2030 targets in the NDCs as necessary to align with the Paris Agreement temperature goal, taking into account different national circumstances.[27]

100. The 2022 NDC synthesis report provides updated information based on the latest available NDCs, up to 23 September 2022.[28] The report indicates the median emissions gap to 1.5 °C (>50 per cent probability) in 2030 is 23.9 Gt CO_2 eq without conditional elements and 20.3 Gt CO_2 eq with the implementation of conditional elements underpinned by support.[29] For a median emissions gap of 2 °C (>67 per cent probability), the respective emissions gaps in 2030 are 16.0 and 12.5 Gt CO_2 eq, without and with conditional elements and support respectively. 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.

101. **Key finding 5: much more ambition in action and support is needed in implementing domestic mitigation measures and setting more ambitious targets in NDCs to realize existing and emerging opportunities across contexts, in order to reduce global GHG emissions by 43 per cent by 2030 and further by 60 per cent by 2035 compared with 2019 levels, and reach net zero CO_2 emissions by 2050 globally.**

102. **Urgent action and support are needed to ramp up implementation of domestic mitigation measures by realizing opportunities across all sectors and systems**. Urgently implementing domestic mitigation measures is key to reducing emissions and following through on ambitious pledges. There are many opportunities for implementing more ambitious mitigation measures in all sectors and systems (see para. 112 below). If fully implemented and supported, realizing such opportunities can raise ambition to sufficiently address the emissions gap and can offer substantial potential to reduce net GHG emissions by 2030.

103. 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 CO_2 eq or less (with an estimated net emission reduction potential of 31–44 Gt CO_2 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 CO_2 eq are estimated to comprise more than half of this potential. Large contributions with costs of less than USD 20 per t CO_2 eq come from solar energy, wind energy, energy efficiency improvements in industry, reduced conversion of

[27] See decision 1/CMA.3, para. 29.
[28] FCCC/PA/CMA/2022/4.
[29] See document FCCC/PA/CMA/2022/4, para. 16.

natural ecosystems and CH_4 emission reductions (from coal mining, and oil and gas operations).[30]

104. There remain significant challenges associated with capturing these opportunities and 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 can accrue from climate action. While large-scale and feasible mitigation options exist, feasibility in the short term differs across sectors and regions. Most options face higher barriers if they are to be implemented rapidly on a large scale. However, a range of enabling conditions can help with implementing these actions, including strengthening policies and institutions, increased finance, technological innovation and transfer and demand-side measures including behaviour change.

105. **More ambitious mitigation targets in NDCs are needed to reduce emissions more rapidly and to align with each country's LT-LEDS towards just transitions to net zero emissions by or around 2050, while enhanced transparency can help track progress.** Through their NDCs, nearly all Parties have communicated domestic mitigation measures to achieve their mitigation targets. The nationally determined mitigation targets in NDCs range from absolute economy-wide emission reduction targets, economy-wide emission reduction and limitation targets and enhanced mitigation efforts to strategies, policies, plans and actions for low-emission development. In their NDCs, most Parties (90 per cent) provided quantified mitigation targets, expressed as clear numerical targets, while the rest (10 per cent) included strategies, policies, plans and actions. Most Parties (80 per cent) communicated economy-wide targets covering all or almost all sectors defined in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*,[31] with an increasing number of Parties moving to absolute emission reduction targets in their new or updated NDCs.

106. Although mitigation measures communicated in current NDCs are not collectively sufficiently ambitious, the Paris Agreement provides for progression, including by stating the expectation that each Party's successive NDCs will represent its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances, and will be informed by the outcomes of the GST. Progression may involve, among other options, more rapid emission reductions through adopting more stringent targets and more comprehensive forms of targets. The Paris Agreement states that developed country Parties should continue taking the lead by undertaking absolute economy-wide emission reduction targets, and that developing country Parties should continue enhancing their mitigation efforts and are encouraged to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances.

107. As Parties formulate and communicate their LT-LEDS that chart just transitions towards net zero emissions by or around mid-century, tailored to different national circumstances, they should begin to implement concrete measures to shift to such pathways. Many Parties have set goals and communicated strategies aiming for either net zero CO_2 or GHG emissions around or by 2050, yet in many cases mitigation ambition in NDCs is not aligned with pathways to achieve LT-LEDS.

108. Various perspectives and technical information on how Parties can deliver new mitigation targets in NDCs in 2025 in line with the Paris Agreement temperature goal are covered extensively in the summary reports on the meetings of the TD and in inputs submitted to the GST. These also identified a number of good practices, opportunities, barriers and challenges in relation to implementing measures that achieve mitigation targets in NDCs. This information can be relevant to discussions under the consideration of outputs phase of the first GST, during which Parties may decide to provide more specific guidance on the next round of NDCs.

[30] See figure 4 in the summary report on TD1.3, available at https://unfccc.int/sites/default/files/resource/GST_TD1.3%20Summary%20Report_15_August_Final.pdf.

[31] IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

109. Compared with those in the INDCs, the targets in the new or updated NDCs are generally more clearly defined in quantitative terms, with a larger share of targets communicated relative to a historical base year or quantified future reference level. Now that the Parties have experience developing NDCs and implementing relevant policies, and soon will have experience undertaking a GST, they are better placed, as they prepare their next NDCs, to provide the information necessary to facilitate clarity, transparency and understanding of their mitigation measures and targets in their NDC. Each country must provide information in its BTR on actions, policies and measures that support the implementation and achievement of its NDC under Article 4 of the Paris Agreement, focusing on those that have the most significant impact on GHG emissions or removals and those impacting key categories in its national GHG inventory.

110. The 2022 NDC synthesis report noted that Parties communicated good practices for NDC preparation, such as conducting a preliminary assessment of pre-2020 efforts to identify gaps and needs and develop an NDC road map; mainstreaming NDC mitigation targets in existing strategies, plans and policies to obtain political support and benefit from existing arrangements; communicating sectoral quantitative mitigation targets; including mitigation targets or mitigation co-benefits resulting from adaptation actions and/or economic diversification plans; and providing detailed information on key domestic mitigation measures for achieving the mitigation targets. Such good practices may be used by Parties, in a nationally determined manner, to increase ambition of their actions and support in their next NDCs.

111. **Mitigation measures that successfully deliver on other sustainable development goals can be scaled up and replicated across different contexts.** The sustainable development benefits of implementing mitigation measures are very important in broadening and deepening these measures, in particular when they also address poverty eradication.[32] Accelerating action on mitigating climate change is crucial for actions on sustainable development, and these actions can be mutually supportive. 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 noted 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) and AFOLU measures contributing to achieving SDG 15 (life on land) being the most frequently indicated measures.

112. **Key finding 6: achieving net zero CO_2 and GHG emissions requires systems transformations across all sectors and contexts, including scaling up renewable energy while phasing out all unabated fossil fuels, ending deforestation, reducing non-CO_2 emissions, and implementing both supply- and demand-side measures.**

113. Achieving net zero CO_2 emissions globally by mid-century requires radical decarbonization of all sectors of the economy, as countries design and implement systems transformations. 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 urgently increase the ambition of near-term actions while charting pathways to net zero CO_2 and GHG emissions, ensuring access to energy for all, including by making international and domestic financial flows consistent with pathways towards low GHG emissions.

114. Many mitigation actions can have co-benefits and help achieve SDGs. Developmental benefits of mitigation actions include significant benefits, for example through health benefits from lowered air pollution, energy access for underserved populations and jobs created.

115. Net zero CO_2 energy systems require the phasing out of all unabated fossil fuels over time, rapid scaling up of renewable energy, widespread electrification of end uses, use of clean fuels, including low-carbon hydrogen and ammonia, solutions for applications that are more challenging to electrify, and boosting energy efficiency gains and demand-side management. Reaching net zero emissions also requires curbing deforestation and protecting natural terrestrial and ocean-based sinks, restoring deforested and degraded lands,

[32] See figure 3 in the summary report on TD1.3.

sustainably managing land, and shifting agricultural and food systems. While CO_2 removal cannot serve as a substitute for deep emissions reduction, methods of CO_2 removal can further reduce net CO_2 or GHG emissions in the near term, counterbalance residual emissions from hard-to-abate sectors, and achieve and sustain net-negative CO_2 or GHG emissions in the long term, given sufficient ambition. Also, rapid reductions of non-CO_2 GHG emissions would lower temperatures in the near term relative to scenarios with higher non-CO_2 GHG emissions and reduce the level of peak warming. Reducing these emissions would also lessen the amount of CO_2 removal required to achieve net zero GHG emissions.

116. **Scaling up renewable energy and phasing out all unabated fossil fuels are indispensable elements of just energy transitions to net zero emissions.** Energy system mitigation measures could account for 74 per cent of total global mitigation in reaching net zero GHG emissions. From 2010 to 2019, renewable energy trends were highly promising, with notable reductions in unit costs for solar energy (85 per cent), wind energy (55 per cent), and lithium-ion batteries (85 per cent), as highlighted by the AR6. This has resulted in a significant increase in their deployment, with solar and electric vehicles witnessing deployment growth rates of over 10 times and 100 times respectively, though rates, costs and benefits all vary widely across regions. Strengthening power grids and storage is critical to unlocking the potential for renewable energy sources and to providing clean power as transport industry and buildings electrify (see paras. 122–125 above).

117. Early signs of transformation and urgency among key stakeholders help 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 projected that average annual investment requirements for 2020–2030 in scenarios that limit warming to 2 °C or 1.5 °C are a factor of three to six times greater than current levels, and total investment (public and private, domestic and international) in mitigation would need to increase across all sectors and regions. Dramatic increases in investment 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.

118. The projections in the AR6 showed that actions towards limiting global warming to 1.5 °C require reducing use of unabated coal power by 67–82 per cent by 2030 from the 2019 level, while oil and gas consumption will fall more slowly. By 2050, coal should hardly be used for electricity generation globally, although global modelled pathways in the AR6 do not specify pathways for any single country. At the same time as the phasing out of all unabated fossil fuels, low- and zero-carbon sources are scaled up and account for between 97–99 per cent of global electricity by 2050 in these pathways.

119. A rapid reduction of the world economy's reliance on fossil fuels towards clean energy is central for reaching global net zero CO_2 and GHG emissions. To achieve rapid reductions in emissions, the phase-out of unabated fossil fuels is required and should be undertaken responsibly, including through socially inclusive phase-out plans developed as part of just transitions. Before a full phase-out, fossil fuels will remain an important source for some, particularly those least able to afford to transition away from those fuels. Fossil fuels may remain important in hard-to-abate sectors and strategic industrial uses for a limited period. The timing of phase-outs will differ for different contexts and fuels, and the phase-out of any unabated coal power needs to be accelerated in this decade.

