**Joint Work Programme of the UNFCCC Technology Mechanism
for 2023–2027**

Accelerating Climate Action through Technology Development and Transfer

**Supporting countries to achieve the goals of the Paris Agreement and the United Nations
Framework Convention on Climate Change and to implement national climate plans
through transformative technologies**

I. Introduction

1.   The joint work programme of the UNFCCC Technology Mechanism for 2023–2027 (herewith referred to as the joint work programme) lays out the Technology Mechanism's strategy for the five-year period. It is composed of the joint activities and common areas of work of the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), the rolling workplan of the TEC and the Programme of Work of the CTCN, for the duration of 2023–2027. The joint work programme brings together, for the first time, the long-term strategies of the TEC and the CTCN and defines areas of focus for the mechanism as a whole, in order to elevate the performance of the Technology Mechanism and increase its impact. The TEC and CTCN may update the joint work programme as appropriate.

A. Technology Mechanism

2.   COP 16 established the Technology Mechanism, comprising the TEC and the CTCN, to facilitate the implementation of enhanced action on technology development and transfer to support action on mitigation and adaptation in order to achieve full implementation of the Convention.[1]

3.   The TEC is the policy arm of the Technology Mechanism. It analyses climate technology issues and provides policy recommendations that inform and facilitate country efforts to enhance climate technology development and transfer. The TEC consists of 20 technology experts representing both developed and developing countries.

4.   The CTCN is the implementation arm of the Technology Mechanism. Its main purpose is to catalyse, coordinate and stimulate technology cooperation and enhance the development and transfer of technologies to developing countries at their request. It does this through three core services: 1). Providing technical assistance at the request of developing countries on technology issues; 2). Creating access to information and knowledge on climate technologies; and 3). Fostering collaboration among climate technology stakeholders via its network of national, regional, sectoral and international organisations which support the implementation of CTCN services. The CTCN is accountable to and guided by Parties through an advisory board, comprised of 30 members, including government representatives representing both developed and developing countries, non-governmental representatives, and representatives of constituted bodies, including the TEC.

5.   Both the TEC and the CTCN report to the Conference of the Parties (COP), and the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA), through subsidiary bodies.[2]

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[1] Decision 1/CP.16, para. 117.
[2] Decision 17/CP.20, paragraph 4, by decision 15/CMA.1, paragraph 4.

B.   Technology framework and the Glasgow climate pact

6.   The Paris Agreement, adopted in 2015, highlights the importance of technology for the implementation of mitigation and adaptation actions, and the importance of strengthening cooperative action on technology development and transfer.

7.   Article 10, paragraph 4, of the Paris Agreement, established the technology framework. The framework provides overarching guidance to the Technology Mechanism and can play a strategic role in improving the effectiveness and efficiency of the work of the mechanism in addressing the transformational changes envisioned in the Paris Agreement and the long-term vision for technology development and transfer.

8.   At COP24 (CMA1) in 2018 in Katowice, Parties adopted the elaboration of the technology framework and agreed to operationalise it through a series of focused areas of actions to be undertaken by the TEC and CTCN, organised under five key themes[3] as follows: Innovation, Implementation, Enabling environment and capacity building, Collaboration and stakeholder engagement, and Support. The Katowice decision also underlines the pressing need to accelerate and strengthen technological innovation and the importance of upscaling and diffusing emerging climate technologies.

9.   The Glasgow Climate Pact, agreed at COP26 in 2021, called upon Parties to accelerate the development, deployment and dissemination of technologies to transition towards low-emission energy systems. The pact also emphasised the importance of cooperative action on technology development and transfer, including accelerating and enabling innovation, and the importance of predictable, sustainable and adequate funding for the Technology Mechanism.[4]

10.   Further, Parties, through decision 9/CP.26 paragraph 2 and decision 15/CMA.3 paragraph 2, invited the TEC and the CTCN to strengthen their collaboration with a view to ensuring coherence and synergy and effective implementation of the mandates of the Technology Mechanism, inter alia, by exploring the preparation of a joint programme.