120. Carbon capture, usage and storage is an option for reducing emissions from large-scale fossil-based energy and industry sources, but wider deployment hinges on resolving geophysical, environmental-ecological, economic, technological, sociocultural and institutional challenges.

121. 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. Several developing countries have recently pursued just energy transition partnerships, which are promising examples of how international cooperation can support national efforts for just transitions while accounting for specific national contexts and are based on lessons learned; these partnerships could be models for action in additional developing countries.

122. **Measures to implement systems transformations in industry, transport, buildings and other sectors must rapidly reduce process and energy emissions.** Reducing industrial emissions, which make up about 25 per cent of global emissions, will require demand management, significantly increasing energy efficiency gains across all sectors, electrification, innovation in hard-to-abate subsectors, greater circularity and attention to emissions across supply chains. Ambitious implementation of such measures can also save costs and deliver co-benefits.

123. 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 to reduce and manage waste and making cities more compact, walkable and efficient. Local authorities and other actors may take measures to co-locate housing and jobs, as well as 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 energy demand and implement mitigation options in design, construction, use and retrofits. Subnational leaders and communities are central to waste management and should add measures that address CH_4 emissions in the treatment of solid waste and wastewater.

124. Transportation currently contributes about 15 per cent of global GHG emissions. Phasing out internal combustion engines and using electric vehicles offer the greatest mitigation potential in the sector. In addition, demand-side interventions, such as shifting transport modes (e.g. to walking and using public transport), will be essential in the context of rethinking mobility. Rapidly reducing emissions from international shipping, aviation and freight transportation will require more effective international cooperation on sustainable fuels, energy-efficient design, data analytics and other solutions.

125. Energy efficiency and demand-side management remain important ways of reducing emissions, often with cost savings over short payback periods. Energy conservation also deserves continued attention, especially in contexts with high energy consumption. Energy storage technologies and demand-side measures can help stabilize variability in renewable energy.

126. **Halting and reversing deforestation and degradation and improving agricultural practices are critical to reducing emissions and conserving and enhancing carbon sinks.** In 2019 AFOLU accounted for 13 Gt CO_2 eq (22 per cent) of global GHG emissions. Around half of net AFOLU emissions result from land-use change: predominantly CO_2 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 and land degradation by 2030 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 CO_2 absorption and have further co-benefits.

127. Large-scale commodity production remains the primary driver of deforestation and degradation and requires strengthening national policies, securing land tenure and increasing action by governments, financial institutions and companies. Land carbon accounting and incentive systems, such as REDD+ and payment for forest-based ecosystem services, are increasingly implemented by governments as an approach for incentivizing forest conservation and restoration at different scales.

128. In the agriculture sector, demand-side measures such as shifting to sustainable healthy diets, reducing food loss and waste, and intensifying sustainable agriculture without further land expansion can reduce emissions, halt deforestation and free up land for reforestation and ecosystem restoration. Actions in agricultural and food systems have sustainable development benefits, including increasing productivity sustainably, reducing food loss and waste and shifting to sustainable healthy diets. All these options can have multiple synergies with the SDGs.

129. **More effective international cooperation and credible initiatives can contribute to bridging implementation and emissions gaps**. 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-Party stakeholders, have taken on mitigation commitments and actions. Mitigation measures by non-Party stakeholders will be an important factor for success in achieving the Paris Agreement goals. While pledges for mitigation actions and relevant international cooperation by non-Party stakeholders have accelerated significantly in response to the Paris Agreement, efforts are still far from being pledged or implemented at the level needed. Some estimates for mitigation actions suggest that non-Party stakeholders could reduce emissions by up to 20 Gt CO_2 eq in 2030, although care needs to be taken in making assumptions explicit.

130. International cooperation takes many forms, and a rapidly growing number of initiatives have been launched, including some focused on systems transformations and many on specific sectors. The AR6 reported on initiatives focusing on energy efficiency, buildings, transport, renewable energy, forestry, non-CO_2 emissions and agriculture, as well as multi-sectoral initiatives, assessing key actors, scale, mitigation targets, membership and mitigation potential. On emissions from international transport, the International Maritime Organization has set a goal consistent with reaching net zero GHG emissions by or around 2050, and the International Civil Aviation Organization has set a goal consistent with reaching net zero CO_2 emissions by 2050. It remains important to understand whether and how these efforts are additional to action within NDCs, and rigorous accounting is needed to avoid potential overlaps across and within initiatives.

131. **Key finding 7: just transitions can support more robust and equitable mitigation outcomes, with tailored approaches addressing different contexts.**

132. In discussions at TD, diverse views were expressed on dimensions of equity in mitigation, including: all Parties joining the effort to reduce emissions; Parties explaining how their NDCs are fair and ambitious, in line with their national circumstances; changing historic, current and future contributions to emissions; ensuring equitable allocation of carbon space; ensuring availability of mitigation options and increasing capacity for implementing them; minimizing costs while promoting development; identifying the need for support across finance, technology and capacity-building for developing countries; including all stakeholders in decision-making; minimizing global warming to avert loss and damage; enabling just transitions to net zero emissions; and generating criteria for benchmarking NDCs as fair and ambitious. The concept of equity is complex and multidimensional, encompassing both national and international dimensions, and includes considerations associated with differing national circumstances, capabilities and opportunities for action. A common thread across the discussions was that equity should align with an upward spiral of ambition in implementing the Paris Agreement.

133. Given the scale of changes, all countries face potential challenges and opportunities. The transformation to low-emission development will entail distributional consequences, including shifts of income and employment. Integrating broader considerations into policy development and implementation can improve the ability to address equity and gender equality. Just transition principles can also be adopted and implemented through collective and participatory decision-making processes to reduce the disruptive consequences of rapid systems transformations.

134. Another way to operationalize equity in mitigation issues is for Parties to provide clearer information on fairness in their NDCs.[33] All countries are expected to explain in their NDCs how their NDCs are fair and ambitious. The vast majority of countries (98 per cent) have already done so voluntarily, although such information is mandatory for second NDCs. Many different frameworks and criteria for assessing fairness and ambition exist, but none of them have 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 the gross domestic product, or global averages, and several other benchmarks including global pathways to net zero emissions. Approaches that not only focus on the costs

[33] See https://unfccc.int/sites/default/files/resource/GST_SR_23c_Addendum_Final_02230417.pdf.

of action, but also recognize the opportunities and co-benefits associated with low GHG emissions development can inform perceptions of fairness. When explaining how they consider their NDCs to be fair and ambitious in the light of their national circumstances, a few Parties included the following considerations: the right to promote sustainable development, inter- and intra-generational equity, harm prevention, precaution, and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

135. **Key finding 8: economic diversification is a key strategy to address the impacts of response measures, with various options that can be applied in different contexts.**

136. Informed approaches can address negative impacts of response measures and promote positive synergies within LT-LEDS, including through economic diversification.[34] Just transitions need to create decent work and quality jobs and protect the communities that depend on them. While some jobs may be lost in some industries, low-emission development can create opportunities for just transitions that enhance skills and create more durable jobs in other industries, with differences across countries and sectors. Global job creation resulting from just energy transitions will potentially be 3.5 times greater than job losses by 2030. 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 for addressing the negative impacts of response measures and promoting positive synergies. Opportunities for such diversification include green industrialization, the greening of supply chains, and diversifying to related and unrelated products.

C. Adaptation, including loss and damage

137. Collective progress on adaptation must undergo a step change in fulfilling the ambition laid out in Article 2, paragraph 1(b), and Article 7, paragraph 1, 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 adaptative capacity, strengthening resilience and reducing vulnerability; however, their ability to systematically monitor progress towards these aims is limited. Owing to climate-related and other factors, loss and damage is already being observed and risks are growing, meaning that enhancing action and support for averting, minimizing and addressing loss and damage is urgently needed.

138. **Key finding 9: as climate change threatens all countries, communities and people 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 from disasters.**

139. Climate impacts are a threat to human well-being and to ecosystems. The window of opportunity to secure a liveable and sustainable future for all is rapidly closing. Increasing impacts from climate change are being observed, and risks are being compounded and cascading across systems with projections of increased warming. At current global warming levels, losses and damages to human and natural systems have already been observed, including for example damage to infrastructure, reductions in crop production, heat-induced labour productivity losses, losses due to tropical cyclones and losses of species. Every fraction of a degree of temperature increase closer to and beyond 1.5 °C will cause increases in multiple climate hazards and present greater risks to human systems and ecosystems. Climate impacts are already eroding past development gains and, without adaptation action, will impede the ability to make human development gains.

140. The GGA referred to in Article 7, paragraph 1, of the Paris Agreement, of enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change in the context of the temperature goal referred to in Article 2 of the Paris Agreement, provides

[34] See the summary report on TD1.3, para. 53.

grounds for implementing a variety of actions to respond to climate impacts. Adaptation is the responsibility of all governments at all levels, and each has a role to play in promoting approaches to develop and use climate information relevant to local conditions to enable adaptation action in their jurisdictions. Parties recognized in 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. An adequate adaptation response needs to be ensured in the context of the Paris Agreement temperature goal. The Paris Agreement affirms the importance of support for and international cooperation on adaptation efforts, taking into account the needs of developing country Parties.

141. The AR6 highlights 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. Efforts to promote climate-resilient development can enable progress towards the GGA, particularly when these efforts are included within national and local plans and planning processes. Yet the design of existing and planned infrastructure, for example, has rarely addressed climate risks, and, more broadly, the costs and barriers to adaptation are significant and, in many cases, growing.

142. Even with successful adaptation action, the residual risks for loss and damage will remain and comprehensive risk management approaches will need to be deployed broadly. And, of growing concern is that the capacity of some governments to recover from recent extreme events has been exceeded, and the compounding impacts of such events leave very limited residual response capacity.