11.   The short- and long-term work of the TEC and CTCN is therefore guided by the technology framework and other relevant decisions adopted by Parties, with the additions of the mandate and functions of the Technology Mechanism as set out originally by COP16.

C.   Scientific context

12.   The key messages from the 2018 IPCC Special Report on the impacts of Global Warming of 1.5 °C (SR 1.5)[5] and the 2021 IPCC Working Group I report on the physical science underpinning climate change[6] are clear: urgent, immediate, rapid and large-scale reductions in greenhouse gas emissions are needed to keep the global goal of limiting warming to close to 1.5°C or even 2°C within reach.

13.   This message was further highlighted in the IPCC's Sixth Assessment Report (IPCC AR6) and the contributions from Working Group III (IPCC WG III), on Mitigation of Climate Change,[7] which stresses that the time for action to halve emissions by 2030 is now, pointing to the increasing evidence of climate action. The tools and know-how required to limit warming are available; what is needed now is to scale up efforts at a faster pace.

14.   IPCC AR6 also highlights that limiting global warming will require major transitions in the energy sector and points to a number of key areas with high potential for emission reductions such as: cities/urban areas, industry, agriculture, forestry, and land use change.

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[3] Decision 15/CMA.1.
[4] Decision 1/CMA.3, paragraphs 36 and 60.
[5] https://www.ipcc.ch/sr15/chapter/spm/.
[6] https://www.ipcc.ch/report/ar6/wg1/.
[7] https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/.

15.   Further, chapter 16 of the IPCC WG III brings a focus on innovation and technology development and transfer with key insights on the following:[8]

(a)   Substantial unit cost reductions in several granular technologies: Some of technologies options are increasingly technically viable, becoming rapidly cost-effective, and have relatively high public support; although many still face institutional barriers. The adoption of low emission technologies is slower in most developing countries, particularly in the least developed countries;

(b)   Technology can be an enabler to accelerate mitigation and a key dimension of potential feasibility of climate responses and adaptation options;

(c)   Technology development is not linear. A systemic perspective on technological change can provide insights for policymakers in supporting their selection of effective innovation policy instruments. This systemic view of innovation considers the role of actors and institutions, and their interactions, and can inform how innovation systems that vary across technologies, sectors and countries, can be strengthened. It can also play a role in clarifying the synergies and trade-offs between technological innovation and the SDGs;

(d)   The speed of technological change can be explained by the key drivers of innovation: R&D, learning-by-doing and spill-over effects. In addition, new innovations are sometimes enabled by the development of general-purpose technologies, such as digitalization;

(e)   Policies can influence changes in technologies, as well as changes to the systems they support. Technology-push policy instruments stimulate innovation by increasing the supply of new knowledge through funding and performing research. Demand-pull instruments support market creation or expansion and technology transfer and thus, promote learning by doing, economies of scale, and automation;

(f)   Developing countries have lagged in benefitting from technological opportunities. Technological change is inhibited if technological innovation system functions are not adequately fulfilled, this inhibition occurs more often in developing countries;

(g)   International cooperation on technological innovation is one of the enablers of climate action in developing countries on both mitigation and adaptation. Experiences with international cooperation on technology development and deployment suggest that such activities are most effective when approached as result-oriented "innovation cooperation" that engenders a holistic and systemic view of innovation requirements, is done via an equitable partnership between donors and recipients, and develops local innovation capabilities;

(h)   Emerging ideas for international cooperation on innovation include promoting developing country participation in technology programmes, climate-related innovation system builders, universities in developing countries that play the role of central hubs for capacity-building, sectoral agreements, and international emission standards.