143. **Key finding 10: collectively, there is increasing ambition in plans and commitments for adaptation action and support, but most observed adaptation efforts are fragmented, incremental, sector-specific and unequally distributed across regions.**

144. **Adaptation planning is the first step in an iterative cycle to enable moving swiftly from understanding risks to more ambitious and effective adaptation action and support, the implementation of which must now be accelerated to increase adaptive capacity, support greater resilience gains and reduce vulnerability.** Parties and non-Party stakeholders need to put in place long-term reforms that integrate climate change risks into all aspects of planning, decision-making and implementation. The adaptation cycle can be broken down into an iterative approach for developing and implementing long-term 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 them. Of the 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;[35]

(b) Planning process/mainstreaming: planning for actions that respond to and reduce assessed risks from climate change is developed through an inclusive process and instituted in a policy or practice. Financial and other support for the planned actions is identified and accessed. As at 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;[36]

(c) Implementation of adaptation actions: adaptation plans are put into practice and support delivered where necessary. According to the contribution of Working Group II to the AR6,[37] progress on implementation is taking place across all sectors and regions, albeit unevenly, with observed adaptation gaps and growing support needs;

[35] See document FCCC/PA/CMA/2022/4, para. 158.

[36] See UNEP. 2022. *Adaptation Gap Report 2022: Too Little, Too Slow – Climate Adaptation Failure Puts World at Risk.* Nairobi: UNEP. https://www.unep.org/resources/adaptation-gap-report-2022.

[37] IPCC. *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. H Pörtner, D Roberts, M Tignor, et al. (eds.). Cambridge: Cambridge University Press. Available at https://www.ipcc.ch/report/ar6/wg2/.

(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 according to the contribution of Working Group II to the AR6. Indeed, as at August 2021, only around 25 per cent of countries had a monitoring and evaluation system in place;[38]

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

145. Across the adaptation cycle, progress is being made in mainstreaming climate-related risks in decision-making, but sustained and enhanced action is needed to fully implement NAPs and adaptation processes over time to integrate long-term changes that reduce risks equitably. Nevertheless, each stage of the adaptation 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. Implementation of adaptation action and support may take into consideration themes identified as possible elements in the framework for the GGA being developed under the Glasgow–Sharm el-Sheikh work programme on the GGA: water; food and agriculture; cities, settlements and key infrastructure; health; poverty and livelihoods; terrestrial and freshwater ecosystems, and oceans and coastal ecosystems; tangible cultural heritage; mountain regions; and biodiversity.

146. **Transparent reporting on adaptation can facilitate and enhance understanding, implementation and international cooperation.** Many governments are developing diverse portfolios of adaptation actions, policies and goals, tailored to national and local adaptation needs. A total of 60 Parties have submitted adaptation communications, 36 of which as stand-alone documents and 24 of which as a component of, or in conjunction with, NAPs (2), NDCs (19) or national communications (3) that outline their experience and national efforts on building resilience, including priorities, implementation and support needs, plans and actions. However, there is extensive action and support on adaptation beyond what has been reflected in submitted adaptation communications. Parties should consider reflecting their progress in mainstreaming the adaptation cycle to undertake more ambitious adaptation actions, when periodically updating these communications. The review of adaptation communication guidelines in 2025 will provide an opportunity for Parties to share their experience with adaptation communications and consider potential improvements to the technical information provided in these communications. Parties may wish to consider a more systematic approach to assessing such information ahead of the next GST.

147. In comparison with Parties' previous NDCs, more NDCs submitted in 2022 contained adaptation information, and all developing countries included adaptation in these NDCs. Most Parties (80 per cent) included an adaptation component in their NDCs, and 13 per cent of these were designated adaptation communications. The 2022 NDC synthesis report noted that most Parties included detailed information on adaptation in their NDCs, in particular on adaptation-related research, vulnerabilities, adaptation measures such as NAPs and sectoral actions, contingency measures, and monitoring and evaluation of adaptation. The adaptation components of the NDCs reflect an increased focus on national adaptation planning, in particular on the process to formulate and implement NAPs. The new or updated NDCs synthesized in the report include, in comparison with the same Parties' previous NDCs, more information on time-bound quantitative adaptation targets and the associated indicator frameworks, more specific links between adaptation efforts and efforts towards the SDGs, and more specific information on synergies and co-benefits between adaptation and mitigation.

[38] See UNEP. 2021. *Adaptation Gap Report 2021 – The Gathering Storm: Adapting to Climate Change in a Post-Pandemic World*. Nairobi: UNEP. Available at https://www.unep.org/resources/adaptation-gap-report-2021.

148. A total of 140 developing countries have embarked on the process of formulating NAPs, although progress on formulating and implementing NAPs has been slow, especially among the least developed countries. To date, only 46 developing countries, including 20 least developed countries, have submitted NAPs. The process to formulate and implement NAPs is guided by the following principles: ensuring a continuous, progressive and iterative process that is not prescriptive; facilitating country-owned, country-driven action; following a gender-sensitive, participatory and transparent approach, taking into consideration vulnerable groups, communities and ecosystems; and being based on and guided by the best available science and traditional and Indigenous knowledge. The Least Developed Countries Expert Group developed technical guidelines for the process to formulate and implement NAPs, and these guidelines have been supplemented with resources, developed by the Least Developed Countries Expert Group and various other organizations, including tools, methodologies and guidance. Countries have highlighted their key climate hazards, vulnerabilities, and priority activities to be implemented in their NAPs and are increasingly making attempts to ensure that climate change is integrated into all development plans at the national, regional and local level while also linking the process to formulate and implement NAPs to the broader policy context, such as the SDGs and the Sendai Framework for Disaster Risk Reduction 2015–2030. Within their NAPs, countries are also placing a focus on considering gender and the vulnerability of women to climate impacts, as well as on meaningfully engaging Indigenous Peoples and local communities and their knowledge systems. NAPs most frequently cover the areas of agriculture, infrastructure and spatial planning, health, water resources, ecosystem services, forestry, fisheries, education, livestock, coastal zones and disaster risk reduction. Some NAPs also identify tourism, urban areas, mining and industry as priority areas for adaptation action. Concerningly, adaptation 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.

149. 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[39] 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 on to inform the monitoring and evaluation stage of adaptation planning. Nevertheless, there is a need for continued development of methodologies and metrics or indicators that are applicable in particular circumstances, including capacity-building, on how to use indicators within planning and implementation. Parties' ongoing discussions on reviewing collective progress towards achieving the GGA are proceeding and a more in-depth assessment should be possible during the second GST.

150. Adaptation efforts by developing countries are being recognized and will receive further recognition during high-level events at CMA 5. Article 7, paragraph 14(a), of the Paris Agreement calls for the GST to recognize the adaptation efforts of developing country Parties. The CMA decided that the adaptation efforts of developing country Parties will be recognized in various ways. As inputs to the GST, the CMA requested that the secretariat include information on the adaptation efforts of developing country Parties in the synthesis report on the state of adaptation efforts, experience and priorities for the GST and 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 decided that the adaptation efforts of developing country Parties will be recognized, guided by the high-level committee, during the high-level events of the GST. 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.[40]

[39] Decision 18/CMA.1, annex.

[40] See decision 11/CMA.1, section II.

151. **Key finding 11: when adaptation is informed and driven by local contexts, populations and priorities, both the adequacy and the effectiveness of adaptation action and support are enhanced, and this can also promote transformational adaptation.**

152. To understand the risks faced and to be able to adjust accordingly, decision makers at all levels must continually evaluate a country's particular climate change 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 entail a continuous process with iterations that build on previous actions and experience, in order to manage new risks as they are identified and exchange best practices with other national and subnational governments.

153. Transformational approaches to adaptation generate new options for adapting to the impacts and risks of climate change by changing the fundamental attributes of a system, including altered goals or values and addressing root causes of vulnerability. According to the contribution of Working Group II to the AR6, success in making adaptation more transformational depends on the availability of appropriate enabling environments, including experiential and niche learning, alignment of transformational change objectives with strategic priorities of governments and non-Party stakeholders, strong bottom-up governance grounded in local contexts, phased long-term programme support and appropriate financing.

154. There is no single procedure to measure progress in terms of adequacy or effectiveness of adaptation and support for adaptation. Over time, the adequacy and effectiveness of adaptation action can be measured in stages and by the degree to which adaptation results in resilience that is sustained. In contrast, the amount of reported international financial support for adaptation can be measured, as can the reported needs for adaptation support. Comparing these would likely show that the needs are greater than the level of support. In both cases, however, the actual amounts may be larger, as adaptation support and needs for support are difficult to distinguish from broader sustainable development support and needs. It is more difficult to measure how finance flows are made consistent with climate-resilient development, as they ultimately comprise decisions made by actors such as households, governments and international organizations. Shifting financial flows – domestic and international, public and private – away from maladaptation towards mainstreaming adaptation in decision-making is a critical component in scaling up finance for adaptation to effectively support iterative and sustained adaptation actions. Judging the adequacy of support for adaptation will also require an understanding of the effectiveness of that support.

155. 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, which underscores the need for systemic capacity-building and comprehensive risk management approaches where the risks from climate change are incorporated into decision-making at all levels.

156. **There are opportunities for adaptation across systems and sectors, many of which have been mainstreamed into existing development priorities and processes.** Good practices in adaptation are well documented across a wide range of sectors and themes, addressing a wide range of hazards, and are available to help guide adaptation action (see the table below). 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 the 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 and for managing and restoring coastal habitats and ecosystems, providing alternative livelihoods for coastal populations and enhanced floodwater management are examples of good practice. Some approaches identified extend across hazards and sectors, such as advancing ecosystem-based adaptation or nature-based solutions and multi-hazard early warning systems. To be effective, these systems need to connect to early action in responding swiftly to extreme events on a local, national, regional and international scale. 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.

157. **A fundamental starting point for enhanced adaptation action is the dissemination of climate information through climate services to meet local needs and priorities.** Climate services provide actionable climate information and predictions to decision makers to inform policies, planning and implementation of adaptation. This includes information on assessing and tracking risks and ways to manage such risks. To be effective, climate services should be driven by user needs and priorities. For example, early warning systems can integrate data collection into developed risk profiles and help decision makers understand transboundary risks more clearly. Initiatives to expand access to early warning systems to new areas and strengthen existing system have been launched by the Secretary-General of the United Nations.

158. Climate services also help disseminate top-down information from global systems to local users. Such efforts could be complemented by enhanced information collection to catalogue impacts of extreme and slow onset events as well as the effectiveness of adaptation efforts across local and sublocal scales. Improving such databases over time and building accessible, user-driven climate services systems would strengthen implementation across the adaptation cycle. It could also help Parties report information on observed and potential impacts and on related approaches, methodologies and tools, and associated uncertainties and challenges under the enhanced transparency framework.

159. There are also efforts under way to capture information on the impacts of disasters and climate change. Under the Sendai Framework for Disaster Risk Reduction 2015–2030, for example, governments are establishing and strengthening national disaster loss databases to improve the collection and use of disaster risk data, as well as contribute to a composite global picture of impacts from disasters. Systematically inventorying the impacts of disasters and climate change can enable better understanding of risks and the effectiveness of adaptation measures.

160. Climate services inform adaptation planning and implementation based on local engagement and locally determined priorities, and improve the identification of action and support for responding to projected risks and scenarios, promote social inclusion and facilitate just resilience. Just resilience involves avoiding actions that simply shift risks to other actors or reinforce existing vulnerabilities. Durable and transformational adaptation is facilitated by governments at all levels working with communities, civil society, educational bodies, scientific and other institutions, media, investors and businesses. It is also important to develop partnerships with traditionally marginalized groups, including women, youth, Indigenous Peoples and local communities as well as ethnic and other minority groups.

Figure 2

Climate responses, adaptation actions and examples of good practices responding to climate hazards across systems and sectors as identified by the Intergovernmental Panel on Climate Change and by Parties

Themes, systems, and sectors	Climate responses and adaptation actions	Climate Hazards: Changes in temperature, including extreme heat	Changes in precipitation: Flooding	Changes in precipitation: Droughts and dryness	Cyclones and storms	Sea level rise	Changes in oceans: circulation, temperature, and chemistry	Changes in cryosphere: sea ice and glaciers	Synergies with SDGs
					Examples of good practices				1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Coastal zones	Coastal defence and hardening				Flood embankments, coastal polders	Sea wall construction, coastal embankments	Artificial reef projects		+ ▪ + − ▪ ▪ ▪ ▪
	Integrated coastal zone management		Planting wave-protection bamboo forests		Developing coastal disaster-prevention forests	Managing and restoring coastal habitats and ecosystems	Reducing coastal pollution to limit deoxygenation	Habitat protections	+ + + + + + + + + + + + + + + + +
Terrestrial and ocean ecosystem services	Forest-based adaptation		Planting traditional tree and root crops						+ ▪ + + + + + + + + + + + + +
	Sustainable aquaculture and fisheries				Increasing disaster-resilient fishery areas	Reducing impacts from unsustainable aquaculture	Relocating fisheries and changing fish stocks	Opening/closure of different areas	+ + + + + + + + + + + + + + +
	Agroforestry			Green belts and reforestation					+ + + + + + + + + + + + + +
	Biodiversity management and ecosystem connectivity			Promoting soil conservation schemes	Enforcement of buffer zones for coastal areas and mangrove areas			Change in gear, timing of hunting, species switching	+ + + + + + + + +
Water	Water use efficiency and water resource management		Improving water supply systems	Improving irrigation efficiency, water harvesting	Emergency water supply	Desalination plants			+ + ▪ + + ▪ + + + + + ▪
Food	Improved cropland management	Planting multiple species with different ripening periods, switching to heat-tolerant crops	Diversification of crops, using paddy fields and agricultural reservoirs as rainwater storage and for infiltration	Switching to drought-tolerant or low-water crop varieties	Garden relocations	Salt-tolerant food production		Shifting the timing of harvesting and the selection of harvest areas	+ + + + + + + + ▪ + + + + + +
	Efficient livestock systems	Heat-tolerant livestock breeds, providing cool areas for livestock grazing	Diversification of small ruminant rearing						+ + + ▪ + + + +
Urban areas and infrastructure	Green infrastructure and ecosystem services	Infrastructure plan directed at urban cooling, including green roofs and parks	Engineered flood defences, e.g., dykes		Redesign and fortify buildings, cyclone shelters, hurricane resistance building codes			Retrofitting and redesigning infrastructures to degrading permafrost conditions	+ + + + + + + + + + +
	Sustainable land use and urban planning		Flood zone mapping and water retention areas		Urban stormwater management and urban drainage systems	Developing standards, regulations and guidelines for construction and flood protection			+ + + + + + + +
Energy	Improve water use efficiency		Emergency action plans for dam safety						+ + + + + + + + + +
	Resilient power systems		Emergency power sources		Electricity storage systems				+ + + + + + + + + +
Health and well-being	Health and health systems adaptation	Redesign/retrofit homes, schools, and health-care facilities, Reducing outdoor workers' heat exposure	Manage increases in vector-borne and waterborne diseases					Improving access to in-home water and sanitation services	+ + + + + + + + + + + + + + + + +
	Planned relocation and resettlement		Removal of buildings and resettlement of occupants		Resettlement policy frameworks	Relocating aquifers		Relocation of human settlements	▪ ▪
	Human migration					Adopting organized migration			▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪
	Disaster risk management	Heat preparedness plans, mapping heat hotspots	Flooding mapping and preparedness plans	Increasing the use of mobile pumping stations	Updating stormwater management plans, storing emergency food supplies	Hazard maps and models for sea level rise		Community-based monitoring programs	+ + + + ▪ + ▪ + + ▪ +
	Climate services, including Early Warning Systems	Heat warning services	Rainfall gauge networks	Drought contingency plans	Strengthening weather observation, emergency warning and monitoring systems	Marine monitoring and surveillance systems		Monitoring of sea ice	+ + + ▪ ▪ ▪ ▪ + + +
Livelihoods, economy, and sustainable development	Livelihood diversification			Documenting indigenous knowledge and practices		Diversification of coastal livelihoods			+ + + + ▪ ▪ ▪ ▪ ▪ − − ▪ ▪ ▪
	Social safety nets		Credit Facilities, emergency relief measures	Drought funds, rebates, and tax measures	Debt instruments in which a disaster clause is embedded			Community freezers to increase food security	+ + + + + + + + + + ▪
	Risk spreading and sharing		Discounted flood insurance for flood mitigation activities	Crop insurance	Reinsurance pool for cyclone damage				+ + + ▪ ▪ ▪

Source: Based on the contribution of Working Group II to the AR6; UNFCCC. 2022. *How developing countries are addressing hazards, focusing on relevant lessons learned and good practices*. *Synthesis report by the Adaptation Committee in the context of the recognition of adaptation efforts of developing countries.* Available at https://unfccc.int/sites/default/files/resource/ac_synthesis_report_hazards.pdf; and the synthesis report prepared by the secretariat on the technical assessment component of the first GST, available at https://unfccc.int/sites/default/files/resource/Synthesis%20report%20on%20the%20state%20of%20adaptation%20efforts%2C%20experiences%20and%20priorities.pdf.

161. Climate change greatly impacts the world's most vulnerable communities and social groups, whether in developed or developing countries, and exacerbates existing inequalities. There is a great need for climate services to reach communities that have historically not had access to climate information, such as women. Women often face higher risks and greater burdens from the impacts of climate change because they are in situations of poverty and owing to existing roles, responsibilities and cultural norms.

162. **International cooperation can help share experience in realizing opportunities and overcoming barriers and challenges to implementation of adaptation plans and promote learning from good practices across various contexts.** 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-Party stakeholders working on adaptation, can enhance and support systems transformations. A wide range of actors, including communities, local authorities, civil society and businesses, can help identify activities that require international cooperation and support. 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.

163. Discussions on collective progress towards the GGA took place within the technical assessment phase of the GST, including on efforts across the adaptation cycle, and on opportunities and challenges in addressing adaptation within sectors and across contexts. The Glasgow–Sharm el-Sheikh work programme on the GGA has informed the first GST.

164. **Key finding 12: averting, minimizing and addressing loss and damage requires urgent action across climate and development policies to manage risks comprehensively and provide support to impacted communities.**

165. Loss and damage has already been observed at current global warming levels and requires an urgent response. While the adaptation cycle aims to mainstream understanding of and action in response to the impacts of climate change in policy and planning processes to reduce risks, there remains a residual level of risk for loss and damage. Limiting warming to the Paris Agreement global temperature goal would significantly reduce the risks and impacts of climate change. Impacts will increase for every fraction of a degree 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. Near-term actions that limit global warming to close to 1.5 °C would substantially reduce projected loss and damage to human and natural systems, compared with higher warming levels, but cannot eliminate them all. More information is needed on which impacts are reversible and which are irreversible. In particular, more understanding is needed on how to avoid and respond to tipping points, such as glacier melt, melting permafrost (which also risks releasing large amounts of CH_4) and forest dieback.

166. Averting, minimizing, and addressing loss and damage requires action across the spectrum of climate policies and sustainable development. There is an urgent need for more knowledge, understanding, support, policy and action to comprehensively manage risks and avert, minimize, and address 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 to risks (access to land, infrastructure, etc.). These efforts are also closely related to efforts on disaster recovery from slow-onset and extreme events and should take into account measures to respond to both 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 programmes, internalize the risk and respond should an impact occur. There are also significant barriers to accessing 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 for Loss and Damage associated with Climate Change Impacts has developed knowledge products and tools for comprehensive risk management and the Santiago network for averting, minimizing and addressing loss and damage

associated with the adverse effects of climate change was recently established to catalyse demand-driven technical assistance, including of relevant organizations, bodies, networks and experts, for the implementation of relevant approaches to averting, minimizing and addressing loss and damage in developing countries that are particularly vulnerable to the adverse effects of climate change. There is a need to strengthen understanding of priority gaps in funding arrangements, which is directly relevant to the work of the Transitional Committee (see para. 173 below).

167. **Key finding 13: support for adaptation and funding arrangements for averting, minimizing and addressing loss and damage need to be rapidly scaled up from expanded and innovative sources, and financial flows need to be made consistent with climate-resilient development to meet urgent and increasing needs.**

168. Finance is a critical enabler of adaptation action across contexts and countries, yet finance availability and access are limited in almost all cases. Assessment of collective progress on adaptation shows an urgent need to rapidly scale up finance for adaptation to meet growing needs, in terms of both the amount of funding available and the speed with which funds flow. It is also critical that, over time, international and domestic public and private financial flows are made consistent with climate-resilient development pathways and shifted away from actions that lead to maladaptation.

169. Public support and finance play a critical role in building the capacities and knowledge needed to develop enabling conditions for building resilience and to move away from actions that increase exposure 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. The share of adaptation finance as a percentage of total spending on mitigation and adaptation has increased but is still below levels needed and significantly smaller than the share for mitigation.

170. 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 sector must be aligned with climate-resilient development priorities and needs, and not with 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 in national and subnational governance and policymaking is necessary for the effective use of limited public finance for adaptation.

171. With increasing flows of climate finance and in considering the consistency of existing flows with climate-resilient development, the amount and effectiveness of funding going to adaptation needs ongoing attention. These efforts can help build enabling conditions that help align investments – domestic and international, public and private – and should take into account evolving climate risks.