16.   Also relevant are findings from the Working Group II contribution (IPCC WGII) to IPCC AR6 on Impacts, Adaptation and Vulnerability,[9] which highlight the following:

(a)   Climate-resilient development is enabled when governments, civil society and the private sector make inclusive development choices that prioritise risk reduction, equity and justice, and when decision-making processes, finance and actions are integrated across governance levels, sectors and timeframes;

(b)   Climate resilient development is facilitated by international cooperation and by governments at all levels working with communities, civil society, educational bodies, scientific and other institutions, media, investors and businesses; and by developing partnerships with traditionally marginalised groups, including women, youth, Indigenous Peoples, local communities and ethnic minorities;

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[8] Extracted from the presentation by Ambuj Sagar and Heleen de Coninck during the roundtable on the first technical dialogue of the first Global Stocktake which took place in June 2022 and the contents of chapter 16 WG III. The full presentation is accessible on: https://unfccc.int/event/roundtables-on-the-first-technical-dialogue-td11-of-the-global-stocktake.

[9] https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/.

(c)   These partnerships are most effective when supported by enabling political leadership, institutions, and resources, including finance, climate services, and information and decision support tools.

17.   The two bodies of the Technology Mechanism will strive to take into account the findings from IPCC reports in their future work, in particular by focusing on transformative technologies.

D.   Activities of the Technology Mechanism

18.   The TEC and CTCN have undertaken their mandated functions through their respective rolling workplans and Programmes of Work. In addition, the CTCN implements annual operating plans, which provide detail on the specific activities to be carried out annually, in line with the resources available to support its operations and its Programme of Work. In accordance with CMA guidance, the TEC workplan and CTCN Programme of Work for 2019-2022 ensured alignment with the technology framework of the Paris Agreement and the five key themes and activities that Parties defined therein.

19.   To ensure enhanced coherence and synergy under the Technology Mechanism, the TEC and CTCN have sought out opportunities to collaborate and platforms through which to share information and provide feedback, namely:

(a)   Joint sessions between the TEC and the CTCN Advisory Board: Joint sessions organised as part of the bi-annual TEC and CTCN Advisory Board meetings have provided valuable venues for the exchange of experiences, knowledge and feedback arising from the work of each body;

(b)   Joint communication and outreach efforts: The TEC and CTCN have undertaken joint communication and outreach activities to ensure coherent communication under the Technology Mechanism and Technology Framework. Examples include joint Technology Mechanism events organised during the SBs and COPs which provide valuable opportunities for the TEC and the CTCN to speak with one voice – as the Technology Mechanism – and to jointly discuss challenges and lessons learned regarding technology transfer and development;

(c)   Participation in each other's events: TEC members have been invited to moderate and present the findings of their work during the regional forums for national designated entities (NDEs) organised by the CTCN as part of the UNFCCC regional climate weeks. The CTCN has also facilitated the participation of NDEs in TEC events held during the regional climate weeks;

(d)   Joint monitoring and evaluation system: In 2019, the TEC and the CTCN jointly implemented a consistent and robust monitoring and evaluation system to report on their respective activities, and their contributions to the transformational changes envisioned in the Paris Agreement. The system includes a biennial NDE survey which is carried out jointly to track the impacts of activities under the Technology Mechanism;

(e)   Exchange of technical data and information: At the technical level, the TEC and the CTCN have worked closely through the exchange of technical data and information across different areas of work of the TEC and the CTCN to ensure synergy and overall coherence of the work of the Technology Mechanism. For example, CTCN technical assistance data has been used by the TEC to analyze enablers and barriers in technology development and transfer, while TEC policy briefs have been used by countries to help countries identify priorities and enable them to develop requests for technical assistance from the CTCN.

20.   In addition to the recurring collaborations and feedback mechanisms listed above, the TEC and the CTCN have undertaken joint activities on specific topics of mutual relevance where the expertise of each body is harnessed to deliver a coherent contribution from the Technology Mechanism to inform the broader activities of the UNFCCC. Examples of recent joint activities include:

(a)   In 2021, the TEC and CTCN conducted joint work on technology and nationally determined contributions (NDCs) which provided a comprehensive analysis and synthesis of information on technology needs and challenges; linkages between policy and implementation; and linkages between NDCs and national adaptation plans (NAPs). The joint work resulted in the first

Technology Mechanism publication[10] and the first joint key messages and recommendations to the CMA on this topic;[11]

(b)   The TEC and the CTCN, in collaboration with the gender team of the UNFCCC secretariat, supported the integration of gender considerations into the UNFCCC process, including by disseminating briefs on gender integration under the UNFCCC process, raising awareness of gender equality issues on International Women's Day and organizing a meeting with other UNFCCC constituted bodies to share experience on gender-mainstreaming. The TEC and the CTCN also initiated discussions with the gender team on operationalizing an online gender expert roster in 2022.