172. A variety of approaches can increase the effectiveness of financial support for adaptation. Various initiatives by multilateral financial institutions, such as the Green Climate Fund Productive Investment Initiative for Adaptation to Climate Change, Project Preparation Facility and Private Sector Facility, the GEF Challenge Program for Adaptation Innovation and the World Bank's Global Practice for Urban, Disaster Risk Management, Resilience and Land, are demonstrating effectiveness in building new partnerships, unearthing innovative ideas and catalysing private sector investment in adaptation. Overall, mainstreaming resilience in investments made by financial institutions, building an enabling environment for adaptation support by policymakers and other stakeholders, and promoting innovative measures that match national- and local-level policy and economic and social conditions can help increase the volume and effectiveness of both adaptation and support.

173. Ongoing discussions by Parties, including through the Transitional Committee, are focusing on the operationalization of funding arrangements, including a fund, for responding to loss and damage associated with the adverse effects of climate change, including a focus on addressing loss and damage. Parties, together with non-Party stakeholders, are working on strengthening existing efforts, including on climate risk pooling, early warning systems,

and support for humanitarian response and disaster risk reduction. These discussions indicate a wide range of relevant sources, funds, processes and initiatives for supporting efforts related to averting, minimizing and addressing loss and damage. It is essential to develop a common understanding of the priority gaps in responding to loss and damage and of the areas where support is most effective. Financing gaps relate to aspects such as the speed, adequacy, delivery, access to and thematic coverage of funding. Other gaps may relate to the application of existing methodologies, poor data quality and availability, limited coordination and coherence across efforts, and limited capacity- and knowledge-building.

174. Technology, innovation and technical assistance are increasingly important needs for building capacity for averting, minimizing and addressing loss and damage, and international cooperation on technology development and transfer also remains important. The Santiago network also provides opportunities for enhancing the technical capacities of developing countries in responding to loss and damage.

175. 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.

D. Means of implementation and support and finance flows

176. The Paris Agreement recognizes finance, technology and capacity-building under Articles 9, 10 and 11 respectively as important levers for enabling climate action. It further recognizes in Article 2, paragraph 1(c), that making financial flows consistent with a pathway towards low GHG emissions and climate-resilient development will also be critical. During the three meetings of the first TD, all these topics were discussed at round tables and world café stations under the heading “Means of Implementation and Support”, which is one of the elements identified in Article 14 of the Paris Agreement, used to assess collective progress towards achieving the purpose of Paris Agreement and its long-term goals, and in decision 19/CMA.1, paragraph 6(b). Finance flows, means of implementation and support, and provision and mobilization of support are sources of input to the GST, as specified in decision 19/CMA.1, paragraph 36(d). This chapter reflects the discussions on these topics and does not take a view on the relationship between them.

177. Finance, technology, capacity-building and international cooperation are critical enablers for accelerated climate action. The AR6 found that, if climate goals are to be achieved, both adaptation and mitigation financing would need to increase many-fold. It is also important to recognize that, while finance, technology development and transfer, and capacity-building are important individually, they also function together as multiple levers for enabling climate action.

178. Means of implementation and support to developing countries are foundational to implementing more ambitious mitigation and adaptation actions and making progress in achieving the long-term goals of the Paris Agreement. International public finance remains a critical enabler for scaling up climate action in developing countries and requires urgent efforts to scale it up and strategically deploy it. Further efforts on enhancing the scale and effectiveness (including access, ownership, and impact) while ensuring alignment with the needs and priorities of developing countries are critical enablers for increasing ambition.

179. Finance flows cannot be shifted to make them consistent with a pathway towards low GHG emissions and climate-resilient development without addressing all flows – domestic and international, public and private – which involves shifting flows away from high GHG emissions infrastructure and activities and from maladaptation. While creating incentives to invest in climate action globally and across different national circumstances, it is imperative to unlock and shift the trillions of dollars required to accelerate climate action commensurate with limiting global warming to 1.5 °C.

180. Scaling up climate ambition requires the implementation of regulations and policies to incentivize international and domestic investments towards transforming the financial system. In this regard, a wide range of actors needs to engage in systematic reform efforts to improve the international finance architecture, which enhances access to finance to support effective climate action at the required scale and speed, provides access to capital and improves debt sustainability, in particular in developing countries.

181. **Key finding 14: scaled-up mobilization of support for climate action in developing countries entails strategically deploying international public finance, which remains a prime enabler for action, and continuing to enhance effectiveness, including access, ownership and impacts.**

182. Climate finance from developed to developing countries has increased since the adoption of the Paris Agreement. However, the needs and priorities of developing countries are growing for mitigation ambition, consistent with limiting global warming to the Paris Agreement temperature goal, and adaptation ambition that will make collective progress towards the GGA. Significant and continuous efforts to scale up public and private climate finance are required.

183. **Rapidly scaling up the mobilization of support for climate action in developing countries is necessary to meet urgent needs.** Several reports point to the increases and shortfalls in the mobilization and provision of finance from developed to developing countries. The fifth BA[1] points to increases in public climate finance flows from developed to developing countries since the adoption of the Paris Agreement, from USD 30 billion in 2015 to USD 40.1 billion per year on average in 2019–2020, while multilateral development banks provided USD 45.9 billion per year on average in 2019–2020. However, the collective goal of developed countries to jointly mobilize USD 100 billion per year for the needs of developing countries in the context of meaningful mitigation action and transparency on implementation was not fully met in 2020.

184. Developed countries mobilized USD 83.3 billion in 2020.[2] According to the fifth BA, mitigation finance constituted the largest share (57 per cent) of climate-specific financial support through bilateral, regional and other channels in 2019–2020. However, the share of adaptation finance continued to increase from 20 per cent in 2017–2018 to 28 per cent in 2019–2020 and grew at a higher rate than mitigation finance. The share of cross-cutting finance, which serves both mitigation and adaptation purposes, was 15 per cent 2019–2020. The same report highlights the limitations on assessing collective progress on climate finance and continues to identify specific actions and recommendations to address methodological and data limitations.

185. Financial support for adaptation continues to fall far behind mitigation investments and remains disproportional to the increasing need to enhance climate resilience globally, particularly in developing countries that are particularly vulnerable to the adverse effects of climate change.

186. Accelerated action is required to scale up climate finance from all sources. Public finance alone is not sufficient to address the gap between financing needs and current finance flows, particularly in developing countries. Actions are required to mitigate risks, lower investment costs and enhance access while also pursuing efforts to make all finance flows consistent with a pathway towards low GHG and climate-resilient development. Delivering climate finance at scale requires, inter alia, transforming financial systems, their architecture and processes; continuing to enhance access to finance; building capacity; reducing investment costs; and strengthening enabling conditions that encourage climate action.

187. The GST has highlighted the significant levels of investment requirements and needs in developing countries for climate action. The first report by the SCF on the determination

[1] Available at https://unfccc.int/topics/climate-finance/resources/biennial-assessment-and-overview-of-climate-finance-flows.

[2] See OECD. 2022. *Aggregate Trends of Climate Finance Provided and Mobilised by Developed Countries in 2013-2020*. Paris: OECD. Available at https://www.oecd.org/environment/aggregate-trends-of-climate-finance-provided-and-mobilised-by-developed-countries-in-2013-2020-d28f963c-en.htm.

of needs of developing countries identified 4,274 needs in developing country NDCs, out of which 1,782 across 78 NDCs were costed, cumulatively amounting to USD 5.8–5.9 trillion.[3] The report, drawing from national reports submitted by 153 Parties, notes that needs varied widely among countries and many needs remain uncosted. Of the costed needs, USD 502 billion was identified as requiring international sources of finance, and USD 112 billion as sourced domestically, while 89 per cent of costed needs lacked information on sources of finance. The needs based on national communications and biennial update reports provide different estimates, leading to a range of cost estimates. Enhanced capacity to assess needs is essential in developing countries through improved understanding of methodologies for costing needs.

188. Furthermore, achievement of robust and equitable mitigation and adaptation outcomes requires consideration of just transitions tailored to specific contexts. International cooperation to support domestic efforts in this regard can contribute to the achievement of such outcomes.

189. **Access to climate finance in developing countries needs to be enhanced.** Simplified and expeditious access to climate finance can allow for more rapid deployment of urgently needed finance while also better serving local needs, particularly in developing countries that are particularly vulnerable to the adverse effects of climate change. More standardized approaches to public funding, including grants, would enhance the ability of developing countries, including those with limited capacity, to access funds with the urgency required to adapt. The SCF recommends developed countries, other climate finance providers and recipients to enhance access to climate finance through addressing the barriers arising from the complex architecture of multilateral climate funds.

190. The costs of capital can often be high in developing countries, reflecting both real and perceived investment risks and pointing to the need to enhance the international financial architecture. Multilateral development banks and other international financial institutions have potential to evolve and strengthen their roles, including by expanding financial capacity and technical expertise, continuing to use a diversity of financial instruments, increasing their focus on adaptation and resilience and enhancing the mobilization of private finance, supported by innovative solutions.

191. Debt and the costs of servicing debt sometimes take up a large share of national budgets in some developing country, limiting fiscal space for investments in climate action and other sustainable development priorities. Continued efforts to promote effective solutions to debt sustainability are needed to enable enhanced climate ambition and action.

192. **Directing climate finance towards meaningful activities and continuing to strengthen monitoring, evaluation, and learning can more effectively meet needs, particularly in developing countries.** Enhancing the effectiveness (access, ownership and impact) of climate finance, as well as improving the tracking of effectiveness are important considerations in achieving effective support and delivering desired outcomes. The fifth BA highlights that multilateral climate funds are reporting growth in the impact of their projects, notably the reported expected and actual results from climate finance providers indicate an increase in portfolio-level emission reductions and number of beneficiaries reached. Impact reporting systems play a critical role in facilitating learning from climate finance by providing information on where interventions have succeeded or failed, and why. If climate finance providers have clear evidence that climate finance is leading to results, they can be more confident in allocating funding and reducing access barriers. From the recipient perspective, increased transparency and understanding regarding impacts can improve overall programming efforts and facilitate the selection of interventions that have the greatest climate and co-benefits in a given regional, country or sectoral context as well as increasing country ownership.