21.   COP 26 and CMA 3 invited the TEC and the CTCN to strengthen their collaboration, with a view to ensuring coherence and synergy and effective implementation of the mandates of the Technology Mechanism, inter alia, by exploring the preparation of a joint programme.

II.   Purpose

22.   The purpose of the Technology Mechanism's first joint work programme is to accelerate efforts on transformative climate technology development and transfer in order to support countries to achieve the goals of the Paris Agreement and those of the UNFCCC, and to implement their national climate plans.

23.   The joint work programme coordinates the work of both bodies in responding to Parties' guidance and the latest scientific findings described above and facilitates further coherence, synergy and impact in the work of both bodies, through defining areas of focus for the mechanism as a whole, while allowing flexibility for each body to perform their respective functions.

24.   By focusing the efforts of the TEC and CTCN on defined programme areas, this joint work program ensures that the work of both bodies is mutually supportive while allowing for activities to be held jointly and separately. Further, the joint work programme serves to ensure that the TEC and CTCN collectively implement all the mandates and guidance of the Technology Framework of the Paris Agreement.

25.   The joint work programme also provides the flexibility to incorporate new guidance received from Parties, such as outcomes of the first periodic assessment of the Technology Mechanism at COP27 and outcomes of the Global Stocktake at COP28.

26.   The joint work programme of the Technology Mechanism comprises a section on joint activities and common areas of work between the TEC and the CTCN, elaborated in Section III , the rolling workplan of the TEC, elaborated in section IV, and the Programme of Work of the CTCN, elaborated in V.

III.   Joint activities and common areas of work of the Technology Executive Committee and the Climate Technology Centre and Network

27.   The work of the TEC and the CTCN, through their joint work programme, focuses on facilitating and stimulating the uptake of technologies to support NDC ambition and implementation, and enhancing the role of innovation in deploying technological solutions at a faster pace and at scale. In this respect, the TEC and CTCN are uniquely positioned to strengthen the ability of countries to accelerate climate action and to achieve national climate goals as well as the collective goals of the Paris Agreement, through more ambitious mitigation and adaptation actions.

28.   This section highlights the points of intersection between the activities of the TEC and the CTCN where joint and complementary approaches to implementing activities can increase coherence and amplify the impact of the Technology Mechanism's work as a whole. Core to the Technology Mechanism's work over the next five years and building upon efforts to date (see section I.D), the TEC and the CTCN will ensure the mainstreaming and progression of systematic feedback on an ongoing basis. To ensure continued complementarity and closer collaboration

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[10]   See https://unfccc.int/ttclear/tec/techandndc.html.
[11]   See Joint annual report TEC and CTCN for 2021 FCCC/SB/2021/5.

between the two bodies, every TEC activity will be implemented with CTCN engagement and vice versa. Engagement between the two bodies can take multiple forms, including the provision of inputs; consultations to ensure coherent approaches (e.g. on what constitutes impactful technology); the use of CTCN technical assistance data to inform the TEC's analytical work and vice versa, the use of TEC policy findings and recommendations to inform the implementation of CTCN activities; and implementation of joint activities. Moreover, the TEC and the CTCN will jointly plan and implement various high-level and regional events, knowledge-sharing activities on available technologies and highlight key thematic issues. Both bodies will also strive to speak with one voice, as the Technology Mechanism, and submit joint submissions, as appropriate.

29.   The focus areas described below fall into two categories: specific joint activities and common areas of work. The former will be carried out jointly, where both bodies agree on the scope and modalities and jointly lead on the work; while the latter consists of distinct, yet complementary, activities carried out by each body as part of common areas of work.

30.   The Technology framework, under Article 10, paragraph 4, of the Paris Agreement designates that the TEC and CTCN should support technology transfer through the meaningful participation of all stakeholders, with consideration of gender as well as indigenous capacity building and knowledge sharing. As such, special attention will be given to engaging various stakeholders in undertaking the activities presented in the joint work programme, including opportunities for integrating gender, youth and indigenous people's considerations.

A.   Joint activities

31.   The section below outlines new joint activities and continuing joint activities of the TEC and CTCN from 2022.[12] Additional joint activities may be included at a later date.

1.   Technology roadmaps

32.   Technology planning tools, including technology roadmaps (TRMs), form the architecture of a strategic approach to maximising the potential for deployment of technologies to achieve climate objectives. This includes embedding TRMs and other planning tools in NAPs and NDCs, and in plans to implement NDCs and support net-zero development pathways.

33.   One of the TEC's functions is to catalyse the development and use of TRMs at the international, regional and national levels to support the implementation of NDCs, NAPs and LT-LEDS. The CTCN, through its provision of technical assistance and capacity building, also facilitates the implementation of mitigation and adaptation actions, including the use of planning tools and processes such as TRMs.

34.   Previous joint work of the TEC and CTCN on Technology and NDCs highlighted the potential role of TRMs for different sectors to stimulate the uptake of technologies in support of NDC implementation. As such, both bodies have agreed to further this work as part of their joint activities for 2022-2023, namely through the preparation of a background paper on TRMs, built on, inter alia, the TEC work on roadmaps. This joint work will consist of the following:

        (a)   Analysing success stories and lessons learned, from CTCN technical assistance, stakeholders' experiences and international organisations' work, in preparing sectoral climate TRMs and implementing them to stimulate the uptake of technologies in support of NDC implementation;

        (b)   Analysing the various steps of TRM preparation, including potential linkages with TNAs and TAPs;

        (c)   Giving due consideration to how to make such roadmaps implementable (looking beyond linkages to NDCs and long-term low greenhouse gas emission development strategies) and exploring the links to financial resources needed for the development, transfer and deployment of climate technologies.

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[12]   Joint TEC-CTCN activities 2022–2023.

35.   Based on the findings of this initial analysis and exploration of TRMs, and the identification of relevant sectoral focus areas, further joint activities will be defined and added to the joint work programme, including potentially the development of guidelines or pilot roadmaps.

2.   Digitalization

36.   The IPCC AR6 identifies digitalization as one of the reasons to expect a fast energy transition and cited as one of three megatrends that are transforming the delivery of services in innovative ways. Emerging digital technologies, such as distributed ledger technologies (DLTs) and blockchain, have the potential to unlock and accelerate global actions toward the Paris Agreement and the SDGs.

37.   Digital platforms can also play a role in accelerating innovation and the diffusion of green technologies. Green technology databases, for example, provide online catalogues of green technologies and marketplaces for a wide variety of groups seeking to commercialize, license or distribute green technologies from prototype to marketable products.

38.   The TEC workplan employs the framework of general-purpose technologies (GPTs) to analyse the potential of digital technological platforms to provide solutions across sectors and industries for a growing number of interrelated innovations. Digitalization is embedded across several of the TECs activities in its new workplan, including on the role of artificial intelligence and applied machine learning as enablers of climate solutions. The CTCN Programme of Work identifies digitalization as an enabler whereby digital tools can accelerate and amplify the impact of system transformations and bring more transparency to the climate governance and decision-making process. The Programme of Work will explore how digital technologies and circular design can bring significant reductions in the global carbon footprint, specifically through promoting access to digital public goods.

39.   As part of their joint work, the TEC and the CTCN will explore the role of distributed ledgers and green technology databases as supporting tools and resources for innovation cooperation.

3.   Continuing joint activities

40.   The continuing joint activities for the period 2022–2023[13] include work on gender and technology, technology and NDCs, monitoring and evaluation, joint communication and outreach, and enhancing systematic feedback between the two bodies.