193. Robust methodologies for tracking and assessing climate outcomes are important in this regard. The fifth BA has documented challenges associated with measuring the impacts of climate change, such as limited reporting capacity of implementing entities and time lags between reporting on outcomes and impacts of projects. The fifth BA found that developing

[3] Available at https://unfccc.int/topics/climate-finance/workstreams/needs-report.

countries face challenges in reporting information on climate finance received owing to limited capacities and resources to track climate finance received. It also noted that overlaps in the definition of development and adaptation concepts have led to a diverse set of results areas being captured for finance supporting adaptation. Furthermore, while multilateral climate funds and multilateral development banks at the portfolio level are adept at reporting outputs, it is much harder to develop robust outcome indicators. In this sense, it is also very difficult to measure transformational change, though institutions such as the Green Climate Fund have begun to develop frameworks for doing so. Addressing gaps in knowledge on effectiveness across aspects of ownership, access, impacts and outcomes in relation to climate finance is necessary to facilitate transformational change on the ground.

194. **Key finding 15: making finance flows – international and domestic, public and private – consistent with a pathway towards low GHG emissions and climate-resilient development entails creating opportunities to unlock trillions of dollars and shift investments to climate action across scales.**

195. Article 2, paragraph 1(c), of the Paris Agreement includes the goal to make financial flows consistent with a pathway towards low GHG emissions and climate-resilient development. While the discussions among Parties and stakeholders on the scope of Article 2, paragraph 1(c), and its relationship with Article 9 is ongoing, it is becoming increasingly evident that efforts must be pursued on all fronts in order to meet investment needs. The TD discussed ongoing efforts across a growing number of public and private sector initiatives, including coalitions and practices that focus on the development and adoption of net zero emissions pathways, as well as efforts to integrate assessments of climate risk into operations and financial disclosures.

196. The AR6 states that there is sufficient global capital to close the global investment gaps but there are barriers to redirecting capital to climate action. The mobilization of private capital is relevant to achieving scale. A growing number of initiatives such as taxonomies and other tools encourage the participation of the private sector. These initiatives are often voluntary, and the participation and inclusion of more entities, and the promotion of efforts to increase accountability to avoid greenwashing, is needed. It is therefore important to recognize that the private sector operates differently in each country, and small and medium-sized enterprises in some countries may require support to transform their processes.

197. Global and domestic capital markets are likely to be the primary source for scaling up investment in mitigation and adaptation, while public finance may be deployed to high-impact investments and to crowd-in private sector finance. In terms of mitigation, increased efforts to scale up green investments, therefore shifting incentives away from high-emission activities and financing transitions, are needed in all countries. How such efforts will be carried out will differ by context. While public finance will continue to have a key role to play in financing adaptation, increased private sector engagement is needed to make financial flows consistent with climate-resilient development. Private sector engagement in adaptation could entail providing products and services to build climate resilience and investment to enhance the resilience of their operations and supply chains, investing in businesses that build climate resilience; and providing direct financing to private or public sector actors for implementing adaptation actions.[4]

198. Climate change vulnerability has the potential to negatively impact credit ratings, restricting access to capital at the national, local, entity or project level. Adverse impacts of climate change, such as damage to infrastructure, population shifts due to forced displacement and rising social cost increase the risk of default on debt servicing for financial institutions, increasing the cost of capital.

199. Significant financial flows continue to be directed towards investments and subsidies in activities and infrastructure that have high emissions and lack resilience. The GST can play a role in exploring solutions, methodologies and tools to scale up investments in climate

[4] Adaptation Committee. 2022. *Synthesis report for the technical assessment component of the first global stocktake.* Bonn: UNFCCC. Available at https://unfccc.int/sites/default/files/resource/AC_SR_GST.pdf.

action, address support needs and make financial flows consistent with a pathway towards low GHG emissions and climate-resilient development.

200. **Opportunities for financing mitigation and adaptation can be enhanced by enabling conditions and overcoming constraints.** 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 creating pipelines of investable products for adaptation and mitigation, present an important opportunity for delivering finance at the scale needed.

201. Public finance can play a critical role in scaling up finance by deploying public interventions to crowd-in private sector finance. Actions are required to mitigate risks, lower investment costs and enhance access while also pursuing efforts to make all finance flows consistent with the goals of the Paris Agreement. While domestic and international private sector climate finance thrives on sector-specific support mechanisms, cross-cutting features of enabling environments including country-level good governance and institutional capacities have also proven to be significant drivers.

202. The fifth BA found that domestic regulators are beginning to implement policies to address climate risk at both the institutional and systemic levels. There has been an increase in multilateral coordination on climate finance policy measures, with a wide variety of initiatives now designed to mainstream climate risk assessment in policymaking at finance ministries and central banks. In 2021, there was a 16 per cent increase in the number of policy and regulatory measures for green finance compared with 2020, bringing the total to 648 measures registered in over 100 jurisdictions globally.[5] Policy measures include the creation of sustainable finance strategies, green budget taxonomies and sustainable finance taxonomies.

203. **It is essential to unlock and redeploy trillions of dollars to meet global investment needs, including by rapidly shifting financial flows globally to support a pathway towards low GHG emissions and climate-resilient development.** Global investment needs to meet the goals of the Paris Agreement are in the order of trillions of United States dollars. Accelerated action is required to scale up climate finance from all sources beyond the mobilization and provision of support from developed to developing countries. In order to close finance gaps, climate finance – private and public, domestic and international – will need to fund activities to support a pathway towards low GHG emissions and climate-resilient development, including shifting flows from activities that promote high emissions and maladaptive development.

204. Assessments by the SCF show the general increasing trends in global finance flows 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 finance flows is 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 overall investment needs. Many investments still support infrastructure that locks in high emissions or that is not designed for resilience to climate impacts. For instance, USD 892 billion was invested in fossil fuels annually on average, and a further USD 450 billion was provided as subsidies for fossil fuel annually on average in 2019–2020. Moreover, investments in climate action are not distributed equally across regions; thus, significant opportunity exists for scaling up investments in developing countries in particular.

205. **A systematic approach to shifting finance flows is needed to support effective climate action at the required scale and speed.** The scale of investment required to achieve the goals of the Paris Agreement highlights the need for a transformation of the financial system and its structures and processes through engaging a wide range of institutions, including governments, ministries of finance, central banks, commercial banks, institutional investors, and other financial and regulatory actors. Momentum is growing behind

[5] See pp.14–15 in document FCCC/CP/2022/8/Add.4–FCCC/PA/CMA/2022/7/Add.4.

fundamental and impactful improvements to public financial institutions, or possible new institutional arrangements, including to reduce existing structural inequalities and make them more capable of addressing climate change in the context of sustainable development and efforts to eradicate poverty. For example, the need for the multilateral development banks and other international financial institutions to evolve in the light of emerging global challenges has been identified to scale up action on mitigation and adaptation to meet the goals of the Paris Agreement. There is also significant interest in deploying innovative instruments such as debt-for-climate swaps, special drawing rights, blended finance or emission pricing mechanisms.

206. A growing number of private sector initiatives focus on developing net zero targets, transition plans and strategies as well as climate-related financial disclosures, including umbrella initiatives such as the Global Financial Alliance for Net Zero and a range of actor-based net zero alliances (Asset Owners Net Zero Alliance, Net Zero Banking Alliance, etc.) Similarly, initiatives such as the Coalition of Finance Ministers for Climate Action and the Network for the Greening of the Financial System have been pursuing efforts to address macroeconomic implications of climate change in the context of their mandates.

207. **Key finding 16: existing cleaner technologies need to be rapidly deployed, together with accelerated innovation, development and transfer of new technologies, to support the needs of developing countries.**

208. The uneven pace of the 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 are crucial for knowledge-sharing, ownership, acceptance of technologies and accelerating innovation.

209. The Technology Mechanism, comprising the Technology Executive Committee and the Climate Technology Centre and Network, facilitates international cooperation on technology development and transfer through capacity-building, knowledge-sharing, and technical and financial support to aid developing countries in their efforts to develop, adopt and deploy climate technologies. Parties continue to consider strengthened linkages between the Technology Mechanism and the Financial Mechanism to accelerate action on technology development and transfer, including on TNAs and technology action plans. More than 100 developing country Parties have completed at least one TNA, and almost 1,000 technology action plans and project ideas derived from TNAs have been developed to date, for many of which support is being sought.

210. However, more effective strategic technology cooperation would enable rapid systems transformation that is aligned with achieving the goals of the Paris Agreement. 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 as well as accelerators of progress in key climate technology priorities. Information on the global status of technology development and transfer is needed to better inform such efforts, under the Technology Mechanism and beyond it.

211. Reductions in costs and increased access to finance for some key technologies should enable greater deployment globally, particularly in developing countries. Technology development has already led to tremendous reductions in costs. The unit costs of some technologies have decreased by up to 80 per cent. Continuing to drive down the average cost of capital for such technologies and reducing unit costs for other key technologies for just energy and other sectoral transitions will be deciding factors for whether the goals of the Paris Agreement are met.

212. 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 promote learning through successful climate technology initiatives, with the aim of increasing access to new and existing technologies and driving down costs.

Collaborative approaches can also foster domestic data generation and ownership and innovation sharing 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, including national systems of innovation (focusing on technology hardware, software and orgware). Such approaches can include investments in technology development and transfer through joint research and development programmes and capacity-building.

213. 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, while ensuring inclusive multi-stakeholder engagement and access to financial support and capacity-building.

214. A need for further research and development of technologies exists in all sectors, but particularly in "hard to abate" sectors and in technologies that are required to achieve net zero CO_2 emissions by 2050 and to address overshooting in emission pathways pursuing efforts to limit the temperature increase to 1.5 °C. Research is also needed to understand the role of technology and innovation in supporting transformational adaptation.

215. **Key finding 17: capacity-building is foundational to achieving broad-ranging and sustained climate action and requires effective country-led and needs-based cooperation to ensure capacities are enhanced and retained over time at all levels.**

216. The fundamental challenges presented by climate change require the capacity to act to be strengthened in all countries, particularly in developing countries where the underlying institutional and foundational capacities are less developed and the risks and vulnerabilities can be much greater. Capacity limitations present barriers across all dimensions of climate action, including mitigation, adaptation, enabling and using technology and finance, and averting, minimizing, and addressing loss and damage.

217. To be effective, capacity-building needs to be systemic, which could include some modalities such as training, but invariably entails investing in the existing underlying social and economic systems, such as education and health, which will allow for the creation of sustained human and institutional capacities across all sectors in society. Capacities, including skilled human and institutional capacities, need to be retained over time. Developed countries need to increase the level of support provided for strategic capacity-building to developing countries to address locally determined needs.

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

219. Capacity-building is a systemic challenge. Needs-based approaches to capacity-building determine the priority capacities required to move forward in terms of implementing the key instruments of the Paris Agreement (e.g. NDCs, NAPs, LT-LEDS, BTRs) 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 ensuring 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 and the ability to develop plans to support the implementation of domestic mitigation measures in NDCs.

220. 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, which can include capacity-building support, for example, by universities, research organizations, civil society organizations and the private sector. Capacity-building based on Indigenous and other traditional knowledge systems also presents opportunities for more sustainable avenues to long-term capacity development.

221. 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 is key and requires coherent and consistent effort across multiple United Nations organizations and other intergovernmental organizations to support coordinated systemic capacity-building support that integrates across efforts related to mitigation, adaptation and averting, minimizing, and addressing loss and damage.

V. Way forward

222. The first GST is taking place in an era of dramatic and widespread changes. While multiple crises cannot be ignored, neither can the opportunities for enhanced climate action. Since its adoption, the Paris Agreement has inspired near-universal climate action, but the global community is not on track to meet the long-term goals set out in the Paris Agreement, despite the collective progress made. The Paris Agreement, through its GST, provides the basis for informing further ambition in enhancing action and support to respond to the climate crisis. The best available science has made clear that the window of opportunity for taking action is closing rapidly. The first GST comes at a critical moment for accelerating collective progress. As this report shows, much more action is needed now, on all fronts and by all actors, if the long-term goals of the Paris Agreement are to be met.

A. Good practices

223. The 2022 NDC synthesis report noted that many Parties have communicated good 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 in and lessons learned from INDC preparation and implementation efforts; submitting updated or new NDCs in 2020–2021; conducting extensive stakeholder consultations and peer review to enhance their understanding of NDCs; 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. As Parties prepare their next NDCs, they may draw on the rich technical information from the input and technical assessment phases of the GST.

224. The technical assessment phase of the first GST included discussions on good practices, challenges, opportunities and barriers across a range of topics. Many actionable solutions and creative suggestions for overcoming challenges were identified. Examples of good practices are documented in the summaries of the three meetings on the technical dialogue and the extensive inputs that have been received, including information on action already being undertaken by Parties and non-Party stakeholders to implement the Paris Agreement.

225. Some ways were proposed to make the good practices from the GST information portal more easily accessible, including through technical annexes and/or through an online searchable interface. Several examples of technical annexes were submitted and discussed, with a wide range of views among participants. Two groups of participants submitted further details on previous proposals: a compendium of illustrative adaptation actions and an example of a technical annex on mitigation.[6] A searchable interface was also developed by an independent organization and shared with participants.[7] It enables Parties and non-Party stakeholders to explore the rich content generated through the GST for themselves, finding good practices of most relevance to their interests and needs.

[6] See https://unfccc.int/topics/global-stocktake/information-portal.
[7] https://gst1.org/.

B. Information gaps

226. The TD has been based on the best available science, drawing on the findings of the AR6 and other knowledge sources, with extensive involvement of experts and facilitators, with a view to laying a strong scientific and technical basis for the consideration of outputs component of the GST. The active engagement of a wide range of participants from Parties and non-Party stakeholders in the TD has demonstrated the importance of strong scientific evidence and inclusion of diverse voices.

227. During a learning-by-doing process, the following information gaps emerged that the scientific community might address in the years ahead in order to better inform the next GST and work programmes and other processes under the Paris Agreement:

(a) Information gaps exist in relation to emissions scenarios in which the global warming temperature temporarily exceeds and then returns to below 1.5 °C above pre-industrial levels. Further research on such scenarios could determine the extent of CO_2 removal measures needed, improve understanding of potential economic and non-economic loss and damage during a period of overshoot and identify proactive adaptation options for managing that potential loss and damage;

(b) More information is needed on which climate change impacts are reversible and which are irreversible. In particular, more understanding is needed of how to avoid and respond to tipping points.

228. Reviewing overall progress in achieving the GGA during the TD included considering efforts across the adaptation cycle and opportunities and challenges related to making adaptation more transformational. Discussions under the Glasgow–Sharm el-Sheikh work programme on the GGA are ongoing with a view to developing a common understanding of the GGA, and focus on dimensions, themes, cross-cutting issues and sources of information for informing the framework for the GGA. Increasing understanding of progress in achieving the GGA and provision of information on adaptation in national reporting should enable a more comprehensive assessment of adaptation during the second GST.

C. Agreed next steps

229. At CMA 5, the first GST will conclude with the consideration of outputs phase. This will consist of a series of high-level events at CMA 5 as well as discussions by Parties in the joint contact group established by the subsidiary bodies. In line with decision 19/CMA.1, these discussions are expected to inform and deliver the political outcome of the GST, identify opportunities and challenges in relation to enhancing climate action, summarize key political messages and support and identify possible measures and good practices. The work under the input and technical phases of the first GST has brought to light critical information, research, experience and best practices that can inform these discussions at CMA 5.

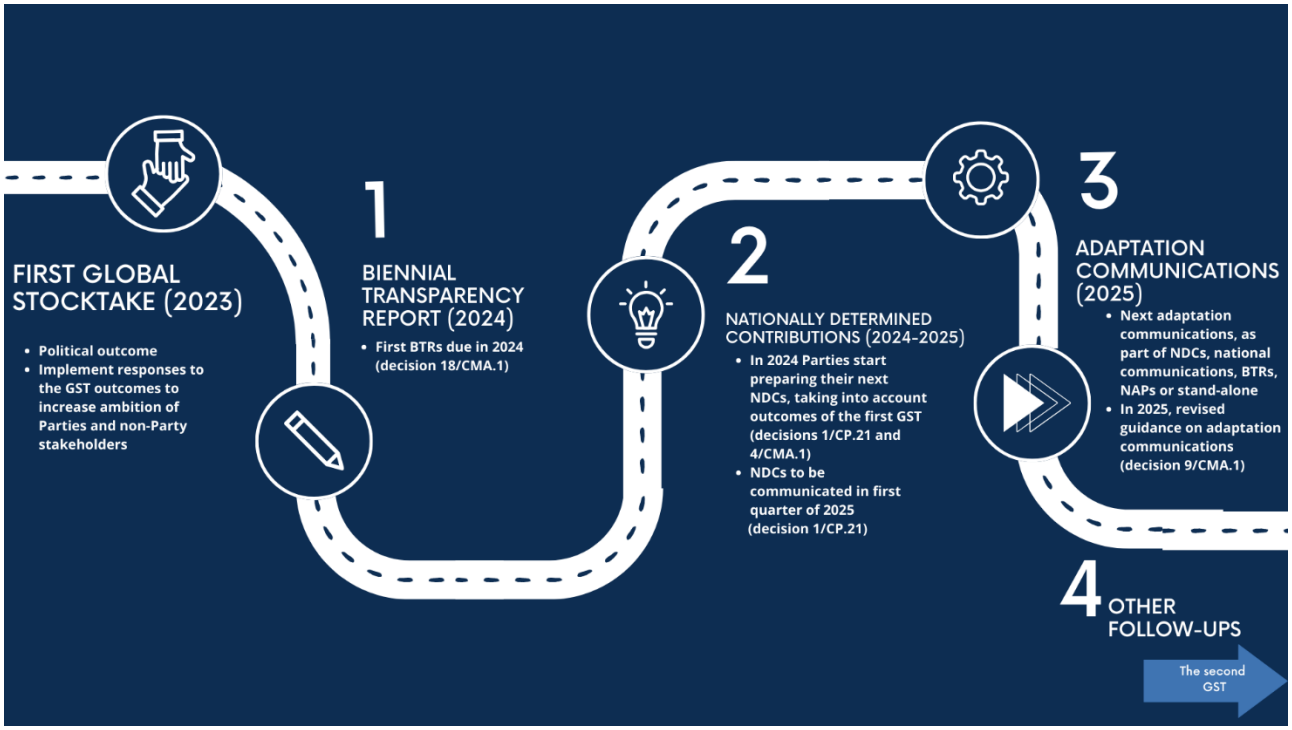
230. Some of the follow-up activities to the first GST that have already been agreed by Parties are illustrated in figure 3:

(a) The next round of NDCs, which are required by the Paris Agreement to be submitted every five years, will be prepared and then communicated by Parties by 2025, to be informed by the outcomes of the first GST;

(b) In 2024, after the first GST, Parties will submit their first BTR, which is a key step to enhance transparency and enable collective accountability;

(c) Parties may update their adaptation communication at any time and submit it as a component of or in conjunction with other communications or documents, including a NAP, an NDC or a national communication.

Figure 3
Follow-up activities to the first global stocktake



231. Under the CMA, other mandated activities of constituted bodies and under ongoing work programmes are relevant to matters identified through the TD, such as the Sharm el-Sheikh mitigation ambition and implementation work programme and the ad hoc work programme on the new collective quantified goal on climate finance, established for 2022–2024. In 2025, Parties will consider and potentially revise the guidance on adaptation communications. The GST outcomes and outputs (including this synthesis report) can inform these other processes.

Annexe I

[*Anglais seulement*]

Traceable accounts

1. This annex provides, for each subchapter in chapter IV of this document, some details that could assist readers in understanding the sources of specific information used in preparing key and supporting information.

I. Context

2. This topic was discussed at TD1.2 in response to calls from TD1.1 to consider integrated and holistic findings resulting from intersections among the thematic areas of the GST. The report of TD1.2 summarized focused exchanges on this matter (paras. 288–324), as well as initial emerging messages that emerged during TD1.1 and TD1.2 (paras. 102–119). The report on TD1.3 summarized further discussions on this matter (paras. 147–193). The three key findings are also supported by information from the synthesis reports prepared by the secretariat under the guidance of the co-facilitators, pursuant to decision 19/CMA.1, paragraph 23,[1] the AR6 and the UNEP *Emissions Gap Report 2022*.[2]

II. Mitigation, including response measures

3. This topic was discussed at all the meetings of the TD and was summarized as follows: in the report on TD1.1, paragraphs 24–28 (initial contributions by participants), 55–104 (round-table discussions), 242–280 (world café stations), 353–358 (comments by negotiating groups, Parties and non-Party stakeholders) and 387–394 (reflections); in the report on TD1.2, paragraphs 29–55 (reflections), 129–181 (round table and breakout groups), 328–349 and 426–466 (world café stations); and in the report on TD1.3, paragraphs 35–85 (round-table discussions and world café stations). The five key findings (4–8) are also supported by information from the synthesis reports prepared pursuant to decision 19/CMA.1, paragraph 23, the AR6 and the UNEP *Emissions Gap Report 2022*.