41.   Upon the conclusion of the above-mentioned joint activities, the TEC and CTCN will review them and reflect on what has worked, with the aim of continuing modalities of collaboration. Additionally, these joint activities may generate new proposals for future joint activities which will be included in the joint work programme at a later date.

B.   Common areas of work

42.   Common areas of work under the joint work programme are elaborated below. Across all areas, the TEC and CTCN will ensure systematic feedback and strive to make use of each bodies' work, including but not limited to, TEC publications and policy recommendations and CTCN technical assistance and capacity building outcomes, to inform to development and implementation of their respective activities. In light of the CTCN's demand driven nature, further activities and common areas of work where complementarities between the two bodies are identified, may be added to this document as appropriate.

1.   National Systems of Innovation

43.   National systems of innovation (NSI) is a topic highlighted under the Innovation key theme of the Technology Framework. Specifically, the framework guides the TEC and CTCN to support Parties to incentivise innovation through the improvement of enabling environments for establishing and/or strengthening national systems of innovation.[14]

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[13] See footnote 12.
[14] Decision 15/CMA.1, Annex, paragraph 8(a).

44. The IPCC emphasizes the transformative potential of a focus on NSI in developing countries. Strengthening institutions and building local capacity to promote innovation can serve as the basis for enhanced enabling environments, another key theme of the technology framework, and set the stage for enhanced technology development and transfer, in support of climate and other sustainable development goals, and across multiple sectors.[15]

45. The TEC intends to continue its work on NSIs in its next rolling workplan, informed by the findings of the IPCC AR6 Working Group III report relevant to strengthening NSIs, in particular the policy frameworks that are effective enablers for research and development, innovation and access to funding. Activities to be carried out include the finalisation of a compilation of good practices and lessons learned from the setup and implementation of NSIs and the development of a tool to identify and map country needs for NSI. Furthermore, the TEC will explore ways, in collaboration with the operating entities of the Financial Mechanism, to support readiness and capacity building processes to facilitate access to funding for innovation (Reference activities A1.1 and A1.2 in TEC workplan 2023-2027).

46. NSI also plays a central role in the CTCN's next Programme of Work where it features as one of two enablers through which the CTCN will catalyse progress and achieve impact in its targeted areas of focus. The Programme of Work cites examples of innovation as approaches that include support to policies, institutional and regulatory frameworks and planning processes, and the strengthening of NSI. It also highlights the importance of engagement and collaboration with academic and research institutions that are key actors in strengthening NSI.

47. The TEC and CTCN's respective work on NSI offer opportunities for complementary collaboration that can enable both bodies to extend their reach and develop more comprehensive outputs by integrating the findings of each other's work. For example, the TEC can use the outputs and lessons learned from the CTCN's technical assistance and capacity building activities on NSIs to inform its work on the compilation of good practices and lessons learned. The CTCN, in turn, may also consider the findings and recommendations emanating from the TEC's work on NSI when it develops its menu of technical assistance offerings designed to support innovation in the five system transformation areas for consideration by NDEs. The TEC and the CTCN can also jointly conduct outreach to NDEs to promote awareness of the role of NSI in fostering innovation. Finally, the TEC and the CTCN can jointly design a capacity building workshop or guidelines for Direct Access entities and NDEs to enhance capacities to develop funding proposals on innovation.

2. Water-Energy-Food systems

48. The TEC's workplan includes work on Water-Energy-Food systems including an analysis on knowledge gaps on the nexus of agriculture, water, food security, energy and climate and plans to identify relevant adaptation technologies (including indigenous), innovations, and digital solutions that can strengthen adaptation planning (NAP) and NDCs in agriculture (Reference activity C1.1 of TEC workplan for 2023-2027).

49. The TEC's workplan includes work on Water-Energy-Food systems including an analysis on knowledge gaps on the nexus of agriculture, water, food security, energy and climate and plans to identify relevant adaptation technologies (including indigenous), innovations, and digital solutions that can strengthen adaptation planning (NAP) and NDCs in agriculture (Reference activity C1.1 of TEC workplan for 2023–2027).