III. Adaptation including loss and damage

4. This topic was discussed at all the meetings of the TD and was summarized as follows: in the report on TD1.1, paragraphs 29–33 and 43 (initial contributions by participants), 105–175 (round-table discussions), 281–305 (world café stations), 359–361 (comments by negotiating groups, Parties and non-Party stakeholders) and 395–402 (reflections); in the report on TD1.2, paragraphs 56–81 (reflections), 182–248 (round table and breakout groups), 350–366 and 467–474 (world café stations); and in the report on TD1.3, paragraphs 86–107 (round-table discussions and world café stations). The five key findings (9–13) are also supported by information from the synthesis reports prepared pursuant to decision 19/CMA.1, paragraphs 23–24, the AR6 and the UNEP *Adaptation Gap Report 2022*.[3]

[1] See https://unfccc.int/global-stocktake-secretariat-synthesis-reports-and-addendas.

[2] UNEP. 2022. *Emissions Gap Report 2022: The Closing Window – Climate crisis calls for rapid transformation of societies.* Nairobi: UNEP. Available at https://www.unep.org/resources/emissions-gap-report-2022.

[3] UNEP. 2022. *Adaptation Gap Report 2022: Too Little, Too Slow – Climate adaptation failure puts world at risk*. Nairobi: UNEP. Available at https://www.unep.org/resources/adaptation-gap-report-2022. Available at https://www.unep.org/resources/adaptation-gap-report-2022.

IV. Means of implementation and support and financial flows

This topic was discussed at all the meetings of the TD and was summarized as follows: in the report on TD1.1, paragraphs 34–39 (initial contributions by participants), 176–237 (round-table discussions), 306–332 (world café stations), 362–367 (comments by negotiating groups, Parties and non-Party stakeholders) and 403–414 (reflections); in the report on TD1.2, paragraphs 82–101 (reflections), 249–287 (round table and breakout groups), 367–425 (world café stations); and in the report on TD1.3, paragraphs 108–145 (round-table discussions and world café stations). The four key findings (14–17) are also supported by information from the synthesis reports prepared pursuant to decision 19/CMA.1, paragraphs 23–24, the AR6 and the fifth BA.

Annexe II

[*Anglais seulement*]

Approach taken to the process of the technical dialogue of the first global stocktake

1. In accordance with decision 19/CMA.1, paragraphs 9–10, the co-facilitators conducted the TD in a comprehensive, facilitative and efficient manner, and as a Party-driven, transparent process that allowed Parties to engage and hold discussions with each other, experts, accredited observer organizations and other non-Party stakeholders (see table 2 for an overview of relevant information).

2. All written inputs in the form of submissions were made fully accessible online to participants. The GST submissions and information portals were upgraded to improve on their functionality in the course of the TD. These submissions, representing over 170,000 pages, helped to inform the planning of, and fed into the discussions at, the meetings of the TD. They are reflected in the summary reports on each meeting and served as valuable resources for this synthesis report. They also functioned as the basis for the two poster sessions held at SB 57 and 58.

3. The co-facilitators prepared and made available, with the assistance of the secretariat, information notes to aid in participants' planning prior to, as well as summary reports following, each meeting of the TD. The co-facilitators also held informal consultations and webinars with Parties and non-Party stakeholders on these documents, including on emerging messages, to provide clarification and hear constructive feedback; taking into account views expressed by participants. Additionally, the co-facilitators made themselves available to Parties, groups of Parties and non-Party stakeholders during the sessions of the subsidiary bodies.

4. The TDs were organized in a variety of formats, including opening and closing plenaries, world cafés, round tables (TD1.2 included four breakout groups established per round table after an initial introduction by the co-facilitators) and focused exchanges[1] organized in four clusters: mitigation, including response measures; adaptation, including loss and damage; means of implementation and support; and integrated and holistic approaches. The co-facilitators were also committed to pioneering innovative forms of participant engagement and launched calls for poster sessions and creative spaces.[2] At TD1.3, the co-facilitators arranged for a demonstration session on a searchable interface/online GST tool.[3] A total of 252 hours of meetings and discussions were held during the three meetings of the TD across all formats.

5. The arc of discussions included laying the information base at TD1.1, including on well-known gaps and discussions on what is being done; identifying how to bridge gaps and shift the focus to implementation at TD1.2; and concluding with focused discussions on what is next at TD1.3, including how Parties, observer organizations and other non-Party stakeholders could progress in their collective efforts towards the Paris Agreement goals and objectives using the emerging messages contained in the summary report on TD1.2.

6. The co-facilitators employed a learning-by-doing approach to the organization of the TD by building on the organization of work in each successive meeting, continuing with what worked well, and making improvements where the process could have worked better based

[1] In response to requests from Parties to discuss integrated and holistic approaches, two focused exchanges were organized at TD1.3 at SB 57. A round table was held on this thematic area at TD1.3.

[2] Submissions to the creative space held at TD1.2 and the two poster sessions held at TD1.2 and TD1.3 are available at https://unfccc.int/global-stocktake-td12-creative-space, https://unfccc.int/global-stocktake-td12-poster-session and https://unfccc.int/event/gst-td-poster-session respectively.

[3] Available at https://gst1.org/.

on many good suggestions by participants, and introduced norms for discussion that helped to foster an inclusive, transparent, robust and fruitful process throughout the TD.[4]

7. Invited speakers at TD meetings included the IPCC Chair, the UNFCCC Executive Secretary, the Chairs of the subsidiary bodies, and representatives of the COP 27 and incoming COP 28 Presidencies. In addition, a number of experts, facilitators and panel members were invited to support TD events and prepare presentations, prompts, and world café station notes to guide the discussions.[5] Selection of experts, facilitators and panel members respected gender and geographical balance to the extent possible, while ensuring relevant expertise in the related fields. Participants at the round tables and focused exchanges included a mix of Parties, accredited observer organizations and other non-Party stakeholders. Parties self-selected within their negotiating groups, nominations were received from each constituency within accredited observer organizations, and the secretariat ran an expression of interest process for other non-Party stakeholders, where participants were proposed based on similar evaluation criteria as applied to the selection of experts. Participants were issued with secondary badges to facilitate easy identification and secure their seats at the round tables.

8. While the TD events were all held in-person, the plenaries, round-table discussions and focused exchanges were streamed to an online platform that was accessible to all registered participants. The world cafés were not streamed but dedicated notetakers captured the results of the discussions to inform the round tables and for inclusion in the TD summary reports. Opening, closing and reporting plenaries were webcast, and on-demand videos can be accessed on the UNFCCC website.[6] Graphic artists recorded the results of the discussions at several events. Their artwork captures the salient aspects of these events in a universally understandable pictorial format.[7]

Table
Information relevant to the technical dialogue

Information relevant to the TD	*Links*
General	
GST web page	https://unfccc.int/topics/global-stocktake
Compilation of relevant mandates and provisions	https://unfccc.int/sites/default/files/resource/Mandates_%20Global%20stocktake_2022%20%28002%29%5B80%5D.pdf
Non-paper by the Chairs of the subsidiary bodies	https://unfccc.int/sites/default/files/resource/Non-paper%20on%20Preparing%20for%20GST1_0.pdf
Call for inputs for the first GST	https://unfccc.int/sites/default/files/resource/Call%20for%20inputs%20SB%20Chairs_GST_reminder_Feb23.pdf
Guiding questions for the technical assessment component of the first GST	https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf
GST information portal containing inputs to the GST	https://unfccc.int/topics/global-stocktake/information-portal
Synthesis reports and addenda for the technical assessment by the secretariat and constituted bodies and forums and other institutional arrangements serving the Paris Agreement	https://unfccc.int/global-stocktake-secretariat-synthesis-reports-and-addendas

[4] See annex III in https://unfccc.int/sites/default/files/resource/GST_Technical_Dialogue_Information_Note.pdf.

[5] All presentations, prompts and world café station notes are available at https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogue-of-the-first-global-stocktake.

[6] See https://unfccc.int/SB58/schedule?access=All&field_event_has_webcast_value=1&amount-time=23%3A59%20h&field_start_datetime=&field_end_datetime=&search=&field_event_datetime_value_1=1.

[7] See https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogue-of-the-first-global-stocktake. The pictorial format facilitates understanding but does not inform the synthesis report by the co-facilitators.

Information relevant to the TD	*Links*
Searchable interface/online GST tool	https://gst1.org/
GST events at regional climate weeks in 2022	https://unfccc.int/topics/global-stocktake/global-stocktake-governance-and-facilitation/the-global-stocktake-at-regional-climate-weeks-2022
TD1.1	
TD1.1 web page	https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogues-of-the-first-global-stocktake/technical-dialogue-11-td11-of-the-first-global-stocktake
Information note on TD1.1	https://unfccc.int/sites/default/files/resource/GST_Technical_Dialogue_Information_Note.pdf
Statements by Parties and non-Party stakeholders	https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogues-of-the-first-global-stocktake/technical-dialogue-11-td11-of-the-first-global-stocktake
Summary report on TD1.1	https://unfccc.int/sites/default/files/resource/GST%20TD1_1_sreport_26_09_2022_Final.pdf
TD1.2	
TD1.2 web page	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
Call for inputs for TD1.2	https://unfccc.int/sites/default/files/resource/message_to_parties_and%20observers_sb_chairs_call%20for%20inputs_first_gst.pdf
Information note on TD1.2	https://unfccc.int/sites/default/files/resource/GST%20TD1.2%20Information%20Note_20221007.pdf
Statements by Parties and non-Party stakeholders	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
Summary report on TD1.2	https://unfccc.int/sites/default/files/resource/TD1.2_GST_SummaryReport.pdf
TD1.3	
TD1.3 web page	https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogues-of-the-first-global-stocktake/third-meeting-of-the-technical-dialogue-td13-of-the-first-global-stocktake
Call for inputs for TD1.3	https://unfccc.int/sites/default/files/resource/message_to_parties_and%20observers_sb_chairs_call%20for%20inputs_first_gst.pdf
Information note on TD1.3	https://unfccc.int/sites/default/files/resource/GST%20TD1.3%20Information%20Note_0205.pdf
Statements by Parties and non-Party stakeholders	https://unfccc.int/topics/global-stocktake/components-of-the-gst/technical-dialogues-of-the-first-global-stocktake/third-meeting-of-the-technical-dialogue-td13-of-the-first-global-stocktake#Opening-plenary
Summary report on TD1.3	https://unfccc.int/sites/default/files/resource/GST_TD1.3%20Summary%20Report_15_August_Final.pdf