50. The CTCN Programme of Work highlights the "Water-Energy-Food nexus" as one of five areas where countries seek system-wide transformations (see Figure 11 of the CTCN Programme of Work). The CTCN's efforts in this area will focus on supporting conservation restoration, and enhancement of marine and terrestrial ecosystems and food security.

51. The respective activities of the TEC and CTCN are complementary - the gaps analysed by the TEC can be based on findings and lessons learned from CTCN technical assistance, while the TEC's analysis on innovative adaptation technologies and the role of digitalization can feed back into the CTCN's work in responding to related requests from developing countries.

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[15] IPCC Working Group III on the mitigation of climate change, Chapter 16.

3. Energy systems

52. Energy-related considerations have been integrated across different areas of work of the TEC's new workplan. For example, the TEC proposes to analyse country needs for RD&D for high-impact emission-reduction technologies, considering the need to ensure long-term environmentally sustainable supplies of energy (Reference activity A2.1 in TEC workplan 2023–2027).

53. Many developing countries are impeded in their efforts to a clean energy transition due to lack of a supportive policy and regulatory environment to propel rapid energy transitions. By working to improve such enabling environments supported by digital technologies, as well as promoting systemic innovation; building circular economy practices; and providing guidance on appropriate financing schemes, the CTCN will make substantial contributions toward enabling countries to activate a sustainable energy sector that integrates circular economy, renewable energy solutions including green hydrogen and energy efficiency in their energy mix.

54. The work of the TEC on energy, including its earlier work on energy supply and demand, can help inform the work of the CTCN and vice versa.

4. Buildings and resilient infrastructure

55. Buildings and infrastructure are identified as a dedicated area of work for the TEC in its next workplan, as part of a focus on transformative and innovative solutions. The TEC's work on buildings and infrastructure will explore the use of low carbon materials in buildings, green building codes and green zoning systems that promote energy efficiency and resilience (Reference activities C.2.1 in TEC workplan 2023–2027).

56. The CTCN has made great strides in fostering resilience in buildings and infrastructure through its technical assistance and capacity building. In its new programme of work, the CTCN will focus on supporting efficient and resilient buildings and infrastructure through the development of enabling environments (including regulations and efficiency standards), sectoral roadmaps for urban and rural planning, knowledge sharing and training, and the deployment of grey and green infrastructure.

57. The TEC and CTCN will closely inform and engage each other on their work in relation to buildings and infrastructure.

5. Business and Industry

58. The TEC's new workplan places a focus on transformative and innovative technological solutions as a means to accelerate the reduction of greenhouse gas emissions. As part of this focus, the TEC will dig deeper into hard-to-abate industrial sectors, in particular the steel and cement industries, to promote low and near zero emission production and products. The TEC's work will be guided by an initial mapping of existing initiatives to identify areas where the TEC can add value, in addition to the development of a synthesis report on standards for low and near zero emission production and products. (Reference activity A.2.2 in TEC workplan 2023–2027).

59. To address this system transformation, the CTCN plans to support decarbonization initiatives for carbon intensive business and industry, optimizing material flows and reducing life-cycle emissions, costs, and policies. In part, this will be achieved through active partnerships facilitated by the CTCN to provide matchmaking services (between the scientific community, private sector, cooperatives, and financial institutions), and through regional fora to assist beneficiaries with new and innovative technology solutions and business models. Additionally, the CTCN will continue to provide capacity-building to develop women and youth entrepreneurship initiatives and to support frameworks, policies, and programmes for early-stage innovation.

60. The TEC can consider outputs from the CTCN's initiatives and activities in this area and the CTCN can consider the outcomes of the work of the TEC on low and near zero emission production and products in its technical assistance work.

6. Technology Needs Assessment

61. Building on its recent work on linkages between the TNA and NDC processes, the TEC will carry out an initial gap assessment of existing guidance on TNAs, in addition to an analysis of success stories of implemented TAPs, as the basis for initiating an update of the TEC's TNA

guidance. In addition, the TEC will develop a knowledge product on how developing countries can be supported in updating their TNAs and implementing their TAPs (Reference activities B.1.1 in TEC workplan 2023–2027). In carrying out its work, the TEC will draw from the CTCN's technical assistance and capacity building experience supporting countries to develop and update their TNAs and implement their TAPs.

62.   The CTCN has supported countries in undertaking their TNAs to strengthen their abilities to analyse and prioritize climate technologies, as well as enhancing the implementation of their results. As NDCs are updated, the CTCN anticipates greater need to support countries in identifying what technologies are best suited to implement the priorities defined in NDCs. The CTCN will continue to support countries in prioritising climate technologies and facilitate the implementation of TNAs and TAPs for the alignment with NDCs taking into account the TEC's work on the update of TNA guidance.

63.   The complementary functions of the TEC and the CTCN will continue to support countries' efforts to address both policy and implementation aspects of climate technology development and transfer in support of the implementation of their NDCs.

C.   Other areas

64.   There are rapidly emerging global technology issues and respective decisions and outcomes of the COP; CMA and high-level activities, including on Loss and Damage, that may require the urgent attention of the Technology Mechanism, within the period of the implementation of the latest plans and programmes above-stated, that may also be given due consideration. As such, reporting includes but is not limited to the plans our forward in this document.

IV.   Rolling Workplan of the Technology Executive Committee

65.   The new rolling work plan of the TEC for the period 2023–2027[16] was developed taking into account a number of considerations including, among others, to be responsive to Parties' guidance, embedding components of the Technology Framework in the activities of the TEC, to be informed by science and be transformative, and to support NDC implementation and ambition.

66.   Every activity of the TEC will be implemented with CTCN engagement and will consider the potential for complementing CTCN activities. Further, the TEC will engage various stakeholders in undertaking its work, mainstream gender and enhance its communication and outreach.

67.   The activities of the TEC for the period 2023–2027, are grouped into the following four workstreams:

- Workstream 1: National Systems of Innovation and Collaborative Research, Development and Demonstration and General Purpose Technologies;

- Workstream 2: Technology needs assessments and technology planning tools to support NDC implementation;

- Workstream 3: Transformative and innovative solutions (water-energy-food system, buildings and infrastructure, transformative industry, nature and ecosystem);

- Workstream 4: Collaboration and engagement with other UNFCCC processes and constituted bodies and other UN agencies.

68.   Full details on the activities, deliverables, and timeline of the above workstreams can be found in the table contained in the TEC rolling workplan document.

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[16]   TEC rolling work plan 2023–2027.

V. Programme of Work of the Climate Technology Centre and Network

69.   In developing its third Programme of Work for 2023–2027,[17] the CTCN sought views from its core stakeholders both under and outside the Convention, including among others, the CTCN Advisory Board, TEC members, Network members, NDEs, and representatives of constituency groups. In addition, the CTCN considered outcomes from the second independent review of the effective implementation of the CTCN and the guidance provided by Parties, including in the Technology Framework.

70.   Integral to the CTCN's third Programme of Work is the continuation of the delivery of its mandate to respond to country-driven requests for services with a focus on building and strengthening developing country capacity to address technology challenges and opportunities for adaptation and mitigation.

71.   The CTCN's third Programme of Work has identified two enablers (National Systems of Innovation and Digitization) that it plans to focus its efforts on to deliver its functions, allowing it to respond quickly to the needs of developing country parties and build the scale of its interventions. In addition to the two enablers, the Programme of Work also identifies five system transformational areas to complement the CTCN's demand driven delivery model. These are: water-energy-food nexus; buildings and resilient infrastructure; electro-mobility; energy systems and business and industry.

72.   Full details on the programme framework and priority areas can be found in the CTCN Programme of Work document.

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17   CTCN Third Programme of Work 2023-2027; CTCN Third Programme of Work 2023-2027 - Summary